Product/Process Change Notice - PCN 22_0178 Rev. C

Analog Devices, Inc. One Analog Way, Wilmington, MA 01887, USA

This notice is to inform you of a change that will be made to certain ADI products (see Appendix A) that you may have purchased in the last 2 years. **Any inquiries or requests with this PCN (additional data or samples) must be sent to ADI within 30 days of publication date.** ADI contact information is listed below.

Note: Revised fields are indicated by a red field name. See Appendix B for revision history.

PCN Title:	UTAC Thailand as an Alternate Assembly Site and UTAC Singapore as an Alternate Test Site for Select (LFCSP) Products
Publication Date:	09-May-2023
Effectivity Date:	11-Aug-2023 *(the earliest date that a customer could expect to receive changed material)*
Revision Description:	Revised Qualification Report and Added Test Cpk Report

Description Of Change:

Analog Devices will be utilizing UTAC Thailand as an alternate assembly site and UTAC Singapore as an alternate test site for select products in LFCSP packages.

See attached Material_Change_Description in the supporting documents section of this PCN for details regarding change to mold compound and die attach material.

Reference the attached qualification report for the material set used by UTAC Thailand for the LFCSP package.

Reason For Change:

Adding capacity to ensure continuity of supply in order to meet customer demand.

Impact of the change (positive or negative) on fit, form, function & reliability:

There are no changes to fit, form, functionality or reliability.

Summary of Supporting Information:

Qualification has been performed per Industry Standard Test Methods. See attached Qualification Results Summary.

Test correlation and validation has been performed per ADI's standard product site to site and/or platform change correlation procedure. See attached Qualification Report.

Supporting Documents

Attachment 1: Type: Qualification Results Summary

ADI_PCN_22_0178_Rev_C_ADI_PCN_22_0178_Rev_B_Qualification_Report.pdf...

Attachment 2: Type: Test Correlation Report

ADI_PCN_22_0178_Rev_C_AD2426W_AD24227W_AD24228W_Test_Site_Test_Correla...

Attachment 3: Type: Detailed Change Description

ADI_PCN_22_0178_Rev_C_Material_Change_Description.pdf...

Attachment 4: Type: Delta Qualification Matrix

ADI_PCN_22_0178_Rev_C_PCN-Delta-Qualification-Matrix-ZVEI-5_0_14_2.xls...

Attachment 5: Type: Test Correlation Report

ADI_PCN_22_0178_Rev_C_AD2428W_Assembly_Site Test Correlation Report.pd...

Note: If applicable, the device material declaration will be updated due to material change.

ADI Contact Information:

For questions on this PCN, please send an email to the regional contacts below or contact your local ADI sales representatives.

Americas:	Europe:	Japan:	Rest of Asia:
PCN_Americas@analog.com	PCN_Europe@analog.com	PCN_Japan@analog.com	PCN_ROA@analog.com

Appendix A - Affected ADI Models:

Existing Parts - Product Family / Model Number (25)

AD2426W / AD2426WCCSZ	AD2426W / AD2426WCCSZ-RL	AD2426W / AD2426WCCSZ01	AD2426W / AD2426WCCSZ01-RL	AD2427W / AD2427WCCSZ
AD2427W / AD2427WCCSZ-RL	AD2427W / AD2427WCCSZ01	AD2427W / AD2427WCCSZ01-RL	AD2428W / AD2428WCCSZ	AD2428W / AD2428WCCSZ-RL
AD2428W / AD2428WCCSZ01	AD2428W / AD2428WCCSZ01-RL	AD2428W / AD2428WCCSZ02	AD2428W / AD2428WCCSZ02-RL	AD2428W / ADW95179Z-10
AD2428W / ADW95179Z-10RL	AD2428W / ADW95185Z-01	AD2428W / ADW95185Z-01RL	AD2428W / ADW95186Z-01	AD2428W / ADW95186Z-01RL
AD2428W / ADW95187Z-01	AD2428W / ADW95187Z-01RL	AD2428W / ADW95190Z	AD2428W / ADW95190Z-RL	AD2428W / ADW99038Z-RL

