Test Report: NGE90U12-P1J

90W AC-DC Reliable Wall-mounted Interchangeable Type Green Adaptor

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Control Function Test
Component Stress Test

■ SAFETY & E.M.C. TEST

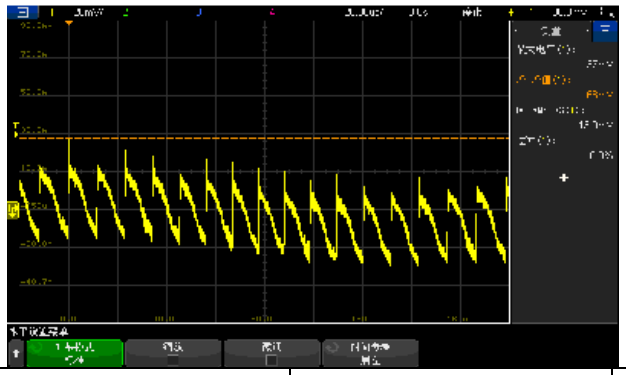
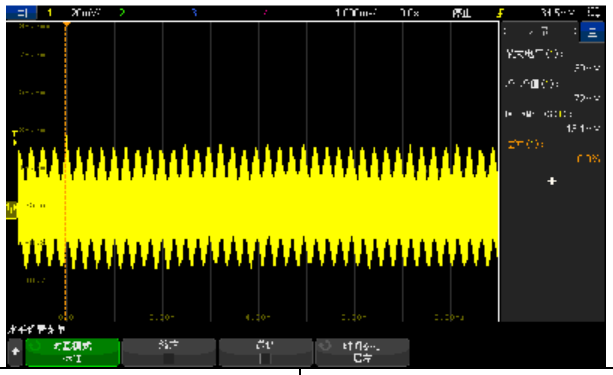
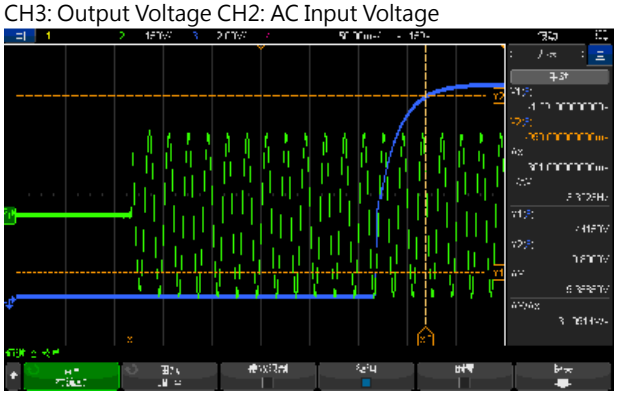
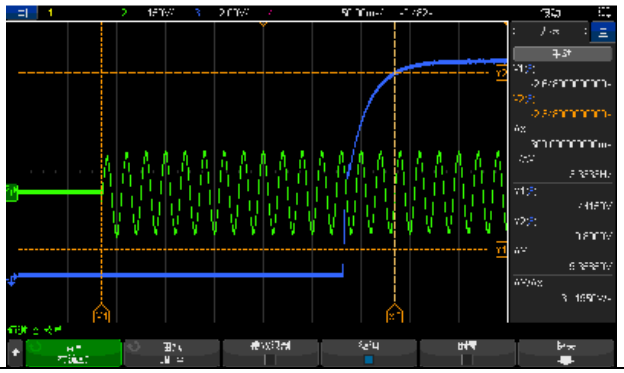
Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

