

ADC3683-EP Enhanced Product Qualification and Reliability Report



TI Device: ADC3683-EP

DLA VID: V62/24602

TI qualification testing is a risk mitigation process that is engineered to assure device longevity in customer applications. Wafer fabrication processes 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 Enhanced Products are qualified with industry standard test methodologies performed to the intent of Joint Electron Devices Engineering Council (JEDEC) standards and procedures. Texas Instruments Enhanced Products are certified to meet GEIA-STD-0002-1 Aerospace Qualified Electronic Components.

Qualification by Similarity (Qualification Family)

A new device can be qualified either by performing full scale quality and reliability tests 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 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 parameters, or package shall define which attributes are required to remain fixed for the QBS rules to apply. The attributes which are expected and allowed to vary is reviewed and a QBS plan is 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 is reviewed for conformance to the QBS rule sets applicable to that device. See JEDEC JESD47 for more information.

Table 1-1. Enhanced Products New Device Qualification Matrix

Note that qualification by similarity ("qualification family") per JEDEC JESD47 is allowed.				
Description	Condition	Sample Size Used and Rejects	Lots Required	Test Method
Electromigration	Maximum recommended operating conditions	N/A	N/A	Per TI Design rules
Wire bond life	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	JEDEC JS-001 or EIA/JESD22-A114
	CDM			JEDEC JS-002 or EIA/JESD22-C101
Latch-up	Per technology	3/0	1	EIA/JESD78
Thermal impedance	Theta-JA on board	Per pin-package	N/A	EIA/JESD51
Biased HAST	130°C / 85% / 96 hours	77/0	1	JESD22-A110/A101*
Extended biased HAST	130°C / 85% / 250 hours (for reference)	77/0	1	JESD22-A110/A101*
Unbiased HAST	130°C / 85% / 192 hours	77/0	1	JESD22-A118*
Temperature cycle	-65°C to +150°C non-biased for 500 cycles	77/0	1	JESD22-A104*
Solderability	Bake Preconditioning	22/0	1	ANSI/J-STD-002
Bond pull strength	Per wire size	Two units × 30/0 bonds	1	ASTM F-459
High temperature storage	150°C / 1000 hours	77/0	2	JESD22-A103*
Moisture sensitivity	Surface mount only	12	1	J-STD-020*

*Precondition performed per JEDEC Std. 22, Method A112/A113.

Technology Family FIT / MTBF Data

Mean Time Between Fails (MTBF) and Failures in Time (FIT) rates are device reliability statistics calculated based on data collected from TI's internal reliability testing (life test).

TI's DPPM/FIT/MTBF Estimator Search Tool reports the generic data based on technology groupings and shows conditions under which the rates were derived. All terms used in the tool and definitions can be found on the TI reliability terminology page. Failure rates are summarized by technology and mapped to the associated material part numbers. The failure rates are highly dependent on the number of units tested, therefore, it is not recommended to compare failure rates.

TI DPPM/FIT/MTBF Estimator Search Tool webpage link:

www.ti.com/quality/docs/estimator.tsp

Device Family Qualification Data

TI's Qualification Summary Search Tool reports generic qualification data representative of the material sets, processes, and manufacturing sites used by the device family and may not include all of the testing performed for a specific EP device. Please see the Enhanced Products New Device Qualification Matrix above for the full suite of qualification testing performed to release Enhanced Product devices.

TI Qualification Summary Search webpage link:

<https://www.ti.com/qualificationsummary/qualsumm/home>

Ongoing Reliability Monitoring

TI periodically monitors the reliability of its products, wafer fab processes, and package technologies, through its Ongoing Reliability Monitor (ORM) program. The ORM program involves collecting environmental reliability stress data on representative sets of devices, processes and packages. The results from the ORM program are updated quarterly in this report.

TI Ongoing Reliability Monitoring Search webpage link:

www.ti.com/orm/home?actionId=2801.html

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](https://www.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
Copyright © 2025, Texas Instruments Incorporated