Reliability Report

ADS1278-SP Production Flow and Reliability Report

Table of Contents

1 Trademarks

All trademarks are the property of their respective owners.

2 Texas Instruments MLS Product Qualification and Reliability Report

TI qualification testing is a risk mitigation process that is engineered to assure device longevity in customer applications. Wafer fabrication process and package level reliability are evaluated in a variety of ways that may include accelerated environmental test conditions with subsequent derating to actual use conditions. Manufacturability of the device is evaluated to verify a robust assembly flow and assure continuity of supply to customers, TI MLS Products are qualified with industry standard test methodologies performed to the intent of Joint Electron Devices Engineering Council (JEDEC) standards and procedures. Texas Instruments MLS Products are certified to meet GEIA-STD-0002-1 Aerospace Qualified Electronic Components.

3 Texas Instruments MLS Production Flow

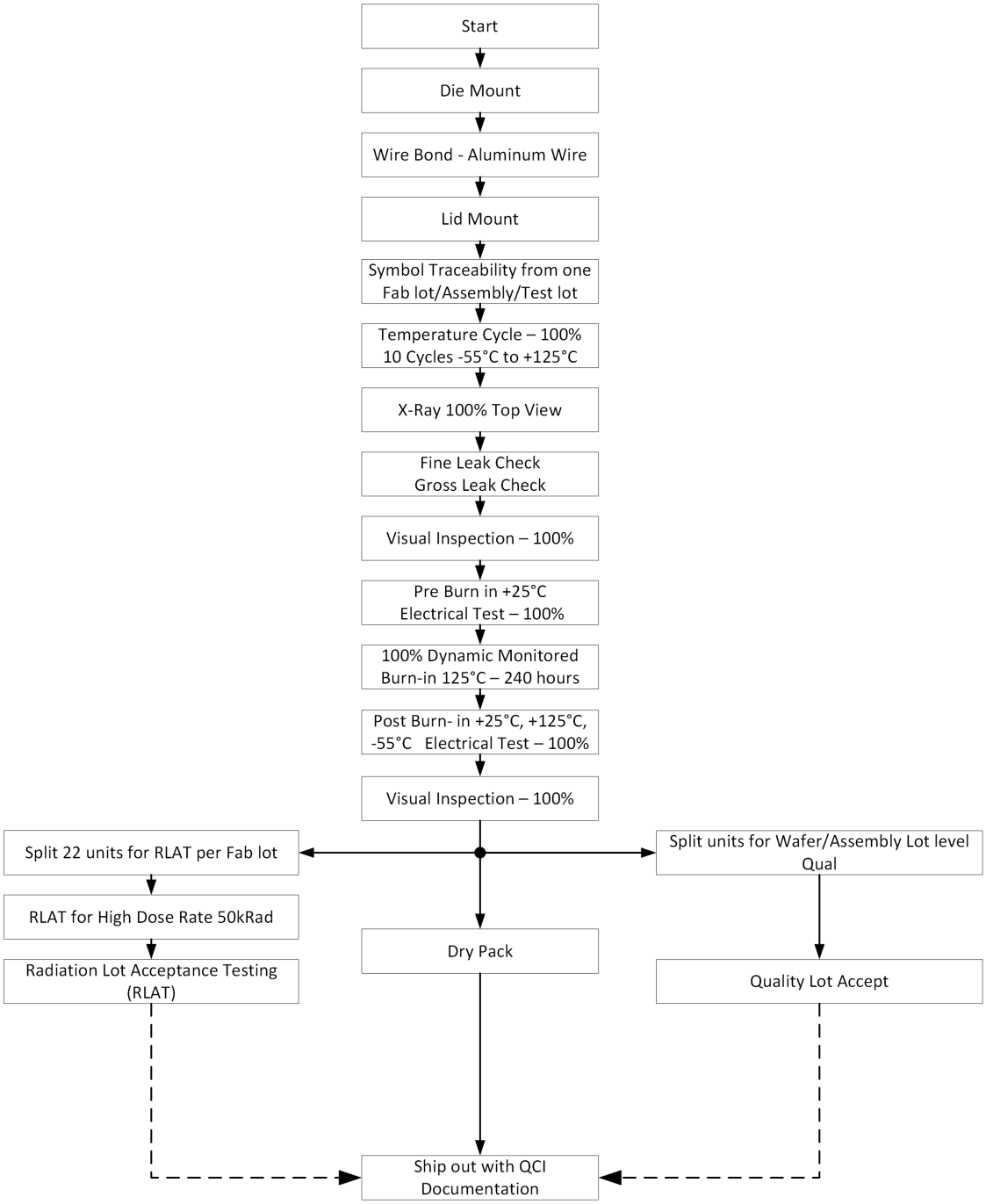

Figure 3-1. MLS Production Flow

4 Qualification by Similarity (Qualification Family)

A new device can be qualified either by performing full-scale quality and reliability test on the actual device or using previously qualified devices through *qualification by similarity* (QBS) rules. By establishing similarity between the new device and those qualified previously, repetitive tests are eliminated, allowing for timely production release. When adopting the QBS methodology, the emphasis is on qualifying the differences between a previously qualified product and the new product under consideration. The QBS rules for a technology, product, test parameter, or package shall define which attributes are required to remain fixed in order for the QBS rules to apply. The attributes that are expected and allowed to vary are reviewed and a QBS plan shall be developed, based on the reliability impact assessment above, specifying what subset of the full complement of environmental stresses is required to evaluate the reliability impact of those variations. Each new device shall be reviewed for the conformance to the QBS rule sets applicable to the device. See JEDEC JESD47 for more information.

