12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PCN# 20251211003.2
Qualification of LFAB using qualified Process Technology and additional Test site for select devices

Change Notification / Sample Request

Date: December 12, 2025
To: MOUSER PCN

Dear Customer:

This is an announcement of a change to a device that is currently offered by Texas Instruments. The details of this change are on the following pages.

Texas Instruments requires acknowledgement of receipt of this notification within 60 days of the date of this notice. Lack of acknowledgement of this notice within 60 days constitutes acceptance and approval of this change. If samples or additional data are required, requests must be received within 60 days of this notification.

The changes discussed within this PCN will not take effect any earlier than the proposed first ship date on Page 3 of this notification, unless customer agreement has been reached on an earlier implementation of the change.

This notice does not change the end-of-life status of any product. Should product affected be on a previously issued product withdrawal/discontinuance notice, this notification does not extend the life of that product or change the life time buy offering/discontinuance plan.

For questions regarding this notice or to provide acknowledgement of this PCN, you may contact your local Field Sales Representative or the change management team.

For sample requests or sample related questions, contact your local Field Sales Representative.

TI values customer engagement and feedback related to TI changes. Customers should contact TI if there are questions or concerns regarding a change notification.

Change Management Team
SC Business Services

20251211003.2
Attachment

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, you have recently purchased these devices. The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
M0L1228QPTRQ1	NULL
M0L1228QRHBRQ1	NULL
M0L2228QPMRQ1	NULL
M0L1228QPMRQ1	NULL
M0L1227QRHBRQ1	NULL
M0L2228QPTRQ1	NULL
M0L2228QPNRQ1	NULL
M0L1227QPTRQ1	NULL
M0L1228QPNRQ1	NULL
M0L2227QPMRQ1	NULL
M0L1227QPMRQ1	NULL
M0L1227QPNRQ1	NULL
M0L2227QPNRQ1	NULL
M0L2227QPTRQ1	NULL

Technical details of this Product Change follow on the next page(s).

PCN Number:	20251211003.2	**PCN Date:**	December 12, 2025
Title:	Qualification of LFAB using qualified Process Technology and additional Test site for select devices		
Customer Contact:	Change Management Team	**Dept:**	Quality Services
Proposed 1st Ship Date:	June 10, 2026	**Sample requests accepted until:**	February 10, 2026*

***Sample requests received after February 10, 2026 will not be supported.**

Change Type:

☐	Assembly Site	☐	Design	☐	Wafer Bump Material
☐	Assembly Process	☐	Data Sheet	☐	Wafer Bump Process
☐	Assembly Materials	☐	Part number change	☒	Wafer Fab Site
☐	Mechanical Specification	☒	Test Site	☐	Wafer Fab Material
☒	Packing/Shipping/Labeling	☐	Test Process	☐	Wafer Fab Process

PCN Details

Description of Change:

Texas Instruments is pleased to announce the addition of LFAB using the F65 qualified process technology and additional test site for the devices listed below.

Current Fab Site			Additional Fab Site		
Current Fab Site	**Process**	**Wafer Diameter**	**Additional Fab Site**	**Process**	**Wafer Diameter**
UMCI	F65	300 mm	LFAB	F65	300 mm

	Current	Additional
Test Site	CD-PR	TIEM-PR

Qual details are provided in the Qual Data Section.

Reason for Change:

Supply continuity

Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):

None. Review the standard data packet (SDP).

Impact on Environmental Ratings:

Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings.

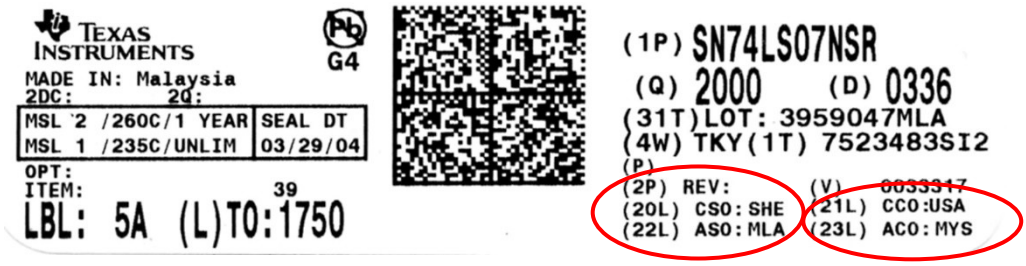
RoHS	REACH	Green Status	IEC 62474
☒ No Change	☒ No Change	☒ No Change	☒ No Change

