



Test Report: UHP-200-55

200W Slim Type with PFC Switching Power Supply

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

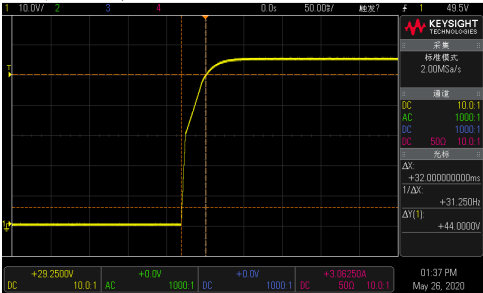
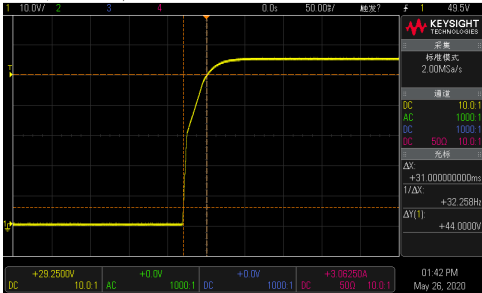
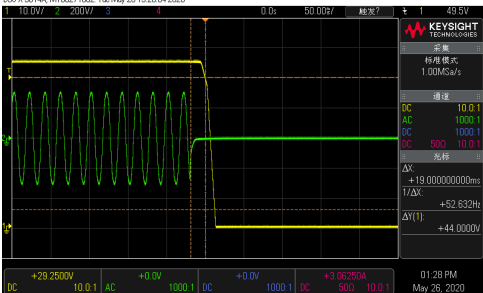
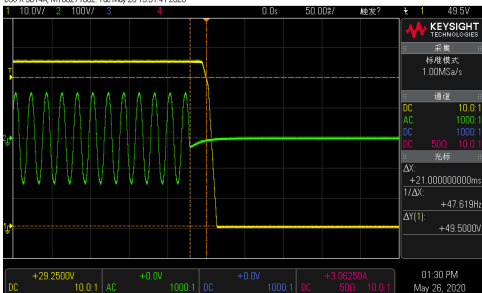

