

**TABLE 1A**  
**PLASTIC PACKAGE/PRODUCT QUALIFICATION REQUIREMENTS**

TEST SEQ	TEST DESCRIPTION	ACC#/ S. SIZE	NEW ASSY. PLANT	NEW PKG TYPE I	NEW PKG TYPE II	NEW PKG TYPE III LF DESIGN	NEW ASSY. TECHNIQUES (MAT'L/PROCESS/METHOD)					NEW DEVICE MASK	NEW FAB PROCESS	FULL QUAL	
	(Note #1)	(Note #2)		(Note #3)	(Note #4)	(Note #5)	LEAD FRAME	DIE ATTACH	DIE COAT	WIRE BOND	MOLD CPD	LEAD FINISH	(Note #6)		
B1	* Phy. Dimension	0/5	X	X	X							X		X	
B2	* Resist. to Solvents (Note #7)	0/3	X								X	X		X	
B3	* Solderability Test (Note #7)	0/5	X				X					X		X	
B4	Solder Heat Test (Optn'l)	0/15				X	X				X			X	
B5	Auto Clave (SPP)(optn'l) 0/76	0/76	X	X	X	X	X		X		X		X	X	
B6	* Ball Shear/Bond Pull (Note #7)	0/5	X	X					X	X	X		X	X	
B7	** X-Ray (Note #7)	0/5	X	X	X	X			X	X	X		X	X	
B8	* S.A.T / Dye Pen Test (Note #7)	0/10	X	X	X	X	X				X	X		X	
B9	* Adhesion of L/Finish (Optn'l) (Note #7)	0/3	X				X					X		X	
B10	* External Visual (Note #7)	0/25	X	X	X	X	X				X			X	
B11	Internal Visual (Note #7)	0/5	X	X	X		X	X	X	X			X	X	
B12	* Die Shear (Note #7)	0/5	X					X					X	X	
B13	Flammability test (Note #7)	Per lot									X			X	
C1-A	High Temp Life Test	0/76							X				X	X	
C1-B	Low Temp Life Test (Note #7)	0/22											X	X	
C2	C2-A: HAST (0/22) or C2-B: 85/85	0/76	X	X		X	X	X	X		X			X	
C3	ESD (HBM)	0/3											X	X	
C4	High Temp Storage (Optn'l)	0/77									X		X	X	
D1	* Lead Integrity	0/3	X	X	X							X		X	
D2	Thermal Shock (Optn'l)	0/76												X	
D3	Temp Cycle	0/76	X	X	X	X	X	X	X	X	X		X	X	
E1	Electrical test & data log	0/30											X	X	
E2	Electrical characterization	0/30											X	X	
E3	T.D.D.B (Note #7)	-											X	X	
E4	Latch-Up	0/9											X	X	
E5	Electromigration (Note #7)	-											X	X	
E6	Photosensitivity (Optional)	0/11											X	X	
E7	Data Retention Bake EPLD & EPROM	0/22											X	X	
E8	Input/Output Capacitance	0/5											X	X	
E9	Power Cycling (Optional)	0/22											X	X	
Qty required per lot		E. Good	239	238	162	248	248	157	314	86	325	0	393	464	636
		E. Reject	63	48	43	35	43	5	5	5	43	29	10	10	64
		Total	302	286	205	283	291	162	319	91	368	29	403	474	700

- Note:
- 1) Refer to Table #2 for test method and stress conditions.
  - 2) For any QUAL which does not meet the standard requirements, approval from Product Engineering and Product QA is required.
  - 3) Any new package which has not been qualified in the qualified assembly facility.
  - 4) Any new package where the same package body size with different lead pitch has been qualified.
  - 5) New leadframe design whereby the paddle size is larger than the existing largest leadframe paddle size used in the same qualified package.
  - 6) For new mask from same device family, only high temp life test is required.
  - 7) In process monitor data may be used to satisfy this requirement.
- (\*) - Electrical rejects can be used as test sample  
(\*\*) - This is a non-destructive test. sample can be re-used.