Appendix B - Revision History:			
Rev	**Publish Date**	**Effectivity Date**	**Rev Description**
Rev. -	05-Dec-2022	09-Mar-2023	Initial Release.
Rev. A	24-Jan-2023	28-Apr-2023	Add Material Change Description. Add Revised Delta Qualification.
Rev. B	04-Apr-2023	07-Jul-2023	Revised Qualification Report for Mold Compound Change.
Rev. C	09-May-2023	11-Aug-2023	Revised Qualification Report and Added Test Cpk Report

Material Change Description

UTAC Thailand as an Alternate Assembly Site and UTAC Singapore as an Alternate Test Site for Select (LFCSP) Products

Materials/Specifications	UTAC Assembly Site	STATSChipPAC Assembly Site
Mold Compound	Sumitomo G700LTD	Sumitomo G770
Adhesive Material	Ablestik 8600 conductive	Ablestik 3230 conductive
Bond Wire Type	GMG 4N Au	MKE 3N Au
Leadframe Material	Cu	Cu
Bond Wire Diameter	1.0 mil	1.0 mil
Finish Composition	100% Sn	100% Sn
Marking Process	Laser	Laser

TEST PRODUCT QUALIFICATION REPORT

TITLE:
AD2426W, AD2427W, AD2428W (LFCSP)
Test Second Source UTAC (Singapore) Qualification

PCN NUMBER:
22_0178

REVISION:
C

DATE:
1 May 2023

PROJECT BACKGROUND

Test correlation is carried out to qualify UTAC Singapore as an additional final test site for ADI devices to support production.

SUMMARY

All references to AD2428W in this report, apply to all AD2426W, AD2427W, and AD2428W products.

AD2428W is released at UTAC as 2nd source test solution.

There is no change to the form, fit, function, quality or reliability between platforms.

This report documents the successful completion of the product test correlation requirements of AD2428W LFCSP between StatsChipPAC and UTAC sites.

Test product qualification was performed according to Analog Devices Specification

TEST AND PRODUCT INFORMATION

Device	AD2428W
Package	32-LFCSP-SS-5X5X0.75
Tester Platform	HP93K_15
Handler	HT1028C

Description and Test Results

Table 1 provides a description of the qualification tests conducted and corresponding test results for AD2428W. All the units have undergone electrical tests on both the sending and receiving sites on the same test platform. Any device that did not meet the electrical qualification requirements without further analysis and data to prove passing, the qualification would be considered failed.

Table 1. Test Product Transfer Qualification Criteria

Generic	Package	Lot Size	Sending Site	Receiving Site	Mean Shift =< 5%	Sigma Ratio =< 1.3
AD2428W	32-LFCSP-SS-5X5X0.75	100	SCS	UTAC	Passed	Passed

The AD2428W was qualified by running a qualification lot with 100 units both in STATSCHipPAC and UTAC. Data between sites were analyzed as summarized in Table 1.

A passing result was recorded when the yield from receiving site met or exceeded yield from sending site as summarized in Table 2. Succeeding lots with increased quantity will be closely monitored once the device has started production at UTAC.

Table 2. Test Product Transfer Qualification Lot Run

GENERIC	Package	Lot Size	Test Site	Results
AD2428W	32-LFCSP-SS-5X5X0.75	100	UTAC	Passed

No valid rejects were encountered during the said evaluation in both sending and receiving sites.

Rejects Verifications

5 valid rejects tested in STATSCHipPAC and UTAC having the same result.

Table 3. Setup verification using Reject units.