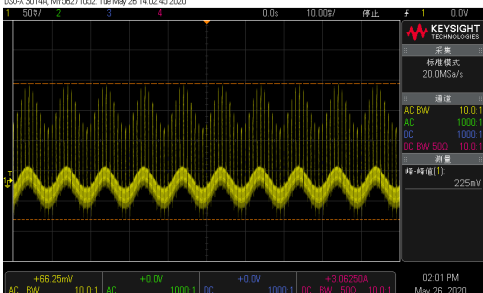
■ RELIABILITY TEST

Environment Test

■ DESIGN VERIFY TEST

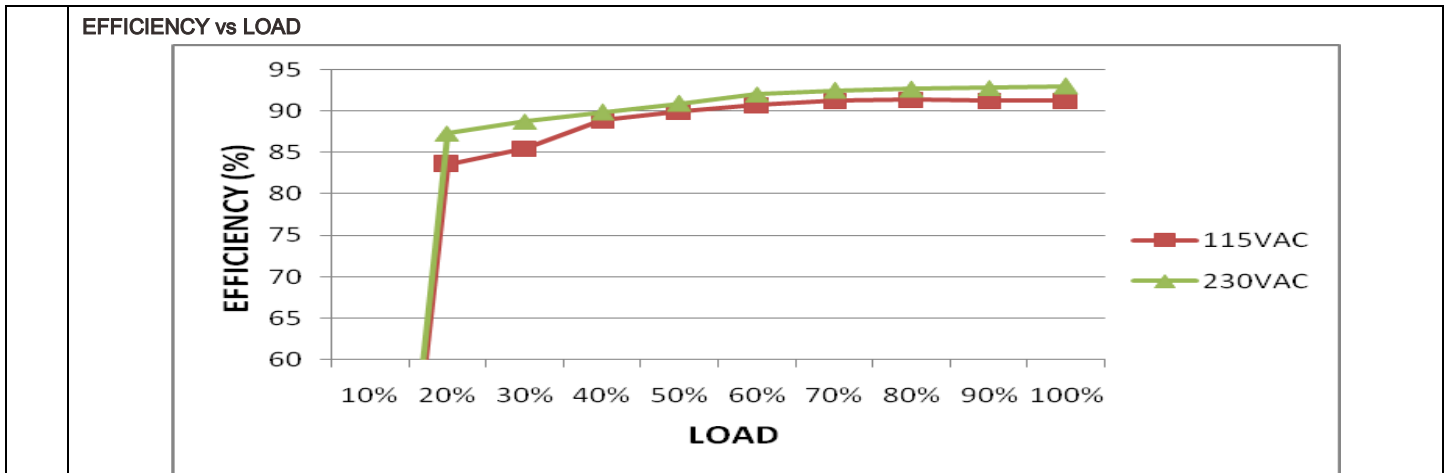
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	40V~58V	I/P: 230VAC/115VAC O/P: NO LOAD Ta: 25°C	37.40V~ 58.39V/230VAC 37.35V~ 58.39 V/115VAC
2	OUTPUT VOLTAGE TOLERANCE	-1%~1%	I/P: 90VAC /264VAC O/P: FULL/ NO LOAD Ta: 25°C	-0.12 % ~0 %
3	LINE REGULATION	-0.3%~0.3%	I/P: 100VAC ~ 264VAC O/P: FULL LOAD Ta: 25°C	0% ~ 0.004%
4	LOAD REGULATION	-0.5%~0.5%	I/P: 230VAC O/P: FULL ~NO LOAD Ta: 25°C	-0.015%~ 0.11%
5	OVER/UNDERSHOOT TEST	<± 5 %	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	0.4%
6	RIPPLE & NOISE (Max)	360mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	76mVp-p /CCH 100%load
<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>high frequency :</p> </div> <div style="width: 45%;"> <p>low frequency :</p> </div> </div>				
7	SET UP TIME(Max)	230VAC/ 550ms 115VAC/ 3000ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 432ms 115VAC/ 537ms
<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> </div> <div style="width: 45%;"> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH2: AC Input Voltage</p> </div> </div>				
8	RISE TIME (Max)	230VAC/ 80ms 115VAC/ 80ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/32ms 115VAC/31ms

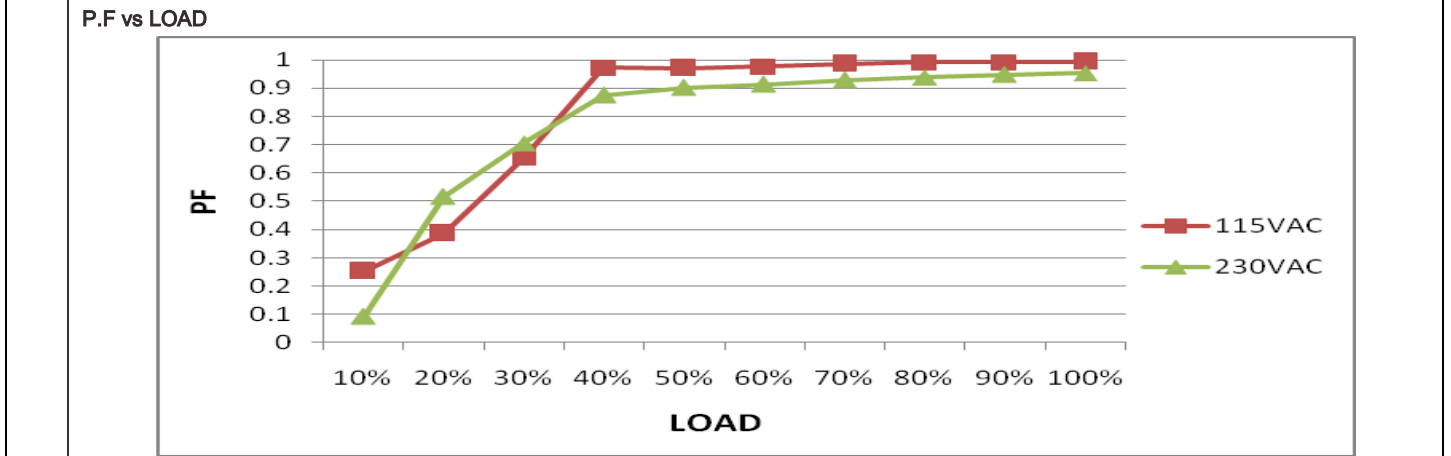
	<p>INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage</p> 	<p>INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage</p> 	
<p>9 HOLD UP TIME(Typ)</p>	<p>230VAC/ 10ms 115VAC/ 10ms</p>	<p>I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C</p>	<p>230VAC/19ms 115VAC/21ms</p>
	<p>INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage</p> 	<p>INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage</p> 	
<p>10 DYNAMIC LOAD</p>	<p>5500mVp-p</p>	<p>I/P: 230VAC O/P: (1)FULL/50% LOAD 50%DUTY / 120HZ (2)FULL/50% LOAD 50%DUTY / 1KHZ Ta: 25°C</p>	<p>(1) 257mVp-p (2) 225mVp-p</p>
	<p>FULL /50% LOAD 50%DUTY / 120HZ</p> 	<p>FULL /50% LOAD 50%DUTY / 1KHZ</p> 	