Changes to product identification resulting from this PCN:

Fab Site Information:

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
UMCI	UMI	SGP	SUNNYVALE
LFAB	**LHI**	**USA**	**Lehi**

Sample product shipping label (not actual product label):



Product Affected- Additional Fab site and Test site

M0L1227QPMRQ1	M0L1227QRHBRQ1	M0L1228QRGZRQ1	M0L2227QPTRQ1
M0L1227QPNRQ1	M0L1228QPMRQ1	M0L1228QRHBRQ1	M0L2228QPMRQ1
M0L1227QPTRQ1	M0L1228QPNRQ1	M0L2227QPMRQ1	M0L2228QPNRQ1
M0L1227QRGERQ1	M0L1228QPTRQ1	M0L2227QPNRQ1	M0L2228QPTRQ1
M0L1227QRGZRQ1	M0L1228QRGERQ1		

Product Attributes

Attributes	Qualification Devices[1]	Qualification by Similarity (QBS = Generic Data) Reference Devices		
	Qual Device: M0L2228QPNRQ1	QBS PReference: M0L2228QPNRQ1	QBS Reference: M0G3507QPMRQ1	QBS Reference: TMS320F28379SPTPQ
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Product Function	Microcontroller	Microcontroller	Microcontroller	Microcontroller
Wafer Fab Supplier	LFAB	UMCI	LFAB, UMCI	LFAB, UMCI
Assembly Site	PHI	PHI	PHI	PHI
Package Group	QFP	QFP	QFP	QFP
Package Designator	PN	PN	PM	PTP
Pin Count	80	80	64	176

Notes

1. All MSPM0L22xx* and M0L12xx** Devices listed in the orderable part table below, use the same die and are the same physical design; these products differ only in the package size and number of pins. The Qualification Device listed above, MSPM0L2228*, is the full-featured device in the largest package and it serves as the qualifation vehicle for the MSPM0L22xx / MSPM0L12xx products in the QFP packages. Product TMS320F28379SPTPQ is a 12F65 microcontroller qualification and represents the technology driver for this 12F65 technology, for 2 manufacturing sites, LFAB, and UMCI; similarly, M0G3507QPMRQ1 is also an ultralow power microcontroller qualified in both LFAB and UMCI, uses the same 12F65 technology and has the same features as the MSPM0L22xx / MSPM0L12xx* products listed above; see the "Product Attributes Table" listed above. Also note that MSPM0L22xx / MSPM0L12xx* products were previously qualified in UMCI. QBS data is leveraged from both these devices.
2. EMEG700SL TYPE B (EME-G700SLB) is the same mold compound with the same physical properties as EME-G700LB, only filtered to remove alpha particles.

- QBS: Qual By Similarity, also known as Generic Data
- Qual Device M0L2228QPNRQ1 is qualified at MSL3 260C. Orderable part numbers below in **PN** packages are also qualified at MSL3
- Devices MSPM0L22xx / MSPM0L12xx* are qualified at MSL2 260C when in **PM** or **PT** Packages. Orderable part numbers below in **PT** and **PM** packages are also qualified at MSL2

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Qualification Stresses and Conditions								Qualification Device	Qualification by Similarity (QBS = Generic Data) Reference Devices		
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: M0L2228QPNRQ1	QBS Reference: M0L2228QPNRQ1	QBS Reference: M0G3507QPMRQ1	QBS Reference: TMS320F28379SPTPQ
Test Group A - Accelerated Environment Stress Tests											
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	QBS M0G3507QPMRQ1 + MOL2228QPNRQ1	2/154/0[1] + QBS M0G3507QPMRQ1	3/432/0	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL3 260C	-	QBS M0G3507QPMRQ1 + MOL2228QPNRQ1	1/77/0[1] + QBS TMS320F2837X*	-	6/462/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	110C/85%RH	264 Hours	QBS TMS320F2837X*	QBS TMS320F2837X*	-	6/432/0[2]
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	130C/85%RH	96 Hours	QBS TMS320F2837X*	QBS TMS320F2837X*	-	6/462/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	QBS Reference Devices	3/231/0[1]. See also note 1, above	3/231/0	6/462/0
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	QBS Reference Devices	3/15/0[1]; See also note 1, above.	1/5/0	2/10/0
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	QBS TMS320F28379SPTPQ	QBS TMS320F2837X*	-	6/270/0[3]
Test Group B - Accelerated Lifetime Simulation Tests											