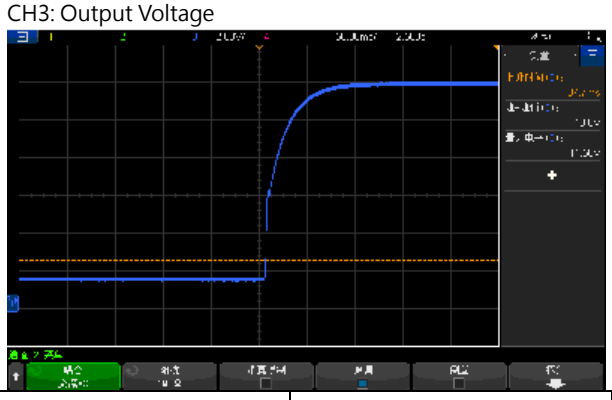
■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

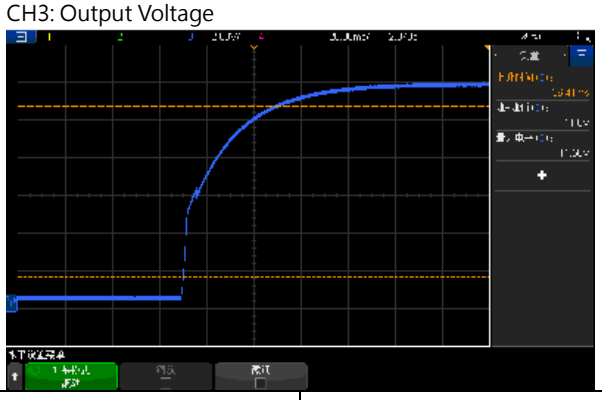
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	V1: -4%~ +4%	I/P: 80VAC~264VAC O/P:FULL~MIN. LOAD Ta:25℃	V1: -1.7%~0.935%
2	LINE REGULATION	V1: -1%~ +1%	I/P: 80VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: -0.016%~0.008%
3	LOAD REGULATION	V1: -4%~ +4%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -1.7%~0.935%
4	OVER/UNDERSHOOT TEST	<± 5%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	1.04%
5	RIPPLE & NOISE (Max)	V1: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	V1: 72Vp-p / high frequency 68Vp-p / low frequency
	high frequency : 		low frequency : 	
6	SET UP TIME(Max)	230VAC/1000ms 115VAC/1000ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 301ms 115VAC/ 300ms
	INPUT=230VAC/50HZ @ FULL LOAD CH3: Output Voltage CH2: AC Input Voltage 		INPUT=115VAC/60HZ @ FULL LOAD CH3: Output Voltage CH2: AC Input Voltage 	