Unit #	SCS	UTAC
1	Failed	Failed
2	Failed	Failed
3	Failed	Failed
4	Failed	Failed
5	Failed	Failed

AD2426/27/28W Initial Process Study (Test Temperature = 125 degC)

	Datasheet Specs				Site (STATS-ChipPac Singapore)			Site (UTAC Singapore)				
Key Datasheet Parameter	**Min**	**Typ**	**Max**	**Units**	**Mean**	**Stdv**	**Cpk**	**Mean**	**Stdv**	**Cpk**	**GR&R (%)**	**NDC**
Digital I/O Input Leakage High			10	uA	0.0035	0.0008	4039	0.0035	0.0008	4039	0.01	14142
Digital I/O Input Leakage Low			10	uA	0.0045	0.0012	2777	0.0045	0.0012	2777	0.01	14142
I_{VIN} Operating Current			29	mA	28.6	0.0619	2.15	28.60	0.0107	12.5	0.07	2020
V_{OD} APort High Transmit Level	425		545	mV	517.0	3.5	2.67	516.4	3.7	2.58	4.88	29
V_{OD} BPort High Transmit Level	425		545	mV	517.1	3.9	2.38	516.6	3.6	2.63	4.85	29
V_{OD} APort Medium Transmit Level	315		415	mV	372.6	5.2	2.72	373.20	4.60	3.03	5.23	27
V_{OD} BPort Medium Transmit Level	315		415	mV	372.1	5.2	2.75	372.70	5.00	2.82	5.18	27
V_{OD} APort Low Transmit Level	210		305	mV	264.9	7.1	1.88	265.50	6.70	1.97	4.34	33
V_{OD} BPort Low Transmit Level	210		305	mV	264.0	7.0	1.95	264.40	6.80	1.99	5.39	26

Note:
Key datasheet specifications are guaranteed by 100% test at both 125C and -40C.
Cpk's are comparable between sites; Any Cpk's slightly below 1.67 are accepted by the TRB.

AD2426/27/28W Initial Process Study (Test Temperature = -40 degC)

	Datasheet Specs				Site (STATS-ChipPac Singapore)			Site (UTAC Singapore)		
Key Datasheet Parameter	**Min**	**Typ**	**Max**	**Units**	**Mean**	**Stdv**	**Cpk**	**Mean**	**Stdv**	**Cpk**
Digital I/O Input Leakage High			10	uA	0.0010	0.0017	1961	0.0008	0.0007	4762
Digital I/O Input Leakage Low			10	uA	0.0013	0.0022	1515	0.0010	0.0011	3030
I_{VIN} Operating Current			29	mA	28.4	0.0665	3.0	28.40	0.0090	22.2
V_{OD} APort High Transmit Level	425		545	mV	476.1	7.8	2.18	474.8	8.2	2.03
V_{OD} BPort High Transmit Level	425		545	mV	478.7	8.1	2.21	477.3	8.1	2.16
V_{OD} APort Medium Transmit Level	315		415	mV	339.4	4.9	1.66	339.4	5.1	1.60
V_{OD} BPort Medium Transmit Level	315		415	mV	340.5	5.3	1.60	339.1	5.3	1.52
V_{OD} APort Low Transmit Level	210		305	mV	239.6	5.1	1.93	238.9	4.9	1.95
V_{OD} BPort Low Transmit Level	210		305	mV	239.8	5.2	1.91	238.9	5.1	1.90

Note:
Key datasheet specifications are guaranteed by 100% test at both 125C and -40C.
Cpk's are comparable between sites; Any Cpk's slightly below 1.67 are accepted by the TRB.

AD2428W Assembly Site Test Cpk Comparison: StatsChipPAC China vs. UTAC Thailand

Prepared by:

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ADPhils SEA Transfer

Table of Contents

I. Product Information

The Automotive Audio Bus (A2B®) provides a multichannel, I2S/TDM link over distances of up to 15 m between nodes. It embeds bidirectional synchronous pulse-code modulation (PCM) data (for example, digital audio), clock, and synchronization signals onto a single differential wire pair. A2B supports a direct point to point connection and allows multiple, daisy-chained nodes at different locations to contribute and/or consume time division multiplexed (TDM) channel content. A2B is a single-master, multiple-slave system where the transceiver at the host controller is the master. The master generates clock, synchronization, and framing for all slave nodes. The master A2B transceiver is programmable over a control port (I2C) for configuration and read back. An extension of the control port protocol is embedded in the A2B data stream, which grants direct access of registers and status information on slave transceivers as well as I2C to I2C communication over distance.