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	87 V~ 300 V
			I/P: LOW-LINE-3V=87 V HIGH-LINE+15%=300 V O/P: FULL/NO LOAD ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 90 VAC ~264 VAC O/P: FULL~NO LOAD Ta: 25°C	TEST: OK
3	Withstand 300VAC Surge Test	300VAC input for 5 seconds No damage	I/P: 300VAC O/P: FULL LOAD Ta: 25°C	TEST: OK
4	AC CURRENT	2.2A/115VAC 1.1A/230VAC	I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 0.95A/ 115VAC I = 1.88A/ 230VAC
5	LEAKAGE CURRENT	< 0.75mA / 240VAC	I/P: 240 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.135mA N-FG: 0.145mA
6	NO LOAD CONSUMPTION	---	I/P: 115VAC I/P: 230VAC O/P: NO LOAD Ta: 25°C	1.37 W/115VAC 1.46 W/230VAC
7	INRUSH CURRENT(Typ)	230V/ 80A 115V/ 40A Twidth = us measured at 50% Ipeak COLD START	I/P: 230 VAC/115VAC O/P: FULL LOAD Ta: 25°C	I = 80 A/ 230VAC I = 38.8 A/ 115VAC
<p>INPUT=230VAC/50HZ @ FULL LOAD CH2: Input current CH1: AC Input Voltage</p> <p>Tek 预览 触发? Ch1 最大 80.0 A 27 5月 2020 14:54:13</p>		<p>INPUT=115VAC/60HZ @ FULL LOAD CH2: Input current CH1: AC Input Voltage</p> <p>Tek 运行 触发? Ch1 最大 38.8 A 27 5月 2020 15:10:41</p>		
8	EFFICIENCY(Typ)	94%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	94.35%



9	POWER FACTOR	0.98/ 115VAC 0.94/ 230VAC	I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.994/ 115VAC PF= 0.96/ 230VAC
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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER CURRENT PROTECTION	110%~140%	I/P: 110VAC I/P: 230VAC I/P: 264VAC O/P: TESTING Ta: 25°C	130.28%/ 110VAC 130.67%/ 230VAC 130.64%/ 264VAC ■ Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	60V~69V	I/P: 90VAC I/P: 230VAC I/P: 264VAC O/P: NO LOAD Ta: 25°C	64.4V/ 90VAC 64.0V/ 230VAC 63.6V/ 264VAC ■ Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 100VAC I/P: 230VAC I/P: 264VAC O/P: FULL LOAD	O.T.P. Active ■ Shut down o/p voltage or Hiccup mode, recovers automatically after temperature goes down

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT
1	REDUNDANT CONTROL	For parallel connection protection:For parallel applications,when one PSU can not work,the another one will be automatically enabled.This can preven the system crash,and provide the reliability of system	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	TEST : OK
2	DCOK CONTACT RATINGS	15VDC/10mA RESISTIVE LOAD	I/P:230VAC O/P:FULL LOAD Ta:25°C	TEST : OK

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q6 Rated 18A/500V	I/P:High-Line +3V =267V AC ON/OFF VDS: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load FULL Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. I/P:Low-Line -3V = 87V O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load FULL Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load.	VDS: (1) 466V (2) 450V (3) 462V (4) 458 V (5) 466V (6) 474V (7) 442V VDS: (1) 433V (2) 433V (3) 434V (4) 434V (5) 434V (6) 434V (7) 434V
2	Diode Peak Voltage	Q100 Rated 33A/150V	I/P:High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load FULL Load/	Q100: Q102: VDS: VDS: (1) 141V (1) 143V (2) 20.5V (2) 26.6V (3) 141V (3) 143V49 (4) 141V (4) 143V (5) 141V (5) 143V (6) 141V (6) 143V