7	RISE TIME (Max)	230VAC/60ms 115VAC/60ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 37.7ms 115VAC/ 36.41ms

INPUT=230VAC/50HZ @ FULL LOAD
CH3: Output Voltage

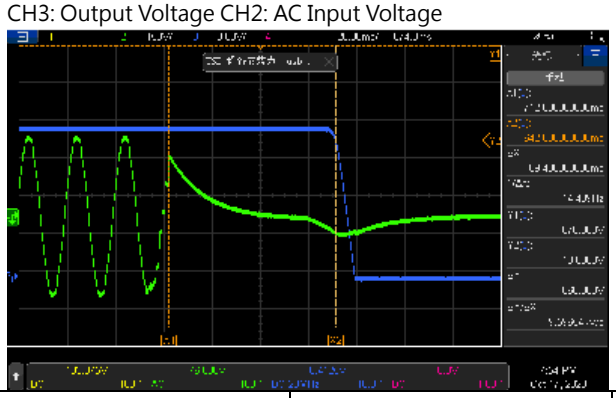


INPUT=115VAC/60HZ @ FULL LOAD
CH3: Output Voltage

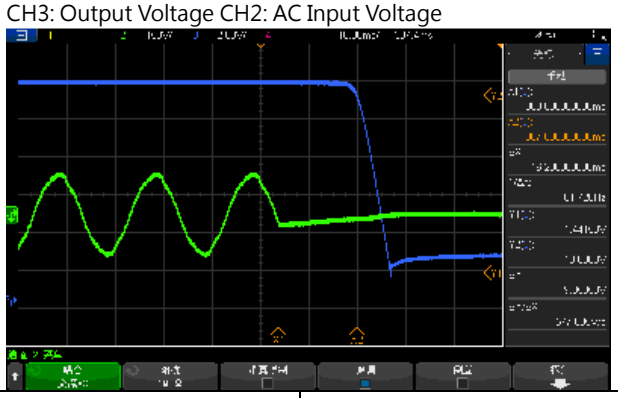


8	HOLD UP TIME (Typ.)	230VAC/30ms 115VAC/10ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/69.4ms 115VAC/16.2ms

INPUT=230VAC/50HZ @ FULL LOAD
CH3: Output Voltage CH2: AC Input Voltage

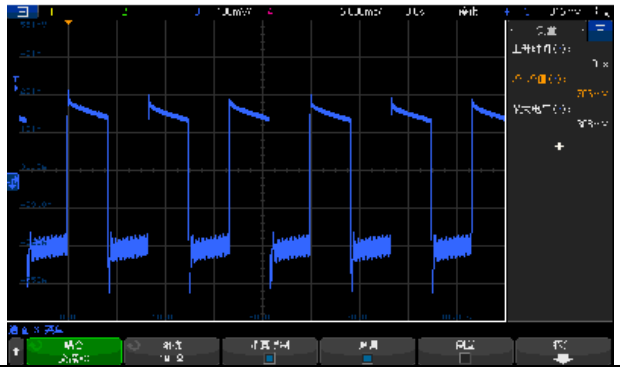


INPUT=115VAC/60HZ @ FULL LOAD
CH3: Output Voltage CH2: AC Input Voltage

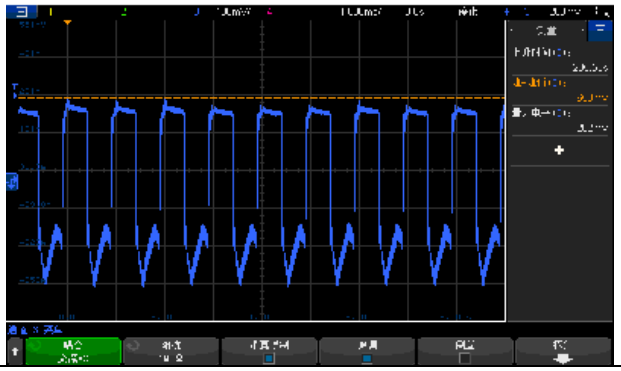


9	DYNAMIC LOAD	V1: 1200mVp-p	I/P: 230VAC O/P: (1) FULL/0% LOAD 50%DUTY/ 120HZ (2) FULL/0% LOAD 50%DUTY / 1KHZ Ta:25℃	706mVp-p 653mVp-p

FULL /0% LOAD 50%DUTY / 120HZ

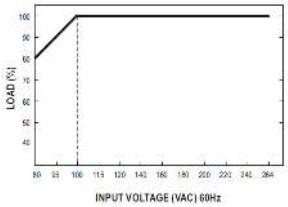
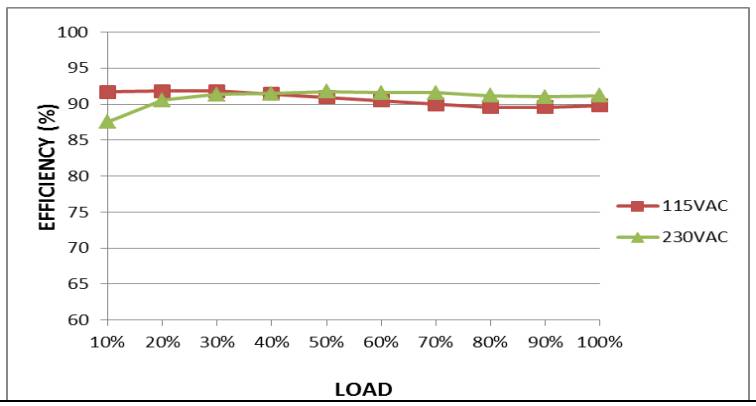


