

TEST

PRODUCT

QUALIFICATION

REPORT

TITLE:

ADuM4223 and ADuM4224 High Voltage Test
Platform Migration from Harris-Tuvey to MPS

PCN NUMBER:

17_0189

REVISION:

A

DATE: August 25, 2017

SUMMARY

The **ADuM4223 and ADuM4224** are 4 A isolated, half-bridge gate drivers that employ the Analog Devices, Inc., iCoupler® technology to provide independent and isolated high-side and low-side outputs. Combining high speed CMOS and monolithic air core transformer technology, these isolation components provide outstanding performance characteristics superior to alternatives, such as optocoupler devices. In accordance with UL and VDE standards, these products are high voltage tested using the Harris-Tuvey 9464 test platform, an aging and limited manufacturing test platform. The proposed change is to add new high voltage test capability using the MPS PD test platform manufactured by MPS Mess-& Prüfsysteme GmbH.

There is no change to the form, fit, function, quality or reliability of product when tested on the new test platform.

This report documents the result of the evaluations done to qualify the MPS PD tester as an additional high voltage test platform for the **ADuM4223 and ADuM4224**.

Test product qualification was performed according to Analog Devices Specifications (TST00094/TST00095 – Test Platform Migration Specification).

TEST AND PRODUCT INFORMATION

Device(Generic):	ADuM4223	ADuM4224
Package:	SOIC_W	SOIC_W
Leads:	16	16
Parts Affected:	ADuM4223ARWZ ADuM4223ARWZ-RL ADuM4223BRWZ ADuM4223BRWZ-RL ADuM4223CRWZ ADuM4223CRWZ-RL ADuM4223WARWZ ADuM4223WARWZ-RL ADuM4223WBRWZ ADuM4223WBRWZ-RL ADuM4223WCRWZ ADuM4223WCRWZ-RL	ADuM4224WARWZ ADuM4224WARWZ-RL ADuM4224WBRWZ ADuM4224WBRWZ-RL ADuM4224WCRWZ ADuM4224WCRWZ-RL
Current Platform:	Harris-Tuvey with Atrium 5050FHV handler	Harris-Tuvey with Atrium 5050FHV handler
New Platform:	MPS with Atrium VMAX handler	MPS with Atrium VMAX handler

Description and Test Results

The Harris-Tuvey high voltage test platform does not provide data logs for units tested; only a pass or fail result is provided. The MPS test platform will provide data logs for leakage current and partial discharge measurements that will be recorded and maintained over time.

The **ADuM4223** and **ADuM4224** isolated, half-bridge gate drivers are manufactured using the same package, the same transformer technology and on the same high voltage isolation process. The five lots listed below, along with additional test results from multiple products using the 16-lead SOIC_W package, were used to qualify the two generics on the MPS test platform.

Table 1: Shows results of the qualification lot run for the **ADuM4223 and ADuM4224** family. The qualification lots have undergone high voltage testing on both Harris-Tuvey and MPS test platforms. Any deviation on the lot qualification run criteria, without further analysis and data to prove a passing qualification would be considered a failed qualification lot run.

As shown in Table 1, all units that passed on the Harris-Tuvey platform also passed on the MPS platform and all units rejected by the Harris-Tuvey platform were also rejected by the MPS test platform thereby demonstrating correlation of both good and bad units between platforms.

Table 1: Test Product Qualification Lot Run

Generic	Package	Lot number	Lot Size	Good units passed on both test platforms?	Reject units failed on the same test parameter for both test platforms?
ADuM4223	SOIC_W	AN88913.3	100	Yes	Yes
ADuM4223	SOIC_W	AN91221.3	100	Yes	Yes
ADuM4223	SOIC_W	AN91845.3	100	Yes	Yes
ADuM4224	SOIC_W	AO40270.2	100	Yes	Yes
ADuM4224	SOIC_W	AO34965.3	100	Yes	Yes

Approvals

Product Line Manager
Test Development Manager
Test Product Manager
Quality Manager

Supporting Document

Technical Review Board: TRB #32500

Additional Information

Homepage: <http://www.analog.com/en/index.html>

Datasheet:

http://www.analog.com/media/en/technical-documentation/data-sheets/ADuM3223_4223.pdf

http://www.analog.com/media/en/technical-documentation/data-sheets/ADuM3224_4224.pdf

**ADuM4223W _R3 Qualification Results Summary
Automotive Grade 1 Qualification (16L_SOIC_W)**

QUALIFICATION PLAN / STATUS			
TEST	SPECIFICATION	SAMPLE SIZE	RESULTS
High Temperature Operating Life (HTOL)* ²	JEDEC <i>JESD22-A108</i>	9 x 77	Pass
Highly Accelerated Stress Test (HAST)* ¹	JEDEC <i>JESD22-A110</i>	9 x 77	Pass
Temperature Cycle (TC)* ¹	JEDEC <i>JESD22-A104</i>	9 x 77	Pass
Unbiased HAST* ¹	JEDEC <i>JESD22-A118</i>	9 x 77	Pass
High Temperature Storage Life (HTSL) ¹	JEDEC <i>JESD22-A103</i>	6 x 77 3 x 45	Pass
Solder Heat Resistance (SHR)* ¹	JEDEC/IPC <i>J-STD-020</i>	3 x 10	Pass
Latch-Up ¹	JEDEC <i>JESD78</i>	1 x 18	Passed ±200mA @+8.25V / +27V
Electrostatic Discharge <i>Human Body Model</i> ¹	ESDA/JEDEC <i>JS-001</i>	3/voltage	Passed ±2500V
Electrostatic Discharge <i>Field-Induced Charged Device Model</i> ¹	JEDEC <i>JESD22-C101</i>	3/voltage	Passed ±1250V

*Preconditioned per JEDEC/IPC J-STD-020

¹Electrical test was performed at Room/Hot/HV First&Last.

²Electrical test was performed at Cold/Room/Hot/HV First&Last

**ADuM4224W_R2 Qualification Results Summary
Automotive Grade 1 Qualification (16L SOIC_W)**

QUALIFICATION PLAN / STATUS			
TEST	SPECIFICATION	SAMPLE SIZE	RESULTS
High Temperature Operating Life (HTOL)* ²	JEDEC <i>JESD22-A108</i>	9 x 77	Pass
Highly Accelerated Stress Test (HAST)* ¹	JEDEC <i>JESD22-A110</i>	9 x 77	Pass
Temperature Cycle (TC)* ¹	JEDEC <i>JESD22-A104</i>	9 x 77	Pass
Unbiased HAST* ¹	JEDEC <i>JESD22-A118</i>	9 x 77	Pass
High Temperature Storage Life (HTSL) ¹	JEDEC <i>JESD22-A103</i>	9 x 77	Pass
Solder Heat Resistance (SHR)* ¹	JEDEC/IPC <i>J-STD-020</i>	3 x 10	Passed
Latch-Up ¹	JEDEC <i>JESD78</i>	1 x 18	Passed ±200mA @+8.25V / +27V
Electrostatic Discharge <i>Human Body Model</i> ¹	ESDA/JEDEC <i>JS-001</i>	3/voltage	Passed ±2500V
Electrostatic Discharge <i>Field-Induced Charged Device Model</i> ¹	JEDEC <i>JESD22-C101</i>	3/voltage	Passed ±1250V

*Preconditioned per JEDEC/IPC J-STD-020

¹Electrical test was performed at Room/Hot/HV First&Last.

²Electrical test was performed at Cold/Room/Hot/HV First&Last