Summary of Test Results

Test	Results
Biased Life	
PTH08T240WAH	Pass – Approx. 41,760 devices hours @ 100.3ºC case temperature
Biased Humidity	
PTH08T240WAH	Pass – Approx. 12,480 device hours @ 85ºC/85% R.H.
Thermal Shock	
PTH08T240WAH	Pass – 200 Cycles, -40ºC to +125ºC
Vibration	
PTH08T240WAH	Pass - 15g
PTH08T240WAS	Pass - 15g
Mechanical Shock	
PTH08T240WAH	Pass - 500g
PTH08T240WAS	Pass - 250g
Radiated Emissions	
PTH08T240WAH	Pass - Class B EN55022 Regulations
Conducted Emissions	
PTH08T240WAH	Data Provided

Environmental Qualification Process Flow

Texas Instruments Product Environmental Qualification Process

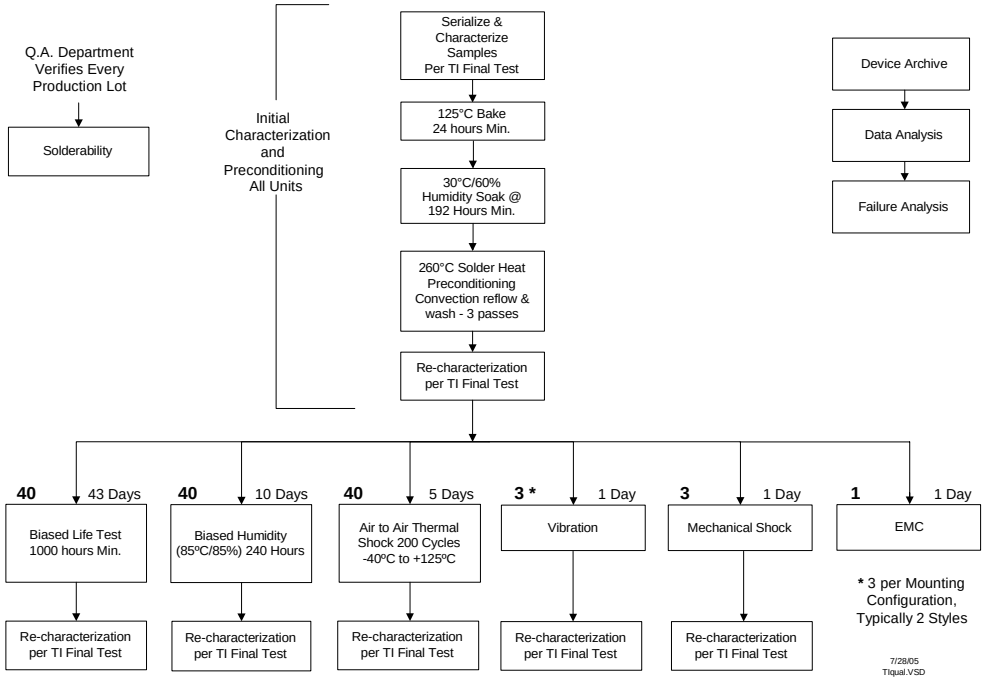


Diagram 1

The process flow for environmental qualification testing is shown in Diagram 1. Product characterization testing was performed at Texas Instruments using final test systems. Reflow pre-conditioning was performed at Texas Instruments using a production reflow oven. Environmental life and humidity testing was performed at Texas Instruments. EMC testing was performed at Underwriters Laboratories. The remaining environmental and mechanical testing was performed at Trace Laboratories or Elite Electronic Engineering Inc.

Environmental Qualification Requirements Summary

Preconditioning

All environmental qualification samples are preconditioned to simulate a customer manufacturing process. Samples shall be subjected to a convection reflow/aqueous wash process. The oven will be set to Texas Instruments Inc. (TI) recommended customer reflow profile. This process is to be repeated three times with sufficient time between cycles to allow parts to cool to room temperature.