**TABLE 2A (Page 1 of 2)**  
**PLASTIC PACKAGE QUALIFICATION / PRODUCT MONITOR REQUIREMENTS**

TEST SEQ	TEST DESCRIPTION	REFERENCE SPEC	XILINX	TEST OR STRESS CONDITIONS	Quality Level (ACC#/S.S)		PRODUCT MONITOR FREQUENCY	NOTES (#1)
		Mil-Std-883/ JEDEC/STACK			For QUAL	PRODUCT MONITOR		
<b>B</b>	<b>PACKAGE / PROCESS</b>							
B1	Phy. Dimension	Mil-Std-883 Mtd 2016	B1027	Per applicable pkg outline drawing	0/5	0/5	1x / 3months	#2
B2	Resist. to Solvents	Mil-Std-883 Mtd 2015	B1026	1 dev per chemical for 1min, then brush 10 times	0/3	0/3	In-line Process Monitor + 1x / 3 months	#2, #16
B3	Solderability Test	Mil-Std-883 Mtd 2003 STACK 0001 Test 5	B1023	8 hrs steam age: PTH: 245°C / 5 sec PSMC : 215 °C for 5 sec (wetting) : 260 °C for 10sec (dewetting)	0/76 ( 3 units)	0/76 ( 3 units)	In-line Process Monitor + 1x / 3 months	#2, #13, #14, #16
B4	Solder Heat Test (Optional)	JEDEC Std-22 Mtd A112	B1005	Immersion in solder @ 260 °C for 12 sec End-point electrical test @ 25 °C	0/15	-	For Qualification only	#4
B5	Auto Clave (SPP)	JEDEC Std-22 Mtd A102	RTP0002	Preconditioning flow #1 or #2 (for PSMC only) 96 hrs @ 2 ATM with saturated steam @ 121°C End-point electrical parameter @ 25 °C	0/76	0/76	1 x / 3 months	#2, #6 #14
B6	Ball Shear and Bond Pull	STACK 0001 Test 6	B1004	Ballshear strength > 50 gm Bondpull Strength > 5.0gm	0/10 (2units) 0/8 (2 units)	0/10 (2 units) 0/8 (2 units)	In-line Process Monitor	#16
B7	X-Ray	-		Wire sweep, Pkg void and Epoxy void	0/5	0/5	In-line Process Monitor	#16
B8	S.A.T and Dye Pen. Test	-		Scanning Acoustic Tomography 60 psig / 2 hrs. Dye Pen. < 10 mils from lead tip	0/10	-	For Qualification only	#11, #16
B9	Adhesion of Lead Finish (Optional)	Mil-Std-883 Mtd 2025	B1018	Bend coated lead at an angle of 90° until fracture occurs. No flaking, peeling or detachment of coating at the interface.	0/15 (3 units)	-	For Qualification only	
B10	External Visual	Mil-Std-883 Mtd 2009		Package defects, Lead defects	0/25	0/25	In-line Process Monitor	#16
B11	Internal Visual	Mil-Std-883 Mtd 2010		Die defects, die-attach and wirebond defects	0/5	0/5	In-line Process Monitor	#16
B12	Die Shear	Mil-Std-883 Mtd 2019		Die Shear strength > 5.0 kg	0/5	0/5	In-line Process Monitor	#16
B13	Flammability	UL-94 V0		Bulk material in C of C per material shipment	-	-	-	#16
<b>C</b>	<b>MICRO CIRCUIT FAMILY</b>							
C1-A	High Temp Life Test	Mil-Std-883 Mtd 1005	RTP0003	145 ° C / 256, 500 and 1000 hrs or equivalent End-point electrical test @ 25 °C, verify device parameter drift (<10%)	LTPD-3 +0/76	LTPD 5 +0/45	1 x / 3 months	#3, #5, #12
C1-B	Low Temp Life Test	Mil-Std-883 Mtd 1005		< -10 °C /1000 hrs End-point electrical test @ 25 °C, verify device parameter drift (<10%)	0/22	-	For Qualification only	#16
C2-A	85 deg C/ 85 % RH	JEDEC Std-22 Mtd A101	RTP0006	Preconditioning flow #1 or #2 (for PSMC only) End-point electrical test @ 25 °C (for PSMC only) 85 °C / 85% RH static bias for 168, 500, 1000 hrs. End-point electrical test @ 25 °C	LTPD 3 0/76	LTPD 5 0/45	1 x / 3 months	#2, #6, #8 #12, #14
C2-B	HAST	JEDEC Std-22, Mtd 110	RTP0011	Preconditioning flow #1 or #2 (for PSMC only) End-point electrical test @ 25 °C (for PSMC only) HAST -130 °C/85%RH static bias for 50, 100 hrs. End-point electrical test @ 25 °C	0/22	0/22	1 x / 3 months	#2, #6, #9, #14
C3	ESD (HBM)	Mil-Std-883, Mtd 3015	TSP0001	3 +ive and 3 -ive pulses, all pins tested, 1000 volts min.	0/3	-	For Qualification only	
C4	High Temp Storage (Optional)	Mil-Std-883 Mtd 1008		150 °C / 500, 1000 hrs End-point electrical test @ 25 °C	0/76	-	For Qualification only	#12