Qualification Stresses and Conditions								Qualification Device	Qualification by Similarity (QBS = Generic Data) Reference Devices		
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: M0L2228QPNRQ1	QBS Reference: M0L2228QPNRQ1	QBS Reference: M0G3507QPMRQ1	QBS Reference: TMS320F28379SPTPQ
HTOL	B1	JEDEC JESD22-A108[5]	3	77	Life Test	125C	1000 Hours	QBS Reference Devices	1/77/0 + QBS to M0G3507QPMRQ1	6/462/0	6/462/0
HTOL	B1	JEDEC JESD22-A108[5]	3	77	LIfe Test	-10C	1000 Hours	QBS TMS320F28379SPTPQ	QBS TMS320F28379SPTPQ	QBS TMS320F28379SPTPQ	6/462/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate	125C	48 Hours	QBS Reference Devices	QBS Reference Devices	3/2400/0	6/4800/0
EDR	B3	AEC Q100-105[5]	3	77	Data Retention	150C	1000 Hours	QBS Reference Devices	1/77/0 + QBS M0G3507QPMRQ1	6/462/0	4/631/0[4]
EDR	B3	AEC Q100-105	3	77	Endurance Cycling	-40C, 25C, 125C	≥10K cycles	QBS Reference Devices	1/77/0 at 125C + QBS M0G3507QPMRQ1	6/462/0 (2/144/0 for each temperature)	6/462/0 (2/144/0 for each temperature)
Test Group C - Package Assembly Integrity Tests											
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	3/90/0	**6/180/0**	**6/180/0**
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	1/30/0	3/90/0	**6/180/0**	**6/180/0**
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	-	1/10/0	3/30/0	**6/60/0**	**6/60/0**
Test Group D - Die Fabrication Reliability Tests											
EM	D1	JESD61	-	-	Electromigration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements

Qualification Stresses and Conditions								Qualification Device	Qualification by Similarity (QBS = Generic Data) Reference Devices		
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: M0L2228QPNRQ1	QBS Reference: M0L2228QPNRQ1	QBS Reference: M0G3507QPMRQ1	QBS Reference: TMS320F28379SPTPQ
BTI	D4	-	-	-	Bias Temperature Instability	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	-	-	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E - Electrical Verification Tests											
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	1/3/0	1/3/0	1/3/0	2/6/0
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0	1/3/0	1/3/0	2/6/0
LU	E4	AEC Q100-004	1	3	Latch-Up	Per AEC Q100-004	-	1/3/0	1/3/0	1/3/0	2/12/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	-	1/30/0	3/90/0	3/90/0	6/180/0

Notes:

1. Results here include data from 3 QFP Packages: 1 lot of M0L2228QPNRQ1 in a PN Package; 1 lot of MOL2228PMRQ1 in a PM package, and 1 lot of MOL2228PTRQ1 in a PT packages.
2. For UMCI, Test A2 for the BHAST stress was conducted at THB conditions 85C/85% RH for 1000 hrs; results passed for 3 lots, 231 total units, 0 fails
3. In addition to the LFAB data, this Includes 3 lots of 150C HTSL Data from TSMC-F14 in the same AT site/PKG for the same technology. UMCI HSTL test is also supported by the 150C, B3 (Retention Test) data, ran at the same temperature.
4. Includes 1 lot of LFAB data for high-temperature data retention, collected at 250C, 400 units.

