DeltaQualifikationsMatrix

Kurze Produkt- und Technologiezyklen elektronischer Bauelemente sowie neue Umweltauflagen führen häufig zu Short product and technology cycles as well as new environmental regulations frequently result in process prozeß- und werkstofftechnischen Änderungen an Bauelementen, Leiterplatten, Verbindungstechnik und Schaltung, welche evaluiert werden müssen. Eine geeignete Methodik zur Handhabung von Änderungen an elektronischen Bauelementen beschreibt die ZVEI "Guideline for Customer Notifications of Product and /or Process Changes (PCN) of Electronic Components specified for Automotive Applications". Ein wesentlicher Teil dieser Guideline sind die hier vorliegenden Matrizen, welche sich als Empfehlungen für die Evaluierung von typischen Änderungen an elektronischen Bauelementen verstehen. Dies sollte Teil des offenen und risikobewussten Dialoges zwischen Lieferant und Kunden sein.

Diese DeltaQualifikationsMatrizen wurden durch den Industriearbeitskreis "PCN DeltaQualifikationsMatrix" und den Bauteilexperten des ZVEI Arbeitskreis "PCN-Methodik" erarbeitet. Der Inhalt wurde basierend auf dem aktuellen Stand der Technik erstellt und erhebt keinen Anspruch auf Vollständigkeit. Im Einzelfall ist ggf, ein abweichendes Vorgeben abzustimmen, da kundenspezifische Vereinbarungen zur Qualifikation zu berücksichtigen sind.

Anwendung der DeltaQualifikationsMatrix (auszufüllen durch den Bauelementehersteller)

- a) Diese Tabelle ist nur bei Änderungen anzuwenden. Neugualifikationen und Sondergualifikation (z.B. Verguß von Modulen) sowie Information Notes bleiben von diesen Matrizen unberührt.
- b) Ist eine Änderung in dieser Tabelle nicht aufgeführt, so ist der Qualifikationsumfang zwischen Kunde und Lieferant abzustimmen.
- c) Die Matrix der Aktiven Bauelemente ist so aufgebaut, dass zwischen integrierten Halbleitern (AEC-Q100 Rev. H) und diskreten Halbleitern (AEC-Q101 Rev. D1) auszuwählen ist (Zelle D4). Für passive Bauelemente gilt die AEC-Q200. Für LED's gilt die AEC-Q102. Für Multi-Chip-Module ailt die AFC-Q104.
- d) Alle Änderungen in der PCN sind in der Spalte B durch ein Kreuz (x) zu markieren und werden dadurch farblich hervorgehoben. Sofern dies geschehen ist, werden im Feld "Tests, which should be considered for the appropriate process change" alle in Betracht zu ziehenden Zuverlässigkeitstests angezeigt.
- e) In "Tests, which should be considered for the appropriate process change after selection of condition table" wird die Anpassung der in Betracht zu ziehenden Tests in Folge der Relevanz bezüglich der Änderung berücksichtigt.
- Dazu ist die Tabelle "Conditions" entsprechend der Auswahl (A/B/C) mit einem (x) zu bewerten
- f) In "Suppliers performed tests" dokumentiert der Bauelementehersteller die durchgeführten bzw. genlanten Tests.
- g) Falls von der Testempfehlung abgewichen wird, so sollten diese Abweichungen vom Bauelementehersteller angezeigt und kommentiert werden. Hierzu ist der Bereich "Reason for exception of tests" zu verwenden. Werden die in Betracht zu ziehenden Tests durch generische Daten (G) belegt, ist dies ebenfalls hier anzuzeigen und zu begründen.

Die Einstufung des Untersuchungslevel erfolgt in folgende Kategorien

- "C: Component level": Die Evaluierung der Änderung am Bauelement ist durch Untersuchungen ausschließlich am Bauelement beim Bauelementehersteller durchführbar. Zur Evaluierung der Änderung dürfen Ergebnisse aus bereits durchgeführten Untersuchungen herangezogen werden, wenn diese zu einem ähnlichen Bauelement bereits vorliegen (Generische Daten).
- "B: Board level": Die beschriebene Änderung hat möglicherweise Einfluss auf die Verarbeitbarkeit des Bauelementes im Steuergerät. Die Evaluierung der Änderung wird wie unter C beim Bauelementehersteller durchgeführt. Zusätzlich ist durch den Kunden/Steuergerätehersteller die Verarbeitbarkeit zu prüfen, die z.B. abhängig von der Änderung, Zuverlässigkeitsuntersuchungen auf applikationsrelevanten Testbords erfordert.
- "A: Application level": Die beschriebene Änderung hat möglicherweise Einfluss auf die Applikation/ das Steuergerät. Die Evaluierung der Änderung wird wie unter C oder B durchgeführt. Zusätzlich ist vom Kunden/Steuergerätehersteller der Einfluss der Änderung im Steuergerät durch geeignete Untersuchungen zu hewerten. Dieses Vorgeben ist mit dem OEM abzustimmen. Hierbei ist zu berücksichtigen, ob die Steuergeräte-/Baugruppenanforderungen durch andere Qualifikationer hereits hinreichend abgesichert sind (annlikationssnezifische Risikohetrachtung)
- " *: Not relevant for qualification matrix": Änderung(en), die nicht in A, B oder C eingestuft werden können und somit nicht relevant für die DeQuMa sind

Änderungen die nur eine Information Note benötigen (bei der Bewertung Risk on Supply Chain als "I" gekennzeichnet), dürfen nicht in der DeQuMa angekreuzt werden, da Sie ansonsten den erforderlichen Evaluierungslevel verfälschen. Für als "I" bewertete Änderungen ist das Information Note Formblatt zu

- Zur formgerechten Anwendung der DeltaQualifikationsMatrizen steht auf der Homepage des ZVEI AK ein Tutorial bereit (ZVFI-Tutorial).
- ID Nummer; ist eine eindeutige Identifikationsnummer für iede angegebene Änderung, die in den ZVEI PCN DeltaQualifikatiosMatrizen identifiziert ist. Die gleiche ID Nummer wird zur Identifizierung der Änderung im PCN Form Sheet verwendet.
- Die mittels Matrix identifizierten Tests sind in Betracht zu ziehen, d.h. es ist zu prüfen, ob der jeweilige Test für die spezifische Änderung in dieser Form notwendig ist. Abweichungen oder generische Daten sind im Detail zu begründen.
- Die Spalte "Further applicable conditions", Bemerkungen und Fußnoten sind unbedingt zu beachten, da sie wichtige Hinweise und Einschränkungen enthalten.
- Zur Nutzung aller Funktionen muss in Excel die Anwendung von Makros freigegeben sein.

DeltaQualificationMatrix

and material changes of components, printed circuit boards, assembly techniques and circuit layout which have to be evaluated. The ZVEI "Guideline for Customer Notifications of Product and /or Process Changes (PCN) of Electronic Components specified for Automotive Applications" describes an appropriate methodology for dealing with changed electronic components. The qualification matrices in this guideline are recommendations for how to assess typical changes of electronic components. These recommendations promote an open risk-based discussion between supplier and customer regarding

The DeltaQualificationMatrices were developed by the Industry Task Force Team "PCN DeltaQualificationMatrix" together with component experts from the ZVEI Working Group "PCN-Methodology". Actual content represents state-of-the-art technology and does not claim to be comprehensive. Deviation from proposed guideline should be mutually agreed as customer specific

DeltaQualificationMatrix Application (completion by component manufacturer)

- a) This table has to be used for changes only. The matrices are not applicable for new product. special qualifications (for instance for encapsulation of module) or Information Notes.
- b) If a change is not listed in this table, the qualification plan has to be defined and agreed between customer and supplier.
- c) The matrix for Active Components requires the user to choose between integrated circuits (AEC-Q100 Rev. H) and discrete semiconductors (AEC-Q101 Rev. D1) (cell D4). For Passive Components AEC-O200 is used. For LED'S the AEC-O102 is used. For Multi-Chip-Modules the AFC-Q104 is used.
- d) All changes as listed in the PCN have to be marked by a cross (x) in column B and will appear colored. The relevant reliability tests are then shown in "Tests, which should be considered for the appropriate process change".
- e) In "Tests, which should be considered for the appropriate process change after selection of condition table" is for modification of the found relevant tests under consideration of the weight
- Related table "Conditions" has to be assessed per proposed letters with an (x).
- f) In "Suppliers performed tests" the component manufacturer documents the planned and performed tests
- g) In case of deviations from tests, which should be considered this should be notified and commented by the component manufacturer in the area "Reason for exception of tests" Test results in form of generic data (G) are allowed when notified and justified

Evaluation Levels are categorized as follows

- "C: Component level": The evaluation of a change at component level by the component manufacturer is sufficient. Generic data from other relevant evaluations can be used.
- "B: Board level": The intended change described in the PCN may influence processability / manufacturability of the component at board level. Therefore additional evaluation by customer may be necessary, for example reliability tests on application relevant testboards depending on change.
- "A: Application level": The intended change described in the PCN may influence the properties of the application (e.g. Electronic Control Unit). In addition to the evaluation under C or B the influence of the change in the application is evaluated by suitable investigations by the customer. The scope of the evaluation has to be aligned with the OEM. It has to be considered whether the application / assembly requirements are already sufficiently safeguarded by other qualifications (application specific risk assessment).
- " *: Not relevant for qualification matrix": Changes which fulfill neither A,B nor C definitions

Changes indicated as "I" shall not be marked in the DeQuMa. For those changes the Information Note sheet shall be used. As the DeQuMa is desired for PCN only, a marking of "I"-changes would automatically influence evaluation level and test effort

- To use the matrices in the right form the ZVEI working group provides a Tutorial on its homepage
- ID number: is a unique identification number for each indicated change defined in the ZVEI PCN DeltaQualificationMatrices. The same ID number is used in the PCN Form sheet to identify the
- Tests identified by the matrix have to be considered and checked if they are necessary to assess the specific change. Test modifications or generic data have to be justified in detail.
- "Further applicable conditions", comments and notes need attention, as they provide important
- In order to use all functions in EXCEL, macros have to be allowed.

History of DeQuMa

Version	Remarks
2.0	Revised by ZVEI PCN Methodology Workgroup in March 2015
2.1	Released March 2015
2.1.1	Active Components - delete write protection in comments
2.2	Solved problems with some ActiveX configurations
2.2.2	Solved Problems in Active Components
2.2.3	Solved Problems ActiveX, Active Components SEM-DE-02 (Design changes in routing) error fixed
2.2.4	Minor fixes
3.0	General Revision by ZVEI PCN Methodology Workgroup in June 2016
	Changes are indicated by underlining in the read only version named Changes_DeQuMa_rev3_vs_rev2.xlsx
3.0.4	Expert Release
3.0.5	Fixing of macro bugs
3.1	Final Release (orthographic and punctuation corrections)
4.0	General Revision by ZVEI PCN Methodology Workgroup in July 2019.
	Muliti Chip Modules newly added to DeQuMa
	LED Components now based on the AEC Q102
	Further Changes see separate PDF's Excel-File, where changes are indicated by underlining
4.1	LED worksheet: Content of columns had been swapped due to rearrangement and omission of columns.

Worked on:																											
Date:			Form provided by ZVEI - Revision 4.1 - No	vember 2019																							
PCN number:																											
Signature:											MATER	UAL DEDE	ODMANO		ice eva			C 0400 I	Davida la	- 110						additi	anal to
ircuits or discrete tors select below:	AEC-Q100 Revision H -							inclu	des integrate	d circuits	(e.g. ASI	Cs, µ-Con	troller, m	emories	, voltage r	egulator	s of AE	c-Q100 F	evices,	n H) logic de	vices,	analog	devic	es,)		AEC-	Q10x
Ţ	Assassment of impact on Supply Chain regarding following aspects	Remain	ing		Evaluation level in matrix A/B/C	Further applicable conditions	from site check)		urridity Bas or blased HAST rbines HAST	yeling sture Cycling	ue Strage Life ue Operating Life	re Rate 20, Data Retertion, and 0	Shear Pul	sions		g Latestic measurown glan	Temperature instability n	nange lodel nange e Model	Topological Control of the Control o	n n Communitie	aradadation		ge Test		Napor	2, JED EC JES0201)	Pomarks
ID 1	- Uninciazia i appeamenta - Lechnical Instella of processibility/manufacturability of customer - Loun, fit, function, quality performance, seliability	risks wi Suppl Chain	y Understanding of semiconductors experts	Examples to explain	A Application level B Boardlevel C. Component level *: Not relevent for qualificati		vion fusing by data or aud	00 Revision H	Tempeature I	Power Temper	High Tempera High Tempera	NVM Enduran Operational U	Whe Bond Shi	Physical Dimer Solder Bal Sh	Lead Integrity Electromigratic	Hot CarrierInj	Negative Blas Stess Mgrate	Electronic Disc Human Body I Electronic Disc Changed Davk	Latch up	Chanacherisatic	Short Grouk C	Soft Error Rate Leadfree	Hermetic Pack	List Tompe	Die Shear Internal Water	Whis low test ()EC 60:089-T2-1	Advantages of the control of the con
	Type of change	No	res		4805 5803		n be exe	AEC-Q1	E 5	2 2 A4 A5	H2F	5 8	88W 6	0 0 8	5 8	B g	TBN SM	HBM COM	3 8	CHAR CHAR	S S	S P	MECH	5	8 <u>§</u>		
SEM-AN-01	Any change with impact on agreed upon technical contractual agreements	Р	P intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	I			-		_	A4 A5	AB B1								. E4 E			- ·					
	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix below.	Р	technical contractual acreements. Any change which is not covered in the matrix p below, but risk assessment at customer is recommended.		В														-								
	DATA SHEET Change of datasheet parameters/electrical specification (min./max./lyp. values) and/or AC/DC apacification	T _P T	P Update of data sheet because of technical change of the product.	e.g. recommendations for pull-up/pull-down or NC pins, MSL	A					1.1.1			I.I.I		1.1.1	. 1.1			1.1			I.I.	I . I .	.] . [
SEM-DS-02 0	specification Correction of data sheet or issue of emita		No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please indicate clearly, that Infonde contains	NC pine, MSL a.g. Errata	A											- -											
SEM-DS-03 S	Specification of additional parameters	1	this type of channel. Disscription of a new not previously covered parameter. No technical change of the product. (P): Definition of new parameter which was not documented before. (P): Not known as single change. Only in combination with other changes.	(i): e.g. adding new tested parameter.	A																						
	DESIGN			I																							
SEM-DE-01	Design changes in active elements. ')	Р	Any device relevant changes in design / byout of elements with effect on data sheet P Not included: Modification to adjust product parameter within specified process window and design rules. Any advances of soline harmon designs in which	e.g. change of ESD structure e.g. add / remove a translator in layout	A	Please check if data sheet is affected (SEM-DS-01).		٠ .	٠.	• M		• D,J			- D	D D	D D	• •		• • •		•	- 1	-			•
SEM-DE-02	Design changes in routing . 1)	Р	Any change of wining between elements in chip design / laryout with effect on data sheet. P 7) Not included: Modification to adjust product parameter within specified design rules.	e.g. mask changes in metal fix for corrective action (based on external 8D report)	с	A Impact on EMC behavior cannot be evaluated / excluded on component level. A If Impact or electrical function is not excluded on component level. Please check if data sheet is affected (SEM-DS-01).				A M									1.	• •							•
SEM-DE-03	Die shink ³)	Р	P Shrink of active area. 3) Not included: sawing street/kerf/scribe line.	Typical shrink of die.	A	Please check if change in process technology (SEM-PW-00) is also affected.		•		- M	•	• D,J			- •	• •	• •		•	• • •	• •	•		- -		-	•
SEM-DE-04	Permane modification	ı	integrated software by design or memory as defined by supplier. (I): Firmware modification or update without of feet of functional performance at the customer floor file. (P): Firmware modification or update with effect of functional performance at the customer.	(i): e.g. addition of Firmware opportunities (P): e.g. bug fix with impact on functional performance	A		÷													. . .							
SEM-PW-01	PROCESS - WAFER PRODUCTION New / charge of wafer substrate material	T _P	P New wofer material.	e.g. different waf er material to currently released material (like change from EPI material) into non-EPI material)	С														1.1.								Qualification effort soc. AEC-Q100: see diffusion/doping
SEM-PW-02	New waf or diameter	Р	P Change of water diameter resulting in equipment and process changes.	material into non-EP1 material)	С	Impact on changes in SEM-PW-09 and/or SEM-EQ-01.	٠			E M			E E					E E	++								AEC-0100: "For broad changes that involve multiple attributes (e.g., site, make processes), refer to section A1.3 of this apparetix and section 2.3 of 0100, while allows for the selection of worst-case test vehicles to cover all the possible permutations."
SEM-PW-03	New final sofer thickness	Р	p Change in final wafer thickness.	e.g. change in final chip/die thickness	с	A: If thermal conductivity is affected (like MOSFET; IGBT, BGA package, stacked dex,) A: If impact on EMC or ESD behavior cannot be evaluated / excluded on component level.				ЕМ			E E					E E	Е.								•
SEM-PW-04	Change of electrically active doping/implantation element	Р			А					- м		# -											-				•
SEM-PW-05	Charge of gate material / delectrics	Р	P Change of gate material and / or gate dielectric material.		А					• M		- D,J					•		•	• •							•
SEM-PW-05	New / change of backside operation (grinding / metalization)	Р	P Change of bottom layer of die (between die and leadframe). Change in process, material, or dimensions necessary. Alternative a see SEM-PW-00	e. g. change from CnN///Au to CnN///Ag	с	A: If thermal conductivity is affected (like MOSFET; IGBT, BGA package, stacked dies,) A: If impact on EMC or ESD behavior cannot be evaluated / excluded on component level.				• M								м м					н .		н -		AEQ-Q100: Applicable to all arriset power devices.
SEM-PW-07	New / change of metalization / visa / contacts	Р	Change in metalization of bondpads, material, layer thickness specifically for chip frontside and internal layers.	e. g. change from AlSiCu to AlCu e. g. change in over pad metallization	с					• M						- -								- -		-	•
SEM-PW-08	New / change of passivation or die coating (without bare die)	Р	 Change of top layer on die (between mold compound and die). 	e. g. addition of polylimide	С	A: If transia consuctively is serected (see MOGFE1; IGB1, BGA package, stacked dies,) A: If impact on EMC or ESD behavior cannot be evaluated /				• M		#,N D,J							•	• •				. -			•
SEM-PW-09	Change in process technology not covered by any other type of change	-	(-): If the change in process technology does not influence the integrity of the final product.	(-): e.g. change from wet to dry etching, e. g. change from hostonial to vertical oven for exidation (P): e.g. change of layer thickness	A	Please also check changes described under EQUIPMENT. Please check if change is described by specific type of change in this matrix.	٠												-	- - -							Cualification effort depends on type of change.
SEM-PW-10	Process integrity: tuning within specification	-	Variation within process specification (-): If tuning within process specification does not influence the integrity of the final product. (9): If remaining risk on product specification is anticipated.	(-): e.g. process control	С	Please check if DATA SMEET is affected. Please check if SEM-PW-G0 is affected.										- -			-								
SEM-PW-11	Charge of wafer supplies.	-	(-): If no remaining risk in supply chain exist P (P): If the change of water supplier can influence the integrity of the final product.	(-): e.g. change of wafer supplier with same material composition. e.g. same material composition and does not influence electrical behavior. (P): e.g. new supplier with impact on substrate material and / or electrical behavior.	с	Not on component, tested on test structure (by pical for IC). Interaction on component lies of for discrete components to case of SOI substanta HF properties have to be qualified. Please check if SEM-PW-01 and SEM-DS-01 is affected.													- 6	9• -							Qualification for IC & p-Controllar difficult on product levil. Characterisation or wide in levil city on test institutes. Many of the product of the product of the product levil of the product of the
			Any change which is not covered by another type of change. Risk is to be assessed. (P): No Risk for Supply chain. (P): Risk for Supply chain (influence on product integrity)	(-); e.g. change of cleaning process in wafer production	с																						
SEM-PW-12 0	Change of specified wafer process sequence (deletion and/or additional process step)	-	Wafer fab transition with additional changes (described above), Includes transit or well as additional abe.	production (P): e.g. additional sinker implantation after standard implantation (to protect circuit against interference impulses).						Ш						Ш								Ш	Ш		AEC-Q100: "For broad changes that involve multiple stiributes (e.g., site, material processes), refer to section A1.3 of this appends and section 2.3 of Q100, which allows for the selection of worst-tess test which so to