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TEST SEQ	TEST DESCRIPTION	REFERENCE SPEC		TEST OR STRESS CONDITIONS			PRODUCT MONITOR FREQUENCY	NOTES (#1)
		Mil-Std-883/ JEDEC/STACK			For QUAL	PRODUCT MONITOR		
D	PACKAGE DESIGN							
D1	Lead Integrity	Mil-Std-883 Mtd 2004	B1024	Cond. B2	0/15 (3 units)	0/15 (3 units)	1x / 3months	#2
D2	Thermal Shock		RTP0001		0/76	0/45	1 x / 3 months	#2, #7
				Cond. C -65/150 °C, 500 cycles				#2, #7, #14
E								
E1	Electrical Test & Datalog	STACK 0001, Test 1c						
E2	Electrical Characterization	STACK 0001, Test 1d	TSP0003	Shmoo plot and temp trend for critical parameters	0/30			
E3	T.D.D.B	STACK 0001, Test 38		Charaterization of oxide integrity	-		in-line process monitor	#10, #16
			TSP0006				New Product Characterization	
				> 100,000 hours for 0.1% cumulative failures > 100,000 hours for 50% cumulative failures	-		In-line process monitor	#16
E6	Photosensitivity (Optional)				0/11		New Product Characterization	
E7	Data Retention Bake	Mil-Std-883 Mtd 1033		Write device with suitable pattern, bake @ 150 °C for 1000 hrs Read and confirm data pattern End-point electrical test @ 25 °C	0/22			#15
E8	Input/Output Capacitance	Mil-Std-883 Mtd 3012	TSP0002	Device shall be biased @ nominal operating voltage	0/5	-	New Product Characterization	

- 3) The Product Monitor Frequency applies to each Micro Circuit Family, each Quarter.  
4) For Moisture sensitive PSMC, a bake @ 125 °C for 16 hrs prior to solder heat test is required.  
5) End-point electrical test shall be performed within 48 hrs window.  
6) End-point electrical test shall be performed within 96 hrs window.  
7) For Plastic encapsulated laminated PCB package, use condition B, -55 / 125 °C.  
8) 85/85 Test is not required if HAST test is used.  
9) HAST Test data is for information and not required for qualification.  
10) T.D.D.B - Time dependent Dielectric Breakdown.  
11) Dye Penetration test will be used as verification after S.A.T  
12) Interim read point is optional.  
13) PTH - Plastic Through Hole.  
14) PSMC - Plastic Surface Mount Component.

assembly lot traveller or FAB/Assembly/Vendor monitor data.

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**TABLE 1B**  
**HERMETIC PACKAGE/PRODUCT QUALIFICATION REQUIREMENTS (COMMERCIAL)**