The transceiver can connect directly to general-purpose digital signal processors (DSPs), field-programmable gate arrays (FPGAs), application specific integrated circuits (ASICs), microphones, analog-to-digital converters (ADCs), digital-to-analog converters (DACs), and codecs through a multichannel I2S/TDM interface. It also provides a pulse density modulation (PDM) interface for direct connection of up to four PDM digital microphones. Finally, the transceiver also supports an A2B bus powering feature, where the master node supplies voltage and current to the slave nodes over the same daisy-chained, twisted pair wire cable as used for the communication link.

AD2428/AD2428W is master capable with up to 10 number of slaves discoverable. It includes the A and B Functional TRX blocks and supports I2S/TDM with PDM microphone inputs of 4 mics and a maximum node to node cable length of 15 m.

II. Test Cpk Comparison

Included here are the test screens directly linked to guaranteed datasheet parameters as identified by the Product Line with **UT2 (UTAC Thailand)** as **Qual lot** and **SC3 (StatsChipPAC China)** as **Control lot**.

Mean Shift Criteria = {(Mean_Control – Mean_Qual)/(Upper_limit – Lower_limit)}

Mean Shift ≤ 5% are considered pass

Sigma Spread Criteria = (Qual_SD / Control_SD)

SD Criteria ≤ 1.3 are considered pass; CPK ≥ 1.67 are considered pass

❖ Cpk Comparison @ 125°C

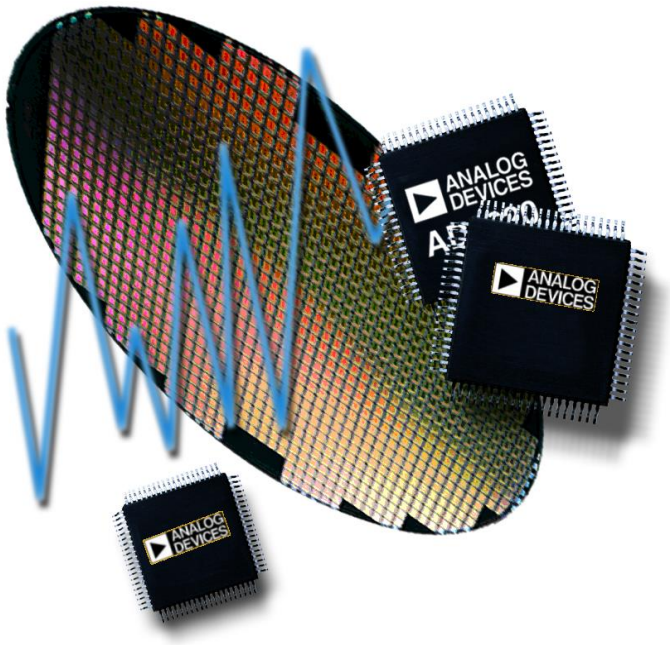
Tnum	Test Name	QC Limits		Units	SC3 125C			UT2 125C		
		MIN	MAX		MEAN	SD	CPK	MEAN	SD	CPK
1611	power_supply_shorts_P50320:TRXVDD[1] (TRXVDD)	-0.002	0.002	A	1.22E-05	1.80E-06	1.8E-06	1.33E-05	5.66E-06	75.43
1614	power_supply_shorts_P50320:DVDD[1] (DVDD)	-0.002	0.002	A	3.83E-05	5.70E-06	5.7E-06	5.80E-05	5.70E-06	84.92
1616	power_supply_shorts_P50320:IOVDD[1] (IOVDD)	-0.002	0.002	A	6.36E-07	1.80E-06	6.36E-07	1.20E-06	1.80E-06	284.16
4001	ioz_lkg:passCurrentLow_uA[1] (8)	-10	10	uA	-0.0036	0.0016	2050	-0.0042	0.0013	2640
4002	ioz_lkg:passCurrentLow_uA[1] (10)	-10	10	uA	-0.0036	0.0016	2050	-0.0038	0.0016	2020
4003	ioz_lkg:passCurrentLow_uA[1] (14)	-10	10	uA	-0.0036	0.0016	2050	-0.0026	0.0013	2530
4004	ioz_lkg:passCurrentLow_uA[1] (15)	-10	10	uA	-0.0036	0.0016	2050	-0.0032	0.0014	2440
4005	ioz_lkg:passCurrentLow_uA[1] (12)	-10	10	uA	-0.0036	0.0016	2050	-0.0025	0.0021	1610
4006	ioz_lkg:passCurrentLow_uA[1] (13)	-10	10	uA	-0.0036	0.0016	2050	-0.0036	0.0014	2310
4007	ioz_lkg:passCurrentLow_uA[1] (16)	-10	10	uA	-0.0036	0.0016	2050	-0.0048	0.0015	2250