FULL /0% LOAD 50%DUTY / 1KHZ



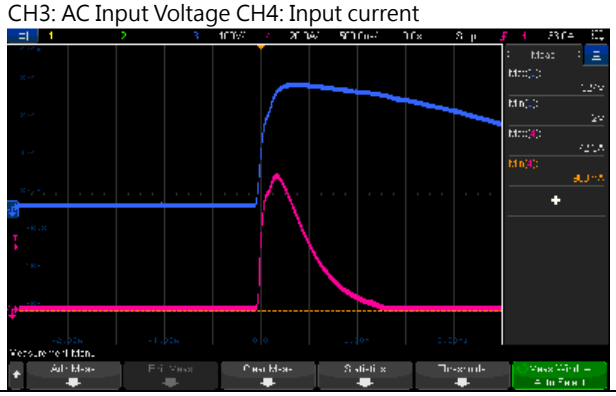
10	TRANSIENT RECOVERY TIME	V1: 1200mVp-p < 500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	324mVp-p 0us

INPUT FUNCTION TEST

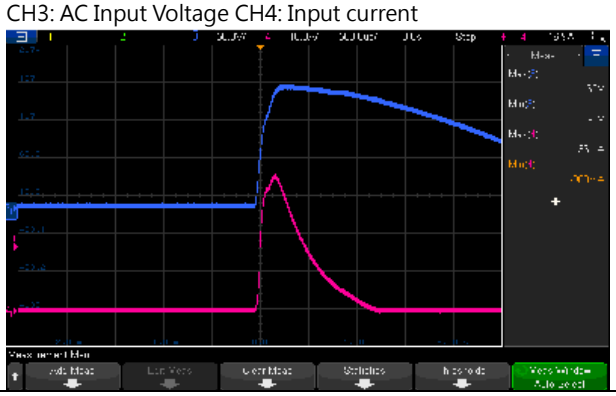
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	80VAC~264VAC 113VDC~ 370VDC  	(1) I/P: TESTING O/P: FULL LOAD/ 80% LOAD (2) I/P: DC TESTING (L: + N:-) O/P: FULL LOAD/ 80% LOAD (3) I/P: DC TESTING (L: - N: +) O/P: FULL LOAD/ 80% LOAD Ta:25℃	(1) 66.7V~264V/ FULL LOAD 66.7V~264V/ 80% LOAD (2) 94.5Vdc~370Vdc/FULL LOAD 94.5Vdc~370Vdc/80% LOAD (3) 94.5Vdc~370Vdc/FULL LOAD 94.5Vdc~370Vdc/80% LOAD
			I/P: HIGH-LINE+15%=300V O/P:FULL LOAD /MIN LOAD (PLEASE CHECK DERATING CURVE) 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:80 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST：OK
3	INPUT CURRENT (Typ.)	230V/ 0.9A 115V/ 1.8A	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =0.632A/ 230VAC I =1.232A/ 115VAC
4	LEAKAGE CURRENT	100uA/ 264 VAC	I/P： 264 VAC O/P：Min LOAD Ta：25℃	78.8uA
5	NO LOAD CONSUMPTION	< 0.1W	I/P：240VAC O/P：NO LOAD Ta：25℃	0.075W
6	EFFICIENCY(Typ.)	90%	I/P:230VAC O/P:FULL LOAD Ta:25℃	91.12%/230VAC
	EFFICIENCY vs LOAD  			

7	INRUSH CURRENT(Typ.)	230V/100A 115V/50A COLD START	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I =72.3A/ 230VAC I =36.1A/ 115VAC T50=490us/230V