High Temperature Biased Life

Samples shall be operated steady state at room ambient temperature with convection airflow. Test duration will be a minimum of 1,000 hours. Output voltage measurements will be taken each weekday. Samples are to be electrically characterized before and after the test.

High Temperature High Humidity Bias

Samples shall be placed in a chamber and operated steady state while being subjected to a non-condensing relative humidity of 85% and a temperature of 85° C for a minimum of 240 hours. Output voltage measurements will be taken every weekday. Samples are to be electrically characterized before and after the test.

Temperature Cycling (air to air)

Samples shall be subjected to 200 temperature cycles from -40C to +125C, dwelling 15-minutes at each temperature extreme. Samples are to be electrically characterized and visually inspected before and after 200 cycles.

Vibration

Samples shall be subjected to a sinusoidal excitation, swept logarithmically from 20Hz to 2000Hz and returned to 20Hz. This entire frequency range will be traversed 4 times in 4-minute intervals for a total of 16 minutes in each of three mutually perpendicular axes, so that the motion is applied for a total of 48 minutes. Samples are to be visually inspected after each axis to verify no degradation. Samples are to be electrically tested after each G level vibrated to verify no degradation.

Mechanical Shock

Samples shall be subjected to a half-sine, 1ms mechanical shock pulse. The shock pulse will be applied 5 times in each direction (+/-) in all three mutually orthogonal axes for a total of 30 shock pulses. Samples are to be electrically characterized before and after the test.

Radiated Emissions

Samples shall be operated while delivering rated full-load output current. Measurements of the radiated emissions in the frequency range of 30 MHz to 1000 MHz will be taken in both a horizontal and vertical polarization.

Conducted Emissions

Samples shall be operated while delivering rated full-load output current. Measurements of the conducted power in the frequency range of 30 MHz to 300 MHz will be taken using the absorbing clamp on the mains and interface cables. Data is provided as an engineering aid only, as the device is not directly AC Mains Power equipment.

Vibration

Part # Tested	Package Style	Quantity Tested	Test Initiated
PTH08T240WAH/S	EBS, EBT	9	12/15/2005
Lot Codes	**Test Standard Reference**		**Test Completed**
0540E604, 0540E605	MIL-STD-883D, METHOD 2007.2		12/21/2005
Reviewed By	**Test Subject Serial #'s**		**Documentation By**
J Pudlo	See attached		J Killion

Purpose

A vibration test was performed as part of a qualification for a new design. This section summarizes the procedures, requirements, and results of vibration testing.

Requirements

Samples shall be subjected to a sinusoidal excitation, swept logarithmically from 20Hz to 2000Hz and returned to 20Hz. This entire frequency range will be traversed 4 times in 4-minute intervals for a total of 16 minutes in each of three mutually perpendicular axes, so that the motion is applied for a total of 48 minutes. Samples are to be electrically tested and visually inspected after each axis to verify no degradation.

Procedure

9 units built according to Texas Instruments standard production procedures were serialized and tested to verify proper operation. The samples were mounted to 4"X 4" FR4 PCB's by manually dispensing eutectic Sn/Pb 63/37 solder paste and running them through a convection reflow oven. Some solder joints were touched up with a soldering iron due to inadequate solder applied by the manual dispense process. The test boards were then mounted to an aluminum fixture that was rigidly mounted to a vibration machine. A control/measurement accelerometer was placed near the point of sample attachment. Acceleration began at 10g and increased up by 5g to a maximum of 20g to determine the highest passing level. Photographs depicting the mounting fixture and axis orientation have been included along with the characterization data taken after vibration was completed

Results

PTH08T240WAH passed 15g showing no signs of physical or electrical degradation.

PTH08T240WAS passed 15g showing no signs of physical or electrical degradation.

