

**RELIABILITY MONITOR REPORT  
FOR**

**QFN Package**

**Dallas Semiconductor**

**4401 South Beltwood Parkway  
Dallas, TX 75244-3292**

**This Report was prepared by  
Dallas Semiconductor Reliability Engineering**

**Summary:**

The data in the tables that follow was generated as the result of an on-going Package Reliability Monitor. The assemblies covered by this package monitor are:

ASSY SITE	PINS	PACKAGE		
ATK (Amkor, K)	68	QFN	ATK (Amkor, K)	68 QFN (Pb-Free)
CIRTEK	2	SFN (Pb-Free)	Unisem	10 TDFN (Pb-Free)
Unisem	8	TDFN (Pb-Free)	UTL (NSEB) UTAC	2 SFN (Pb-Free)
UTL (NSEB) UTAC	10	TDFN	UTL (NSEB) UTAC	6 TDFN
UTL (NSEB) UTAC	10	TDFN (Pb-Free)	UTL (NSEB) UTAC	14 TDFN (Pb-Free)
UTL (NSEB) UTAC	28	TDFN (Pb-Free)	UTL (NSEB) UTAC	6 TDFN (Pb-Free)
UTL (NSEB) UTAC	8	TDFN (Pb-Free)	UTL (NSEB) UTAC	12 TQFN
UTL (NSEB) UTAC	28	TQFN	UTL (NSEB) UTAC	48 TQFN
UTL (NSEB) UTAC	56	TQFN	UTL (NSEB) UTAC	12 TQFN (Pb-Free)
UTL (NSEB) UTAC	16	TQFN (Pb-Free)	UTL (NSEB) UTAC	28 TQFN (Pb-Free)
UTL (NSEB) UTAC	32	TQFN (Pb-Free)	UTL (NSEB) UTAC	36 TQFN (Pb-Free)
UTL (NSEB) UTAC	38	TQFN (Pb-Free)	UTL (NSEB) UTAC	48 TQFN (Pb-Free)
UTL (NSEB) UTAC	56	TQFN (Pb-Free)	UTL (NSEB) UTAC	48 TQFN (Pb-Free) Au Metal
UTL (NSEB) UTAC	28	TQFN Exposed Pad (Pb-Free)	UTL (NSEB) UTAC	48 TQFN Exposed Pad (Pb-Free)
UTL (NSEB) UTAC	68	TQFN Exposed Pad (Pb-Free)		

The calculated failure rate for this assembly is:

**FAILURE RATE: MTTF (YRS): 20638 FITS: 5.5**

The parameters used to calculate this failure rate are as follows:

**Cf: 60% Ea: 0.7 Tu: 25 °C**

The reliability data follows. At the start of this data is a description of the assembly vehicle used to generate this reliability data. The next section is the detailed reliability data for each stress. The reliability data section includes the latest data available. This report covers data between 7/1/2006 and 6/30/2007.

**Assembly Information:**

Package Type: TDFN 3x3x0.8  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 1  
 Date Code Range: 0603 to 0623

**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0603	DS4404	125C, 5.5 VOLTS	192 HRS	45	0	
HIGH TEMP OP LIFE	0617	DS4420	125C, 5.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0623	DS4404	125C, 5.5 VOLTS	1000 HRS	45	0	
<b>Total:</b>						<b>0</b>	

**Assembly Information:**

Package Type: TDFN 4x8x0.8  
 Flammability: UL 94-V0  
 Moisture Sensitivity (JEDEC J-STD20A) Level 3  
 Date Code Range: 0648 to 0648

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**MOISTURE SENSITIVITY LEVEL 3**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
ULTRASOUND	0648	DS2790	J-STD-020		8	0	
STORAGE LIFE			125C	24 HRS	8		
MOISTURE SOAK			30C/60% R.H.	192 HRS	8		
CONVECTION REFLOW			260C +/-5C	3 PASS	8	0	
EXTERNAL VISUAL			J-STD-020, 6.1a		8	0	
PRECONDITION U/S			J-STD-020		8	0	
					<b>Total:</b>	<b>0</b>	

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**PACKAGE TESTS**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
SOLDERABILITY (Sn/Pb)	0648	DS2790	JESD22-B102, COND C		3	0	
SOLDERABILITY (Pb-Free)			JESD22-B102, COND C		3	0	
X-RAY	0648	DS2790	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS			JESD22-B100		6	0	
MARK PERMANENCY			JESD22-B107		6	0	
EXTERNAL VISUAL			JESD22-B101		6	0	
X-RAY FLUORESCENCE			25 C		6	0	
					<b>Total:</b>	<b>0</b>	

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**PRECONDITIONING LEVEL 3**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0648	DS2790	125C	24 HRS	231		
MOISTURE SOAK			30C/60% R.H.	192 HRS	231		
CONVECTION REFLOW			260C +/-5C	3 PASS	231	0	
					<b>Total:</b>	<b>0</b>	

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**STORAGE LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
STORAGE LIFE	0648	DS2790	150C	1000 HRS	77	0	
					<b>Total:</b>	<b>0</b>	

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**TEMPERATURE CYCLE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
TEMP CYCLE	0648	DS2790	-55C TO 125C	1000 CYS	77	0	
					<b>Total:</b>	<b>0</b>	

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**UNBIASED MOISTURE RESISTANCE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
AUTOCLAVE	0648	DS2790	121C, 2 ATM STEAM, UNBIASED	168 HRS	76	0	
					<b>Total:</b>	<b>0</b>	

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**Assembly Information:**

Package Type: TQFN (Pb-Free) 4x4x0.8  
Flammability: UL 94-V0  
Moisture Sensitivity (JEDEC J-STD20A) Level 1  
Date Code Range: 0620 to 0620

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**OPERATING LIFE**

DESCRIPTION	DATE CODE	TEST VEHICLE	CONDITION	READPOINT	QUANTITY	FAILS	FA NO
HIGH TEMP OP LIFE	0620	DS28CZ04	125C, 5.25 VOLTS	1000 HRS	77	0	
				<b>Total:</b>		<b>0</b>	

**FAILURE RATE: MTTF (YRS): 20638 FITS: 5.5**