SEM-PW-14	Lithography		Change in process technique for lithographic																	1 1			
	Lindgraphy	- P	Change in process technique for lithographic process and material (-): if the change in process technology does not influence the integrity of the final product. (P): if the change in process technology can influence the integrity of the final product.	(-): e.g. exchange of defect mask (P): e.g. change from E-beam process to X-ray process e.g. change from contact into projection mode	с	Please also check charges described under EQUIPMENT.		-	•	• M					 •								•
SEM-PW-15	Ocide / Interlayer Dielectric	- P	Change in process technique for caide / interlayer delectric process (-): if the change in process technology does not influence the integrity of the final product (P): if the change in process technology can influence the integrity of the final product.		A	Please also check changes described under EQUIPMENT.				• M	- #.	N D,J			 								
	BARE DIE		in series are integral or the rine product.																				
SEM-BD-01	New final wafer thickness	РР	Change in final wafer thickness.	Change in final chip/die thickness	A		100								 	E E	E • -					-	ELFR can only be performed on packaged test vehicles. NBTI was removed in deviation from the AEC-Q100 Matrix because there it is a combined type of change (Wafer Dimension/Thickness). NBTI is applicable for wafe dimension change only.
SEM-BD-02	Change of top metallization or bond paid stack	p p	Change in bondpads (incl. stack below), material, pad pitch, surface changes, layer	e. g. change from AlSiCu to AlCu e. g. change in over pad metalization	В										 								dimension chance only.
SEM-BD-03	New / charge of backside metallization	1	Change of bottom layer of die (between die and leadframe). Change in process, material, or	e. g. change in over pad metalization e. g. change from CnN/r/Au to CnNV/Ag	Α											мм		\pm	++	-	+		
SEM-BD-03	New/ change of backside metalization	РР			^			-							 	мм	•				1.1.	-	•
SEM-BD-04	Change of wafer satup or number of possible good dies on wafer.	I P	Needed information for pick & place machine. (I): amount of possible good dies on wafer (P): influence on wafer setup and wafer mapping	(i): e.g. change from 350 to 240 good dies on wafer (P): e.g. information change for pick & place machine.	В		100								 								
SEM-BD-05	Change of optical appearance of wafer edge region (like imide coverage or edge exclusion)	I P	Selection of class in wafer edge region which have if all electrical functionality. (I): in case of wefer edge is all fected only (P): in case of single die is all fected	(f): e.g. appearance of wafer edge (rounded instead of aquare) (P): e.g. polylmide as new coating on die	В										 							-	•
SEM-BD-06	Die sorbe or separation	I P	Needed information for saving and pick & place machine. (I): If the change in saving process does not influence the integrity of the final product. (P): in case if product is delivered on wafer.	(f): e.g. if product is delivered as known good die (in tape and reel) (P): e.g. information change for pick & place machine. e.g. information change for sawing machine.	В	Please check if SEM-BD-04 is affected.					- - -				 							-	
SEM-BD-07	Die Preparation / Clean	- Р	Charge in process technique for de preparation / cleaning / cleaning / cleaning in process does not influence the integrity of the final product. (P): if impact on product integrity is anticipated		В	Please check if SEM-BD-05 is affected.									 								
SEM-BD-08	New / change of passiv ation or die coating	РР	Change of top layer on die.	e.g. addition of polylmide e.g. change of polylmide thickness	В						- #,	N D,J			 								•
SPMPARI	PROCESS - ASSEMBLY Change in critical dimensions of package	Ι.Ι.	Change in dimensions of existing package.	e. g. changes in package dimensions (further	В					• M				. T.	 T. 1					u	. IuI u	1.1	
		P P		development). e. g. change from alloy 42 to copper e. g. change between two different copper							111			-		-			, ,		н		
SEM-PA-02	Change of leadframe base material	P P	New lead rame material in new composition.	e. g. change between two different copper alloys	В		1	•	•	• M	•		• •	• •	 	-		•	- L	н	н -	٠	1
SEM-PA-03	Change in lead rame dimensions	P P	Charge in lead farme dimensions which has impact to the specified electrical parameter acc. data sheat or specification (e.g. heat sink, pin dimensions, die paddle size,). Not included: Variation within specification.	e. g. change in lead frame geometry	В	ESD investigations are only necessary if internal ground and power apply, connection of head rame is affected. A II impact on EMC behavior cannot be evaluated / excluded on component level.				• м					 				- ц	н			
SEMPA-04	Change of lead frame finishing material / area (internal)	РР	Charge of surface material of die attach pad and second bond assa (e.g. influence in adhesion to mold compound, wedge bond reliability)	a. g. change from Ag flash to NP protection layer a. g. change from Ag spot to Au spot a. g. increase of silver plating area.	с					• M	• .		- с •		 				- L	н	н -	-	For whe bond strengt test: Pre- & Post-process change comparison to evaluate process change robusiness (AEC-Q101).
SEM-PA-05	Change of lead and heat alug plating material/plating thickness (external)	P P	Change in material and / or process resulting in a new technology (e.g. pure tin).	e.g. change in heat slug stack e.g. change from Sn into Ni/Pd/Au e.g. change of layer thickness	В		100			• M	•		- c •		 				- L	н	н -	-	
SEM-PA-05	Sump Material / Metal System (internal)	РР	Stack die or die to substrate (*lip chip)	e. g. change to Pb-free material e. g. change of copper pillars	С					• M					 				• L				
SEM-PA-07	Die attach material	РР	Change of die attach material and / or process resulting in a new technology (e.g. soft solder, epoxy, etc.)	e. g. crange or copper points	с	A: If impact on EMC behavior cannot be evaluated / excluded on component level (if die attach has impact on electrical conductivity).				• M					 				- L	н	н н	-	
SEM-PA-08	Charge of wie bording	РР	Material, diameter, change in bonding diagram and / or change in process resulting in a new technology.	s.g. change from Au to Cu material s.g. change from 25µm to 25µm diameter s.g. change from single to double bond s.g. change from stich bond to stich on ball bond.	С	A In case of bond diagram change and EMC carnot be we shared on component level. Please also check changes described under SEM-EC-01.				• a					 		- м -			н			Parameter Analysis: Strictly required only for Power devices, in general: Dist audit for makerial charge with impact on bordprocess (e.g. from Au Act, Collor, Tor broad changes hat the volve emplays bettered (e.g., e.g., ematerials, processes), refer to section A1.3 of this spends and section 2.3 of CRG, which percentages are described and action 2.3 of CRG, which percentages are considered from the control of the control for the control of the control
SEM-PA-09	Substitute / Intergraver	РР	Charge of BGA substrate	e.g. changes in routing	В	& Impact on EMC behavior cannot be evaluated / excluded on component level. A If Impact on electrical function is not excluded on component level.				• M				. т.	 			@• ·	- L	н	- н н	-	
SEMPA-10	Die Overcost / Undef ill	- Р	Supporting layers for complex packages like flip chip and / or change in process resulting in any technology. (-)-If change does not influence the integrity of the final procedure. (P)-If impact does not integrity is anticipated	(-): e.g. change of dispensing speed (P): e.g. change of underfill material	с					• M					 						н		
SEM-PA-11	Charge of mold compound / encapsulation material	РР	Change of mold compound / encapsulation material.	e.g. change to green mold compound e.g. change of title particles	с	B: Impact on thermo-mechanical stress caused by mismatich of mold compound, interconnecting technology and carter is antiquoted (specific for Power Dev closs). At in case of high frequency signals (> 20Hd) is should be assessed if possible changes in permeability of mold assessed if possible changes in permeability of mold compound could affect signal behavior (s.g., digital signal processor).				• M			.		 				• L			-	
SEM-PA-12	Charge of hermetic sealing	РР	Affected areas are material and process of hermatic (e.g. ceramic) packages, capped die and sealed devices (e.g. pressure sensors)	e.g. change of sealing material for RoHS	В	A impact on EMC behavior cannot be evaluated / excluded on component level (if encapsulation / sealing has impact on electrical conductivity).									 							-	
SEM-PA-13	Change of product marking	1 P	and sealed devices (e.g. pressure sersions) Change of marking on device and / or change in pocean resulting in a rew technology (I): If change does not inflance the integrity of the first product. (IF): If impact on product integrity is articipated.	(f): e.g. change of appearance (additional materia) (P): e.g. change from inked marking to laser materia; a.g. materian of pin 1.	В	on electrical conductivity).							в		 								
SEM-PA-14	Change in process technology (e.g. frim and form, lead rame preparation)	- P	(-): If the change in process technology does not influence the integrity of the final product. (P): If the change in process technology can influence the integrity of the final product.		В	Please also check changes described under SEM-EQ-01. Please check if change is described by specific type of change in this matrix.									 							-	
SEMPA-15	Phosess Integrity: luring within specification	- Р	Variation within process specification (-): If turing within process specification does not influence the integrity of the final product. (IP): If impact on product specification is articipated.	(-): a.g. process control	С			·							 								
SEM-PA-16	Change of direct material supplier	- Р	Change of suppliers for direct materials which are used in assembly process (BOM). (-): If change does not inflaence the integrity of the final product. (P): If impact on product integrity is articipated.	(-); e.g. change of whe material supplier. (P); e.g. change to new mold compound supplier e.g. additional lead rame supplier with specific lead rame manuf actuating technology	с	Please check if material is changed									 								See change of material.
SEM-PA-17	Charge of specified assembly process sequence (deletion and/or additional process step)	- P		(-): e.g. additional cleaning step e.g. distains of optical impection (P): e.g. change lead finishing pre trim & form to post trim & form	С										 							-	- Qualification depends on specific change.
SEMPA-18	Move all or parts of production to a different assembly also.	РР	Assembly transfer or relocation. Includes transfer as well as additional site.	e.g. dual source / fab strategy	С	Acr B: impact on other type of changes described under PROCESS ASSEMBLY and SEMEG-91. Check if any other type of process change is applicable due to the transfer.		-		• м				• т •	 				- L	н	нн		Whisker tests have to be done on monitoring basis! AEC-0100: The board changes that live low multiple attributes (e.g., site, materials processes), let or to section A1-0 of this appendix and section 2.0 of 1000, which allows for the selection of worst-case test vehicles to cover all the possible permutations.
SEMPA-19	Die solbe or separation	- Р	Separation process from single wafer to dies. (-): If the change in process does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(-): e.g. change of kerf width (P): e.g. change from assving to lease out	С					• M					 								

SEM-PA-20	Die Preparation / Clean	-	Change in process technique for die prepar / cleaning p (-): If the change in process does not influ- the integrity of the final product. (P): If impact on product integrity is anticipe	nce (-): e.g. change of cleaning time.	с			 •	м - •	 	 	-	 	 	 	 - н	-					
SEMPA-21	Molding / Encapsulation process	- 1	Change in process technique for molding / encapsulation. p (-): If the change in process does not influt the integrity of the final product. (P): If impact on product integrity is setticipe.	nce (-): e.g. tuning within process specification ted.	С			 •	 м • •		 	-			 - ц	 						
	PACKING/SHIPPING																					
SEM-PS-01	Packing/shipping specification change	Р	P Packing/shipping specification change.					 -	 	 	 		 	 	 	 						
SEM-PS-02	Dry pack requirements change	P	P Change of dry pack requirements (e.g. cha of MSL)	rige.				 -	 	 	 	-	 	 	 	 	-					
SEM-PS-03	Change of carrier (tray, reel)	P	P Change of carrier (tray, reel)		В				 	 	 		 	 	 	 						
SEM-PS-04	Change of labeling	-	Change of labelling also on reel. (I): Change of material label without impact barcode. (P): Changes of material label information v affects data processing at customer.	(f) e.g. additional information (RoHS stamp) (P) e.g. change of defined nomenclature for data processing	В				 	 	 			 	 	 						
	EQUIPMENT																					
SEM-EQ-01	Production from a new equipment/tool which uses a different basic technology or which due to its unique form or function can be expected to influence the integrity of the final product	Р	P Change in process technique which is not already covered above.	Change from single water to batch process (e.g. over pad metalization) e.g. damber cutting (mechanical to laser cutting)	A				 	 . . .	 - - -		 	 • -	 	 	-	. .	Affected	process change is	o check.	
SEM-EQ-02	Production from a new equipment/loof which uses the same basic technology (episcement equipment or estension of esisting equipment pool) without change of process.	-	PCN required for dedicated equipment for sensitive component production. (-) If change does not influence the integric of the final product. (P): If impact on product integrity is anticipated.	(-)c e.g. extension of existing equipment pool (P): e.g. extension of dedicated equipment in case basic technology still need to be proven ted.	с				 	 . -	 	-		 	 		-					
SEMEQ-03	Change in final test equipment type leading to a different test concept.	Р	P Change of tester platform with diff enences HW or SW that makes a change in test con necessary (only in case of bare die: final to means wafer test).	cept	С				 	 	 	-	 	 • -	 		-	•	Gage Rã	UR / delta correlation		
	TEST FLOW																					
SEM-TF-01	Move of all or part of electrical wafer test and/or final test to a different test site.	Р	P Check impact on SEM-AN-01	Dual source strategy	С	Check if any other type of process change is applicable due to the transfer		 	 	 	 	-	 	 • .	 	 	-		Gage R&	UR / delta correlation		
	Q-GATE																					
SEM-QG-01	Change of the sext coverage/heating process flow used by the supplier to ensure data sheet correlators (e.g. electrical reasonment test flow block indexedonate the second of monitoring procedure or serving).	1	a.g. test flow block, reduction from three temperature measurements to two temperature pressurements to two temperature process. (-): If change does not inflaence the integri of the final product. (P): If impact on product integrity is anticiped.	(P): e.g. reduction from three temperature measurements to two temperature measurements	с		٠		 - - -	 	 	-		 •	 	 	-			er Analysis: Delta ci m in" changes EUFF		
	Tests, which should be considered for the appropriate process change.								 	 	 		 	 	 	 						
	Tests, which should be considered for the appropriate process change after select	tion of co	dition table.						 	 	 		 	 	 	 						
	Suppliers performed tests (mark with an 'X' for done or 'G' for generic)																					
	Reason for exception of tests and/or usage of generic data:																					_

Not required.
 Information Note required.
 P PCN required.

A letter or 1** indicates that performance of that desire to 4 should be considered for the appropriate process change.