Vibration

Test Set Up

No Pictures Available

Vibration

Test Data

Part # PTH08T240WAH
V_{in} 12.0 V
V_{out} 3.3 V
I_{out} 10 A

Date 12/21/2005
Operator JK
Date Code 0540E604

Accel. Level (g)	Serial #	Measured V_{out} Initial	Measured V_{out} Post	Axis Sequence	Comments
10	187	3.30	3.30	Z,X,Y	
	188	3.29	3.29	X,Y,Z	
	189	3.29	3.29	Y,Z,X	
15	190	3.29	3.28	Z,X,Y	
	191	3.29	3.29	X,Y,Z	
	192	3.30	3.29	Y,Z,X	

Part # PTH08T240WAS
V_{in} 12.0 V
V_{out} 3.3 V
I_{out} 10 A

Date 12/21/2005
Operator JK
Date Code 0540E605

Accel. Level (g)	Serial #	Measured V_{out} Initial	Measured V_{out} Post	Axis Sequence	Comments
10	15	3.30	3.30	Z,X,Y	
	16	3.29	3.29	X,Y,Z	
	18	3.28	3.28	Y,Z,X	
15	19	3.29	3.29	Z,X,Y	
	20	3.29	3.29	X,Y,Z	
	21	3.28	3.28	Y,Z,X	

Mechanical Shock

Part # Tested	Package Style	Quantity Tested	Test Initiated
PTH08T240WAH/S	EBS, EBT	3	12/15/2005
Lot Code	**Test Standard Reference**		**Test Completed**
0540E604, 0540E605	MIL-STD-883D, METHOD 2002.3		12/21/2005
Reviewed By	**Test Subject Serial #'s**		**Documentation By**
J Pudlo	See attached		J Killion

Purpose

A mechanical shock test was performed as part of a qualification for a new design. This section summarizes the procedures, requirements, and results of mechanical shock testing.

Requirements

Samples shall be subjected to a half-sine, 1ms mechanical shock pulse. The shock pulse will be applied 5 times in each direction (+/-) in all three mutually orthogonal axes for a total of 30 shock pulses. Samples are to be electrically characterized before and after the test.

Procedure

3 units built according to Texas Instruments standard production procedures were serialized and tested to verify proper operation. Samples were mounted to an aluminum fixture that was rigidly mounted to a shock machine. A control/measurement accelerometer was placed near the point of sample attachment. Characterization data was taken before and after the test was completed.

Results

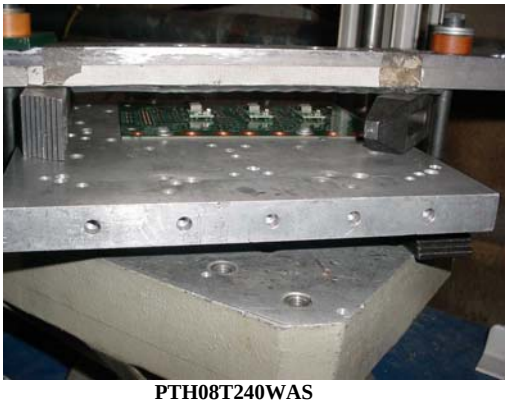
Upon conclusion of the test the units showed no signs of degradation. See test results on the following pages.

Mechanical Shock

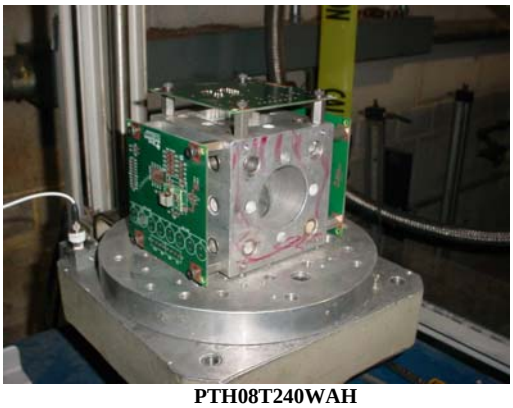
Test Set Up

PTH08T240WAS

PTH08T240WAS



PTH08T240WAS



PTH08T240WAH