INPUT=230VAC/50HZ @ FULL LOAD
CH3: AC Input Voltage CH4: Input current



INPUT=115VAC/ 60HZ @ FULL LOAD
CH3: AC Input Voltage CH4: Input current



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~160% rated output power Protection type: Hiccup mode, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P:TESTING Ta:25℃	128.8%/ 264VAC 135.2%/ 230VAC 128.8%/100VAC PROTECTION TYPE： Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	12.6V~16.2V Protection type: Shout down O/P vlotage, re-power on to removed	I/P: 264VAC I/P: 80VAC O/P:MIN LOAD Ta:25℃	14.0V/ 264VAC 14.1V/ 80VAC PROTECTION TYPE： Shout down O/P voltage, re-power on to removed
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Protection type: Hiccup mode, recovers automatically after fault condition is removed	I/P: 264VAC I/P: 80VAC O/P: FULL LOAD Ta:25℃	NO DAMAGE PROTECTION TYPE： Hiccup mode, recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated: 25A/ 650V	AC ON/OFF I/P: High-Line +3V =267V VDS: O/P: (1)Full Load (2)Output Short	Q1 VDS: (1) 565V (2) 489V (3) 561V

			(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 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25℃	(4) 561V (5) 557V (6) 561V (7) 569V
2	Diode Peak Voltage	Q100 Rated: 100A/80V	AC ON/OFF I/P: High-Line +3V =267 V 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 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8).NO LOAD Ta:25℃	Q100: VDS: (1) 68.0V (2) 70.4V (3) 67.4V (4) 67.4V (5) 68.6V (6) 66.2V (7) 66.8V (8) 66.8V
3	Input Capacitor Voltage	C5 Rated: 150μ /400 V	I/P: High-Line +3V =267V O/P: (1)Full Load input on/off (2) Min load input on /Off (3) Full Load /Min load Change (4) Full load continue Ta:25℃	(1) 385V (2) 380V (3) 385V (4) 382V
4	Control IC Voltage Test	PWM IC U2 Rated: 9V~ 28V O/P IC U101 Rated: 4V~ 13V	AC ON/OFF I/P: High-Line +3V =267 V O/P:(1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P (5) NO LOAD VRmin (LOW LINE) Ta:25℃	U2 U101 (1) 17.2V (1) 10.03V (2) 17.2V (2) 9.94V (3) 17.2V (3) 9.94V (4) 17.2V (4) 9.66V (5) 17.2V (5) 9.57V
5	Clamp Diode Peak Voltage	D1 Rated： 620V/1A	AC ON/OFF I/P：High-Line +3V = 267 V O/P： (1) Dynamic Load 90%Duty/1KHz (2) Full load continue Ta：25℃	(1) 486V (2) 461V

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 4KVAC/min	I/P-O/P: 4.4 KVAC/min Ta:25℃	I/P-O/P: 1.641mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 600 VDC Ta:25℃	I/P-O/P: 9999 MΩ NO DAMAGE

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	BS EN/EN61000-3-2 ■ CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25℃	PASS
2	CONDUCTION	BS EN/EN55032(CISPR32)/EN55011, FCC Part15 , CNS15936, GB/T 9254.1-2021 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS
3	RADIATION	BS EN/EN55032(CISPR32)/EN55011, FCC Part15 , CNS15936, GB/T 9254.1-2021 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS
4	E.S.D	BS EN/EN61000-4-2 Level 3, 15KV air; Level 2, 8KV contact	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
5	E.F.T	BS EN/EN 61000-4-4 INPUT： 1KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
6	SURGE	BS EN/EN 61000-4-5 Level 3, 1KV/L-N	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
7	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report			