			<p>Min. Load 50%Duty/120Hz (7)0%→400% Load. (8).NO LOAD</p>	<p>(7) 143V (8) 131V</p>	<p>(7) 151V (8) 133V</p>
3	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 26A/600V	<p>I/P:High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load FULL Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. I/P:Low-Line -3V = 87V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load FULL Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C</p>	<p>VDS: (1) 539V (2) 515V (3) 539V (4) 539V (5) 539V (6) 539V (7) 519V VDS: (1) 499V (2) 499V (3) 499V (4) 499V (5) 499V (6) 499V (7) 499V</p>	
4	Input Capacitor Voltage	C5 Rated: 100u/450V	<p>I/P:High-Line +3V =267V O/P: (1)Full Load (2) No Load (3)Full Load /No Load Change (4)Full load continue</p>	<p>(1) 450V (2) 449V (3) 426V (4) 426V</p>	
5	Control IC Voltage Test	<p>PWM IC U1Rated 0.4V ~38 V O/P IC U101Rated 8 V ~24V</p>	<p>I/P:High-Line +3V =267 V AC ON/OFF O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. (5)NO LOAD VR .LOW LINE</p>	<p>U1 (1) 31.3V (2) 20.3V (3) 21.9V (4) 26.9V (5) 22.4V</p>	<p>U101 (1) 13.4V (2) 2.26V (3) 12.4V (4) 12.4V (5) 11.5V</p>
6	VCC Diode Peak Voltage	<p>D80 Rated: 1.1A/200V D140 Rated: 1.1A/200V</p>	<p>I/P: High-Line +3V = 267VAC O/P: (1) FULL Load (2) Output Short (3) NO Load (4) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz</p>	<p>D80 (1) 110.7V (2) 102.7V (3) 118.0V (4) 128.9V</p>	<p>D140 (1) 91.9 V (2) 100.7V (3) 109.6V (4) 82.5V</p>

■ **SAFETY & E.M.C. TEST**

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-FG: 2.0 KVAC/min I/P-O/P: 3.75 KVAC/min O/P-FG: 1.25 KVAC/min	I/P-FG: 2.4 KVAC/min I/P-O/P: 4.125 KVAC/min O/P-FG: 1.5 KVAC/min Ta:25°C	I/P-FG: 1.92mA I/P-O/P: 2.16mA O/P-FG: 1.90mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-FG: 500VDC>100MΩ I/P-O/P:500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-FG: 500 VDC I/P-O/P: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-FG: >9999MΩ I/P-O/P: >8750MΩ O/P-FG: >9999MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	5 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2	I/P: 230VAC/50HZ O/P: FULL/75% LOAD Ta: 25°C	PASS
2	CONDUCTION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 HEAVY INDUSTRY AIR: 8KV Contact: 4KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA
5	E.F.T	EN61000-4-4 HEAVY INDUSTRY INPUT: 2KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA
6	SURGE	EN61000-4-5 HEAVY INDUSTRY L-N: 2KV L,N-PE: 4KV	I/P: 230VAC/50HZ O/P: FULL LOAD L-N: 2KV L,N-PE: 4KV Ta: 25°C	CRITERIA
7	Test by certified Lab & Test Report Prepare			

