



# Test Report: NGE12U05-P1J

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12W AC-DC Reliable 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

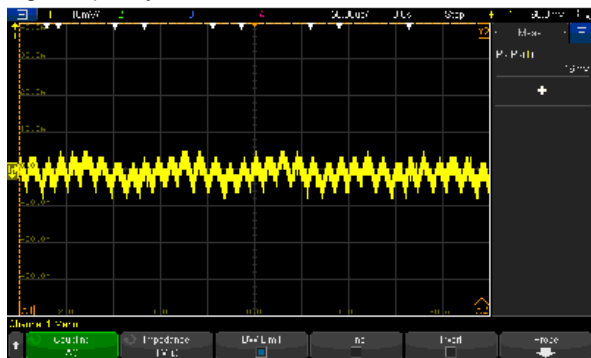
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

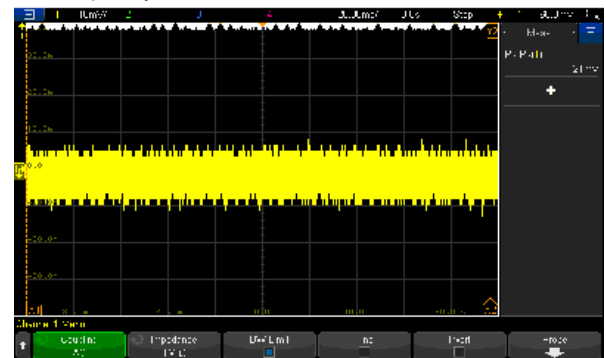
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	VOLTAGE TOLERANCE	V1: -5%~ +5%	I/P: 80VAC~264VAC O/P:FULL~MIN. LOAD Ta:25°C	V1: -3.10%~3.13%
2	LINE REGULATION	V1: -1%~ +1%	I/P: 80VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.01%~-0.01%
3	LOAD REGULATION	V1: -5%~ +5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -3.10%~3.13%
4	OVER/UNDERSHOOT TEST	<± 10%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	6.6%
5	RIPPLE & NOISE (Max )	V1: 60mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 16mVp-p / high frequency 21mVp-p / low frequency

high frequency :

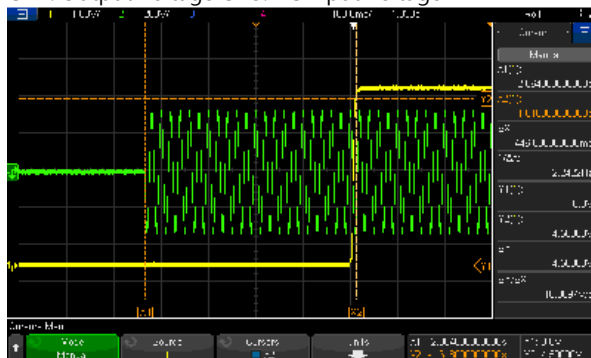


low frequency :