4008	ioz_lkg:passCurrentLow_uA[1] (6)	-10	10	uA	-0.0036	0.0016	2050	-0.0045	0.0011	2970
4009	ioz_lkg:passCurrentLow_uA[1] (4)	-10	10	uA	-0.0036	0.0016	2050	-7.73E-04	0.0023	1470
4011	ioz_lkg:passCurrentLow_uA[1] (5)	-10	10	uA	-0.0036	0.0016	2050	-9.65E-04	0.0011	3170
4012	ioz_lkg:passCurrentLow_uA[1] (11)	-10	10	uA	-0.0036	0.0016	2050	-0.0034	0.0016	2050
4021	ioz_lkg:passCurrentHigh_uA[1] (8)	-10	10	uA	0.0015	0.0012	2770	0.0039	0.0011	3120
4022	ioz_lkg:passCurrentHigh_uA[1] (10)	-10	10	uA	0.0015	0.0012	2770	0.0041	0.0015	2210
4023	ioz_lkg:passCurrentHigh_uA[1] (14)	-10	10	uA	0.0015	0.0012	2770	0.0052	0.0011	3070
4024	ioz_lkg:passCurrentHigh_uA[1] (15)	-10	10	uA	0.0015	0.0012	2770	0.0048	0.0011	3040
4025	ioz_lkg:passCurrentHigh_uA[1] (12)	-10	10	uA	0.0015	0.0012	2770	0.0054	0.0016	2050
4026	ioz_lkg:passCurrentHigh_uA[1] (13)	-10	10	uA	0.0015	0.0012	2770	0.0044	0.0012	2670
4027	ioz_lkg:passCurrentHigh_uA[1] (16)	-10	10	uA	0.0015	0.0012	2770	0.0031	0.0012	2890
4028	ioz_lkg:passCurrentHigh_uA[1] (6)	-10	10	uA	0.0015	0.0012	2770	0.0037	8.67E-04	3840
4029	ioz_lkg:passCurrentHigh_uA[1] (4)	-10	10	uA	0.0015	0.0012	2770	0.0038	0.002	1700
4031	ioz_lkg:passCurrentHigh_uA[1] (5)	-10	10	uA	0.0015	0.0012	2770	0.0038	8.18E-04	4070
4032	ioz_lkg:passCurrentHigh_uA[1] (11)	-10	10	uA	0.0015	0.0012	2770	0.0044	0.0013	2560
4041	ioz_lkg_adr1:passCurrentLow_uA[1] (7)	-10	10	uA	-0.0032	9.72E-04	-0.0032	-0.0036	0.001229	359.43
4051	ioz_lkg_adr1:passCurrentHigh_uA[1] (7)	-10	10	uA	0.0025	7.33E-04	0.000733	0.0044	9.91E-04	3360
4057	ioz_lkg_tm:passCurrentLow_uA[1] (25)	-10	10	uA	-0.0048	9.80E-04	3400	-0.0046	0.0012	2820
4062	ioz_lkg_tm:passCurrentHigh_uA[1] (25)	-10	10	uA	0.0012	7.54E-04	4420	0.0039	0.001	3180
4067	ioz_lkg_sw:passCurrentLow_uA[1] (26)	-230	-50	uA	-163.947	2.2217	9.91	-160.44	2.1136	10.97
4072	ioz_lkg_sw:passCurrentHigh_uA[1] (26)	0	50	uA	44.2723	0.623	3.06	43.2395	0.6047	3.73
4077	ioz_lkg_swp:passCurrentLow_uA[1] (27)	-10	10	uA	-0.0036	0.0015	2240	-0.0041	0.0017	1980
4081	ioz_lkg_swp:passCurrentHigh_uA[1] (27)	-1	20	uA	-0.0038	0.0081	40.83	0.0061	0.0131	25.68
4093	ioz_lkg_sense:passCurrentLow_uA[1] (28)	-10	10	uA	-0.0063	0.0046	719.71	-0.0074	0.0025	1340
4097	ioz_lkg_sense:passCurrentHigh_uA[1] (28)	10	50	uA	37.5801	0.5488	7.54	36.6943	0.5269	8.42
15517	VOD_APort_Trim:Vod_Level[V]@AN,AP[1] (result 1)	0.425	0.545	V	0.515	0.0023	4.32	0.515	0.0023	4.27
15609	VOD_BPort_Trim:Vod_Level[V]@BN,BP[1] (result 1)	0.425	0.545	V	0.515	0.0029	3.45	0.515	0.0023	4.34