■ **RELIABILITY TEST**

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																
1	TEMPERATURE RISE TEST	MODEL: UHP-200-55 1. ROOM AMBIENT BURN-IN: 2HRS I/P: 230VAC O/P: FULL LOAD Ta=27.7 °C 2. HIGH AMBIENT BURN-IN: 2HRS I/P: 230VAC O/P: FULL LOAD Ta=51.8 °C																																																																																																		
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=27.7 °C</th> <th>HIGH AMBIENT Ta=51.8 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>RT1</td><td>59.2°C</td><td>78.6°C</td></tr> <tr><td>2</td><td>ZR1</td><td>43.3°C</td><td>68.6°C</td></tr> <tr><td>3</td><td>BD1</td><td>52.9°C</td><td>78.0°C</td></tr> <tr><td>4</td><td>Q1</td><td>54.9°C</td><td>80.1°C</td></tr> <tr><td>5</td><td>L1</td><td>48.3°C</td><td>74.0°C</td></tr> <tr><td>6</td><td>C5</td><td>47.9°C</td><td>73.4°C</td></tr> <tr><td>7</td><td>C81</td><td>46.3°C</td><td>71.9°C</td></tr> <tr><td>8</td><td>C13</td><td>50.4°C</td><td>75.9°C</td></tr> <tr><td>9</td><td>Q5</td><td>54.4°C</td><td>80.6°C</td></tr> <tr><td>10</td><td>Q6</td><td>50.5°C</td><td>76.4°C</td></tr> <tr><td>11</td><td>D1</td><td>53.8°C</td><td>80.2°C</td></tr> <tr><td>12</td><td>R5</td><td>51.2°C</td><td>76.9°C</td></tr> <tr><td>13</td><td>T1core</td><td>61.3°C</td><td>87.0°C</td></tr> <tr><td>14</td><td>Q102</td><td>49.8°C</td><td>76.4°C</td></tr> <tr><td>15</td><td>Q100</td><td>49.4°C</td><td>76.0°C</td></tr> <tr><td>16</td><td>U101</td><td>47.4°C</td><td>73.6°C</td></tr> <tr><td>17</td><td>Q201</td><td>47.2°C</td><td>73.6°C</td></tr> <tr><td>18</td><td>U1</td><td>48.2°C</td><td>73.7°C</td></tr> <tr><td>19</td><td>C105</td><td>46.6°C</td><td>72.6°C</td></tr> <tr><td>20</td><td>C107</td><td>47.3°C</td><td>73.5°C</td></tr> <tr><td>21</td><td>C140</td><td>46.3°C</td><td>72.4°C</td></tr> <tr><td>22</td><td>TSW1</td><td>45.5°C</td><td>71.1°C</td></tr> <tr><td>23</td><td>TC</td><td>41.0°C</td><td>67.0°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=27.7 °C	HIGH AMBIENT Ta=51.8 °C	1	RT1	59.2°C	78.6°C	2	ZR1	43.3°C	68.6°C	3	BD1	52.9°C	78.0°C	4	Q1	54.9°C	80.1°C	5	L1	48.3°C	74.0°C	6	C5	47.9°C	73.4°C	7	C81	46.3°C	71.9°C	8	C13	50.4°C	75.9°C	9	Q5	54.4°C	80.6°C	10	Q6	50.5°C	76.4°C	11	D1	53.8°C	80.2°C	12	R5	51.2°C	76.9°C	13	T1core	61.3°C	87.0°C	14	Q102	49.8°C	76.4°C	15	Q100	49.4°C	76.0°C	16	U101	47.4°C	73.6°C	17	Q201	47.2°C	73.6°C	18	U1	48.2°C	73.7°C	19	C105	46.6°C	72.6°C	20	C107	47.3°C	73.5°C	21	C140	46.3°C	72.4°C	22	TSW1	45.5°C	71.1°C	23	TC	41.0°C	67.0°C		
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20	C107	47.3°C	73.5°C																																																																																																	
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22	TSW1	45.5°C	71.1°C																																																																																																	
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 127.7%LOAD Ta: 25°C	TEST: OK																																																																																																
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264VAC/110VAC O/P: 100% LOAD Ta= -35°C	TEST: OK																																																																																																
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C /95 %R.H NO DAMAGE	I/P: 272 VAC O/P: FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST: OK																																																																																																
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0-50°C)	I/P: 230 VAC O/P: FULL LOAD	± 0.008%/°C (0-50°C)																																																																																																



6	STORAGE TEMPERATURE TEST	-40~85°C	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : STATIC
7	THERMAL SHOCK TEST	-30~50°C	1. Thermal shock Temperature : -35°C~ +55°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 16 CYCLE 5. Input/Output condition : 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test
8	VIBRATION TEST	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (3) Sweep Time: 12min/sweep cycle (4) Acceleration: 6G (5) Test Time: 180min in each axis (X.Y.Z) (6) Ta: 25°C
9	CAPACITOR LIFE CYCLE	UHP-200-55: SUPPOSE C107 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Ta= 25 °C LIFE TIME (2) I/P: 230VAC O/P: FULL LOAD Ta=50 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta=50 °C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta=50 °C LIFE TIME	(1) 909305HRS (2) 138969HRS (3) 220543HRS (4) 2955694HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 2472.1K hrs min. Telcordia SR-332 (Bellcore) ; 257K hrs min. MIL-HDBK-217F (25°C)	
11	Ongoing Reliability Test	I/P: 230VAC O/P: FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 30,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/HUANGMK	WENF	LIUWY

2018.4.30 GP-A50-F010