Table 4-1. Device Baseline

TI Device:	**ADS1278MHFQ-MLS**		**Assembly Site:**	**Subcon- Microchip Tech (Thailand)**
DLA VID:	Not Applicable		Test Site:	TI-Taiwan
Wafer Fab:	TSMC-WF3		Pin/Package Type:	Ceramic Quad Flatpack | 84
Fab Process:	TSMC 0.35UM DPQM 3.3 V/5 V		Leadframe:	Not applicable for ceramic
Fab Technology:	TSMC 0.35UM		Termination Finish:	Au
Die Revision:	D		Bond Wire:	25.4 µm Al
ESD CDM:	±500 V		Moisture Sensitivity:	Not applicable for Ceramic
ESD HBM:	±2000 V			
1Baseline information in effect as of the date of this report				

Table 4-2. Space Enhanced Products New Device Qualification Matrix

Note that qualification by similarity (“qualification family”) per JEDEC JESD47 is allowed				
Description	**Condition**	**Sample Size Used/ Rejects**	**Lots Required**	**Test Method**
Electromigration	Maximum Recommended Operating Conditions	N/A	N/A	Per TI Design Rules
Electrical Characterization	TI Data Sheet	30	1	N/A
Electrostatic Discharge Sensitivity	HBM	3 units/voltage	1	EIA/JESD22-A114
	CDM			EIA/JESD22-C101
Latch-up 25°C and 125°C	Per Technology	6/0	1	EIA/JESD78
C1 Life Test	140°C / 500 hours or equivalent	47/0	1	MIL-STD-883/Method 1005
Temperature Cycle	–65°C to +150°C non-biased for 500 cycles	15/0	N/A	MIL-STD-883/TM1010, Cond C
Visual Quality Reliability Inspection	Post Temp Cycle	2/0	1	Per TI Design Rules
B2 Resistance to Solvents	Ink symbol only	3/0	2	MIL-STD-883/Method 2015
B3 Solderability	245C +/-5%, 22 leads from each unit (3 unit minimum)	3/0	1	MIL-STD-883/Method 2003
B5 Bond Strength	Destructive Bond Pull Test, 15 wires pull from each unit (4 unit minimum)	4/0	3	MIL-STD-883/Method 2011
D3 Sequence	15 Th/S+100 TC + Moist Resis	15/0	3	MIL-PRF-38535
D4 Sequence	Mech Shock + Vibration + Const Acc	15/0	1	MIL-PRF-38535
Die Shear	Per die size	3/0	1	MIL-STD-883/Method 2019

Table 4-2. Space Enhanced Products New Device Qualification Matrix (continued)

Note that qualification by similarity (“qualification family”) per JEDEC JESD47 is allowed				
Description	**Condition**	**Sample Size Used/ Rejects**	**Lots Required**	**Test Method**
Radiation Response Characterization	Total Ionization Dose, and Single-Event Latch-up	5 units/dose level	1	MIL-STD-883/Method 1019

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265