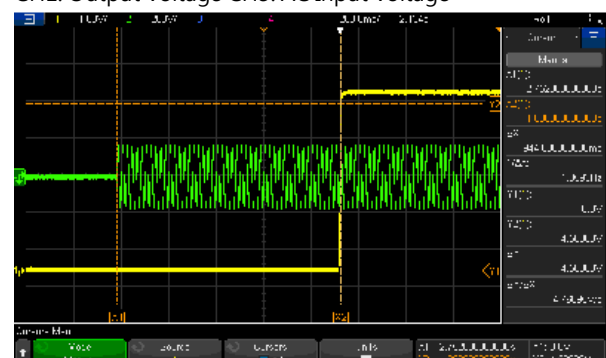


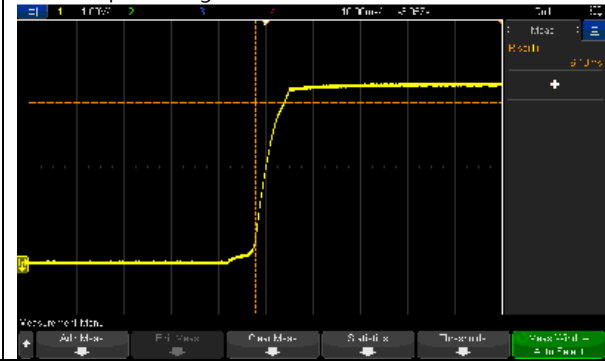
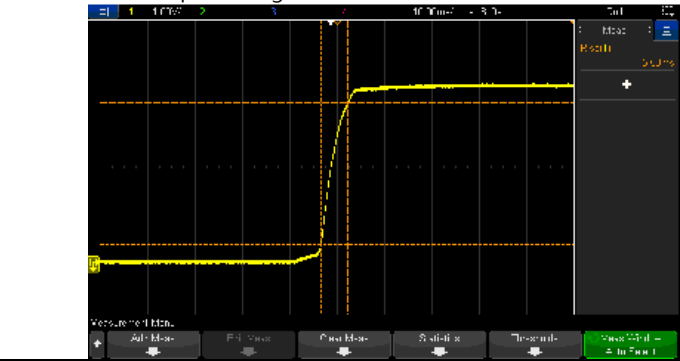

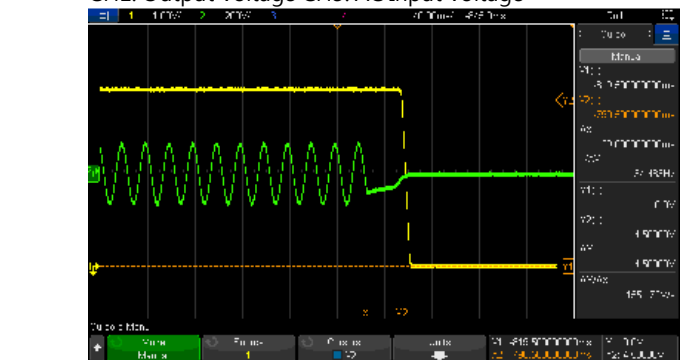
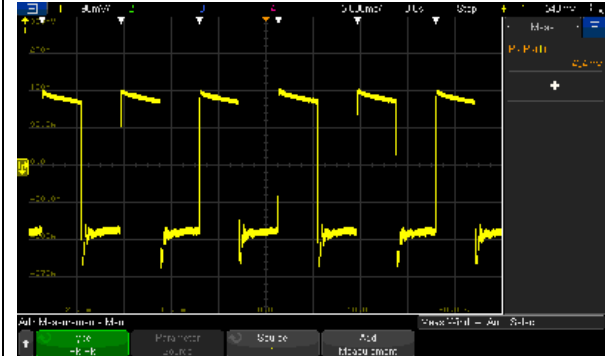
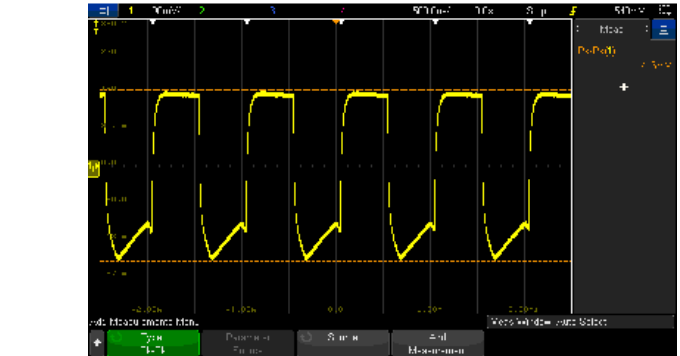
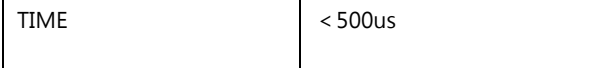
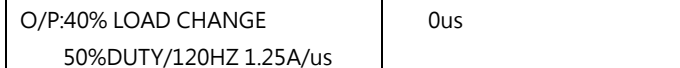
6	SET UP TIME(Max)	230VAC/1500ms 115VAC/3000ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 446ms 115VAC/ 944ms
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INPUT=230VAC/50HZ @ FULL LOAD  
CH1: Output Voltage CH3: AC Input Voltage



