

# i6A Series

## RELIABILITY DATA

### 信頼性データ

\* 試験結果は、代表データではありますが、全ての製品はほぼ同等な特性を示します。

従いまして、以下の結果は参考値とお考え願います。

Test results are typical data. Nevertheless the following results are considered to be reference data because all units have nearly the same characteristics.

**TDK-Lambda****Qualification Report Summary for: i6A24014A033V-002-R**

i6A24014A033V-001-R and i6A24014A033V-002-R difference points are below.

- i6A24014A033V-001-R: Remote on/off is Negative Logic.
- i6A24014A033V-002-R: Remote on/off is Positive Logic. And it has function of Power Good, SYNC and SEQ.

Since i6A24014A033V-002-R is multifunctional, i6A24014A033V-001-R uses the test data of i6A24014A033V-002-R.

Sample universe: Units manufactured at TDK-Lambda - Malaysia in Week 10 - 2015, Lot number: 553M49

	Samples	Failures	Notes
<b>Visual Inspection</b>			
Inspect for quality and workmanship.	116	0	
<b>Dimension check</b>			
Inspect physical dimensions against mechanical requirements.	116	0	
<b>Initial characterization</b>			
Measurements of all applicable tests of manufacturing test requirements.	116	0	
<b>HALT Low Temperature Limits Test - IPC9592A D.1.1.1</b>			
Decrease temperature until UUT is out of regulation.	3	na	1)
<b>HALT High Temperature Limits Test - IPC9592A D.1.1.2</b>			
Increase temperature until UUT is out of regulation.	3	na	1)
<b>HALT Input Voltage Test - IPC9592A D.1.1.5</b>			
Increase input voltage until UUT is out of regulation. This test is performed at both low temperature -50°C (found in D.1.1.1) and high temperature 100°C (found in D.1.1.2).	3	na	1)
<b>HALT Output Load Test - IPC9592A D.1.1.6</b>			
Increase output load until UUT is out of regulation at high temperature 100 °C (found in D.1.1.2).	3	na	1)
<b>HALT Combined Stress Test - IPC9592A D.1.1.7</b>			
Operate the device while combining the environmental effects of random vibration and rapid thermal cycling along with input voltage and output load transients.	3	na	1) 2)
<b>Temperature Humidity Bias (THB) - IPC9592A 5.2.4.1</b>			
Samples are preconditioned for 168 hours at 85°C/85%RH and two reflows. Samples are exposed to 85% relative humidity at a temperature of 85°C. Input voltage is at high line (40V) and minimum output load. Output voltage is measured every minute.			
1000 hours	30	0	
<b>Life Test - High Temperature Operating Bias (HTOB) - IPC9592A 5.2.5</b>			
Samples are preconditioned for 168 hours at 85°C/85%RH and two reflows. UUT's are loaded at 95% of full load. Ambient temperature is set stabilize the "hot spot" Tref point at approximately 95°C±5°C.			
1000 hours	30	0	
<b>Notes</b>	<b>CAR</b>		
1) HALT tests do not have a pass fail limit. They are a marginally test. 2) One module failed at 25Grms which is well above the required limit.			

**Passed: Michael Hay - Representative of Qualification and Test - June 22, 2015**

1. Full functional pre and post test in lieu of operating test
2. Tested per ISTA2A standard
3. Test dwell time customized to package

**TDK-Lambda**

**Qualification Report Summary for: i6A24014A033V-002-R**

i6A24014A033V-001-R and i6A24014A033V-002-R difference points are below.

- i6A24014A033V-001-R: Remote on/off is Negative Logic.
- i6A24014A033V-002-R: Remote on/off is Positive Logic. And it has function of Power Good, SYNC and SEQ.

Since i6A24014A033V-002-R is multifunctional, i6A24014A033V-001-R uses the test data of i6A24014A033V-002-R.

Sample universe: Units manufactured at TDK-Lambda - Malaysia in Week 10 - 2015, Lot number: 553M49

	Samples	Failures	Notes
<b>Temperature Cycling Test (TCT) - IPC9592A 5.2.6<sup>3</sup></b>			
Samples are preconditioned for 168 hours at 85°C/85%RH and two reflows. Samples exposed in an air-to-air thermal shock chamber between temperatures of: -40 to 125°C at a ramp rate of approximately 60°C per minute. Dwell time at each extreme is 15 minutes. After approximately every 100 cycles, all parts are visually check and tested with the full complement of tests including, but not limited to efficiency, Ripple, Line regulation, and Load regulation.			
1000 thermal cycles	30	0	3)
<b>Power and Temperature Cycle (PTC) - IPC9592A 5.2.7</b>			
Samples are preconditioned for 168 hours at 85°C/85%RH and two reflows. Samples exposed to a combined power thermal cycling at 14 amps output load. The reference temperature range is approximately -40°C to 105°C. The dwell time at each temperature is approximately 18 minutes. The thermal ramp rate is approximately 15°C to 25°C per minute. Each line cycle is low line (9V), nominal line (24V), high line (40V) 60 seconds each and line off 60 seconds.			
1000 thermal cycles	3	0	
<b>Random Vibration Operating<sup>1</sup></b>			
Unpowered, sweep 1: 5 to 50 Hz at 0.5g, sweep 2: 50 to 500 Hz at 1.5g, three axis.	3	0	4)
<b>Shock Operating<sup>1</sup></b>			
Unpowered, 50G half sine 6ms, three axis.	3	0	4)
<b>Drop Test - IPC9592A 5.2.13<sup>2</sup></b>			
Shipping container test (carton = 350 pieces).	1 carton	0	
<b>Notes</b>		<b>CAR</b>	
3) Only 700 thermal cycles are requirement for IPC9592A TCT. 4) i6A24014A033V-001 were used due to less pins. Less pin makes the test tougher to pass.			

**Passed: Michael Hay - Representative of Qualification and Test - June 22, 2015**

1. Full functional pre and post test in lieu of operating test
2. Tested per ISTA2A standard
3. Test dwell time customized to package