❖ Cpk Comparison @ -40ºC

Tnum	Test Name	QC Limits		Units	SC3 -40C			UT2 -40C		
		MIN	MAX		MEAN	SD	CPK	MEAN	SD	CPK
1611	power_supply_shorts_P50320:TRXVDD[1] (TRXVDD)	-0.002	0.002	A	1.27E-05	1.60E-06	307.53	1.33E-05	5.20E-06	95.24
1614	power_supply_shorts_P50320:DVDD[1] (DVDD)	-0.002	0.002	A	4.62E-07	1.50E-06	331.42	1.50E-06	1.70E-06	299.4
1616	power_supply_shorts_P50320:IOVDD[1] (IOVDD)	-0.002	0.002	A	2.30E-06	1.50E-06	331.09	2.80E-06	1.70E-06	295.86
4001	ioz_lkg:passCurrentLow_uA[1] (8)	-10	10	uA	-6.55E-04	0.0016	2060	2.13E-04	0.0017	1910
4002	ioz_lkg:passCurrentLow_uA[1] (10)	-10	10	uA	-6.55E-04	0.0016	2060	-0.0014	0.0016	2090
4003	ioz_lkg:passCurrentLow_uA[1] (14)	-10	10	uA	-6.55E-04	0.0016	2060	4.80E-04	0.0014	2390
4004	ioz_lkg:passCurrentLow_uA[1] (15)	-10	10	uA	-6.55E-04	0.0016	2060	0.0014	0.0017	1950
4005	ioz_lkg:passCurrentLow_uA[1] (12)	-10	10	uA	-6.55E-04	0.0016	2060	4.46E-04	0.0016	2040
4006	ioz_lkg:passCurrentLow_uA[1] (13)	-10	10	uA	-6.55E-04	0.0016	2060	0.0015	0.0019	1770
4007	ioz_lkg:passCurrentLow_uA[1] (16)	-10	10	uA	-6.55E-04	0.0016	2060	-4.23E-04	0.0017	2000
4008	ioz_lkg:passCurrentLow_uA[1] (6)	-10	10	uA	-6.55E-04	0.0016	2060	-2.19E-04	0.0016	2070
4009	ioz_lkg:passCurrentLow_uA[1] (4)	-10	10	uA	-6.55E-04	0.0016	2060	-9.72E-04	0.0014	2440
4011	ioz_lkg:passCurrentLow_uA[1] (5)	-10	10	uA	-6.55E-04	0.0016	2060	-1.12E-04	0.0021	1610
4012	ioz_lkg:passCurrentLow_uA[1] (11)	-10	10	uA	-6.55E-04	0.0016	2060	-9.29E-04	0.0013	2580
4021	ioz_lkg:passCurrentHigh_uA[1] (8)	-10	10	uA	-2.26E-04	0.0014	2360	1.11E-04	0.0011	2930
4022	ioz_lkg:passCurrentHigh_uA[1] (10)	-10	10	uA	-2.26E-04	0.0014	2360	-0.0011	0.0012	2880
4023	ioz_lkg:passCurrentHigh_uA[1] (14)	-10	10	uA	-2.26E-04	0.0014	2360	7.85E-04	8.81E-04	3780