A incurrence content of the content

Worked on: (Name, Function)	Max Mustermann	1																									
Date:			Form provided by ZVET+ Revision 6.1 - November 2019																								
PCN number:																e evalu											
Signature:													MATERI	AL PERF	ORMANCE TEST RE	SULTS (on	the bas	is of AEC Q10	e – Revisio	March15, 201)						
					Evaluation loval A / B / C							total														100	
ark change th an "x"	Assessment of impact on Supply Chain regarding following sepects - contractual agreements - cont	Remainin risks within Supply Chain?	G Understanding of semiconductors experts	Examples to explain	A ridget is all on lease! B. Bloard eval C. Component lease! ". Necrol as art for goal file after walks.	Further applicable conditions	andy du craolino du dady 22 dicelo	gh Tengeratus Operating Life	en est un Cycleg	elli gi herpesiki Operaling Life	Ower Nerpostatus Cycleg	SD Chancentration Heran Body M	SD Chance witz alice- COM	by all call Chinamists on a	maked Design.	edanted Book	es la L Lo Sid derHeat	operate by	the the Year	n ye	on life e ci Can	versal R on in tercor	red over all	HBookker	is Shaar Pala or Dense	mand middle to the company of the co	Remarks
ID	Type of change	No Ye			A Aest Coore Coore		5 1	-	-	a	۵.	1	ă	۵.	F 5	-	α .		-	0					0 5	402	
	NIT					1	AEG AEG	4	a	g	3	4	4	ą	a 3	я	1	3 3	4	ğ	1	a	1	ŋ	a 8		
LEDANES	Any change with impact on agreed upon technical contractual agreements.		tranded to be used if no other tipe of change i applicable but the change affects agreed technical contractual agreements.					-	-	-	-	-		-		-	-		-	•	-	-	-	-		-	
LEDANGS	Any change with impact on technical interface or processability/manufacturability of customer, which is not covered in the matrix below DATA SHEET	P P	technical interface means component terminals			Check if LED-09-01 is affected Processability should be assessed.	<u> </u>	•	Т	-	-	-		- 1		1 - 1	S,T			-	-		1.	- 1	- -	-	
	Change of datasheet parameteristical specification (nin.imax.hgp. values) andor Purse/DC specification	р р	Change of application relevant information (e.g. maximum pulse current) due to a technical product or process change.	e.g. change of die substate material.	А			Е	E	Ε	-	Е	Е	-		- 1	s		Е		-	Е	-	-		Е	
LED-03-62	Connection of data wheel or issue of entra			e.g. Einze e.g. Change of typ, values due to new information about component behavior e.g. improved instance. e.g. induction of max allowed forward voltage due to improved statistics.	A			-	-	-	-		-	-		-					-		-	-		-	
LEDOS-03	Specification of additional garanteens	1 P	to Definition of an additional parameter which was not specified before Pr if there is a rick on supply chain where at least one additional other PCN-elliwant change category will apply.	E. e.g.: adding new testind parameter E. e.g.: addissanal temperature coefficient parameter	A						-	-	-			-	-		-			-	-	-			Formation since this is not a product change, ony additional information. Classification: C
	DESEN	ΤÌ	Anydevice relevant changes in design / layout of epitoxial		I			Ť						Ť			Ť						Ť				
LEDOS et	Oneign changes in epitasy. Oneign changes in scoling layout.	P P	Any-device selevant changes in design l'agrunt di epitulial l'agrunt desidades. Changes solari design nuis and design se l'addition de l'agrunt design specified functions, passentess and residable; Any-design l'agrunt design authorité de l'agrunt design Any-trange in chip design l'agrunt. Nois leukades. Changes solari design nuis and design pacification sembout affecting specification sembout affecting se	e.g. change from Double-bearuro Chantum wells e.g. change of barlent hickness. e.g. change in hapout of current episades; trickness of current spisades e.g. peduction of bond pad size		A: change from Double hereo to Quantum wells — spectrum is affected A: change in toyout of current spreader — sadation pattern changes		•	•	•	•	•	•						<u>.</u>	н	. м		- P				To make the consistent for constant fall to the constant for the constant for const
		11												-			•		+:				ľ			H:	
LEDOS-ES		P P	Shinkof active ama. Not included: saving smertket/scribe line	Typical shink of die. e.o. change of dimensions.		Please checkif change in process sechnology (LED-PW-08) is also affected. Check if LED-08-02 is affected which		٠		•		•	•	-		-	-						В	_	•	+ •	
LEDOS 64	Lli D package (except leadhame)			e.g. change of dimensions e.g. change of x, y, or 2 dimension of the package		Check if LED-05-02 is affected which leads to a change of the elcrooptic patements or distributions.		٠		•	•	-		٠	- v	V	٠	T D		D	D		+-		D -	٠.	
	Design of leadframe	P P	any change of leadframe / cartier dimensions any change of outer dimensions	e.g. change in heathams / carrier dimensions in x.y. or z direction e.g. change inner design of the leadleams not affecting the elopedormance & wisbbirty of the device	8	Check if LED-08-02 is affected which leads to a change of the elcooptic patements or distributions.		٠	•	٠	•	•	•	•	. v	v	•	т .		-			В	В	D 2	•	
	PROCESS - WAREK PRODUCTION		•			Processing Structures in adjurced union.												_			† 		_				
	New / change of water substate or cartier material	-	New water substitute material.	e.g. different water nametal to currently eleaced material (change from Sapphire to Sillicon)	c	Check if LED-08-02 is affected which leads to a change of the elcocoptic parameters or distributions.				Р	٠	Р	Р	-		-	٠	. Р		Р	Р		_	-	•	•	
LED-PW-02	Water diameter	P P	change of water diameter resulting in equipment and process changes	*6 *10 *	c	In case other tige of changes are affected i.e equipment/process technology - they need to be identified in addition		٠	-	٠	-	Р	Р	-		- 1	•	-		-		•	-	-	-		
LED-PW-03	New Stad water priciness	р р	Change in final water thickness	e.g. change in Snat chiprile thickness	с	Check if LED-08-02 is affected which leads to a change of the elctooptic				Р		Р	Р	-		-	-				-		В	В			
LED-PW-01	Change of electrically active doping/implantation element	P P	Change in electrically active doping / implantation element resulting in a new technology.	e.g. change from the to C as dopard	с	passing of orthogone.	- • с			С	С			-			-		٠.				-			٠.	
LED-PW-05	Change of stacking		change in lawr sequence or frictness	e.g. change of isolation layer thickness between n- and p-	Α.	customer application needs to be checked due to potential system voltage differences								-			-		٠.	F		-	+-	-		٠.	
	New / change of metalization (specifically thip frontside)	-	Change in metallization of bondpads, material, byer thickness	e.g. change in bond pad metallization thickness	с		- • M					M,B	M,B				-	. м	_		м	٠.	٠.			٠.	
	New / change of metallization (specifically chip backside)		Change of bottom layer of die (between die and leadfame/cartier). Change in process, material, or dimensions	e.o. change from Aurio Aurile		A: customer application needs to be checked due to potential system voltage		_		÷		D,M	D.M					. DA		+	D.M	D.M		_		Ħ.	
_	New / change of restalization (specifically chip backede) Change in process sechnique (e.g. significant process changes like littingssphy, etch, colde apposition, die back subsce preparation/backginst)		leadframeCartier), Change in process, material, or dimensions necessary. Change from wet to diy exching, change from holizontal to welcal own for addation, change from corract liths into alogor liths.	e.g. change from wet eich to diyecch e.g. change from laser cutting (sawing) to placese cutting is surjoon.	c	checked due to potential system writinge difference: R: change tions CVD dep to aputer dep for backerine-frontale metalitation. It case of new equipment please check in LED-PA-14 is also affected.		i		•	•	- D,M	-	-		-	-		-	-	- Dym	-		-			Qualification effort depends on type of change.
	Process tragginy Tuning within specification		Valation within process specification	e.g. change from contact liths to stepper liths e.g. process control	С			-	-	-		-	-	-		+ +	-		-		-	-	+-			+-	
	Change of material supplier with no impact on agreed specifications.	-	Chance of water supplier. Chance of supplier for chemicals		с			-	-		-	-	-	-		- 1	-		-	-	-	-	-	-			Qualification effort depends on type of change.
LED-PW-11	Change of specified water process sequence (deletion ansity additional process step)	р	needed for water production. Any change which is not covered by another type of change. Risk is to be assessed.	e.g. additional cleaning process in water production	С			-	-		-		-	-		-	-			-	-	-	-	-			Custification effort depends on type of change. PPAP has to be updated.
	Change in die coating or passivation	P P	Change in material, thickness, and process for coating and passituation	e.g. change from SICD to SIND	С		· P	٠	•	•	Р	Р	Р	-		-	-	. Р	-	Р	Р	-	Р	Р		•	
	New water production location or transfer of water production to a different ext previously winased location/interbubic ontractor BARE DIE DISLIVEREE 3		New water propduction location or transfer of water production with possible additional changes.			A or it impaction other type of changes described under PROCESS: -PEAFER PRODUCTION and EQUIPMENT categories of this DHOAAS		·	11	٠	-	•	٠	-		-	•		•	-		J		ш	•	•	
	New / change of flort side metallication	P P	Change in bondpads, material, pad pitch, surface changes, layer thickness. Change of bottom layer of die Between die and leadframe/cartier). Change in process, material, or dimeasures.	e.g. change from Auto Au alloy e.g. change in overpad metalization	В			٠			٠	M,B	M,B	-		-	-				•		•		- -	1 -	
LED-RD-02	New / change of backside metalization	P P	leadfaneicartief, Change in process, material, or dimensions.	e.g. change from Auto Au alloy		Check if LED-05-or is affected which leads to a change of the ecological parameters or distributions.	M	٠	•	•	•	D,M	D,M				٠			•	•		1		•	-	customer application needs to be checked due to potential system soltage differences
uspepes	Change of water setup or number of dies on water.	1 P	E only additional number of chips P1 change in spacing between chips and form of water	e.g. information change for pick & place machine.	8		1 1		-	-	-			-	-		•		-	-			-	-		-	
	New final water Stickness	P P	Inadiamentaries, Change in process, material, or distinctions. Newborlinformation for pick in place machine. In only obditional material driple in company in the process of the proces	e.g. change on convenerationness		Check if LED-09-41 is also affected.		٠		Р	٠	Р		•	-		•		•				В		•	•	
	Change in the casting or passivation PROCESS -ASSEMBLY	P P	Change in material, thickness, and process for coating and passituation	e.g. change from Sidz to SiNX		Check if LED-09-01 is also affected.	. • Р	·	•	•	Р	Р	Р			- 1	•	. Р	- 1	Р	Р	1 -	P	Р	- -	•	
	Change of leadlame/carierbase material	РР	New leadhame/carrier material (new in composition)	e.g. change from copper alloy to base copper	8	Check if LED-08-02 is affected which leads to a change of the elcooptic commence or distributions		Р	•	•	-	- 1	- 1	- [3 -	- 1	•	• A	-	A	A	P,1			• P		Sigilanation should be provided in case HIS test is not applicable Regarding applicable materials please refer to the Whister standard.
	Change of inaditame/cartier finishing numerial (internal)	РР	Change of surface material of die attach pad and second bond area (e.g. influence is adhesion to mold compound, wedge bond swalking) Change in material and occess technique for final sin	e.g. change from Ag-Stach to NIPID protection layer e.g. change from Ag-spot to Au apot	A			Р	•	•	٠	-	-	-			•	• A	_	A	A	-	-	•	•	-	HZS text should be considered for automotive extentor applications, explanation should be provided in case HZS test is not applicable
LEDPARI	Change of lead and heat stug plating materialiplating thickness (external)	P P	Change in material and process technique for final pin termination (e.g., pure tin), Heerin package, processability and reliability on board lever can be verified by generic data. Classification depends on impact of change.	e.g. change in-heat dug stack e.g. change form Sin into Ni/P&Hu e.g. change of layer trickness			M	Р	•	к	-	-	-	1		-	•	• A	-	A	A	P,1	-	-	- к	-	Explanation should be provided in case HTS test is not applicable Regarding applicable materials please whento the Whisker standard.
	Burng Miterial / Mitcal System (internal)		Stack die or die to substate	e.g. change to Pti-fee material	A					•	•						•	. w		w	W				•		
LEDPARS			Change of die attach material (e.g. soft solder, epoej, etc). Themat managment must be respected.		8					•		-	-	-	- N	N		- Q		N	Q	•			•	-	
	Change of bond wire material			e.g. change from 30y to 25y	A			•	•	P,D	•	-	-	-	- D	D	•	- P,0		-	P,D	-		•	- -	-	Site audit for marerial change with impact on bondprocess (e.g. from As to Cu) recommended.
	Change in material for each components (excluding LED chip & LED package related beneal) with impact on agreed specifications. De Oserosar / Underfall	P P	Change of sub-component supplier using different technology/materials. Name: Jamp state test at CEAN might be necessary. Supposing layers for complex-packages like flig chip. - No change in product lengthy. Prichange cash influence the imposity of final product.	e.g. using a different \$50-dode in technology and material than previously P. e.g. change of undefit with change of thermal resistance	A B		 P		•	Р	•	-	-	-		Р	•	. P	•	-		- U	-	-	U -		Qualification effort depends on type of change.
LEDPARO	Change of mold-compound/encapsulation leading material	РР	Change of motor compound, encapsulation, or sealing material might be affected optical function in case of package related effect (e.g. bowning). Component ascentify and board coaring has to be assessed, 56th might be changed.	e.g. PPA most compound	A					•	•	-	-	D	3 D		•	т Р		Р	Р	Р		-			
	Change of convention manefall	p p	Change of material class.	e.g. change from granats to nitrides		Check if LED-09-41 is affected for agrical photomenic parameters		•	Υ	•	•	- [-	-	. Y		•	. Р			Р	Y		-		•	
	Change of direct supplier for convener manefall	- P	New supplier with same manufal specification new technology for conveter production	e.o. change from volume convenient to leave conve	с			•	P			•	-		. P	-	:	. Р			P	P				÷	
LEDPA-13	Change of convener process technology Change of poduct making	1 2	new technology for conventer production to no influence-on-en-performance of product P: in case of impact on product integrity that in the product of the product integrity that in the product of the product in the product in the change of connect or change of appearance of data matrix	e.g. change flore values convention to layer convention; e.g. change from examping to printing of layer e.g. marking of cathods;	С В	sheet LED 03-01		•	0	•	•				. Y		т.	. z	Z	Z .	. z	Y				1	
LEDPA-16																									+		
GEDPA-N	Change in process technique (e.g., die attach, bonding, moulding, plating, blim and form,)	PP	Anychange in assembly process technique	e.g. change die attached from gluing to soldering:		A or 8: Please checkif EQUIPMENT and other tipe of changes of material (LED-PA DEDS/DE/ON/DE/ON/DE) are affected.						- 1					•										Qualification effort depends on type of change.

LEDPA-15 Process integrity Tuning within specification	P	Valation within process specification	e.g. process control	c				-	-	-	-	-						-		-	-	-			-	
LEDPA-18 Change of direct material supplier with no impact on specification	Р	Change of suppliers e.g. for lead frames, wire material, die attach, electronical components	Change of suppliers e.g. for lead frames, wire material, ESD- diode	С	Assumption that change material specification remains unchanged. Otherwise see change of material.				-	-	-						-	-			-	-				See change of material.
LEDPA-17 Change of specified assembly process sequence published analor deletion of process step)	1 P	Addition or deletion of a process step in assembly process sequence with potentially slightficant impact on the product performance is not containing the in roll influence on product integrity expected.	e.g. additional ordeletion placeta cleaning process.	с	Single-case assessment recessary to identify possible interactions or 6sk.						-	-						-	-		-	-	. ,	1	-	Qualification effort depends on type of change.
LEDPA-19 New assembly location or transfer of assembly to a different not previously released location/sine/subcontractor	р р	New assembly location, assembly transfer or relocation. Y tansfer of known technology and equipment.	e.g. Dual source stategy	С	A or \$1 impact on other type of changes described under PROCESS ASSEMBLY and EQUIPMENT			-	-	-	-	-		-			-	-	-		-	-		T		Qualification effort depends on type of change.
PACKNOSHPPING		*			•					•																
LEDPS-01 treerPacking httpping specification change	p p	dimension change of direct product packing	e.g. SMT pocket in tape changes.	В		. P.	-		-	-	Р	Р				T		-	-	-		-			-	
LEDP3-62 Outer Packing Integring specification change	1 P	dimension changes indirect product packing it small changes in dimension or appearance P1 number of teets in the packing are changing	e g pizze box						-	-	-	-					-	-	-		-	-				
LEDP3-00 Change of liberting	1 P	Change of labelling also on reel. It additional information no change of previous information Pt change in cornect of devious information	(f) e.g. additional information (RaPCE stamp) (P) e.g. change of customer specific information	в	Check if LED-09-01 is also affected.				-	-						-		-	-	-	-	-			-	
LEDPS-64 Dy-pack-regiment change	P P		e.g. change from MSL3 to MSL1		Check if LED-09-62 is also affected.			-		-									-			-		-	1 .	
COMPANY	1 . 1 .	and a state of the													-										_	
LED-6041 Production form a new equipment/loci which uses a different basic technology	РР	Change in process technique which is not already covered above. Nam: Major changes affecting the product not covered by the table require also a PCM.	e.g.change from single water to batch process e.g. over pad metalisation e.g. dambar cutting (mechanical to laser cutting)	в	Check if LED-05-01 is also affected. Corosion stability should be assessed.				-	-				-		-		-	-			-	Т,	Т		Qualification effort depends on type of change.
LEDECE Production from a new equipment/loci which uses the same basic technology (episcement equipment or extension of existing equipment pool) without change of process.	Р	PCN required for dedicated equipment for sensitive componen production.	e.g. change flore single site to multi site handler.	С						-	-	-		-			-	-	-	-	-	-			-	Qualification effort depends on type of change.
LEP4048 Change in final text equipment type that uses a different technology	1 P	Change of sector platform (e.g. major test program changes , new testerintedace,). It product specification is not affected P: product specification is affected	e.g. Change in test method flors od to turnen	8					-		•	•	-	-		т		-	-	-	-	-		П		Sage RSR / delta constation
WATROW																										
LED 9-61 Stove of all or past of electrical water test and/or final test to a different location/site/subcontractor	p p	Yesser transfer or elocation.	e.g. Dual source stategy	С			В	•	•	В	•	•		-		7	-	В	-	-		В	3 B			Sage RSR / data constation; additional specification check it should be considered for Water testing
Q-GA%																_					_					
Change of the text coverage texting process flow used by the supplier to ensure data sheet compliance (e.g. entimated and electrical reassummentation block; establishment of excitating procedure or exampling)	- Р	Reduction or additional control steps, test coverage within the process flow	e.g. test flow block like Final test / final clearance	с			-		-	-	-		-	-		-		-			-	-		١.	•	
Tests, which should be considered for the appropriate process change.							-	-	-	-	-	-				-	-	-	-			-	ىك	نط		
Tests, which should be considered for the appropriate process change after selection	of condit	ion table.					-		-									-							-	
Suppliers performed tests (mark with an 'X' for done or 'C' for generic)																										
Reason for exception of tests and/or usage of generic data:																					_		_	_		

		_																								
Worked on: (Name, Function)																										
	16/04/2020		Formprovided by ZVEI - Revision-4.1 - November 201			-																				-
PCN number:	PCN 19_0263										MATE	RIAL PERI	FORMANCE T	Dev EST RESULTS	on the bas			vision -Sent	ember 14, 20	17					fditional t	
Signature:																								_	fditional t AEC-Q10x	
1					Evaluation lavel A / B / C		mber 14, 2017	ty Blas or blased HAST	ad HAST 1 1 Oyoling	tongo Ue peratng Ue	to an Retention, and							rparbility	est			omage Life rature Steps	i Arnal yelis		Cuestosos) Indengaldakie	
rk change h an "x"		Remaining risks within Supply Chain?	Understanding of semiconductors experts	Examples to explain	atorievá oval contrával lount for qualitation matic	Further applicable conditions	ebydance auditorate c	Temperature Huma	Autoclave or Unbian Temperature Cyclin Power Temperature	High Temperature S High Temperature C	Early Ure Fature Ro NVM Bridgeres o. D Operational Life	Whe Bond Shear	Scrambility Physical Dimension	Lead integrity X-ray / CSAM	Human Body Model Ble dronic Discharg Charged Device Mo	qu fatal	Faut Grading	Characterisation Electromagnetic Co	Soft Error Rate Hermetic Pachage 1	Package Drop Lid Torque	Does Shear Internal Water Vigor Board Livel Reliability	Start Up and Temps Start Up and Temps Of MOM Drup Test	Destructive Physics X-ray	Acoustic Microscop	(IDC 60008-To-8, JEDS Parameter-Arabysis Ocepaniscent currents	Remarks
10	Type of change ARY	No Yes			A Apple B B are O Con		AEC-Q1(9 E A2	9 2 E	H TO TO	5 8 82 83	88 A8 A C1 C2	S 2 8	3 00 C7	W W W W W W W W W W W W W W W W W W W	3 S	2 5 66	TE CHAR	E9 G1-4	65 GE G	2 A S	A STEP STEP WCM DI	HS HS	30 H7		
MCM-AN-01	Any change with impact on agreed upon technical contractual agreements	РР	intended to be used if no other type of change is applicable but the change affects agreed technical contractual accessments.											-		-								-		
MCM-AN-02	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix below.	P P	contrarted accuments Anychange which is not cowned in the matrix below, but risk assessment at customer is recommended.		В									-		-										
× MCM-DS-01	DATA SMEET Change of datasheet parameters/electrical specification/(nin.htmx/hgs.values) and/or ACIDIC specification	РР	Update of data sheet because of technical change of the product	e.g. recommendations for pull-uplpull-down or NC	A				- - -			1.1.				1.1								- 1		
MCM-OS-02	Connectional disease wheel a remain	1 1	No technical change of product, process or test. New discription of behaviour which was not specified before or which is different from initial specification. Please indicate clearly, that into note contains this type of change! Assessment in application required!	e.g. Ernis	A									-												
MCM-DS-03	Specification of additional parameters	I P	Description of a new not previously covered parameter. No sorbinical change of the product. (§): Definition of new parameter which was not documented before. (§): Not income as single change. Only in combination with other changes.	(it: e.g. adding new tested parameter.	A																					
MCM-06-01	OSSION Firmure modification	П	Imagnated software by design or memory as defend by supplier. (IF Firmmer modification or update without effect of functional performance at the customer (bug 6), (IF) Firmmer modification or update with effect of functional or miskelilly performance at the customer.	(If; e.g. addition of Firmware opportunities (P); e.g. bug flowith impact on functional performance	A																					
MCM-06-02	Change Past adds or subtracts sub-components from the module BCM	РР		e.g. addition of passive elements in filter circuit	A			. @•	e										M @ •,D	e	ġF					
MCM-PA-01	PROCESS - ASSEMBLY - MATERIALS Replacement of any sub-component by a Non-AEC qualified sub-component	РР	Change from an AEC Qualified sub-component to a Non-AEC Qualified sub-component or Change from a Non-AEC Qualified sub-component to snother Non-AEC Qualified sub-component		A .														M @•,D	@• · e	ķ F		e• e•	@•		
X MCM-PA-02	Replacement of any sub-component by an ASC qualified sub-component	РР	Change from one ADC Qualified sub-component to serobre AEC Qualified sub-component Change from Non-AEC Qualified sub-component to an AEC Qualified sub-component 4.g., with ingration electrical notativass (ESD), latch up) electrical functionality, test coverage		A	Requires additional evidence that new sub-component is AEC qualified													M @•,D				e• e•	e•		
MCM-PA-03	Replacement of any sub-component by an AEC qualified sub-component Critical characteristics of sub-component are pag effected	I P	e.g. with <u>no</u> impact on electrical robustness (ESD, latch up,) electrical functionality last coverage		С	Requires additional evidence that new sub-component is AEC qualified									g• @•	e• e			@ M @ •,D	@• · e	8F		e• e•	@•		
MCM-PA-04	Change within a sub-component that has been requalified Critical characteristics of sub-component are affected	P P	e.g. with impact on electrical robustness (ESD, latch up,) electrical functionality, test coverage		A	Requires additional use of the appropriate ZVEI DeQuilda (e.g. active, passive component) for qualification of the changed sub- component													M @•,D	е	8F			-		
MCM-PA-05	Change within a sub-component that has been requalified Critical characteristics of sub-component are not affected	I P	e.g. with <u>no</u> impact on electrical robustness (ESD, latch up,) electrical functionality last coverage		С	Requires additional use of the appropriate ZVEI DeQuilda (e.g. active, passive component) for qualification of the changed sub- component					. @•								@ M @ •,D					- 1		
× MCM-PA-06	Sakarinak-changa sifincing modula schemistic (Changas 13 the Viennal dimensions and/or schemistics)	РР	Design change and routing. Change in substitute, lisatifame dimensions which has impact to the specified electrical parameter acc, data sheet or specification (e.g., heat sink pin dimensions, die pacific size) Not included: Variation within specification.		A	Sample to a		. @•	· · e	к - •	•	8. 8.							м -				e• ·			
MCM-PA-07	Change to the processes used in module assembly/se, p. pick & place, die attach, bonding, relicus encapsulation, singulation, die cercosst, undertill, die preparation, die clean)		(-): If the change in process technology does not influence the imagrity of the final product. (P): If the change in process technology can influence the integrity of the final product.		с				· • e	к - @ А						. е	н .	e• ·					@• ·			
MCM-PA-08	Process integrity turing within specification		Variation within process specification (-)c: If suring within process specification does not influence the imaginity of the final product. (P): Elimpact on product specification is anticipated.		С									-										-		
MCM-PA-09	Charge to materials used in-models assumbly (u.g., softwale, underlik, encopsulate, solder, spose, bump natural, dis amount material, bond size, dir asercos, e abstrate, fundiamen base material)	P P	Change of used meterial (e.g. bump-meterial, die stach-meterial, soft solder, sposy, etc.) Change of bond wire material, dismeter, change in bonding diagram	e.g. Stockde or de to substrate (flip chip) e. g. change to Plo-free material e. g. change of capper pillars e.g. change from Se into Ni Pd/Au	с	It impact on thermomechanical stress caused by mismatch of mold compound, interconnecting technology and carrier is anticipated It external lead finishing material is affected.	·		· • e	K @ • @ E	@ E ·						•	e• ·					e• ·	-	•	
MCM-PA-10	Change of direct makerial supplier	. Р	Change of suppliers for direct materials which are used in samenthy-process (BDM). (-): If change does not influence the integrity of the fired product. (P): If impact on product integrity is anticipated.	(-): e.g. change of wire maintal supplier. (P): e.g. change to new maid compound supplier e.g. additional leadiname supplier with specific leadiname manufacturing suchnology e.g. additional or new substrate supplier	С	Please check if material is changed								-												See change of material.
MCM-PA-11	Change to assembly location (Mose all or parts of production to a different assembly site)	P P	Assembly transfer or relocation includes transfer as well as additional site		С	A or its impact on other type of changes described under PROCESS ASSEMBLY and SEM-DO-64. In case of Covere product please consider AEC-0006.			• • e	к - •	•	١		т •			•	@• ·				-	@•		3	White tests has be done on nonlining basels: AEC-Q190: "For broad changes that incide multiple attributes (e.g., site, materials, processes, eater to section A1.3 of this appends all section 2.3 of Ch50, which allows for the selection of sorts-case less whiches to cover all the possible permutations."
MCM-PA-12	Change of product marking PACHONNOSISSEPPING		Change of marking on desice and / or change in process resulting in a new technology. (E): Ethange does not influence the integrity of the final product. (P): Elimpact on product integrity is anticipated.	(Rc e.g. change of appearance (additional marking) (Pfc e.g. change from inited marking to laser marking e.g. marking of pin 1	В			•				- -	В -													
	Processing and Processing	P P	Packing lithipping specification change. Change of drypack requirements (e.g. change of																							
		0 0	MSL1 Change of carrier (tray, neel) Change of labelling also onneel. (bg. Change of material label without impact on barcode. (bg. Change of material label without impact on barcode. (bg. Changes of material label information which affects data processing at customer.	(f) e.g. additional information (RoHS stemp) (P) e.g. change of defined nonenclature for data processing	В																					
MCM-EQ-01	EQUIPMENT Production for a new equipment loof which saws a different basic technology or which due to its unique form or function cam be expected to influence the integrity of the final product.	РР	Change in process sochrique which is not already covered above.	Change from single safer to batch process (e.g. over pad metallization) e.g. dambar cutting (mechanical to laser cutting)	A												i	@• ·								Affected process change in to check.
MCM-EQ-02	Production from a new equipment tool which vases the same basic sochrology (hiplacement equipment or extension of existing equipment pool) without change of process.	. Р	PCN required for dedicated equipment for sensitive component production. (-): If change does not influence the integrity of the finely product. (P): If impact on product integrity is anticipated.	(): e.g. extension of existing equipment pool (Pp. e.g. extension of dedicated equipment in case basic technology still need to be proven	С									-										-		
MCM-EQ-00	Change to seeing platform (Change in firetal test equipment type leading to a different test concept)		Change of seater platform with differences in HW or SW that makes a change in test concept recessary		С													e• ·								Gage R&R / dehs correlation