- Tests listed with a "-" denote tests and results which are incidental for this qualification.
- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
- Prior to tests B1 (HTOL) and B3 (150C Data retention), units were precycled to ≥10K W/E cycles
- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours
- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours
- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Ambient Operating Temperature by Automotive Grade Level:

- Grade 0 (or E): -40C to +150C
- Grade 1 (or Q): -40C to +125C
- Grade 2 (or T): -40C to +105C
- Grade 3 (or I) : -40C to +85C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

- Room/Hot/Cold : HTOL, ED
- Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
- Room : AC/uHAST

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

TI Qualification ID: R-CHG-2503-028

Product Attributes

Attributes	Qualification Devices[1]	Qualification by Similarity (QBS = Generic Data) Reference Devices for Package Testing			QBS = Generic Data Reference Devices for Process and Product Testing		
	Qual Device: M0L2228QRGZRG1	QBS Package Reference: M0G3507QRGZRQ1	QBS Package Reference: F2800157QRHBRQ1	QBS Package Reference: CC2642R1FRGZR	QBS Product Reference: M0L2228QPNRQ1	QBS Product Reference: M0G3507QPMRQ1	QBS Process Reference: TMS320F28379SPTPQ
Automotive Grade Level	Grade 1	Grade 1	Grade 1	Grade 2	Grade 1	Grade 1	Grade 1
Operating Temp Range (C)	-40 to 125	-40 to 125	-40 to 125	-40 to 105	-40 to 125	-40 to 125	-40 to 125
Product Function	Microcontroller	Microcontroller	Microcontroller	Microcontroller	Microcontroller	Microcontroller	Microcontroller
Wafer Fab Supplier	LFAB	LFAB	UMCI	LFAB, UMCI	UMCI	LFAB, UMCI	LFAB, UMCI
Assembly Site	CDAT	CDAT	CDAT	CDAT / CLARK-AT	PHI	PHI	PHI
Package Group	QFN	QFN	QFN	QFN	QFP	QFP	QFP
Package Designator	RGZ	RGZ	RHB	RGZ	PN	PM	PTP
Pin Count	48	48	32	48	80	64	176

1. M0L222x* and MOL122x* Devices use the same die and are the same physical design and differ only in the optional features, the packaging, and # of pins; the RGZ, RHB and RGE packages use the same assembly site and materials and differ only in the size and number of pins and the MSL rating noted below. All devices listed in the Table above use the same 12F65 Process technology from either of 2 qualified fabrication sites, LFAB or UMCI, with equivalent process technologies. See the product datasheet at ti.com.
2. M0G3507* devices are used for generic (QBS) data; the M0G3507* are from the same product family as M0G3519*.

- QBS: Qual By Similarity, also known as Generic Data
- Qual Devices M0L122x* **RGZ** and **RHB** packages are qualified at MSL2 260C. M0L122x* in the **RGE** package is qualified at MSL1 260C. Orderable part numbers below are listed below.

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Qualification Stresses and Conditions								Qualification Devices[1]	Qualification by Similarity (QBS = Generic Data) Reference Devices for Package Testing			QBS = Generic Data Reference Devices for F Testing	
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: M0L2228QRGZRQ1	QBS Package Reference: M0G3507QRGZRQ1	QBS Package Reference: F2800157QRHBRQ1	QBS Package Reference: CC2642R1FTWRGZRQ1	QBS Product Reference: M0L2228QRGZRQ1	QBS Product Reference: M0G3507QPMRQ1
Test Group A - Accelerated Environment Stress Tests													