TEST SEQ	TEST DESCRIPTION  (Note #1)	ACC#/ S. SIZE  (Note #2)	NEW ASSY. PLANT	NEW PKG FAM'LY (Note #3)	NEW PKG QUALIF'D FAM'LY (Note #4)	NEW ASSY. TECHNIQUES (MAT'L/PROCESS/METHOD)						NEW CAVITY SIZE (Note #5)	NEW DEVICE (Note #6)	NEW FAB/ PROCESS	FULL QUAL
						LEAD FRAME	DIE ATTACH	DIE COAT	WIRE BOND	TYPE OF SEAL	LEAD FINISH				
B1	Solder Heat Test (Optional)	0/15		X	X					X		X			X
B2	* Resist. to Solvents Note #7	0/3	X	X							X				X
B3	* Solderability Test Note #7	0/3	X	X		X					X				X
B4	* Die Shear / Stud Pull Note #7	0/5	X	X	X		X						X	X	X
B5	* Bond Pull Note #7	0/2	X	X	X	X		X	X				X	X	X
B6	* External Visual Note #7	0/25	X	X	X	X				X		X			X
B7	Internal Visual Note #7	0/5	X	X	X	X	X	X	X				X	X	X
C1-A	High Temp Life Test	0/76	X	X				X	X				X	X	X
C1-B	Low Temp Life Test Note #7	0/22											X	X	X
C2	High Temp Storage (Optional)	0/77						X					X	X	X
C3	ESD (HBM)	0/3											X	X	X
D1	* Phy. Dimension	0/15	X	X	X						X	X		X	X
D2	* Lead Integrity	0/3	X	X	X	X					X			X	X
D3	Thermal Shock + Temp Cycle + Moisture resistance	0/32	X	X	X	X	X	X	X	X	X	X	X	X	X
D4	Mech. Shock + Vibration + Constant Acceleration	0/32	X	X	X	X	X		X	X		X	X	X	X
D5	* Salt Atmosphere	0/15	X	X	X	X					X			X	X
D6	* Internal Vapor Content Note #7	0/3	X	X	X		X	X		X		X		X	X
D7	* Adhesion of L/Finish (Optional)	0/2	X	X	X	X					X			X	X
D8	* Lid Torque	0/5	X	X	X					X		X		X	X
D9	Temp Cycle	0/45	X	X	X		X	X	X	X		X	X	X	X
E1	Electrical test & datalog	0/30											X	X	X
E2	Electrical Characterization	0/30											X	X	X
E3	T.D.D.B Note #7	-											X	X	X
E4	Latch-Up	0/9											X	X	X
E5	Electromigration Note #7	-											X	X	X
E6	Photosensitivity (Optional)	0/11											X	X	X
E7	Data Retention Bake	0/22											X	X	X
E8	Input/Output Capacitance	0/5											X	X	X
Qty required per lot			E. Good	190	205	129	69	114	235	190	124	32	124	399	414
			E. Rej.	81	81	75	50	8	5	2	33	41	48	7	81
			Total	271	286	204	119	122	240	192	157	73	172	406	495

- Note:
- 1) Refer to Table #2 for test method and stress conditions.
  - 2) For any Qual which does not meet the standard requirements, approval from Product Engineering and Product QA is required.
  - 3) Package Family - A set of package type with the same package, material, Package construction techniques, terminal pitch, lead shape, row spacing and with identical package assembly techniques.
  - 4) Package Type - A package with a unique case outline, configuration, material, piece parts and assembly processes.
  - 5) Applicable to new piece parts or leadframe where the cavity size is larger than the largest cavity size for the same package.
  - 6) For new mask from the same device family, only high temp life test is required.
  - 7) In-process Monitor data may be used to satisfy this requirement, for Qual data, data from Assy. lot traveler maybe used.
- (\*) - Electrical rejects can be used as test samples