	TEST FLOW					
MCM-TF-	Of Change to seeing location (Nove of all or part of the final seet to a different seet site)	PI	Tester transfer or relocation. Checkimpact on MCM-AN-01 lockides transfer on well as additional site.	Dual source strategy	С	
	Q-GATE					
MCM-QG-	Change of the last coverage leading process flow used by the applier to ensure data sheet completion (e.g chi-indicalization of electrical resourcement best local block, relaxation/instrucement of montoring procedure at sampling)		e.g. test flowblock reduction from three temperature measurements to two temperature measurements, change in burn in I non in process. (): if change does not influence the lengistry of the first product. (P): Elimpact on product integrity is articipated.	(-): e.g. test implemented without customer requirement (P): e.g. reduction from three temperature measurements to teo temperature measurements to be temperature measurements e.g. change in burn in / nun in process.	С	Person Angle Disconnision For Teach English Control of the Contro
	Tests, which should be considered for the appropriate process change.				A	
	Tests, which should be considered for the appropriate process change after	er selectio	n of condition table.			
	Suppliers performed tests (mark with an 'X' for done or 'G' for generic)					G NA G G G NA FC FC G G G X NA X NA X NA NA NA NA NA G G
	Reason for exception of tests and/or usage of generic data:					
	NA - Not applicable since the it is a passive Sub-component change in the substrate based package G - qualified by LTBECGSP which is the exposed die sension of LTBECGS. FC - this is all pic hipporduct. WBP VBG are not applicable.					

Not required.
 Information Note required.
 P IPUN required.

A letter or "•" indicates that performance of that stress test should be considered for the appropriate process change.

ommended additionally by 2VEI.

CONDITIONS

dis exexusation and/or die desan
For ambolt sween, new curs sime, teme
If bond to leadificer finousisment in 051001

G1 + 035 not 04
only for haire die and chance of mole compound
processes for material in direct consect with die surfaces

=> Please mark 'NO' with 'X', default is 'YES

	Worked on: (Name, Function)	Max Mustermann	Form provid	ided byZVII - Revision 41 - Novembe	or 2019																								
	PCN number:																De	vice eva	aluation										
	Signature:														MATERIAL	PERFORM.	ANCE TEST	RESULTS	on the basis	of AEC-Q2	00 Revision	D)						additional t Q200	AEC-
Mark change with an "x"	г					Evaluation level A / B / C		also checkly																				4.000	oden
	\ <u></u>	Assessment of Impact on Supply Chain regarding following aspects - contractual agreements - extractional agreements - technical interface of processability/manufacturability of outdomer - lown, fit, function, quality per	Remaining risks within Supply Unders Chain?	rstanding of component experts	Examples to explain	A Application and B. Bornd and C. Component and I. Not relevant for qualitation matrix	Further applicable conditions	-Q200 Revision D	High Temp Espoarre (Borapa)	Toy perace Cycleg. Destrictive Physical Artights	Moture Resistance	Biacethani diy Operatoral Ule	Enternal Missall Physical Direction	Terretrial Strength (Jacobse) Resistences to Solveries	Methylal Brok	Vitration Resistance to Subbring Hear	Themsi Brod.	El METOGRAC LA METOGRACIA S'Obsenhilley	E MENEAL CHIFTOGRICULES	Board" is:	Terreinal Stength (SAD)	Flur o Raindinos	Roadontire Superidage	Audy pro	Electrical Translert Condusion Shear Strongth	Faut CurrertCurshitly End of Life Mode Werkerkin	Jury Bart Erduarce Land Dury Erduarce	Whister Test (180 00096-T3-6g J8D-6C JES	Remarks Remarks
Selection of component		peof change NETWORKS & RESISTORS	No Yes			AAA CCCo		AEC	2	4		7	9 11	11 12	13	14 15	74	17 18	19 20	21	22 23	24	28 27	29	30 31	22 20	34 35		
NETWORKS & RESISTORS	PAS-RES-AN-OI	NY ny change with impact on agreed upon technical contractual agreements	p p applicable but	be used if no other type of change is at the change affects agreed scholcal N	at relevant for technical evaluation.				_						T T					T T				1 1					
NETWORKS & RESISTORS	PAS-RES-AN-OI PAS-RES-AN-O2		P P applicable but contractual as	of the change affects agreed technical Nancements.	of relevant for technical evaluation.	В														+ - +					1 1			@•	
NETWORKS & RESISTORS NETWORKS & RESISTORS		NATAGHEET					Riskassessmert depending on change for																	$\perp \perp$				0.	
NETWORKS & RESISTORS	PAGRES-DS-01	Parega of datashkud parameterishincintical apacification (prin hraw hyp. values) and it a ACIDC specification correction of data wheel or lessue of erroria	P P Change of app Not included Notechnical of New description I Please Indicat type of change	optication relevant information et. Editorial changes. Il change of product, process or test total of behavior which was not specified inches defended with laddlered their highly specification, et also defended in high specification, et also defended in the specification are quiet of the production and their production are quiet in application required!	g. tighten of electrical parameter distribution g. data sheet correction because of new information and component behavior	A	Risk assaument dispending on change for each application.													-				-				-	
NETWORKS & RESISTORS	PAS-RES-DS-03	puolitasion of additional parametera		of a new not previously covered	g, adding new (setted) parameter.	A														-								-	
NETWORKS & RESISTORS		TATEONI	parametes (st	tot existics)																									
NETWORKS & RESISTORS			P P Change of link		g. nesistor paste, N/Cr, resistor wire	С			•		-			w -			•	F -	В -	•	•	R		-				-	@•
NETWORKS & RESISTORS	PAS-RES-MA-02				g. AgPd paste, Ag paste, lead-wire , NiCr for side enviration	В			٠	•	-			w -			•		в .			R		-				-	@•
NETWORKS & RESISTORS	PAS-RES-MA-OI (thange of material composition. Package Modd	P P Change of Pa	Package e. Passisation /mer protection e.	g, for chip rest: final coating, epoxy g, change of glass	В			•					• •			•			•		R R		- N				-	Check whether ACH at Ser 1 can be affected.
NETWORKS & RESISTORS NETWORKS & RESISTORS	PAS-RES-MA-05	hange of material composition - Passisation hange of material composition - Substrate material	P P Change of sub	Abstrate material	g. Unitige of goods	c				•	•			•			•		В .	•	•			-					@•
NETWORKS & RESISTORS	PAS-RES-MA-06	hange of supplier of material	- P Change to a ni component ma	new or additional material supplier at annufacturer.	g. for 2nd source purpose	с				•	•		•				•	•	в •	-		R		N				-	Assumption material specification rem unchanged. Otherwise see change of material.
NETWORKS & RESISTORS	PAS-RES-DE-01	CSION Zanges of termination, surface linish, shape, color, appearance or dimension structure	I P Change of pac	actinge assivation/mer protection e.		B			•	• -	T • T	• •	: :	• •	1 - 1		· · ·			T • T	•	R		T - T				1 - 1	-
NETWORKS & RESISTORS	PAS-RES-DE-02	hanges of inner construction - Presidention ROCCSS	. p Change of pas	auxivation/Inner protection e.	g. change of glass, laquer, epoxy	С			•	•	•						•					R		N					-
W.T.W.CO.W. & D.C.C.T.CO.C.	PAS-RES-PR-01	thanges in process technology or manufacturing methods - Ink Fine			g, change of firing profile g, change from normal atmospher to nitrogen mospher	С			1	•	-			R ·	-				в .					-					@•
NETWORKS & RESISTORS	PAS-RES-PR-02 0	Panges in process technology or manufacturing methods - Iris Print honous in process serbology or manufacturing methods - Trim	P Change of ink P Change of ink P Change of ink	rikprint process	n channe from mill trimming to large trimming	c c			•	•	- :			R -	1:		•		B -	R	R -	R			: :		: :		@• @•
NETWORKS & RESISTORS	PAS-RES-PR-04	Panges in process technology or manufacturing methods - Trim Panges in process technology or manufacturing methods - Lead Form	. P Change of less	ead form process e.	g, change from mill trimming to baser trimming g, change from bending to punching	В					-	•		•	-				В -					N				-	@•
NETWORKS & RESISTORS	PAS-RES-PR-05	Panges in process technology or manufacturing methods - Termination Attach	P Change of ten P Change of ma	ermination attach process 6.	g, chip resistors: electroplating process g, welding of leads for through put devices.	В		• •						•			-		в -	-				N				-	@•
NETWORKS & RESISTORS NETWORKS & RESISTORS	PAS-RES-PR-05 PAS-RES-PR-07 C	hanges in process technologyor manufacturing methods - Marking hanges in process technologyor manufacturing methods - Molding	P Change of ma P Change of ma P Variation with	narking process e- naking process	g, change from tempon printing to laser marking	В			•				•	. :			•					R						-	-
NETWORKS & RESISTORS NETWORKS & RESISTORS	PAS-RES-PR-08	ACCURACY CONTRACTOR OF THE MATTERNAL CONTRACT CONTRACTOR CONTRACTO			g, process control	С					-									-				-				+	-
NETWORKS & RESISTORS	PAS RES PN-01	hcking / shipping specification-change (lossening of tolerances) Tryosck/resultements.change	P P Change of pac	scling specification.	g, number of pieces corresi.	В					-																	-	-
NETWORKS & RESISTORS	PASRES-PN-02 D		P P Change of day		g. change of MSL g. change in dry pack assurance (HRC, MSB)	В			_		+ -					-	-			+ +		+ +		-				-	
NETWORKS & RESISTORS	PAGRES-PN-03	hange of carrier (tray, reel) MCKING / SHEPPING - VISUAL INSPECTION	P P Change of car	arter 6	g. change by material g. change by geometry	В											<u> </u>			1.1		1	. .	- 1					
	PAGRES-PV-01	hange of labelling	p Change of lab	abelling, also on reel.	e.g. additional information (RoHS stemp) Pj.e.g. change of customer specific information	В			1		-																	-	
NETWORKS & RESISTORS	PAS-RES-PV-02	thange of product marking	I P Marking on de		g. change of content of marking g. change of method of marking g. change of spearance of marking	В										+				+									
NETWORKS & RESISTORS																-												-	
NETWORKS & RESISTORS	PAS-RES-PV-03	thange of packing lahlpping specification	P P described a di packing.	acking specification which does not change of dimensions or material of the e.	g, change of documentation in packing specification	•											-			-				-				-	-
NETWORKS & RESISTORS	PAS-RES-EQ-01	OGSTICS/CAPACITY/TESTING - DOUPNEMONT hadudan from a new equipmentsal which was a sidlevert schradogy or which due to its unique form or collor can be expected to inhance the integrity of the first product	P P Change inpro cosend above Note: Change the table requi	process technique which is not already us. use affecting the product not covered by co usine also a PCN.	g, new equipment supplier with different process accept	с				•									в .					-				-	Test effort depends on final risk assessment. Performance lest according to affected process change.
	PAS-RES-EQ-02	haduction from a new equipment load which uses the same basic technology (replacement equipment or stemsion of existing equipment pool)	- P PCN required component pro	ed for dedicated equipment for sensitive e- production.	g. additional equipment to increase production capacity g. replacement of same equipment	с		• •		•									в .					-				-	Test effort depends on final risk assessment. Performance test accord to affected process change.
NETWORKS & RESISTORS NETWORKS & RESISTORS	PASRES-EQ-03	Zonge in final but equipment get that uses a different schndogy OGESTICS / CAPACITY / TESTING - PROCESS FLOW	parameters.	inal test equipment which use different ad for dedicated equipment for sensitive	g. change of sester platform	с					-						-		@В -					-				-	@● Gage R&R / delta correlation
	PASRES-PF-01	favulacturing site transfer or movement of a part of production process to a different location labe	P P Change of ma Includes trans Note: Reorga		g, movement or transfer of manufacturing site or rocess step(s) to a different location/site.	В			•										в .			R		N				@•	@•
NETWORKS & RESISTORS	PAS-RES-PF-02	limination or addition of a manufacturing process step		nanufacturing process sequence.	g, dual source / fab strategy g, weating / cleaning process g, change of order of processes	С											-		@B -	-								-	Characterisation depends on impact of production flow.
NETWORKS & RESISTORS NETWORKS & RESISTORS		OGISTICS/CAPACITY/TESTING - Q-GATE																											
NETWORKS & RESISTORS	PASRES-QS-01	thange of test coverage used by the supplier to ensure data sheet compliance (e.g., eliminationisdidison of lectrical measurementhest flow block, relaxation/enhancement of monitoring procedure or sampling)	. P Change of test	est coverage.	g. change from 100% to sample inspection .g. test flowblock; reduction from three to two reperature measurements g. change in burn in hun in process.	с					-			- -			-				- -		. .	-	- -			-	R (electr. funct.): test coverage. R (reliability) only for change in burn in process.
NDUCTORS NDUCTORS		NDUCTORS NY	- Date and a second of	want if no other tage of above as in																									
NOUCTORS	PAS-IND-AN-01	ny change with impact on agreed upon technical contractual agreements ny change with impact on processability/menufacturability at customer, which is not covered in the matrix	P P applicable but contractual ag	te used if no other type of change is sof the change affects agreed technical. N agreements.	at relevant for technical evaluation.	•					-						-			-								-	-
NOUCTORS	PAG-IND-AN-02	ny change with impact on processability/manufacturability at customer, which is not covered in the matrix display to the covered in the covered in the covered in the matrix display to the covered in the covered i	Р Р	71	echnical interface means component terminals.	В			•		1 - 1						·					<u> </u>				- -		@•	-
NOUCTORS	PAS-IND-DS-01	NA ASSERTE Transport of disturbent parameters/electrical specification (min/max/typ., values) and for ACIDC apocification	P P Change of acc	pplication relevant information ed: Editorial changes.	g. Sighten of electrical parameter distribution	A	Riskassesment depending on change for each application.				-						-							-				-	-
	PAS-IND-03-02	Correction of data sheet or lease of errota	Notechnical of New description of which before or which I Please Indicas type of change Assessment in	I change of product, process or test. ston of behavior which was not specified ich is different from initial specification. e. size dearly, that infonds contains this gif in application required!	g, data sheet correction because di new information aux component behavior	A					-						-			-				-				-	