4024	ioz_lkg:passCurrentHigh_uA[1] (15)	-10	10	uA	-2.26E-04	0.0014	2360	0.0015	0.0011	3040
4025	ioz_lkg:passCurrentHigh_uA[1] (12)	-10	10	uA	-2.26E-04	0.0014	2360	5.94E-04	0.0012	2860
4026	ioz_lkg:passCurrentHigh_uA[1] (13)	-10	10	uA	-2.26E-04	0.0014	2360	0.0014	0.0013	2610
4027	ioz_lkg:passCurrentHigh_uA[1] (16)	-10	10	uA	-2.26E-04	0.0014	2360	-6.45E-04	0.0011	3000
4028	ioz_lkg:passCurrentHigh_uA[1] (6)	-10	10	uA	-2.26E-04	0.0014	2360	-2.38E-04	8.77E-04	3800
4029	ioz_lkg:passCurrentHigh_uA[1] (4)	-10	10	uA	-2.26E-04	0.0014	2360	-8.26E-04	8.77E-04	3800
4031	ioz_lkg:passCurrentHigh_uA[1] (5)	-10	10	uA	-2.26E-04	0.0014	2360	-3.12E-04	0.0014	2400
4032	ioz_lkg:passCurrentHigh_uA[1] (11)	-10	10	uA	-2.26E-04	0.0014	2360	-8.83E-04	9.63E-04	3460
4041	ioz_lkg_adr1:passCurrentLow_uA[1] (7)	-10	10	uA	-0.001	0.0018	1900	-2.09E-05	0.0014	2370
4051	ioz_lkg_adr1:passCurrentHigh_uA[1] (7)	-10	10	uA	-3.75E-04	0.0013	2590	4.44E-04	9.01E-04	3700
4057	ioz_lkg_tm:passCurrentLow_uA[1] (25)	-10	10	uA	-7.28E-04	0.0013	2530	2.17E-07	0.0018	1810
4062	ioz_lkg_tm:passCurrentHigh_uA[1] (25)	-10	10	uA	-3.38E-04	0.0013	2670	1.57E-04	0.0012	2830
4067	ioz_lkg_sw:passCurrentLow_uA[1] (26)	-230	-50	uA	-149.1392	2.2725	11.86	-144.5109	2.1593	13.2
4072	ioz_lkg_sw:passCurrentHigh_uA[1] (26)	0	50	uA	40.017	0.6494	5.12	38.7285	0.6133	6.13
4077	ioz_lkg_swp:passCurrentLow_uA[1] (27)	-10	10	uA	-0.0017	0.0014	2300	-0.0011	0.0014	2400
4081	ioz_lkg_swp:passCurrentHigh_uA[1] (27)	-1	20	uA	-0.006	0.0084	39.28	-0.0021	0.0097	34.43
4093	ioz_lkg_sense:passCurrentLow_uA[1] (28)	-10	10	uA	-0.0056	0.0014	2360	-0.0029	0.0019	1780
4097	ioz_lkg_sense:passCurrentHigh_uA[1] (28)	10	50	uA	32.9784	0.5408	10.49	31.8762	0.5205	11.61