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TEST SEQ	TEST DESCRIPTION	TEST METHOD (Ref. Spec)		TEST OR STRESS CONDITIONS			PRODUCT MONITOR FREQUENCY	NOTES
		Mil-Std-883/ JEDEC/STACK	XILINX SPEC		For QUAL	Product Monitor		#1
B	PACKAGE / PROCESS							
B1	Solder Heat Test (Optional)	JEDEC Mtd A112	D1005	Immersion in solder @ 260 °C for 12 sec End-point electrical parameter @ 25 °C	0/15	-	For Qualification only	
B2	Resist. to Solvents		B1026		0/3	0/3	In-line Process Monitor	
		STACK 0001 Test 5	B1023		0/76	0/76	In-line Process Monitor	#2 #11
B4	Die Shear / Stud Pull	Mil-Std-883 Mtd 2019	N/A	Die Shear strength > 5.0 kg	0/5	0/3	In-line Process Monitor	#11
B5	BondPull	Mil-Std-883 Mtd 2011	N/A	Bondpull strength > 2 gm	0/8 (2 units)	0/8 (2 units)	In-line Process Monitor	#6 #11
B6	External Visual	Mil-Std-883 Mtd 2009	N/A	Package defects, Lead defects	0/25	0/25	In-line Process Monitor	#11
B7	Internal Visual		N/A		0/5	0/5	In-line Process Monitor	#11
C								
C1-A	High Temp Life Test	Mil-Std-883 Mtd 1005	RTP0003	125 ° C / 168, 500 and 1000 hrs or equivalent End-point electrical test @ 25 °C, verify device parameter drift (<10%)	+0/76	0/45		#3, #4 #5, #8
C1-B	Low Temp Life Test	Mil-Std-883 Mtd 1005	N/A	< -10 °C / 1000 hrs End-point electrical test @ 25 °C, verify device parameter drift (<10%)	0/22	-	In-line Process Monitor	#11
C2	High Temp Storage (Optional)	Mil-Std-883 Mtd 1008	N/A	150 °C / 500, 1000 hrs End-point electrical test @ 25 °C	0/76	-	For Qualification only	
C3	ESD (HBM)	Mil-Std-883 Mtd 3015	TSP0001	3 +ve and 3 -ve pulses, all pins tested, 1000 volts min.	0/3	-	For Qualification only	
D	PACKAGE DESIGN							
D1	Phy. Dimension	Mil-Std-883 Mtd 2016	B1027	Per applicable pkg outline drawing	0/5	0/5	1x / 6 months	#2, #8
D2	Lead Integrity  Seal (Fine/Gross)	Mil-Std-883 Mtd 2004 Mil-Std-883 Mtd 2028 Mil-Std-883 Mtd 1014	B1063/62 B1064 B1024	Cond. B2 (Use Cond. B1 for leaded chip carrier pkgs,  Cond. A, Tracer gas (he) fine leak & Cond. C, Perfluorocarbon gross leak	0/45 (3 units)	0/45 (3 units)	1x / 6 months	#2, #6, #7, #8
D3	Thermal Shock + Temp Cycle + Moisture Resistance Seal (Fine/Gross)  Visual Examination	Mil-Std-883 Mtd 1011 Mil-Std-883 Mtd 1010 Mil-Std-883 Mtd 1004 Mil-Std-883 Mtd 1014  Mil-Std-883 Mtd 1011 & Mtd 1004	B1001 B1002 B1049 B1005 B1006 B1007	Cond C, -65/150 °C (Liquid to Liquid), 15 cycles Cond C, -65/150 °C (Air to Air), 100 cycles 90% RH/ -10/25/65 °C, 10 cycles Cond. A, Tracer gas (he) fine leak & Cond. C, Perfluorocarbon gross leak Per visual criteria in Method 1011 and Method 1004 End-point electrical test @ 25 °C	0/32	0/32	1 x / 6 months	#2, #8, #9
D4	Mechanical Shock + Variable Freq. Vibration + Constant Acceleration  Seal (Fine/Gross)  Visual Examination	Mil-Std-883 Mtd 2002 Mil-Std-883 Mtd 2007 Mil-Std-883 Mtd 2001  Mil-Std-883 Mtd 1014  Mil-Std-883 Mtd 1011 & Mtd 1004	B1083 B1076 B1008  B1005 B1006 B1007	Cond. B, 1500 G Peak, 0.5 msec pulse duration Cond. A, at peak acceleration of 20 g Cond. E - For Pkg < 5 gms or inner sealed cavity < 2 inches Cond. D - For Pkg >= 5 gms or inner sealed cavity >= 2 inches Cond. A, Tracer gas (he) fine leak & Cond. C, Perfluorocarbon gross leak Per visual criteria in Method 1011 and Method 1004 End-point electrical test @ 25 °C	0/32	0/32	1 x / 6 months	#2, #8

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TABLE 2B (Page 2 of 2)