Qualification Stresses and Conditions								Qualification Devices[1]	Qualification by Similarity (QBS = Generic Data) Reference Devices for Package Testing			QBS = Generic Data Reference Devices for P Testing	
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: M0L2228QRGZRQ1	QBS Package Reference: M0G3507QRGZRQ1	QBS Package Reference: F2800157QRHBRQ1	QBS Package Reference: CC2642R1FTWRGZRQ1	QBS Product Reference: M0L2228QRGZRQ1	QBS Product Reference: M0G3507QPMRQ1
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL2 260C	-	QBS M0G3507QRGZRQ1 + F2800157QRHBRQ1	1/77/0	3/900/0	-	-	-
PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	Preconditioning	MSL3 260C	-	-	-	-	6/1656/0	-	-
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST	110C/85%RH	264 Hours	QBS F2800157QRHBRQ1 + CC2642R1FTWRGZRQ1		3/231/0	6/462/0		
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Autoclave	121C/15psig	96 Hours	QBS F2800157QRHBRQ1	-	2/154/0	-	-	-
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Temperature Humidity	85C/85%RH	1000 Hours	QBS F2800157QRHBRQ1	-	1/77/0	-	-	-
AC/UHAST	A3	JEDEC JESD22-A102/JEDEC JESD22-A118	3	77	Unbiased HAST	110C/85%RH	264 Hours	QBS CC2642R1FTWRGZRQ1	-	-	6/462/0	-	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-55C/125C	1000 Cycles	-	-	-	6/462/0	-	-
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle	-65C/150C	500 Cycles	QBS M0G3507QRGZRQ1 + F2800157QRHBRQ1	1/77/0	3/231/0	-	-	-
TC-BP	A4	MIL-STD883 Method 2011	1	5	Post Temp Cycle Bond Pull	-	-	QBS M0G3507QRGZRQ1 + F2800157QRHBRQ1	1/5/0	1/5/0	2/10/0	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temperature Storage Life	150C	1000 Hours	QBS F2800157QRHBRQ1 + CC2642R1FTWRGZRQ1	-	3/135/0	6/270/0	-	-
Test Group B - Accelerated Lifetime Simulation Tests													
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	125C	1000 Hours	QBS Reference Devices	-	-	-	1/77/0 + QBS to M0G3507QPMRQ1	6/432/0
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test	-10C	1000 Hours	QBS TMS320F28379SPTPQ	-	-	-	QBS TMS320F28379SPTPQ	QBS TMS320F28379SPTPQ
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate	125C	48 Hours	QBS Reference Devices	-	-	-	QBS Reference Devices	6/4800/0
EDR	B3	AEC Q100-105	3	77	Data Retention	150C	1000 Hours	QBS Reference Devices	-	-	-	1/77/0 + QBS M0G3507QPMRQ1	6/432/0
EDR	B3	AEC Q100-105	3	77	Endurance Cycling	-40C, 25C, 125C	≥10K cycles	QBS Reference Devices	-	-	-	1/77/0 at 125C + QBS M0G3507QPMRQ1	6/432/0 (2/144/0 for each temperature)

Qualification Stresses and Conditions								Qualification Devices[1]	Qualification by Similarity (QBS = Generic Data) Reference Devices for Package Testing			QBS = Generic Data Reference Devices for P Testing	
Type	#	Test Spec	Min Lot Qty	SS / Lot	Test Name	Condition	Duration	Qual Device: M0L2228QRGZRQ1	QBS Package Reference: M0G3507QRGZRQ1	QBS Package Reference: F2800157QRHBRQ1	QBS Package Reference: CC2642R1FTWRGZRQ1	QBS Product Reference: M0L2228QRGZRQ1	QBS Product Reference: M0G3507QPMRQ1
Test Group C - Package Assembly Integrity Tests													
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/30/0	3/90/0	3/90/0	6/180/0	3/90/0	6/180/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull	Minimum of 5 devices, 30 wires Cpk>1.67	Wires	3/30/0	3/90/0	3/90/0	6/180/0	3/90/0	6/180/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	-	3/30/0	3/30/0	3/30/0	6/180/0	3/30/0	6/180/0
Test Group D - Die Fabrication Reliability Tests													
EM	D1	JESD61	-	-	Electromigration	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
TDDB	D2	JESD35	-	-	Time Dependent Dielectric Breakdown	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
HCI	D3	JESD60 & 28	-	-	Hot Carrier Injection	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
BTI	D4	-	-	-	Bias Temperature Instability	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
SM	D5	-	-	-	Stress Migration	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements	Completed Per Process Technology Requirements
Test Group E - Electrical Verification Tests													
ESD	E2	AEC Q100-002	1	3	ESD HBM	-	2000 Volts	QBS M0G3519QPZRQ1	-	1/3/0	2/6/0	1/3/0	2/6/0
ESD	E3	AEC Q100-011	1	3	ESD CDM	-	500 Volts	1/3/0	1/3/0	1/3/0	2/6/0	1/3/0	2/6/0
LU	E4	AEC Q100-004	1	3	Latch-Up	Per AEC Q100-004	QBS M0G3519QPZRQ1	QBS M0G3519QPZRQ1	-	1/6/0	2/12/0	1/3/0	2/12/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold	3/90/0	3/90/0	3/90/0	3/90/0	6/180/0	3/90/0	6/180/0
Additional Tests													
BLR	T1	-	-	-	Board Level Reliability - Temp Cycle	-40/125C	1000 Cycles	QBS F2800157QRHBRQ1 + CC2642R1FRGZR	QBS F2800157QRHBRQ1 + CC2642R1FRGZR	1/32/0	1/32/0	-	-