INPUT=115VAC/60HZ @ FULL LOAD  
CH1: Output Voltage CH3: AC Input Voltage

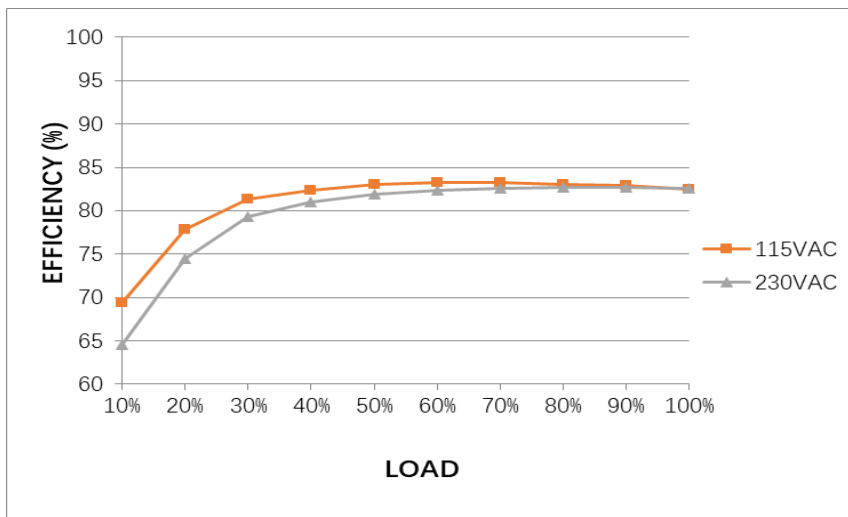


7	RISE TIME (Max)	230VAC/30ms 115VAC/30ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 6.13ms 115VAC/ 5.53ms
<p>INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage</p> 		
8	HOLD UP TIME (Typ.)	230VAC/30ms 115VAC/10ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 150ms 115VAC/ 29ms
<p>INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD CH1: Output Voltage CH3: AC Input Voltage</p> 		
9	DYNAMIC LOAD	V1: 1000mVp-p	I/P: 230VAC O/P: (1) FULL/0% LOAD 50%DUTY/ 120HZ (2) FULL/0% LOAD 50%DUTY / 1KHZ Ta:25°C	434mVp-p 416mVp-p
<p>FULL /0% LOAD 50%DUTY / 120HZ</p> 		<p>FULL /0% LOAD 50%DUTY / 1KHZ</p> 		
10	TRANSIENT RECOVERY TIME	V1: 1000mVp-p < 500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	165mVp-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°C	(1) 68.3V~264V/ FULL LOAD 68.3V~264V/ 80% LOAD (2) 97.10Vdc~370Vdc/FULL LOAD 97.08Vdc~370Vdc/80% LOAD (3) 97.10Vdc~370Vdc/FULL LOAD 97.08Vdc~370Vdc/80% LOAD
			I/P: HIGH-LINE+15%=300 V 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°C	TEST: OK
3	INPUT CURRENT (Typ.)	230V/ 0.25A 115V/ 0.4A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =0.25A/ 230VAC I =0.4A/ 115VAC
4	LEAKAGE CURRENT	Touch current : < 100uA / 264 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	47.0 uA
5	NO LOAD CONSUMPTION	< 0.075W/240V	I/P : 240VAC O/P : NO LOAD Ta : 25°C	40.6 mW
6	EFFICIENCY(Typ.)	82%	I/P:230VAC O/P:FULL LOAD Ta:25°C	83.1%/230VAC

EFFICIENCY vs LOAD



7	INRUSH CURRENT(Typ.)	230V/80A 115V/40A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =37.6A/ 230VAC I =20.2A/ 115VAC T50=300us/230V
INPUT=230VAC/50HZ @ FULL LOAD CH1: AC Input Voltage CH4: Input current		INPUT=115VAC/ 60HZ @ FULL LOAD CH1: AC Input Voltage CH4: Input current		

### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	110%~150% 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°C	130.5%/ 264VAC 128.8%/ 230VAC 129.7%/100VAC Protection type: Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	115%~140% rated output voltage Protection type: Clamp by zener diode	I/P: TESTING O/P: MIN LOAD Ta:25°C	6.58V Protection type: Clamp by zener diode
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°C	NO DAMAGE OK 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: 5.4A / 700V	AC ON/OFF I/P: High-Line +3V =267V VDS: O/P: (1)Full Load (2)Output Short	Q1 VDS: (1) 546V (2) 535V (3) 546V