■ RELIABILITY TEST

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL：NGE90U12-P1J
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 26.2 ℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 40.8 ℃</td></tr>
<tr><td colspan="5">
<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 26.2℃</th><th>HIGH AMBIENT Ta= 40.8℃</th></tr>
<tr><td>1</td><td>RTH1</td><td>70.1℃</td><td>81.3℃</td></tr>
<tr><td>2</td><td>R4</td><td>63.3℃</td><td>74.2℃</td></tr>
<tr><td>3</td><td>LF1</td><td>59.9℃</td><td>72.8℃</td></tr>
<tr><td>4</td><td>ZNR1</td><td>55.9℃</td><td>69.1℃</td></tr>
<tr><td>5</td><td>C1</td><td>55.5℃</td><td>68.9℃</td></tr>
<tr><td>6</td><td>LF2</td><td>53.3℃</td><td>67.0℃</td></tr>
<tr><td>7</td><td>BD1</td><td>63.9℃</td><td>77.3℃</td></tr>
<tr><td>8</td><td>C5</td><td>63.0℃</td><td>76.2℃</td></tr>
<tr><td>9</td><td>C11</td><td>69.9℃</td><td>83.5℃</td></tr>
<tr><td>10</td><td>D3</td><td>75.7℃</td><td>89.3℃</td></tr>
<tr><td>11</td><td>T1 coil</td><td>70.3℃</td><td>83.6℃</td></tr>
<tr><td>12</td><td>T1 core</td><td>69.5℃</td><td>82.7℃</td></tr>
<tr><td>13</td><td>C106</td><td>65.4℃</td><td>78.9℃</td></tr>
<tr><td>14</td><td>U101</td><td>85.0℃</td><td>98.0℃</td></tr>
<tr><td>15</td><td>U5</td><td>54.2℃</td><td>67.8℃</td></tr>
<tr><td>16</td><td>U2</td><td>67.9℃</td><td>81.5℃</td></tr>
<tr><td>17</td><td>R27</td><td>68.6℃</td><td>82.5℃</td></tr>
<tr><td>18</td><td>U3</td><td>63.1℃</td><td>76.6℃</td></tr>
<tr><td>19</td><td>D2</td><td>70.5℃</td><td>84.6℃</td></tr>
<tr><td>20</td><td>Q1</td><td>71.6℃</td><td>86.5℃</td></tr>
<tr><td>21</td><td>Q100</td><td>76.5℃</td><td>90.1℃</td></tr>
<tr><td>22</td><td>C107</td><td>62.1℃</td><td>75.6℃</td></tr>
<tr><td>23</td><td>R101</td><td>84.7℃</td><td>101.4℃</td></tr>
<tr><td>24</td><td>D1</td><td>75.9℃</td><td>89.4℃</td></tr>
<tr><td>25</td><td>RTH2</td><td>69.6℃</td><td>83.2℃</td></tr>
<tr><td>26</td><td>CASE</td><td>54.7℃</td><td>68.1℃</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P： 230 VAC
O/P： 138.08 % LOAD
Ta：25℃</td><td>TEST：OK</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 264VAC/100VAC
O/P： 100% LOAD
Ta= -35 ℃</td><td>TEST：OK</td></tr>
</table>

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 ℃/95 %R.H NO DAMAGE	I/P： 272 VAC O/P：FULL LOAD Ta= 40℃ HUMIDITY= 95 %R.H	TEST：OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/℃(0~45℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.008 %/℃(0~45℃)
6	STORAGE TEMPERATURE TEST	-40~85℃	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / 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	-30~40℃	1. Thermal shock Temperature： -35℃~ +45℃ 2. Temperature change rate ：25℃ / 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, 2G 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：3G (5) Test Time：180min in each axis (X.Y.Z) (6) Ta：25℃	
9	CAPACITOR LIFE CYCLE	SUPPOSE C107 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME (2) I/P： 230VAC O/P：FULL LOAD Ta= 40 ℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta= 40 ℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta= 40 ℃ LIFE TIME		(1) 296409.2 HRS (2) 113099.3 HRS (3) 199740 HRS (4) 324133.3 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 605.3Khrs min. MIL-HDBK-217F (25℃) 5120.6Khrs min. Telcordia TR/SR-332(Bellcore) (25℃)		
11	Ongoing Reliability Test	I/P：230VAC O/P：100% LOAD TA=50℃ Demonstration Mean Time Between Failure：30,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	Yuwei	Liutt	Wangdz

2020.10.1 TAG-QA-009