1. All M0L222x and M0L12xx Devices use the same die and are the same physical design and differ only in the packaging and # of pins and the features; the RGZ, RHB, and RGE packages use the same assembly site and materials and differ only in the size and number of pins. All devices listed in the Table above use the same 12F65 Process technology from either of 2 qualified fabrication sites, LFAB or UMCI with equivalent process technologies. M0G3507* devices are used for generic (QBS) data; the M0G3507* are from the same product family as M0L22xx*/12xx*. Comments on qualification and QBS:

- Package QBS is based on similarity with F2800157QRHBRQ1 + CC2742R1FTWRGZRQ1, which use the same QFN packages (RHB, RGZ, RGE) with the same materials and assembly sites and fabs.
- Package data is supplemented with Temperature cycling data on RHB and RGZ data from M0G* devices from the same family. RGE (MSL1) packages have also completed 3 lots (231 units, 0 fails) of Temperature cycling stress on MOL1306QRGERQ1, a product from the same device family on the same technology, with same package materials and assembly site.
- Generic data for HTOL, ELFR, and EDR data are listed above for M0G* (same product family, same IP) and TMS320F28379SPTPQ, which is the F65 technology driver device. HTOL and EDR data are also included for M0L22xx/12xx* product since this device has an extended feature, the LCD IP.

2. For UMCI, Test A2 for the BHAST stress was conducted at THB conditions 85C/85% RH for 1000 hrs; results passed for 3 lots, 231 total units, 0 fails
3. In addition to the LFAB data, this Includes 3 lots of 150C HTSL Data from TSMC-F14 in the same AT site/PKG for the same technology. UMCI HSTL test is also supported by the 150C, B3 (Retention Test) data, ran at the same temperature.
4. Includes 1 lot of LFAB data for high-temperature data retention, collected at 250C, 400 units.

- In the table above, entries with a "-" are incidental to this qualification and results are not included.
- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
- Prior to tests B1 (HTOL) and B3 (150C Data retention), units were precycled to ≥10K W/E cycles
- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours
- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours
- The following are equivalent Temp Cycle options per JESD47: -55C/125C/700 Cycles and -65C/150C/500 Cycles

Ambient Operating Temperature by Automotive Grade Level:

- Grade 0 (or E): -40C to +150C
- Grade 1 (or Q): -40C to +125C
- Grade 2 (or T): -40C to +105C
- Grade 3 (or I) : -40C to +85C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

- Room/Hot/Cold : HTOL, ED
- Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
- Room : AC/uHAST

Quality and Environmental data is available at TI's external Web site: http://www.ti.com/

TI Qualification ID: R-CHG-2503-030

ZVEI ID: SEM-PW-13 , SEM-TF-01, SEM-PS-04

For alternate parts with similar or improved performance, please visit the product page on TI.com

In performing change qualifications, Texas Instruments follows integrated circuit industry standards in performing defect mechanism analysis and failure mechanism-based accelerated environmental testing to ensure wafer fab process, assembly process and product quality and reliability. As encouraged by these standards, TI uses both product-specific and generic (family) data in qualifying its changes. For devices to be categorized as a 'product qualification family' for generic data purposes, they must share similar product, wafer fab process and assembly process elements. The applicability of generic data (also known at TI as Qualification by Similarity (QBS)) is determined by the Reliability Engineering function following these industry standards. Generic data is shown in the qualification report in columns titled "QBS Process" (for wafer fab process), "QBS Package" (for assembly process) and "QBS Product" (for product family).

For questions regarding this notice, e-mails can be sent to the Change Management team or your local Field Sales Representative.

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