TEST SEQ	TEST DESCRIPTION	TEST METHOD (Ref. Spec)		TEST OR STRESS CONDITIONS	Quality Level (ACC#/S.S)		PRODUCT MONITOR FREQUENCY	NOTES #1
		Mil-Std-883/ JEDEC/STACK	XILINX SPEC		For QUAL	PRODUCT MONITOR		
D5	Salt Atmosphere Visual Examination Seal (Fine/Gross)	Mil-Std-883 Mtd 1009 Mil-Std-883 Mtd 1009 Mil-Std-883 Mtd 1014	B1050 B1027 B1005 B1006	Cond A, soak time = 24 hrs. Per visual criteria in method 1009 Cond. A, Tracer gas (he) fine leak & Cond. C, Perfluorocarbon gross leak	0/15	-	For Qualification only	
D6	Internal Vapor Content	Mil-Std-883 Mtd 1018	B1010	5000 ppm max. at 100 °C.	0/3	0/3	1x / 6 months	#2, #8, #11
D7	Adhesion of L/Finish (Optional)	Mil-Std-883 Mtd 2025	B1018	Bend coated lead at an angle of 90° until fracture occurs. No flaking, peeling or detachment of coating at the interface.	0/15 (2 units)	-	For Qualification only	
D8	Lid Torque	Mil-Std-883 Mtd 2024	B1048	Applicable to Glass Frit Sealed Package only The Torque value must meet the minimum limits as specified in Table #1 of the Mil-Std-883 Method 2024.2	0/5	0/5	1x / 6 months	#2, #8
D9	Temp Cycle Seal (Fine/Gross)	Mil-Std-883 Mtd 1010 Mil-Std-883 Mtd 1014	B1002 B1005 B1006	Cond. C -65/150 °C, 500 cycles Cond. A, Tracer gas (he) fine leak & Cond. C, Perfluorocarbon gross leak End-point electrical test @ 25 °C	0/76	0/76	1 x / 6 months	#2, #5,
<b>E</b>	<b>ELECTRICAL ENDURANCE/EVALUATION &amp; PROCESS VALIDATION DATA</b>							
E1	Electrical Test & Datalog	STACK 0001, Test 1c		@ 25°C, Top min & Top max.	0/30	-	New Prod. Characterization	
E2	Electrical Characterization	STACK 0001, Test 1d		Schmoo plot & Temperature trends for critical parameters.	0/30	-	New Prod. Characterization	
E3	T.D.D.B	STACK 0001, Test 38		Characterization of oxide integrity	-	-	in-line process monitor	#10, #11
E4	Latch-Up	JEDEC-STD-17	TSP0006	a) Immunity to PSOV of 20% over absolute Maximum voltage b) Immunity to 100mA current injection into I/O pins	0/9	-	New Prod. Characterization	
E5	Electromigration	STACK 0001, Test 39		Characterization of Metallisation system > 100,000 hours for 0.1% cumulative failures > 100,000 hours for 50% cumulative failures	-	-	In-line process monitor	#11
E6	Photosensitivity (Optional)	STACK 0001, Test 37		Apply 25W neon bulb, distance = 50 cm during electrical test	0/11		New Prod. Characterization	
E7	Data Retention Bake	Mil-Std-883 Mtd 1033		Write device with suitable pattern, bake @ 150 °C for 1000 hrs Read and confirm data pattern End-point electrical test @ 25 °C	0/22	-	New Prod. Characterization	#12
E8	Input/Output Capacitance	Mil-Std-883 Mtd 3012	TSP0002	Biased @ nominal operating voltage.	0/5	-	New Prod. Characterization	

- NOTES:
- 1) For any Qual or Product Monitor where sample size does not meet the Standard Quality level, approval from Product Assembly Engineering and Product QA is required.
  - 2) The Product Monitor Frequency applies to each package family with assembly locations and package type rotated every 6 months, (when applicable). If only one package type exists within a package family, the product monitor frequency will be 1x / 12 months, minimum.
  - 3) The Product Monitor Frequency applies to each Micro Circuit Family. Plastic monitor data may be used to satisfy this requirement.
  - 4) End-point electrical test shall be performed within 48 hrs window.
  - 5) Interim read point is optional.
  - 6) The sample size is for numbers of bonds or numbers of leads.
  - 7) for LCC packages, use LTPD 15, 15 (0,1)
  - 8) Military QCI monitor data may be used to satisfy this requirement.
  - 9) End-point electrical test @ 25 °C shall be performed within 48 hrs after moisture resistance test.
  - 10) T.D.D.B - Time Dependent Dielectric Breakdown
  - 11) In process monitor data maybe used to satisfy the Qual requirement, refer to Assy. Qual lot traveler or Fab monitor data.
  - 12) Not applicable to F.P.G.A.'s, H.T.O.L. test data @150 +0/-5 degrees C maybe used to satisfy this requirement.

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