			<p>(3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz</p> <p>(4) Dynamic Load Full Load/ Min. Load 90%Duty/3KHz</p> <p>(5) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(6) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>(7)0%→400% Load.</p> <p>Ta:25°C</p>	<p>(4) 546V</p> <p>(5) 546V</p> <p>(6) 546V</p> <p>(7) 542V</p>
2	Diode Peak Voltage	U100 Rated: 25A/60V	<p>AC ON/OFF</p> <p>I/P: High-Line +3V =267 V</p> <p>O/P: (1)Full Load</p> <p>(2)Output Short</p> <p>(3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz</p> <p>(4) Dynamic Load Full Load/ Min. Load 90%Duty/3KHz</p> <p>(5) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz</p> <p>(6) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz</p> <p>(7)0%→400% Load.</p> <p>(8).NO LOAD</p> <p>Ta:25°C</p>	<p>(1) 45.1V</p> <p>(2) 43.5V</p> <p>(3) 45.1V</p> <p>(4) 44.7V</p> <p>(5) 44.3V</p> <p>(6) 43.1V</p> <p>(7) 42.7V</p> <p>(8) 28.3V</p>
3	Input Capacitor Voltage	C5 Rated:27μ /400 V	<p>I/P: High-Line +3V =267V</p> <p>O/P: (1)Full Load input on/off</p> <p>(2) Min load input on /Off</p> <p>(3) Full Load /Min load Change</p> <p>(4) Full load continue</p> <p>Ta:25°C</p>	<p>(1) 376 V</p> <p>(2) 376 V</p> <p>(3) 380V</p> <p>(4) 376V</p>
4	Control IC Voltage Test	<p>PWM IC U3 Rated: 8V~ 26.5V</p> <p>O/P IC U100 Rated: 3V~ 6.3V</p>	<p>AC ON/OFF</p> <p>I/P: High-Line +3V =267 V</p> <p>O/P:(1) FULL LOAD</p> <p>(2) Output Short</p> <p>(3) O.L.P</p> <p>(4) NO LOAD VRmin (LOW LINE)</p> <p>Ta:25°C</p>	<p>U3</p> <p>(1) 16.6V</p> <p>(2) 16.6V</p> <p>(3) 16.6V</p> <p>(4) 8.2V</p> <p>U100</p> <p>(1) 5.41V</p> <p>(2) 3.16V</p> <p>(3) 3.16V</p> <p>(4) 3.88V</p>
5	Clamp Diode Peak Voltage	D5 Rated : 600V/1A	<p>AC ON/OFF</p> <p>I/P : High-Line +3V = 267 V</p> <p>O/P : (1) Dynamic Load 90%Duty/1KHz</p> <p>(2) Full load continue</p> <p>Ta : 25°C</p>	<p>(1) 482V</p> <p>(2) 477V</p>

## ■ 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°C	I/P-O/P: 0.781mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 600 VDC Ta:25°C	I/P-O/P: 50GΩ 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°C	■ PASS
2	CONDUCTION	BS EN/EN55032(CISPR32)/EN55011 , FCC Part15 , CNS15936 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	■ PASS Test by certified Lab
3	RADIATION	BS EN/EN55032(CISPR32)/EN55011 , FCC Part15 , CNS15936 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	■ PASS Test by certified Lab
4	E.S.D	BS EN/EN61000-4-2 ■ <u>MEDICAL/Adaptor</u> AIR : 15KV / Contact : 8KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	■ CRITERIA A
5	E.F.T	BS EN/EN61000-4-4 ■ <u>MEDICAL/Adaptor</u> L-N : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	■ CRITERIA A
6	SURGE	BS EN/EN61000-4-5 ■ <u>MEDICAL/Adaptor</u> L-N : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	■ 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