				Description of a resource resolve site reserved	l																										
PAG-IN	10-05-03	Specification of additional parameters	ı P	Description of a neword previously covered parameter. No outchnical change of the product. No outchnical change of the product. (§t no influence) (§t) Risk assessment depending on change for each application to provide evidence of additional parameter (stat. evaluation).	e.g. adding new (tested) parameter.	A					-																		- 1	-	
				each application to provide evidence of additional parameter (stat. evaluation)																											
	ID-MA-01	MATERIAL		Material without magnetic function ("SpulerkGrper") typically made by plastic material	e.g. change from Thermoset to Thermoplastic	В								• @•	Т														-		
	ID-MA-01	Change of material composition - Sobbin Material Change of material composition - Gore Material		typically made by plastic material Change of core material, which is material with	e.g. change from Thermoset to Thermoplastic e.g. change from NiZh into MinZh				٠	@• •	-					- •		•	1	•		- -		-		-	-		<u> </u>		
	ID-MA-02	Change of material composition - Core Material Change of material composition - Insulation Material		magnetic function Change of insulation material	e.g. change from NiZn into MrZn e.g. wire insulation, insulation tapes, e.g. change from Polyunatane to Polyanide	A			٠		-	_			_			• -		в •				-		-	-		H-	@•	
				Change of insulation material Change of lead material		С		•	٠		-								+	в •				-		-	-		-	-	
PAS-IN	ID-MA-04	Change of material composition - Lead Material	-		e.g. change from tin coverd to non-coverd lead material	В		•	,		-	-							•					-		-	-		@•	- Dec	rtical barrion afforted I mechanical
PAG-IN	ID-MA-05	Change of material composition - Mold Compound	P P	Change of mold compound material	e.g. change to green mold	В		•	•	• •	-	•	• •	• -	-			•	-	в •		- -	- -	-		-	-	- -	- 1	@• stree	chical function affected if mechanical ass distribution changes. ACI, wave dering and board coaling has to be assed MSL might change.
PAG-IN	ID-MA-06	Change of material composition - Solider Material	РР	Change of solder material at internal connection.	e.g. change of SnAgCu composition	В		•	٠		-	-		• -	•		• @•	•	•					-		-	-		@•	-	
PAG-IN	ID-MA-07	Change of material composition - Wire / Foil Material		Whe for wounded inductors. Foil for multilayer inductors (inner electrode).	e.g. change of Cu-composition	В		•	•	@• -	-	•		• -	-				-	в -				-		-	-		- 1	@•	
PAG-IN	ID-MA-08	Change of material composition - Glue	P P	Change of glue material	e.g. change from glue A into glue B	С			٠	- @•	-		@• -	@• -	-		@• @•		@•	@В -				-		-	-		- (@• Con	nsidere in case of core-core glue the air i.
	ID-MA-09	Change of supplier of material		Change to a newor additional material supplier at component manufacturer.	e.g. for 2nd source purpose	С			٠				@• -		•			•		в -				-		-	-				sumption material specification remains thanged. Otherwise see change of solut.
PAG-IN	ID-MA-10	Change of material composition - Putting Material	P P	Change of potting material	e.g. change from eposyresin to silicon	с	A l'influence on other connections on PCB or laquer espected.	1	•	- @•	-	- (@•	@• @•	-		@• @•		@•	@B -				-		-	-		- 1	@•	
p _A <.ac	ID-DE-01	DESIGN Changes of termination, surface finish, shape, color, appearance or dimension structure - Bobbin		Material without magnetic function ("SpulerkGrper") typically made by plastic material	e.g. construction / dimension chance of bobbin	В						- 1					T - T -			в -		Τ.Τ.					.			@•	
	10-06-02	Changes of termination, surface firish, shape, color, appearance or dimension structure - Lead Terminals	1 1	typically made by plastic material Change of lead/terminals	e.g. change from PTH terminals to SMD terminals	A																									nct regarding EMC release for high quancy only.
	10-06-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Mold		Change of mold	e.g. new moidmaterial with different color	В					-	• (@• -		_					в -										@• Para	quancy only. smeter Analysis only for components one mold material has magnetic function.
	D-06-04				_																										ne mold material has magnetic function
	ID-06-06	Changes of inner construction - Core Construction Changes of inner construction - Insulation System		magnetic function Change of insulation system	e.g. change fromdrum.core & shield core into pot core & color plate core e.g. vire insulation, insulation tapes,	A C				@•	-							• A		В -				+					H.	@•	
	10-06-06	Changes of inner construction - Wire / Fell Construction		Change of wire / foil dimensions	e.g. wire insulation, insulation topes, e.g. change from Polyurahane to PTFE (Tellon) e.g. change from round cross section to rectangular cross section e.g. from single sites to litz wine	В						-			_					в -										@•	
	D-06-07	Changes of inner construction - Wire / Foil Construction Changes of termination, surface finish, shape, color, appearance or dimension structure - Posting Material			e.g. from single size to litz size e.g. change of polling (Ming) height	С	F data sheet is affected (PAS-IND-OS-01)			· @•				@• @•			G• G•			®B -				Ė						@•	
1000		Changes of termination, surface finish, shape, color, appearance or dimension structure - Poting Material PROCESS	I P	Creenye of posing dimension	eth-mention bound (anoth unda	e	r cass smeet is sifected (PAS-IND-DS-01)			. @•				⊕• @•	_		@• @•			⊗B .				_						e.	
PAG-IN	ID-PR-01	Changes in process technology or manufacturing methods - Insulation Strip	. Р	(Mechanical) removal of insulation.	e.g. change from mechanical removal to laser removal	В					-			• -	-	• .			@•					-		-	-		- 1	- Mec	chanical damage of sine, act on solderability in case of stripping cess is affecting soldering area.
PAG-IN	ID-PR-02	Changes in process technology or manufacturing methods - Lead Prep. / Plating	. Р	Change of lead prep. / plating	e.g. change from hot dip tinning to electropisting	В			-		-	-												-		-	-		@•	- Influ	uence regarding reliability of solder s.
PAG-IN	ID-PR-03	Changes in process technology or manufacturing methods - Terminal Attach	. р	Connection of wire terminal and / or connection of termination to core-buildin. Change of marking process	e.g. chante from Manual winding to Semi-automic winding (winding of wire on terminal)	С						. (@• -											-		-	-		@•	- inco	rease of contact resistance.
	ID-PR-04	Changes in process technology or manufacturing methods - Marking	. Р	Change of marking process	e.g. change from inkmarking to laser marking	В		•	ŀ		-	-			-				-					-		-	-		-	-	
	ID-PR-06	Changes in process technology or manufacturing methods - Molding	. Р	Change of molding process Change of suddering internal connection Change of winding - insulation	e.g. change from one component molding to two component molding (other technology needed)	В		•	-									• -		в •				-		-	-			-	
	ID-PR-06 ID-PR-07	Changes in process technology or manufacturing methods - Soldering Internal Connections Changes in process technology or manufacturing methods - Winding Insulation	. P	Change of soldering internal connection Change of winding - insulation	e.g. change from hot tip finning to resistance welding e.g. change from manual to automatic process	B			-	@•	-					• -		- A		В -				-		-	-			-	
	ID-PR-08	Changes in process technology or manufacturing methods - Winding Wire	. Р	Change of winding - wine	e.g. change from semi-automatic winding to full automatic winding	С			-	@• -			- •		-					в -				-		-	-		- 7	@•	
	ID-PR-09	Process integrity suring within specification	. Р	Change of winding - wine Variation within process specification. Change of posting process	e.g. process control	С			1		-								-					-		-	-		-	-	
PAG-IN	ID-PR-10	Changes in process technology or manufacturing methods - Poting PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS	- Р	Change of potting process	e.g. change from manual potting process to automatic potting process	С		•	-	- @•	-	- (@• -	@• @•	-				-					-			-		بلنا	-	
PAG-IN	ID-PN-01	Packing / shipping specification-change (loosening of tolerances)	РР	Change of packing specification.	e.g. number of pieces connect.	В		-	4			-												-			-		-	-	
PAG-IN	ID-PN-02	Orypackrequirements change	P P	Change of drypack requirements.	e.g. change of MSL e.g. change in drypack assurance (HIC, MSS)	В		-			-	-												-					-	-	
PAG-IN	ID-PN-03	Change of carrier (tray, reel)	РР	Change of carrier	e.g. change by material e.g. change by geometry	В		-	-			-	-		-									-					-	-	
PAS-IN	ID-PV41	PACKING / SHIPPING - VISUAL INSPECTION Change of labelling		Change of labelling, also on reel.	(f) e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	В									1 .				1.1		T . T .	T . T .		Π.		Ι.					
	ID-PV-02	Change of product marking		Marking on device.	(P) e.g. change of customer specific information e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	В									١.											٠.					
	ID-PV-03			Change in packing specification which does not described a change of dimensions or material of the nations.	e.g. change of appearance of marking																										
PAG-8		Change of packing hispping specification LOGISTICS / CAPACITY / TESTING - EQUIPMEMENT	P	umunitied a change or dimensions or material of the packing.	wwwingle-of accumentation in packing specification									نانا											خلت				للت		
	10-80-01			Change inprocess technique which is not already counted above. Note: Changes affecting the product not covered by the table require also a PCN.	e.g. introduction of patting process															@В -										Υ Test	ot effort depends on final risk assument. formance test according to affected cess change.
						С														an .										Peri prod Tea	formance test according to affected cess change. It effort depends on final risk
PAG-IN	ID-80-02	Production from a new equipment hool which uses the same basic technology (replacement equipment or intension of existing equipment pool)	. Р	PCN required for dedicated equipment for sensitive component production. Change of final test any imment which use different	e.g. duplication of existing winding machine	С		•			•															-	-				of effort depends on final risk assument. formance test according to affected cess change.
PAG-IN	10-60-03	Change in final test equipment tige that uses a different technology	P P	Change of final text equipment which use different suchrology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	С		•	-		-	-			<u> </u>					@В -		- -	-	1		-	-		- (@• Gag	ge R&R / delta correlation
	ID-PF-01	LOGISTICS / CAPACITY / TESTING - PROCESS FLOW Variables for a site transfer or movement of a cert of production process to a different location risks.	р г	Change of manufacturing site. Includes transfer as well as additional site. Note: Reorganization inside one plantisite is not affects	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site.	В						. (@• •	@• -	Τ.					в -	1.1.								@• (@•	
	ID-PF-02	valuablishing are trained or insurant or a pint of production process to a delever localisativities Elimination or addition of a manufacturing process step			e.g. dual source / tub strategy e.g. washing / cleaning process e.g. change of order of processes	С								2.																@• Cha	aracterisation depends on impact of duction flow.
	ID-PF-03	Elimination of final electrical measurement / set flow block		Reduction of final testing. PCN required for dedicated final test reductions for sensitive parameters.		c					-	-			-				-								-			@• Cha	duction flow. eracterisation depends on impact of final
		LOGISTICS/CAPACITY/TESTING - Q-GATE	ĽĽ																								4				
PAG-IN	10-06-01	Change of set coverage used by the supplier to ensure data sheet compliance (e.g., elimination) addition of electrical measuremenths of flow for classific interaccional of monitoring procedure or sampling)	. Р	Change of test coverage.	e.g. change from 100% to sample inspection e.g. sest flowblock, reduction from three to two temperature measurements e.g. change in burn inhun in process.	с					-	-			-				-										-	- R (e	electr. funct.): test coverage. reliabilité only for change in burn in cess.
		CERAMIC / TANTALUM										_																_	_		
PAS-C	ER-AN-OI	NNY Hoy change with impact on agreed upon technical contractual agreements	РР	Intended to be used if no other type of change is applicable but the change affects agreed technical	Not relevant for technical evaluation.				-			-										T - T -					-		- 1		
	ER-AN-02	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix below.	РР	Intended to be used if no other type of change is applicable but the change affects agreed/sechrical contractual adnessments.	Technical interface means component terminals.	В						-										<u> </u>		1			-		@•	_	
M	ER-DS-OI	DATAGHEET			e.c. (ichten of electrical parameter distribution		Disk sessessment dependence on the contra																								
M PAG-C	LA-US-01	Change of datasheet parameters/electrical specification (min/max/tgs, values) and / or ACIDC specification	-	Change of application relevant information Not included: Editorial changes.		A	Riskassessmert depending on change for each application.																	-	- -				-		
PAG-CI	ER-05-02	Correction of data sheet or issue of errors	1 1	No technical change of product, process or test: New description of behavior which was respective before or which is different han initial specification. Please indicate cleanly, that inforces contains this spe of change in Assessment in application required?	e.g., data sheet correction because of new information about component behavior	A			-														-	-							

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I				Description of a newnod previously covered parameter. We included change of the product. (§t. notificance (§F. notificance (§F. notificance (§F. notificance of product) on change for such application is provide micking]																								
CERAMIC /TANTALUM	PAS-CER-DS-03	Specification of additional parameters	I P	(R; no influence (P): Risk assessment depending on change for each application to provide evidence of additional parameter (stat. evaluation)	e.g. adding new (sessed) parameter.	A																'			1.1.	' '			
CERAMIC / TANTALIM CERAMIC / TANTALIM CERAMIC / TANTALIM CERAMIC / TANTALIM	PAS-CER-MA-01	MATERIAL Change of material composition—Ceramic Stinder	P P	Binder material (ceramic) Binder material (tantal)	e.g. change from wax 1 to wax 2	C C					: : :				-			1:1:		-		1:			<u> </u>				-
CERAMIC / TANTALUM CERAMIC / TANTALUM	PAG-CER-MA-02 PAG-CER-MA-03	Change of material composition - Dielectric	P P	Dielectric change (ceramic only)	e.g. change from ceramic A Into-ceramic B	С							•						В -	C	•								
CERAMIC / TANTALLIM CERAMIC / TANTALLIM	PAG-CER-MA-06 PAG-CER-MA-05	Change of material composition - Decrode Attach Change of material composition - Electrode Material		Electrode attach (only tental, glue, carbon, Ag) Electrode Material (only ceramic, inner eletrode)	e.g. change of Ag particle size in conductive adhesive e.g. change from spehric to fisile shape (Ni paste)	c																-	-						
CERAMIC / TANTALUM CERAMIC / TANTALUM	PAG-CER-MA-05 PAG-CER-MA-07	Change of material composition - Encapsulation Change of material composition - Lead material / Termination	P P	Encapsulation Lead material / Termination	e.g. change from spoyd into spoy2 e.g. change from SnPo topure Sn	c					• •			•	•					-			-				-		Check whether AOI at Tier 1 can be affected
CERAMIC / TANTALUM	PAS-CER-MA-08	Change of supplier of material	. Р	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	c									•	• •			В -	•	• (Assumption material specification remains unchanged. Otherwise see change of mesoral
CERAMIC / TANTALUM	PAG-CER-DE-01	Cossish Changes of termination, surface linish, shape, color, appearance or dimension structure - Lead Diameter		Lead diameter	e.g. change from 0.8mm into 0.6mm	В									1.1	. .		T . T .	T . T .	Τ.						1.1.	1.1	$\overline{\mathbf{I}}$	
CERAMIC / TANTALUM	PAS-CER-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area		Termination area	e.g. change in width of termination from 0.1 -0.3mm into 0.2 - 0.4 mm	В				_																			
CERAMIC / TANTALIM CERAMIC / TANTALIM	PAGCER-DE-03 PAGCER-DE-04	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination literature Changes of inner construction - Stactade Thideness	I P	Terminal interface Electrode thickness (ceramic only)	e.g. additional layer in termination e.g. Ni layer change from 2.5µm into 3.5µm	B C					: :		•			: :			B -	•	•			: :					
CERAMIC / TANTALUM	PAS-CER-DE-05	Changes of inner construction - Layer Thickness	. P	Layer thickness (delectric thickness)	e.g. Ceramic layer thickness changes from Juminio Sym.	С		•	100	•	• •		•		-	•		• .	в -		- 0	_	-				-		•
CERAMIC /TANTALIM	PAS-CER-DE-06	Changes of inner construction - Number of Layers	. Р	Number of layers (ceramic only). Allways in combination with PAS-CER-OE-05.	see also layer thickness	С		•	1	. (СС	- C	с -	с -	-	с -	- c	с -	B,C -		- 0	-	-				-	<u> </u>	
CERAMIC / TANTALLIM CERAMIC / TANTALLIM	PAS-CER-PR-01 PAS-CER-PR-02	PROCESS Changes in process technologyor manufacturing methods - Dicing Changes in process technologyor manufacturing methods - Dicing		Change of dicing Electrode apply (delectric layer process)	e.g. change from cutting to saving e.g. change from wet to dry process	С		•		• •	•	• • c		•	•	•	 c c	c -	B,C -	C	- 0				F - F -	1-1-	1-1		-
CERAMIC / TANTALUM	PAS-CER-PR-03	Changes in process suchnology or manuscularing methods - succious apply Changes in process suchnology or manufacturing methods - Firing	. Р	Change of firing profile	e.g. crange non-wer to dry process e.g. seperation of decarbonization and firing profile.	c							•								- 0							+++	
CERAMIC / TANTALIM	PAS-CER-PR-06	Changes in process technology or manufacturing methods - Lamination Changes in process technology or manufacturing methods - Particle Size	. Р	Change of lamination/press techinque	e.g. standard pressing to iso static pressing. e.g. change DSO from 0.5µm into 0.4µm	c		•							-				В -		- (-					-		
CERAMIC / TANTALUM	PAS-CER-PR-06	Changes in process technologyor manufacturing methods - Particle Size Changes in process technologyor manufacturing methods - Screening/Printing		Change of powder particle size. Allways in combination with PAS-CER-MA-03. Change of screening / printing	e.g. change DS0 from 0.5µm/miss 0.4µm e.g. change from screen printing into offset printing	c							с -			c .		c -	B,C -	•									
CERAMIC / TANTALUM	PAS-CER-PR-07	Changes in process technology or manufacturing methods - Termination	. Р	Change for termination preparation like plating or apply of termination base layer.	e.g. change in plating technology (final termination) e.g. change from dip in paste to plating (apply)	В				_									в -								-		
CERAMIC / TANTALLIM CERAMIC / TANTALLIM CERAMIC / TANTALLIM	PAG-CER-PR-08	Process integrity ruring within specification PACKING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS	. Р	Variation within process specification.	e.g. process control	С					. .							<u> </u>	<u> </u>			1						بلطة	
CERAMIC / TANTALUM	PAS-CER-PN-01	Packing / shipping specification-change (lossening of tolerances)		Change of packing specification.	e.g. number of pieces on reel.	В			-						-					-								- [- [
CERAMIC / TANTALUM	PAS-CER-PN-02			Change of drypack requirements.	e.g. change in drypackassurance (HIC, MSB)	В																	-				-		-
CERAMIC / TANTALLIM CERAMIC / TANTALLIM	PAS-CER-PN-03	Change of carrier (tray, real) PACKING / SHPPING - VISUAL INSPECTION	P P	Change of carrier	e.g. change by material e.g. change by geometry	В		• •		. .									- -	-	- -	-	-						
CERAMIC / TANTALUM	PAS-CER-PV-01	Change of labelling		Change of labelling, also on reel.	(f) e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	В									-					-		-	-				-		•
CERAMIC / TANTALUM	PAS-CER-PV-02	Change of product marking		Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	В			-						-					-		-	-				-		
CERAMIC / TANTALUM CERAMIC / TANTALUM	PAS-CER-PV-03	Change of packing labipping specification	P P	Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in padding specification										-					-			-				-		-
CERAMIC / TANTALUM	PAG-CER-EQ-01	EOGRETICS / CAPACITY / TESTING - DOUPNEMENT Production from a new equipmenthod which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product.	P P	Change in process technique which is not sheady contend shows. Note: Changes affecting the product not covered by the table require also a PCN.	e.g. change from wet to dry technology.	С								• A				Τ.Τ.	В -		. (: -							Test effort depends on final risk sessessment.
CERAMIC / TANTALUM	PAS-CER-ED-02	The discrete representative reasonable in the registry of one real product. Production from a new equipment had which uses the same basic sechnology (replacement equipment or estension of existing equipment pool).		the table require also a PCN. PCN required for dedicated equipment for sensitive component production.	e.o. elimination di manual handino propassas	c								• A				+	В -		- (+	Performance seat according to affected process change. Test effort depends on final risk assessment. Performance seat according to affected
CERAMIC / TANTALUM	PAG-CER-EQ-03	extension of existing equipment pool) Change in first less equipment gas that uses a different technology		Change of final test equipment which use different	e.g. change of tester platform	c													@B -										Performance test according to affected process change. Gage R&R / delta correlation
CERAMIC / TANTALUM CERAMIC / TANTALUM		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW																				<u> </u>						#	8.
CERAMIC / TANTALLIM	PAG-CER-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P P	Change of manufacturing site. Includes transfer as well as additional site. Note: Reorganization inside one plantistie is not affected.	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source/fab strategy	В			-	•	• •				٠				в -	٠	• (-						- @•	@•
GERANIC / TANTALUM	PAG-CER-PF-02	Elimination or addition of a manufacturing process step.	. Р	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	с									-	- -				-	- -	-	-	-			-	- -	Characterisation depends on impact of production flow.
CERAMIC / TANTALLIM		LOGISTICS/CAPACITY/TESTING - Q-GATE			e.g. change from 100% to sample inspection e.g. seat flowblock, reduction from three to two temperature measurements					Ŧ																			R (electr. funct.): test coverage. R (reliability) only for change in burn in
CERAMIC / TANTALUM	PAS-CER-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination) addition of electrical measurement less flow block, relaxation/enhancement of monitoring procedure or sampling) FILM CAPACITORS	- Р	Change of test coverage.	e.g. set towtook, recursor from thee to teo temperature measurements e.g. change in burn in hrun in process.	С									•								-				-	<u> </u>	R (reliability) only for change in burn in process.
Film-capacitors Film-capacitors	PAS-FLM-AN-OI	ANY	_	Intended to be used if no other type of change is	Not relegant for technical evaluation.											$\overline{}$						_						$\overline{}$	
Filmcapacitons	PAG-FLM-AN-02	Any change with impact on agreed upon technical contractual agreements Any change with impact on processability/menufacturability at customer, which is not covered in the matrix Any change with impact on processability/menufacturability at customer, which is not covered in the matrix	P P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation. Technical interface means component terminals.	В														-		-						· @•	
Film-capacitors Film-capacitors		DATAGNEET								÷																			
Film capacitors	PAS-FLM-DS-01	Change of datasheet parameters/electrical specification (min/max/typ. values) and / or ACIDC specification	_	Change of application relevant information Not included: Editorial changes.	e.g. tighten of electrical parameter distribution	A	Riskassessment depending on change for each application.														-								
	PAS-FLM-DS-02	Connection of data sheet or leasus of erratio		No technical change of product, process or test. New description of behavior which was not specified before or which is different from initial specification. Please incloses clearly, that informs contains this type of change! Assessment in application required!!	d e.g. data sheet correction because of new information about component behavior	A			-																				
Final Lagran Lab	PAS-FLM-DS-03	Specification of additional parameters	I P	Description of a newnot previously covered parameter. No technical change of the product. (it is no instruction of the product of the (it is not because the product of the parameter of the product of the parameter (stat. evaluation)	e.g. adding new (sested) parameter.	A			-																				
Film-capacitors Film-capacitors		MATERIAL		parametes (stat. evaluation)																									
				Typicalychange within eposyer PU sealing without			At incombination with PAS-FLM-DG-01 or if change of sealing compound with effect to mechanical properties.																						
Filmcapacitys	PAS-FLM-MA-OI	Change of material composition - Sealing Compound	P P	Typically change within eposy or PU sealing without effect to mechanical properties. Note: Change from eposy sealing into PU sealing (both director) will lead to generate a new product.		c		•	•	•		•	•	• @•	•	•	-		•	-			-						Consider vibration in application
Filmospacitors	PAG-FLM-MA-02	Change of material composition - Package	РР	Change material of package	Change material of package, e.g. change from PSIT to PPS e.g. change of glas fiber ratio	В			•		• -				@•				- @-			-	-				-		Consider ACI and processability
	PAG-FLM-MA-03	Change of material composition - LeadTermination	РР	Change of LeadTermination Note: If change of lead trame material leads to an ESR change, than change of data sheet (PAS-FLM DS-01) has to be respected.	e.g. change of basis material from Cu to Fe e.g. change of finishing from SiPb to Sn	В	& in combination with PAS-FLM-QS-Q1								-				в -			-	-				-	· @•	Change of base material: Consider ESR, high frequency parameter.
Film.capacitons	PAS-FLM-MA-OI	Change of material composition - Metal Spray(Schoop)		Change of Metal Spray (Schoop): Use different material for metal apray process for bosed and raiked types	e.g. from Zn to Al	с	B: for roled SMD			- @	B• - 6	g• -	@• -	- @•	- (g• @•		- @·		-		-	-				-		Consider ESR. Solderability Test for relead SMD components.
Plimicapacitors	PAS-FLM-MA-0S		P P	Change of film-material for boxed and nated types	e.g. change of additives (<1%) of film composition (same raw material)	с	B: for raised SMD		•)	B• -	- @•	@• @•	@• -	-		@• -			-		-	-				-		@•
Filmcapacitors	PAS-FLM-MA-06		P P	Change of metal foil for inner electrode Change to a new or additional material supplier at	e.g. change from Al to Al-Zn alloy	С	Check Fother PAG-FLM-MA is affected	•					@• @•		-					-		-	-				-		@ Assumption material specification remains
Film capacitors	PAG-FLM-MA-07	Change of supplier of material	- Р	Change or meas too for inner executions Change to a new or additional material supplier at component manufacturer which are described above.	e.g. for 2nd source purpose	С		•	•	• •	• •	• -	• •	•	•	- •				-	•	1 -	-				-		Assumption material specification remains unchanged. Otherwise see change of material.
Film-capacitors	PAS-FLM-DE-01	OSSON Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter / Thioleass	I P	Change of lead dismeter thickness	e.g. change lead diameter from 65 to 0.4 mm e.g. change of thickness of terminal	В		•			B • -	- -	- @•	@• @•	- (@•			@B -	@•	@•	-	-				-		-
Film.capacitors	PAG-FLM-DG-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area	I P	Changes of termination area are changes which an affecting the area for connection of component and PCB	e.g. change of semiration layer thickness e.g. change in semiration dimensions / shape	В			-	- @	B• -				-			- @		@•	@•	-	-				-	- @•	-