III. **Conclusion and Recommendation**

After reviewing the data and plots for the **UT2 Qual lot (6229300.1)** as correlated to the **SC3 Control lot (6232354.1)**, the Qual lot is comparable to the Control lot. Test result for the Qual lot meets the QC Limit requirement for the device. All CPK values of the Qual lot for hot and cold pass with good response and minimum shifting observed. Thus, **UT2 (UTAC Thailand)** can be recommended as an alternative assembly site for the **AD2428W**.



Reliability Report

Report Title: AD2428W UTAC Assembly Automotive Grade 2 Qualification

Report Number: 19769

Revision: D

Date: 8 February 2023

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the products AD2426W, AD2427W, AD2428W in a 32-LFCSP_SS package assembled at UTAC. This product is an audio bus which provides a multi-channel link over distances.

Revision B adjusts the ETest Temperatures

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics- 0.18um DMOS

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	AD2428W
Die Id	TMJR79A
Die Size (mm)	3.09 x 3.09
Wafer Fabrication Site	TSMC Fab-8B
Wafer Fabrication Process	0.18um DMOS
Die Substrate	Si
Metallization / # Layers	AlCu(0.5%)/6
Polyimide	yes
Passivation	undoped-oxide/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results - 0.18um BCD at TSMC Fab-8B

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS	eTest Temp
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 1,000 Hours	AD2428W	Q19769.1.5	0/45	RH[2]
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD2428W	Q19769.1.1	0/77	RH[2]
					Q19769.2.1	0/77	RH[2]
					Q19769.3.1	0/77	RH[2]

[1] These samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

[2] Pre- and post-stress electrical test was performed at room and hot temperatures.

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics - 32-LFCSP_SS at UTAC

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	AD2428W
Package	32-LFCSP_SS
Body Size (mm)	5.00 x 5.00 x 0.75
Assembly Location	UTAC
MSL/Peak Reflow Temperature(°C)	3 / 260°C
Mold Compound	Sumitomo G700LTD
Die Attach	Ablestik 8600 conductive
Leadframe Material	Copper
Lead Finish	Matte Sn
Wire Bond Material/Diameter (mils)	GMG 4N Gold / 1.00

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - LFCSP_SS at UTAC

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS	eTest Temp
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 1,000 Hours	AD2428W	Q19769.1.5	0/45	RH[2]
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD2428W	Q19769.1.1	0/77	RH[2]
					Q19769.2.1	0/77	RH[2]
					Q19769.3.1	0/77	RH[2]
Solder Heat Resistance (SHR)[1]	A1	J-STD-020	MSL-3	AD2428W	Q19769.1.4	0/11	R[3]
					Q19769.2.4	0/11	R[3]
					Q19769.3.4	0/11	R[3]
Temperature Cycling (TC)[1]	A4	JESD22-A104	-65°C/+150°C, 1,000 Cycles	AD2428W	Q19769.1.2	0/77	RH[2]
					Q19769.2.2	0/77	RH[2]
					Q19769.3.2	0/77	RH[2]
Unbiased HAST (UHST)[1]	A3	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	AD2428W	Q19769.1.3	0/77	R[3]
					Q19769.2.3	0/77	R[3]
					Q19769.3.3	0/77	R[3]

[1] These samples were subjected to preconditioning at MSL 3 with 3x reflow peak temp of 260°C prior to the start of the stress test.
[2] Pre- and post-stress electrical test was performed at room and hot temperatures.
[3] Pre- and post-stress electrical test was performed at room temperature.

Approvals

Reliability Engineer: Bobby Brown