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																																				
1	TEMPERATURE RISE TEST	MODEL : NGE12U05-P1J 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 24.9 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 45.5 °C																																																																																																																						
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=24.9°C</th> <th>HIGH AMBIENT Ta=45.5°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>D2</td><td>52.0°C</td><td>70.9°C</td></tr> <tr><td>2</td><td>BD1</td><td>56.8°C</td><td>75.8°C</td></tr> <tr><td>3</td><td>R40</td><td>57.5°C</td><td>76.7°C</td></tr> <tr><td>4</td><td>U100</td><td>69.2°C</td><td>89.8°C</td></tr> <tr><td>5</td><td>R7</td><td>65.5°C</td><td>84.6°C</td></tr> <tr><td>6</td><td>C8</td><td>65.5°C</td><td>84.7°C</td></tr> <tr><td>7</td><td>R8</td><td>68.2°C</td><td>87.4°C</td></tr> <tr><td>8</td><td>D5</td><td>71.1°C</td><td>90.4°C</td></tr> <tr><td>9</td><td>Q1</td><td>73.4°C</td><td>92.5°C</td></tr> <tr><td>10</td><td>R42</td><td>65.0°C</td><td>84.1°C</td></tr> <tr><td>11</td><td>U2</td><td>53.6°C</td><td>73.9°C</td></tr> <tr><td>12</td><td>C105</td><td>54.9°C</td><td>75.0°C</td></tr> <tr><td>13</td><td>C106</td><td>57.6°C</td><td>77.7°C</td></tr> <tr><td>14</td><td>C49</td><td>68.2°C</td><td>87.2°C</td></tr> <tr><td>15</td><td>C5</td><td>53.7°C</td><td>73.4°C</td></tr> <tr><td>16</td><td>C4</td><td>52.4°C</td><td>71.7°C</td></tr> <tr><td>17</td><td>LF1</td><td>51.4°C</td><td>70.4°C</td></tr> <tr><td>18</td><td>RTH1</td><td>51.5°C</td><td>70.0°C</td></tr> <tr><td>19</td><td>L1</td><td>53.2°C</td><td>72.7°C</td></tr> <tr><td>20</td><td>C40</td><td>55.9°C</td><td>74.7°C</td></tr> <tr><td>21</td><td>R102</td><td>65.9°C</td><td>86.0°C</td></tr> <tr><td>22</td><td>C102</td><td>62.2°C</td><td>82.3°C</td></tr> <tr><td>23</td><td>U3</td><td>65.8°C</td><td>85.1°C</td></tr> <tr><td>24</td><td>T1 coil</td><td>62.4°C</td><td>82.0°C</td></tr> <tr><td>25</td><td>T1 core</td><td>63.3°C</td><td>82.4°C</td></tr> <tr><td>26</td><td>SHR1</td><td>49.0°C</td><td>70.2°C</td></tr> <tr><td>27</td><td>C1</td><td>45.0°C</td><td>64.4°C</td></tr> <tr><td>28</td><td>CASE</td><td>39.8°C</td><td>59.2°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=24.9°C	HIGH AMBIENT Ta=45.5°C	1	D2	52.0°C	70.9°C	2	BD1	56.8°C	75.8°C	3	R40	57.5°C	76.7°C	4	U100	69.2°C	89.8°C	5	R7	65.5°C	84.6°C	6	C8	65.5°C	84.7°C	7	R8	68.2°C	87.4°C	8	D5	71.1°C	90.4°C	9	Q1	73.4°C	92.5°C	10	R42	65.0°C	84.1°C	11	U2	53.6°C	73.9°C	12	C105	54.9°C	75.0°C	13	C106	57.6°C	77.7°C	14	C49	68.2°C	87.2°C	15	C5	53.7°C	73.4°C	16	C4	52.4°C	71.7°C	17	LF1	51.4°C	70.4°C	18	RTH1	51.5°C	70.0°C	19	L1	53.2°C	72.7°C	20	C40	55.9°C	74.7°C	21	R102	65.9°C	86.0°C	22	C102	62.2°C	82.3°C	23	U3	65.8°C	85.1°C	24	T1 coil	62.4°C	82.0°C	25	T1 core	63.3°C	82.4°C	26	SHR1	49.0°C	70.2°C	27	C1	45.0°C	64.4°C	28	CASE	39.8°C	59.2°C
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 124% LOAD Ta : 25°C	TEST : OK																																																																																																																				



3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC 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 45°C/95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 45°C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03%/°C(0~45°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.012%/°C(0~45°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	-30~45°C	1. Thermal shock Temperature : -35°C~ +50°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, 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°C	
9	CAPACITOR LIFE CYCLE	SUPPOSE C106 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= 45 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 45 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 45 °C LIFE TIME	(1) 1158697 HRS (2) 121331 HRS (3) 308298 HRS (4) 682292 HRS	
10	MTBF	Conducted by Parts Stress Analysis Prediction 1272.8 Khrs min. MIL-HDBK-217F (25°C) 7192.4 Khrs min. Telcordia TR/SR-332(Bellcore) (25°C)		
11	Ongoing Reliability Test	I/P : 230VAC O/P : 80% LOAD TA=50°C Demonstration Mean Time Between Failure : 30,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	YUWEI	LIUTT	WANGDZ

2020.10.1 TAG-QA-009