	_																													
Film capacitors	PAG-FLM-DE-03	Changes of inner construction - Inner Connection	. Р	Change of inner connection Change of appearance without impact on product integer; (P): Change in appearance without impact on product integer; (P): Change in appearance with impact on-product integer on additional and integer of the change in additional and integer of the change (PAG-FLM-PV-QP).	e.g. change from soldered connection to welded connection	С				@• -	-	- @•	@• -	@• -	@• @•	@•		- @	9• -	@• @				-		-		-	-	
				Change of appearance. (Et Change in appearance without impact on			Checkif MATERIAL is affected.																							
	PAS-FLM-DE-04	Changes of termination, surface linish, shape, color, appearance or dimension structure - Appearance	I P	product integrity. (P): Change in appairance with impact on product integrity.	e.g. change or adding of color on component	В					-					-					-			-		-		-	-	
				Note: Marking on device is defined as separate change (DAS-E) M-DA-(O)																										
Film capacitors	PAS-FLM-DE-05	Changes of inner construction - FilmFoil	. Р	Change of film or foil design	e.g. change to a different foil supplier.	С	A in combination with PAS-FLM-QS-Q1				-	@• •				-	- •	- E	в -		-			-		-		- 6	D•	
Familiageosins	PAS-FLM-DE-06	Changes of inner construction - Insulation System		Change of inner insulation to protect winding element against housing.	e.g. change to a different foil supplier. e.g. change of potting material e.g. change of number of inner insulation layers (depending of insulation material thickness)	С											- •		в -										D•	
Filmcapacitors				element against housing.	e.g. change of number of inner insustion sayins (depending of insulation material thickness)			•			-													-		-		. ,	B.●	
Film capacitors	PAS-FLM-DE-07	Changes of termination, surface linish, shape, color, appearance or dimension structure - Package	I P	Change of packaging	e.g. change of dimension or shape e.g. change of surface	В				@• -	@•		@• @•	- @•	@• @•	-			- @•		-			-		-		-	-	
Film-capacitons		PROCESS	т т	1		1			_		П					т т									_				_	
F1	PAS-FLM-PR-01	Changes in process technology or manufacturing methods - Package	. Р	Change of resin filling or hardening process (relevant for board types only)	e.g. change in resin filling process (mixing, sequences, potting,) e.g. change in hardering process (temperature, time,)	С		•	1		-					- 1		1 - 1 -			-			-				-	•	
	PAG-FLM-PR-02	Changes in process technology or manufacturing methods - Terminal Attach	. р		e.g. spraying and/or galvanic process, e.g. welding/scidering	С	B: for raised SMD												в -										Consider	r ESR. SiltyTest for rolled SMD ints.
Film capacitors				emer o concarciaceo ges				•																					componer	eres.
Film capacitors	PAS-FLM-PR-03	Changes in process technology or manufacturing methods - Winding	. Р	Change of winding, flattering or tempering process	e.g. change of tempering temperature	С					-	@• •				-		- E	в -		-			-				-		
Filmcapacitors	PAS-FLM-PR-04	Process integrity suring within specification PROCEING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS	. P	Variation within process specification.	e.g. process control	С					-					-					-							-		
Filmcapacitors		PACKING / SHPPING - NEW MATERIAL, CRITICAL DMENSIONS Packing / shipping specification-change (lossening of tolerances)	РР	Change of packing specification.	e.g. number of pieces correel.	В							T . T .			T . T		т. г.			T . T					T . T				
Film capacitors	PAS-FLM-PN-02	Dry packrequirements change				В										+ +			-		+ +									
Filmcapacitors	PAG+LB-N-Q	Drypackrequirements change			e.g. change of MSL e.g. change in drypackassurance (HIC, MSB)						-					-					-					•				
Electronists	PAG-FLM-PN-03	Change of carrier (tray, reel)	P P	Change of carrier	e.g. change by material e.g. change by geometry.	В					-					-					-			-				-		
Film capacitors		PACKING / SHIPPING - VISUAL INSPECTION																												
	PAG-FLM-PV-01	Change of labelling		Change of labelling, also on reel.	(f) e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	В												1												
Film capacitors		ĺ	$\Gamma \Gamma'$																											
	PAG-FLM-PV-02	Change of product marking	I P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	В															-			-		-		-		
Film capacitors				Channa in carling sparify-streethin de	e.g. change of appearance of marking											+		\vdash						-		\vdash				
Elm-caracters	PAS-FLM-PV-03	Change of packing lahipping specification	P P	Change in packing specification which does not discribed a change of dimensions or material of the packing.	e.g. change of documentation in packing specification			100			-						-				-			-	-	-		-	-	
Film-capacitors		LOGISTICS/CAPACITY/TESTING - EQUIPEMENT		*													_													
	PAS-FLM-EQ-01	Production from a new equipment/loof which uses a different technology or which due to its unique form or	. .	Change in process technique which is not already casend above. Note: Changes affecting the product not covered by the table require also a PCM.	e n inniamentation of new re	С						@• •	@• @•						в -											rt depends on final risk wrt.
Discountries		function can be expected to influence the integrity of the final product		Note: Changes affecting the product not covered by the table require also a PCN.		e						@•	@• @•							•									Performan process of	ers. ence test according to affected change.
		Dondarfors from a new an immersional which uses the same basic technology (not recovered to		DCN remined by desirated an imperior																									Test effort	rt depends on final risk
	PAS-FLM-EQ-02	Production from a new equipment/bod which uses the same basic technology (replacement equipment or estension of existing equipment pool)	- P	PCN required for dedicated equipment for sensitive component production.		С		•		• •	•	@•	@• @•	• -		1 - 1		- E	в -	•	- 1			-	-	-		- 6	Performa process o	wert. since test according to affected change.
y struggeout				Change of final test equipment which use-different																										
	PAS-FLM-EQ-03	Change in first test equipment type that uses a different technology	P P	Change of final text equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	С		•			-					-		- 6	≬В -		-			-		-		- (∰• GageRä	SR / delta correlation
Film capacitors Film capacitors		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW																												
	PAS-FLM-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	p p	Change of manufacturing site. Includes transfer as well as additional site. Note: Reorganization inside one plansisite is not affected.	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site.	В													в .									@• (B•	
Film-capacitors				Note: Hearganization intolerone plantesis is not affected	e.o. dual source / fab strategy																							_		
Electronists	PAS-FLM-PF-02	Climination or addition of a manufacturing process step	. Р	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	С		•			-					-					-			-				- (Character production	erisation depends on impact of on flow.
Film capacitors		LOGISTICS/CAPACITY/TESTING - Q-GATE																												
	PAS-FLM-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination) addition of electrical measurementates flow block, relaxation/enhancement of monitoring procedure or sampling)	. Р	Change of test coverage.	e.g. change from 100% to sample inspection e.g. test flow block, reduction from three to two temperature measurements e.g. change in burn initius in process.	С																							R (electr. R (reliabl	t funct.): test coverage. slity) only for change in burn in
Filmcapacitors					e.g. change in burn inhun in process.																								process.	
QUARTZ CRYSTAL / SAW QUARTZ CRYSTAL / SAW		QUARTZ CRYSTAL / SAW																												
QUARTZ CRYSTAL/SAW	PAS-QUA-AN-OI	Any change with impact on agreed upon technical contractual agreements	P P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.				-		-					-												-	-	
				contractual agreements.					_			_			+ + -	+ +	_	+		_			_							
	PAS-QUA-AN-02	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix	р р		Technical interface means component terminals.	R																						@•		
QUARTZ CRYSTAL / SAW	PAS-QUA-AN-02	Any-change with impact on processability/manufacturability at customer, which is not covered in the matrix below. OUT AGMEET	РР		Technical interface means component terminals.	В			-		-							1 - 1 -	. .					-				@•	-	
QUARTZ CRYSTAL / SAW		DATASHEET	P P		Technical interface means component terminals.								1 - 1 -									1 1		-	- -			@•	-	
QUARTZ CRYSTAL / SAW	PAS-QUA-AN-Q2 PAS-QUA-DS-01	Any-drange with regact on processability manufacturability or custome, which is not covered in the mains before DATABHEET Change of detailment parameters bleeched a specification (rein/manufacturability would be ACOC specification).	P P	Change of application relevant information Not included: Editorial changes.	Technical interface means component terminals. e.g. sighten of electrical parameter distribution.	B A					-					-													-	
QUARTZ CRYSTAL / SAW QUARTZ CRYSTAL / SAW QUARTZ CRYSTAL / SAW	PAS-QUA-DS-01	DATASHEET	P P	Change of application relevant information Not included: Editorial changes.	Technical interface means component terminals. e.g. sighten of electrical parameter distribution.	A		* ·			-													-		-			-	
QUARTZ CRYSTAL / SAW QUARTZ CRYSTAL / SAW QUARTZ CRYSTAL / SAW		DATASHEET	P P	Change of application relevant information Not included: Editorial changes.	Technical interface means component terminals. e.g. sighten of electrical parameter distribution.			* · ·																-	 	-		-	-	
QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW	PAS-QUA-DS-QI	CONTRACT Obtained promotectical specification (ref./res./sp. values) and to ACOC specification (ref./res./sp. values) and to ACOC specification (ref./res./sp. values) and to ACOC specification	P P	Change of application nelevers information. Not included: Editorial changes. No authorized change of product process or test. No electrical change of product process or test. Now decorption of behavior which was not application. Please will define them to total application. Please will decide classify, that the total contains this Assessment is application negalized.	Technical interface means component terminals. e.g. sighten of electrical parameter distribution.	A		· ·			-								·		-			-	 		· · ·	-		
QUARTZ CRYSTAL / SAW QUARTZ CRYSTAL / SAW QUARTZ CRYSTAL / SAW	PAS-QUA-DS-QI	CONTRACT Obtained promotectical specification (ref./res./sp. values) and to ACOC specification (ref./res./sp. values) and to ACOC specification (ref./res./sp. values) and to ACOC specification	n P P	Change of agalization relevant Information Net Individual: Editorial changes. Notachrical change of product, process or test to the control of the control	Technical interface means component terminals. ***ag Sighten of electrical parameter distribution ***ag Sighten of electrical parameter distribution ***ag data sheet correction bacause of new information about component terhalor	A					-													-	 	-		-	-	
QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW	PAS-QUA-DS-01 PAS-QUA-DS-02	NAME AND ADMINISTRATION OF THE PROPERTY OF T	n P P	Change of agalization relevant Information Net Individual: Editorial changes. Notachrical change of product, process or test to the control of the control	Technical interface means component terminals. ***ag Sighten of electrical parameter distribution ***ag Sighten of electrical parameter distribution ***ag data sheet correction bacause of new information about component terhalor	A		· ·			-										-		· ·	-				-	-	
QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW	PAS-QUA-DS-QI	CONTRACT Obtained promotectical specification (ref./res./sp. values) and to ACOC specification (ref./res./sp. values) and to ACOC specification (ref./res./sp. values) and to ACOC specification	n P P	Change of agalization relevant Information Net Individual: Editorial changes. Notachrical change of product, process or test to the control of the control	Technical interface means component terminals. ***ag Sighten of electrical parameter distribution ***ag Sighten of electrical parameter distribution ***ag data sheet correction bacause of new information about component terhalor	A		• • • • • • • • • • • • • • • • • • •													-		· ·	-			·	-	-	
QUARTZ CRYSTAL /SAW QUARTZ CRYSTAL /SAW QUARTZ CRYSTAL /SAW	PAS-QUA-DS-01 PAS-QUA-DS-02	NAME AND ADMINISTRATION OF THE PROPERTY OF T	n P P	Change of application nelevers information. Not included: Editorial changes. No authorized change of product process or test. No electrical change of product process or test. Now decorption of behavior which was not application. Please will define them to total application. Please will decide classify, that the total contains this Assessment is application negalized.	Technical interface means component terminals. ***ag Sighten of electrical parameter distribution ***ag Sighten of electrical parameter distribution ***ag data sheet correction bacause of new information about component terhalor	A		· · ·			-										-		· · ·		· .		 	-	-	
QUARTZ CRYSTA: JAMY QUARTZ CRYSTA: JAMY QUARTZ CRYSTA: JAMY QUARTZ CRYSTA: JAMY	PMS-QUA-DS-01 PMS-QUA-DS-02 PMS-QUA-DS-02	The Contract of Action of	n P P	Change of agriculture relational relationals and the final feet feet feet feet feet feet feet fee	Technical interface means component terminals. ***ag Sighten of electrical parameter distribution ***ag Sighten of electrical parameter distribution ***ag data sheet correction bacause of new information about component terhalor	A		• • • • • • • • • • • • • • • • • • •			-																· · · · · · · · · · · · · · · · · · ·			
QUARTZ CRYSTA; JAWY 2040TZ CRYSTA; JAWY 2040TZ CRYSTA; JAWY QUARTZ CRYSTA; JAWY	PAS-QUA-DS-00 PAS-QUA-DS-00 PAS-QUA-DS-00 PAS-QUA-MA-RE	Congress distances permissionism operatures produces produces produces and permission of permission of permission of permission of permission of the congress	I I P	Company of application selected information in the individual Excitor of investment in the individual Excitor of individ	Technical interface means component terminals. ***ag Sighten of electrical parameter distribution ***ag Sighten of electrical parameter distribution ***ag data sheet correction bacause of new information about component terhalor	A		• • • • • • • • • • • • • • • • • • •											· · ·				· · ·				· · · · · · · · · · · · · · · · · · ·			
CAMPIZ CRYSTA, ISANY	PMS-QUA-DS-01 PMS-QUA-DS-02 PMS-QUA-DS-02	The Contract of Action of	I I P	Company of polytomic services in the research of the state of the stat	Technical interface means component terminals. ***ag Sighten of electrical parameter distribution ***ag Sighten of electrical parameter distribution ***ag data sheet correction bacause of new information about component terhalor	A		· · · · · · · · · · · · · · · · · · ·											B - @•				· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·			tale influenced are expension coefficient may
QUARTZ CRYSTA: JAWY	PMS -QUA- DS -QU PMS -QUA- DS -QU PMS -QUA- DS -QU PMS -QUA- DS -QU PMS -QUA- MA- AC	The Commentary of the Commenta	P P P P P P P P P P	Charge of agriculture values for investment of the students of the results of the students of the	Transical service news compared services, as higher of descript of program distribution as distributed or description of the service of the	A A A		· · · · · · · · · · · · · · · · · · ·	•		@•					@•	@• -		· @•		-			-			·	-	change -	sure eigeneon coefficient may
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OLUMNIT CONSTRUCTION	PAG-QUA-PR-OI	Changes in process technology or manufacturing methods - Quartz Blank	1 . I p	Change of Quartz Blankpropess	e.c. change of cutting or lapping technology	С				1	- 1 -						- B		1 - 1 -					1 - 1		1 - 1 - 1	
COMIZ CRISINE ISSUE	PAS-QUA-PR-02	Changes in process technology or manufacturing methods - Blank Stating / Cleaning		Change of Blank Exch/Clean process Using different / newtechnology	e.g. change from liquid exching to plasma exching	С									@• -	@• -	- В					1.1					
QUARTZ CRYSTAL/SAW																							نست	-			
QUARTZ CRYSTAL/SAW	PAG-QUA-PR-03	Changes in process technology or manufacturing methods - Electrode Formation	. Р		e.g. change from evaporation to sputtering	С		•		• -					•	@• -	- B					-					
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-OI	Changes in process technology or manufacturing methods - Trimming	. Р	Change of Auto Trim process (Method of final frequencyturing)	e.g. change from evaporation to ion beam	с										@• -	- B					-					
QUARTZ CRYSTAL/SAW						_										_							=	+ +			
	PAS-QUA-PR-05	Changes in process technology or manufacturing methods - Standing / Annealing	- P	Change of Blankbonding / annealing process. Change of method how apply conductive material to have or blank.		С				• @•	@Y @	Y •			• •	•	- В				- @Y						
QUARTZ CRYSTAL/SAW	PAS-QUA-PR-06			Change of Cap/Can attaching process	an chance of the realism method					• @•							- В						_	+			
QUARTZ CRYSTAL/SAW		Changes in process technology or manufacturing methods - Can / Cap Attaching		Change of Cap/Can attaching process	e.g. change of the sealing method e.g. change from batch owen to reflow owen	С		• •								• -						-					
QUARTZ CRYSTAL/SAW	PAS-QUA-PR-07	Changes in process technology or manufacturing methods - Molding	. P	Change of Overmolding process. Not relevant for typical SMID.	e.g. change of overmoid process parameter	С		•	- @•	• @•	• @	@•		@• - •	• -	•	- B		• -			-	/ · · ·				
	PAG-QUA-PR-08	Changes in process technology or manufacturing methods - Marking	. Р	Change of Marking process	e.g. change from inked marking to laser marking e.g. marking of pin 1 e.g. change of appearance (additional marking)	В															- @•		. 7				ACI chark recommed
QUARTZ CRYSTAL/SAW																					6.		نست				ACTURICIES IN THE PROPERTY OF
QUARTZ CRYSTAL/SAW	PAS-QUA-PR-09	Changes in process technology or manufacturing methods - Aging	. Р	Change of Aging process. Typically no aging done on quantz crystals.	If aging is done: e.g. change of times or temperatures	С		•	- @•						• -	•	- B					-					
QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW QUARTZ CRYSTAL/SAW	PAS-QUA-PR-10	Process integrity tuning within specification	. Р	Variation within process specification.	e.g. process control	С					- 1	- -	- -							1 - 1 -	. . .		خلت				
QUARTZ CRYSTAL/SAW		PACKING / SHIPPING - NEW MATERIAL, CRITICAL OMENSIONS		т —			1			1 1 1		$\overline{}$							$\overline{}$	$\overline{}$			_				
QUARTZ CRYSTAL/SAW	PAG-QUA-PN-01	Packing / shipping specification-change (lossening of tolerances)			e.g. number of pieces on neel.	В																	7				
	PAS-QUA-PN-02	Drygackrequirements change		Change of drypack requirements.	e.g. change of MSL e.g. change in drypackassurance (HIC, MBB)	В																	. 7				
QUARTZ CRYSTAL/SAW																							4				
QUARTZ CRYSTAL/SAW	PAS-QUA-PN-03	Change of carrier (tray, reel)	P P	Change of carrier	e.g. change by material e.g. change by geometry	В			- F		-																
QUARTZ CRYSTAL/SAW	_	PACKING / SHIPPING - VISUAL INSPECTION				_							_									_	_				
QUARTZ CRYSTAL / SAW	PAS-QUA-PV-01	Change of labelling	I P	Change of labelling, also on reel.	(f) e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	В			400																		
QUARTZ CRYSTAL/SAW																							=	\pm			
QUARTZ CRYSTAL/SAW	PAS-QUA-PV-02	Change of product marking	I P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	В																	7. 1.7				
	PAS-QUA-PV-03	Change of packing lahipping specification		Change in packing specification which does not described a change of dimensions or material of the packing.	e.g. change of documentation in packing specification																						
QUARTZ CRYSTAL/SAW	PAS-QUA-PV-GI		РР	packing.	e.g. crange of occurrence on in passing specification																						
QUARTZ CRYSTAL/SAW	_	LOGISTICS/CAPACITY/TESTING - EQUIPMEMENT				_			_				_			_	_					_	_				
	PAS-QUA-EQ-OI	Production from a new equipment/lool which uses a different technology or which due to its unique form or		Change in process technique which is not already covered above. Note: Changes affecting the product not covered by the table require also a PCN.	e.g. new equipment supplier with different process concept	с											- @в									- @•	Test effort depends on final risk assessment.
	nanamata tr	function can be expected to influence the integrity of the final product	P	Note: Changes affecting the product not covered by the table require also a PCN.	concept	c											. 65				1		تراك			. @•	Performance test according to affected process change.
QUARTZ CRYSTAL/SAW				+																			_				Test effort depends on final risk
	PAS-QUA-EQ-02	Phoduction from a new equipment/tool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	- Р	PCN required for dedicated equipment for sensitive component production.	e.g. additional equipment to increase production capacity e.g. replacement of same equipment	С		•	100								- @B					-				- @•	assessment. Performance test according to affected process change.
QUARTZ CRYSTAL/SAW		 	+	 																		++	#				process Change.
	PAS-QUA-EQ-03	Change in final test equipment type that uses: a different technology	P P	Change of final text equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	с											- @в					-				- @•	Gage R&R / delta correlation
QUARTZ CRYSTAL/SAW				parameters.																						3.	
QUARTZ CRYSTAL/SAW		LOGISTICS/CAPACITY/TESTING - PROCESS FLOW		Change of manufacturies are	a.n. mounted or brander of provident class class																						
	PAS-QUA-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P P	Change of manufacturing sits. Includes transfer as well as additional site. Note: Reorganization inside one plantisite is not	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site.	В											• B									@• @•	
QUARTZ CRYSTAL/SAW		 		aflected	e.g. dual source / tab strategy					+				-								+	_				Characterisation depends on impact of
QUARTZ CRYSTAL/SAW	PAS-QUA-PF-02	Dimination or addition of a manufacturing process step	. Р	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	С		•	F																	- @•	Characterisation depends on impact of production flow.
QUARTZ CRYSTAL/SAW	_	LOGISTICS/CAPACITY/TESTING - Q-GATE																					_				
	QUA-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination) addition of	. P	Change of test coverage.	e.g. change from 100% to sample inspection e.g. test flow block, reduction from three to two	с																					R (electr. funct.): test coverage. R (reliability) only for change in burn in
QUARTZ CRYSTAL/SAW		ALIMINIM ELECTROLIVITO CARACITORS			e.g. change in burn intrun in process.																						process.
Al-Cap Al-Cap		ALUMIUM ELECTROLYTIC CAPACITORS ANY																					_				
	PAG-ALU-AN-01	Any change with impact on agreed upon technical contractual agreements	РР	Intended to be used if no other type of change is applicable but the change affects agreed technical	Not relevant for technical evaluation.				100																		
Al-Cap	PAS-ALU-AN-02	Any change with impact on process shiftly transfacturability at customer, which is not covered in the matrix	р р		Technical interface means component terminals.	В							_									+ +	_			@• -	
A-Cap		DATASASET	1 ' 1 '		See processability on board level.																					6.	
	PAS-ALU-DS-01	Change of datashest parameters/electrical specification (min/max/kg. values) and/or AC/DC specification		Change of application relevant information Not included: Editorial changes.	e.g. tighten of electrical parameter distribution	А	Risk assessment depending on change for each application.																				
Al-Cap	PAG-ALU-DS-01	Change of classified parameters actical operations (minimacing, value) and/or ACIOC specification	ь Р		e.g. sgreen of electrical parameter distribution	^	each application.																				
				Notechnical change of product, process or test. New discription of bahasior which was not specified before or which is different horn initial specification. Please indicate clearly, that inforces contains this type of change. Assessment in application required!!																							
	PAS-ALU-DS-02	Correction of data aftest or issue of errata		New description of behavior which was not specified before or which is different from initial specification.	e.g. data sheet correction because of new information about component behavior	Α.																	4. 1.7				
				type of changel	accur component perseon																						
Al-Cap																											
				Description of a newnot previously covered parameter. Notesthrical change of the product. (§): no inflations (§): Risk assessment depending on change for such application to provide evidence of additional parameter (stat. evaluation)																							
	PAS-ALU-DS-03	Specification of additional parameters	ı P	Notechnical change of the product. (Et no influence	e.g. adding new (tested) parameter.	Α.																					
			1 1	(P): Riskassessment depending on change for each application to provide evidence of additional																							
Al-Cap				parametes (stat. evaluation)																							
A-Cap		MATERIAL					B: only if a cap holder holds the Capacitor																_				
H C	PAS-ALU-MA-01	Change of material composition - Housing	P P	Change of housing	e.g. change Al alloyfor housing	С	 only if a cap holder holds the Capacitor body by pressing. 		•	• -	•		-		@• -	•		•				-		-			
	PAS-ALU-MA-02	Change of material composition - Sealing	РР	Change of sealing	e.g. change of rubber compound e.g. change of sealing disc material (solal, Snap in)	С	9: in case of external surface of sealing is								@• @s												
A-Cap	PAG-ALU-MA-02	Change of material composition - Sealing					Evaluation only, if capacitor is glued	•	•													-					
Al-Cao	PAS-ALU-MA-03	Change of material composition - Déternal Insulation	РР	Change of external insulation / sleeping	e.g. change from PVC into PET e.g. change of color	С	se: chily for glassi capacitors.		@•	• •	• @				- @S	•		•				- [Blased Humiditytest can be done without applying sollage.
	PAS-ALU-MA-OI	Change of material composition - Lead/Termination			e.g. change of leadhame from into copper e.g. change of leadhame finish from stellead into sin	В											• B									@• -	
A-Cap					w.g. u æ ge d saarame snah from Snlead into Sn				_		-+											+					
	PAS-ALU-MA-05	Change of material composition - Internal Insulation / Paper	РР	Change of paper type / internal insulation	e.g. change of paper thickness 50 µm to 40µm	С	characterization). Check if datasheet is															-	- 7	-		- @•	
A-Cap																•	- B						_				
11 Com			-	1			A: Only if impedance increase (deline																				
N-Cap	PAS-ALU-MA-06	Change of material composition - Electrolyse	РР		e.g. change informulation	С	A: Cnlylf impedance increase (debs characterization). Check if datasheet is affected (PAS-ALU-OS-01). A: Cnlylf impedance increase (debs characterization). Check if datasheet is affected (PAS-ALU-OS-01).															-		-		· @•	
																						-		-			
A-Cap A-Cap	PAG-ALU-MA-06 PAG-ALU-MA-07 PAG-ALU-MA-08	Oxoque of malarial composition - Electrolyja Change of malarial composition - Tapa Malarial Change of malarial composition - Tapa Malarial Change of malarial composition - Bassa Plate			e.g. change in formulation e.g. change of glue or basis material e.g. change of used plastic material	C C B			 : :								- В					-		-	: :		
A-Cap A-Cap			P P	Change of closing tape material Change of base plate material		В	annin (Popole County).	:		@• - @• -		- @•			@• @• @•	• •	- B					-		-			Test effort depends on final risk assaurent.
A-Cap A-Cap			P P	Change of closing tape material Change of base plate material			annin (Popole County).	:	-	@• - @• -		- @•			@• @• @•	• •	- В					-	 	-			Test effort depends on final risk assessment. Performence set according to efficient manifold.
A-Cap A-Cap	PAG-ALU-MA-07 PAG-ALU-MA-08	Owage of material composition - Type Meaning Owage of material composition - Stee Pulse	P P	Change of closing type material Change of base plate-material	e.g. change of glue or basis material e.g. change of used plastic material	В	annin (Popole County).	:		@• - @• -		- @•			@• @• @•	• •	- B					-		-			Translation depends on final risk assessment. Performance lest according to affected mariental. Assumption method appetition on resident Assumption method appetition on resident participaged. Otherwise see change of
A-Cop A-Cop A-Cop A-Cop	PAG-ALU-MA-08 PAG-ALU-MA-08 PAG-ALU-MA-08	Owage of material composition - Type Meaning Owage of material composition - Stee Pulse	P P	Change of closing tape material Change of base plate material	e.g. change of glue or basis material e.g. change of used plastic material	В	annin (Popole County).	:		@• - @• -		- @•			@• @• @•	• •	- B					-		-			Tarci allors depode on froit risk. Ideasanand Performance one according to affected married. Assumption married appositionion remains curclampted. Chemistes and change of married.
A-Cap A-Cap A-Cap A-Cap A-Cap	PAG-ALU-MA-07 PAG-ALU-MA-08	Owage of material composition - Type Meaning Owage of material composition - Stee Pulse	P P P	Change of closing tape material Change of base plate material	e.g. change of glue or basis material e.g. change of used plastic material	В	animal products and all animal states and animal	:		@• - @• -		- @•			@• @• @•	• •	- B					-		-			Test effort depends or final risk. Performance less according to afficiend restricts. Assurption restricts appetitudes to according to afficiend restricts. Assurption restricts appetitudes to according to a restricts. There were no according to a second to according to a restrict and according to according to according to a restrict and according to acc
A-Cup A-Cup A-Cup A-Cup A-Cup	PAG-ALLI-MA-02 PAG-ALLI-MA-08 PAG-ALLI-MA-09 PAG-ALLI-MA-09	Comput of material composition—Tages Material Comput of material composition—Tages Material Comput of American Computation—State Plans Computed American American Computed American American Computed American Computed American Computed American Computed American Computed American Comp	P P P	Change of closing tops maintail Change of base plate material Change to base plate material Change to a new or skit floorid material supplier at component manufactures. Change of with e dumeter	As charge if give in tests instantial As charge if used plastic mentrial As charge if used plastic mentrial As the Charge in the Charge in the Charge As charge from 38 into 68 mm sine dameter.	C B C	antition (marks a sound);	:		@• - @• -		- @•			@• @• @•		• B		• •			-		-		- @•	Test offort depends on fresi risk assessment, minister of the state of the state of the minister. Assessment of the state of the Assessment of the state of the state of the Assessment of the state of the state of the minister.
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	Process integrity runing within specification		Mariatan attic assessment and Bastisa		С																									
	PACKING / SHPPING - NEW MATERIAL, CRITICAL DIMENSIONS	1 - 1 -	Variation within process specification.	ing productures		<u> </u>																								
MG-ALU-PN-01	Packing / shipping specification change (lossering of tolerances)	P P	Change of packing specification.	e.g. number of pieces on reel.	В			100					-			-						-		-				-	-	
PAS-ALU-PN-02	Drypackrequirements change	р р	Change of drypack requirements.	e.g. change of MSL e.g. change in drypack assurance (HIC, MSB)	В													-				-		-				-	-	
AS-ALU-PN-03	Change of carrier (tray, reel)	РР	Change of carrier	e.g. change by material e.g. change by geometry	В								-									-						1 -		
	PACKING / SHPPING - VISUAL INSPECTION				•						_			_					_				_				_			
PAG-ALU-PV-01	Change of labelling		Change of labelling, also on reel.	(f) e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	В								-			-						-		-				-	-	
PAG-ALU-PV-02	Change of product marking	I P	Marking on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	В			100					-			-						-		-				-	-	
DASAH LEPKON	Chance of packing labicating specification	t. I.	Change in packing specification which does not described a change of dimensions or material of the packing.																											
KS-ALU-PY-UI		РР	packing.	e.g. drange of occumentation in packing specification																		- 1			<u> </u>					
	LOGISTICS/CAPACITY/TESTING - DOUPENEMENT		Change in process technique which is not already							\top			Т			1								1	T					Test effort depends
AS-ALU-EQ-01	Production from a new equipment/look which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product.	P P	Change in process technique which is not already countd above. Note: Changes affecting the product not covered by the table require also a PCN.	e.g. new equipment supplier with different process concept	С		•	100	•		•		•		• -	-	• •	В				•		-	-	-		-	@•	personnent. Performance test a process change.
		-																						+	1			+		Test effort depends
PAS-ALU-EQ-02	Production from a new equipment/hool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	. P	PCN required for dedicated equipment for sensitive component production.		c		•	1	•		•	•	•	· •	• -	-	•	В			- -	•		-	-	-		-	@•	Performance test a process change.
		I. I.	Change of final test equipment which use different technology. PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	С													ØВ											@•	
PAS-ALU-EQ-03	Change in final test equipment type that uses a different technology	PP	PCN required for dedicated equipment for sensitive parameters.	e.g. change of tester platform	С				1							-		@B		- -	- -	-	- -	1	-	-	- -	1	@•	Gage R&R / delta-
	LOGISTICS/CAPACITY/TESTING - PROCESS FLOW		Change of manufacturing site.	e.c. movement or transfer of manufacturing site or																										
PAG-ALU-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P P	Change of manufacturing site. Includes transfer as well as additional site. Note: Reorganization inside one plantisite is not affected.	e.g. movement or transfer of manufacturing site or process step(s) to a different location/site. e.g. dual source/fab strategy	В		•		• @	• •	• •		•	• •		•		В	• •	•		•		-				@•	@•	
PAG-ALU-PF-02	Elimination or addition of a manufacturing process step	. Р	Change of manufacturing process sequence.	e.g. washing / cleaning process e.o. change of order of processes	С		•											-				-						-	@•	Characterisation di production flow
PAG-ALU-PF-03	Elimination of final electrical measurement / set flow block	I P	Reduction of final testing. PCN required for dedicated final test reductions for sensitive parameters.	e.g. elemination of additional impedance control	С		*	100		-						-						-		-	-			-	@•	Characterisation di test flow.
	LOGISTICS/CAPACITY/TESTING - Q-GATE			a.n. channe from 100% to sample impaction	_											_					T T			_	T			_		
PAS-ALU-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination) addition of electrical measurementhest flow block, releastion/enhancement of monitoring procedure or sampling)	. Р	Change of test coverage.	e.g. change from 100% to sample inspection e.g. sest flow block, reduction from three to two temperature measurements e.g. change in burn in tun in process.	С		1			-						-		-						-	-	-		-	-	R (electr. funct.): to R (reliability) only to process.
	NTC		1																											
DISNTC IN O	Any change with impact on agreed upon technical contractual agreements	L	Intended to be used if no other type of change is	Not relevant for technical evaluation.	Π.																									
		P P	Intended to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.																						1			-		
PAG-NTC-AN-02	DATAGHEET			Technical interface means component terminals.								<u> </u>			<u> </u>		<u> </u>								<u> </u>			@•	<u> </u>	
PAS-NTC-DS-01	Change of datasheet parameters/electrical specification (min/mau/typ. values) and / or ACIDC specification	р р	Change of application relevant information Not included: Editorial changes.	e.g. tighten of electrical parameter distribution	А	Riskassesment depending on change for each application.							-					-							-					
PAS-NTC-DS-02	Correction of data sheet or issue of errata	1 1	Notechnical change of product, process or test. New description of behavior which was not specified before or which is different from nistial specification. Please indicate clearly, that inforces contains this type of change. Assessment in application required!	e.g. data sheet correction because of new information about component behavior	A					-			-					-							-					
Į.			Assessment in application required?																											
			Description of a newnot previously covered parameter. Nonechnical change of the product. (§r. noleflateros (§r. noleflateros (§r. Noleflateros (§r. Risk assessment depending on change for each application to provide enidence of additional parameter (stat. evaluation)																											
PAS-NTC-DS-03	Specification of additional parameters	I P	(R): Riskassessment depending on change for	e.g. adding new (tested) parameter.	A			100					-			-						-		-						
		<u> </u>	each application to provide evidence of additional parameter (stat. evaluation)																											
	WATERIAL Change of material composition - Ceramic Binder	P P	Change of Binder Material to bind ceramics.		С					- 1	- -		1 - 1	- @•	- @-	@•		- 1				- 1		1	1	- 1		1 -		
PAS-NTC-MA-02	Change of material composition - Ceramic	١	Change of ceramic composition	e.g. changes in additives amount	с														• @s										@•	Parameter analysis anticipated impact
AS-NIC-MA-02	Change of material composition - Ceramic	PP	Change of ceramic composition	e.g. changes in additives amount	C		•						1	· •	' '	•	'	60	• @5		- -	-		-	-	-		1	@•	performance. S = SMD device or
PAS-NTC-MA-03	Change of material composition - Inner Electrode	P P	Change of inner electrode material (inkmaterial). Valid in case of multilayer structures only.	e.g. change from AgPt material to AgPd material	С								-			-		В				-		-	-	-		-	@•	
			+								_		+ +	_	 	+			_			+ +								
VS-NTC-MA-04	Chance of material composition- Encapsulation	р р	Change of encapsulation material.	e.g. change of coating	R	interaction with other material especial.							-		- @•			@R /	n• -										@•	Parameter analysis anticloated impact
PAS-NTC-MA-04	Change of resterial composition - Encapsulation			e.g. change of costing e.g. change of additives in an insulation.	В	A: Riskassesment on application level, if interaction with other material espected. Riskassesment needed to evaluate.			•	•	_		-			•						-		-	-	-		-	@•	Parameter analyse anticipated impact- performance.
PASINTO-MA-06 PASINTO-MA-06	Change of material composition - Enopsealation Change of material composition - Laud material / Termination		Change of encapsulation material. Change of lead or outer termination. Change of lead (finish) material, termination material or attachment material.		В	Note assessment conspectation visual, it interaction with other material espectaci. Risk assessment needed to evaluate competibility of solidaring process.				@•	_		@•	- @•			@• @•			@• ·		-		-		-		-	@•	Parameter analytic anticipated impact performance.
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PASNTC-EO-03	Change in final test equipment type that uses a different technology	РР	Change of final text equipment which use different technology. PCN required for dedicated equipment for sensitive	e.g. change of sester platform	с											-		@B		-			-				-		@•	Gage R&R / delta correlation
	LOGISTICS / CAPACITY / TESTING - PROCESS FLOW		pa article.					_		_						+		\vdash	_			+		+	+	+		_	+	
PAS-NTC-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/tibe	P P	Change of manufacturing sits. Includes transfer as well as additional site. Note: Reorganization inside one plantistic is not affected.		В		•	•	٠	•	•			•		•		В		٠			-				-	. @		
PASINTO PE-02	Dimination or addition of a manufacturing process step LOGISTICS/CAPACITY/TESTING - O-GATE	- Р	Change of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	С											-				-			-		١.	-	-		@•	Characterisation depends on impact of production flow.
PAS-NTC-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination) additional electrical measurementhes flow block, els sation/enhancement of monitoring procedure or sampling)	. Р	Change of sect coverage.	e.g. change from 100% to sample inspection e.g. start flow block subscript from three to two temperature recoverances e.g. change in burn in him in process.	с											-				-							-		@•	Characterisation depends on impact of test coverage. R (electr. funct.): seat coverage. R (reliability) only for change in burn in process.
	PTC ANY					•																								
PAS-PTC-AN-01	Any change with impact on agreed upon technical contractual agreements.	РР	transled to be used if no other type of change is applicable but the change affects agreed technical contractual agreements.	Not relevant for technical evaluation.	•																		-				-		-	
PAS-PTC-AN-02	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix below. DATASHEET	P P		Technical intertace means component terminals. See processability on board level.	В																		-				-	. @	•	
PAS-PTC-DS-01	Change of datasheet parameters/electrical specification (min/max/kg, values) and/or AC/DC specification	РР	Change of application relevant information Not included: Editorial changes.	e.g. tighten of electrical parameter distribution	A	Riskassessment depending on change for each application.										-				-			-				-			
PAS-PTC-0S-02	Conscion of data sheet or inner of errors	1 1	Notechnical change of product, process or test. New description of behavior which was not specified balors or which is different from initial specification Please indicase clearly, that Inforces consins this type of change! Assessment in application required!!	d e.g. data sheet correction because of new information about component behavior	A											-											-			
PAS-PTC-DS-03	Specification of additional parameters	I P	Description of a newnot previously covered parameter. No exchance change of the product. (§r. no influence (§r. Risk assessment depending on change for each application to provide elidence of additional to an entered size, a elisation?)	e.g. adding new (bested) parameter.	A																		-				-		-	
	WATERIAL Change of material composition - Ceramic Binder	РР	Change of Binder Material sobind ceramics.		С									- @	· · · @•	@•		1 -		- 1			- 1		1 -	1 - 1			1 -	
PAS-PTC-MA-02	Change of material composition - Ceramic	P P		e.g. changes in additives amount	c				-								_	@В	• @s	-			-		-	-	-		@•	Parameter analyse onlynecessary if an anticipated impact on electrical performance.
PAG-PTC-MA-03	Change of material composition - Polymer		Change of polymer composition		с										- @•					-			-		-	-	-		-	S = SMD device only
PAS-PTC-MA-OI	Change of resterial composition - Encapsulation	P P		e.g. change of costing e.g. change of additives in an insulation.	В	A: Riskassessment on application level, if interaction with other material expected. Riskassessment needed to evaluate.				• .	•									-			-		-	-	-		@•	Parameter analyse onlynecessary if an anticipated impact on electrical performance.
PAS-PTC-MA-GS		P P	Change of lead (finish) material, termination material or attachment material.	e.g. change from SnPb topure Sn	В	Risk assessment needed to evaluate compatibility of soldering process.																	-		-	-	-		-	Assumption material annestication arrestore
PAS-PTC-MA-06	Change of supplier of material DCSSGN	- Р	Change to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	С			• •	-	• -	• -	• •		•			· •	В	• •	•	- -	1 -	-	- -		-	-	- -	@•	Assumption material specification remains unchanged. Otherwise see change of material.
PAS-PTC-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter	I P	Change of lead diameter	e.g. change lead diameter from 0.5 to 0.4 mm	В						@• -	· @•	@• @•			-		@B	. @•	@•			-		-	-	-		@•	
PAS-PTC-06-02 PAS-PTC-06-03	Changes of termination, surface Enish, shape, color, appearance or dimension structure - Termination. Area Changes of termination, surface Enish, shape, color, appearance or dimension structure - Internal	I P	Change of termination area Change of inner connection	e.g. change of semination layer hickness e.g. change in termination dimensions e.g. change from soldered connection to welded connection	В		-	• •	-		@• -	· @•	@• -			-	- @•	@B	· @•				-		-	-	-		@•	
PAS-PTC-DS-04	Charges of termination, surface finish, shape, color, appearance or dimension structure - Hernel Connection Charges of termination, surface finish, shape, color, appearance or dimension structure - Appearance	I P	Change of appearance. Note: Marking on device is defined as separate change (PAS-PTC-PV-00).	connection e.g. change or adding of color on component Mainhvin combination with other chances!	В				-				- @•						- @•				-			+ -	-		@•	
PAS-PTC-DE-05	Changes of inner construction - Electrode		change (PAS-PTC-PV-02). Change of electrode layer thickness or geometry.	Mainlyin combination with other changes! e.g. change of electrode design	c										· @•				- @•	@•			-		-	-	-		-	
PAS-PTC-06-06	Changes of inner construction - Layer Thickness	. Р	Change of ceramic layer thickness. For multi-layer technology only.	e.g. change from 1.5µm into 1.0µm	с					@• @•			@• -		· @•					@•			-		-	-	-		-	
PAS-PTC-DE-07	Changes of inner construction - Number of Layers	. Р	Change of number of ceramic or electrode layers. For multi-layer technology only Allways in combination with PAS-PTC-OE-66.	nee also layer thickness	С								@• -			@•			_	@•							-		-	
			combination with PAS-PTC-DE-06.							@• @•			@• -		. @•	@•			. @•	@•					-					
	PROCESS Charges in process technology or manufacturing methods - Lamination	. P			С			•							· @•		- -	@B				- -	- 1		·		-		@•	
PAS-PTC-PR-01	Changes in process technology or manufacturing methods - Lamination Changes in process technology or manufacturing methods - Firing	. P	Change of liamination/ press technique technology Change of firing / sintering profile	e.g. stemp press to isostal-c press 4.g. temperature and/or time and/or atmosphere. 4.g. from surnel to batch kilo.	С			• •	-	· @•	- @-	@• -	· ·		- @•	@• (3• -	@B	· @•				-		-	-	-	 	@•	
PAS-PTC-PR-01 PAS-PTC-PR-02 PAS-PTC-PR-03	Changes in process technology or manufacturing methods - Laminston Changes in process technology or manufacturing methods - Firing Changes in process technology or manufacturing methods - Dicing	. P	Change of lanshation / press technique technology Change of firing / sinsuring profile Change of dicing / slicing	e.g. stimp priess to isochalic press e.g. samparature and/or sinne and/or sinnesphere. e.g. tron surveil to batch life. e.g. change from cutling to seeing	c c			_	. @•	· @•	· @•	@•	@• -	 @• @•	- @•	@• (@B @B	· @•	-			-		-	-		 	@• @•	
PMS-PTC-PR-01 PMS-PTC-PR-02 PMS-PTC-PR-03 PMS-PTC-PR-04	Changes in process schrology or mandaturing natura - Leronatus Changes in process schrology or mandaturing mathat - Fring Changes in process schrology or mandaturing mathat - Fring Changes in process schrology or mandaturing mathat - Doing Changes in process schrology or mandaturing mathat - Terrisolor	. P	Change of flamination / press technique technology Change of fining / sinsuring profile Change of dicing / slicing Change of dicing / slicing Change of the termination preparation like plating or solved for minimal teaches	e.g. stemp press to installer press e.g. stemp press to installer press e.g. stemp press are self or other and/or atmosphere, e.g. from turned to blanch kilo. e.g. change informacisting to steaking e.g. change in printing submidually filed imminishing e.g. change in printing e.g. change	C C C			_	@•	· @•	· @•	@• · · · ·	@•	@• @	- @•	@• (3• -	@B @B B	- @•	-					-	-	-	 	@• @•	
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Qualification Results Summary of LT8650S at Vanguard International Semiconductor

QUALI	FICATION STATUS – LT86503	S 32L LQFN	
TEST	SPECIFICATION	SAMPLE SIZE	RESULTS
Solder Heat Resistance (SHR)*	JEDEC/IPC <i>J-STD-020</i>	1*231	Pass
Highly Accelerated Stress Test (HAST)*	JEDEC JESD22-A110	1*77	Pass
Temperature Cycling (TC)*	JEDEC JESD22-A104	1*77	Pass
Unbiased Highly Accelerated Stress Test (UHAST)*	JEDEC JESD22-A102	1*77	Pass
High Temperature Storage Life (HTSL)	JEDEC JESD22-A103	1*45	Pass
Latch-Up	JEDEC JESD78	>±100mA	Pass
Electrostatic Discharge Human Body Model	ESDA/JEDEC JS-001	3/voltage	Pass 4000V
Electrostatic Discharge Field-Induced Charged Device Model	JEDEC JESD22-C101	3/voltage	Pass 2000V

^{*}Preconditioned per JEDEC/IPC J-STD-020

Qualification Results Summary of LT8650S at Vanguard International Semiconductor

QUALIF	FICATION STATUS – LT8650SP	32L LQFN	
Test	SPECIFICATION	SAMPLE SIZE	RESULTS
High Temperature Operating Life (HTOL)	JEDEC JESD22-A108	3*77	Pass
Solder Heat Resistance (SHR)*	JEDEC/IPC <i>J-STD-020</i>	3*231	Pass
Highly Accelerated Stress Test (HAST)*	JEDEC JESD22-A110	3*77	Pass
Temperature Cycling (TC)*	JEDEC JESD22-A104	2*77	Pass
Unbiased Highly Accelerated Stress Test (UHAST)*	JEDEC JESD22-A102	3*77	Pass
High Temperature Storage Life (HTSL)	JEDEC JESD22-A103	1*45	Pass

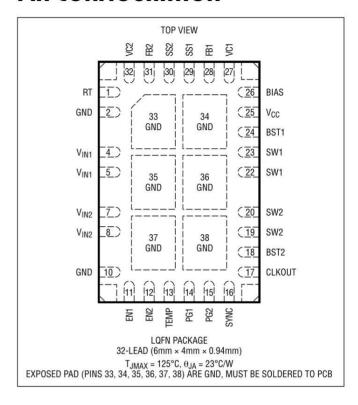
^{*}Preconditioned per JEDEC/IPC J-STD-020

ABSOLUTE MAXIMUM RATINGS

(Note 1)

Absolute Maximum Ratings will now show H Grade information.

PIN CONFIGURATION



ORDER INFORMATION http://www.linear.com/product/LT8650S#orderinfo

		PART	MARKING	PACKAGE**	MSL	TEMPERATURE RANGE
PART NUMBER	PAD OR BALL FINISH	DEVICE	FINISH CODE	TYPE	RATING	(SEE NOTE 2)
LT8650SEV#PBF	Au (DoUC)	8650SV	0.4	LQFN (Laminate Package	2	-40°C to 125°C
LT8650SIV#PBF	- Au (RoHS)	803087	e4	with QFN Footprint)	3	-40°C to 125°C

- Pad or ball finish code is per IPC/JEDEC J-STD-609.
- Terminal Finish Part Marking: www.linear.com/leadfree
- Parts ending with PBF are RoHS and WEEE compliant.
- Device temperature grade is indicated by a label on the shipping container. Recommended PCB Assembly and Manufacturing Procedures: www.linear.com/umodule/pcbassembly
 - · Package and Tray Drawings: www.linear.com/packaging
 - *The LT8650S package has the same dimensions as a standard 6mm × 4mm QFN package

Order Information updated to show H Grade. LT8650SHV#PBF and LT8650SHV#WPBF

ELECTRICAL CHARACTERISTICS The • denotes the specifications which apply over the full operating temperature range, otherwise specifications are at $T_A = 25$ °C.

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Minimum Input Voltage		•		2.6	3	V
V _{IN1} Quiescent Current in Shutdown	$V_{EN/UV1} = V_{EN/UV2} = 0V, V_{SYNC} = 0V$	•		1.7	4 -8 -1	μΑ Ο μΑ
V _{IN1} + V _{CC} Quiescent Current in Sleep with Internal Compensation	$V_{EN/UV1} = V_{EN/UV2} = 2V$, $V_{FB1} = V_{FB2} > 0.8V$, $V_{VC1} = V_{VC2} = V_{CC}$, $V_{SYNC} = 0V$	•		3.7	8 16 2	μΑ Αμ <mark>Ο</mark>
V _{IN1} + V _{CC} Quiescent Current in Sleep with External Compensation	$V_{EN/UV1} = V_{EN/UV2} = 2V$, $V_{FB1} = V_{FB2} > 0.8V$, $V_{VC1} = V_{VC2} = Float$, $V_{SYNC} = 0V$	•		90	120 140	μA μA

Rev A

ELECTRICAL CHARACTERISTICS The \bullet denotes the specifications which apply over the full operating temperature range, otherwise specifications are at $T_A = 25^{\circ}C$.

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
V _{IN1} + V _{CC} Quiescent Current when Active	$V_{EN/UV1} = V_{EN/UV2} = 2V$, $V_{FB1} = V_{FB2} > 0.8V$, $V_{VC1} = V_{VC2} = V_{CC}$, $V_{SYNC} = 3.4V$	•		5	7	mA
V _{IN} Current in Regulation	$\begin{array}{l} V_{IN}=12V,V_{OUT}=3.3V,OutputLoad=100\mu A,V_{VC1}=V_{VC2}=V_{CC},V_{SYNC}=0V\\ V_{IN}=12V,V_{OUT}=3.3V,OutputLoad=1mA,V_{VC1}=V_{VC2}=V_{CC},V_{SYNC}=0V \end{array}$			45 350	75 550	μΑ μΑ
Feedback Reference Voltage		•	0.794 0.790	0.800 0.800	0.806 0.810	V
Feedback Voltage Line Regulation	V _{IN} = 4.0V to 36V			0.004	0.02	%/V
Feedback Pin Input Current	V _{FB} = 0.8V		-20		20	nA
Minimum On-Time	$I_{LOAD} = 3A$, SYNC = $\frac{3.4V}{} > = 2V$	•		40	60	ns
Oscillator Frequency	$R_T = 133k$ $R_T = 35.7k$ $R_T = 15k$	•	270 0.95 0 1.85	300 941.0 2.00	330 1.05 1 2.15	kHz .06 MHz MHz
Top Power NMOS Current Limit	-	•	- 10	12	14	A
Bottom Power NMOS Current Limit			6.5	8.5	10.5	А
SW Leakage Current	$V_{IN} = 42V, V_{SW} = 0V,42V$		-2		2	μА
EN/UV Pin Threshold	EN/UV Falling	•	0.7	0.74	0.78	V
EN/UV Pin Hysteresis				30		mV
EN/UV Pin Current	$V_{EN}/UV = 2V$		-20		20	nA
PG Upper Threshold Offset from V _{FB}	V _{FB} Falling	•	5.5 5.		.2 9	%
PG Lower Threshold Offset from V_{FB}	V _{FB} Rising	•	- 9.5 -9	9 <mark>.3</mark> –7.5	-6 -5	5.7 %
PG Hysteresis				0.3		%
PG Leakage	V _{PG} = 12V		-40		40	nA
PG Pull-Down Resistance	$V_{PG} = 0.1V$	•		600	1200	Ohm
SYNC Threshold	SYNC DC and Clock Low Level Voltage SYNC Clock High Level Voltage SYNC DC High Level Voltage		0.4		1.5 2.8	V V V
SYNC Pin Current	V _{SYNC} = 6V			120		μA
SS Source Current		•	1.0	2.0	3.0	μA
SS Pull-Down Resistance	Fault Condition, SS = 0.1V			200		Ω
Error Amplifier Transconductance	$V_C = 1.25V$			0.9		mS
VC Source Current	$V_{FB} = 0.6V, V_{VC} = 1.25V$			170	185	μA
VC Sink Current	$V_{FB} = 1.0V, V_{VC} = 1.25V$			170	185	μA
VC Pin to Switch Current Gain				9.6		A/V
TEMP Output Voltage	I_{TEMP} = 0μA, Temperature = 25°C I_{TEMP} = 0μA, Temperature = 125°C		190 1100	250 1200	310 1300	mV mV

Note 1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

Note 2: The LT8650SE is guaranteed to meet performance specifications from 0°C to 125°C junction temperature. Specifications over the -40°C to 125°C operating junction temperature range are assured by design, characterization, and correlation with statistical process controls. The LT8650SI is guaranteed over the full -40°C to 125°C operating junction temperature range. High junction temperatures degrade operating lifetimes. Operating lifetime is derated at junction temperatures greater

than 125°C. The junction temperature (T_J , in °C) is calculated from the ambient temperature (T_A in °C) and power dissipation (P_D , in Watts) according to the formula:

 $T_J = T_A + (P_D \bullet \theta_{JA})$ where θ_{JA} (in °C/W) is the package thermal impedance.

Note 3: This IC includes overtemperature protection that is intended to protect the device during overload conditions. Junction temperature will exceed 150°C when overtemperature protection is active. Continuous operation above the specified maximum operating junction temperature will reduce lifetime