



# Test Report: NGE12U12-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

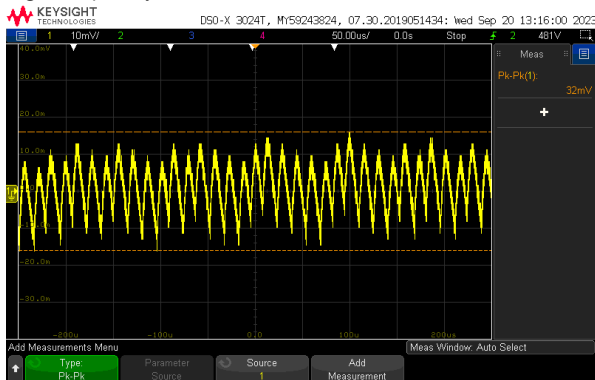
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

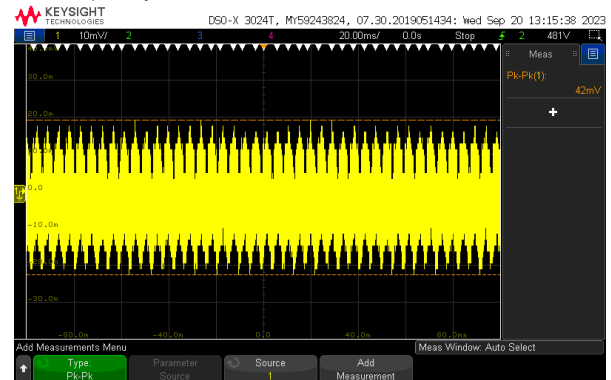
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	V1: -3%~ +3%	I/P: 80VAC~264VAC O/P:FULL~MIN. LOAD Ta:25°C	V1: -0.42 %~0.42%
2	LINE REGULATION	V1: -1%~ +1%	I/P: 80VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0%~0%
3	LOAD REGULATION	V1: -3%~ +3%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.42 %~0.42%
4	OVER/UNDERSHOOT TEST	<± 5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	2.1%
5	RIPPLE & NOISE (Max )	V1: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 32mVp-p / high frequency 42mVp-p / low frequency

high frequency :



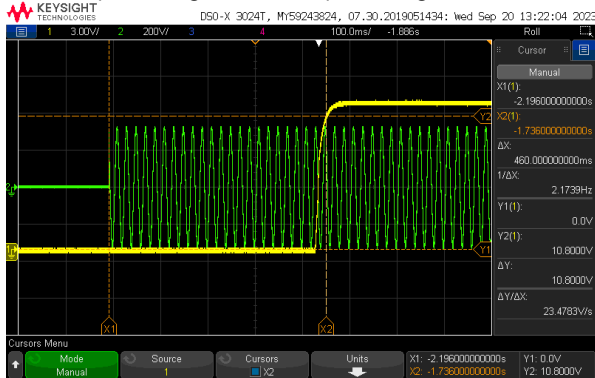
low frequency :



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/ 460ms 115VAC/988 ms
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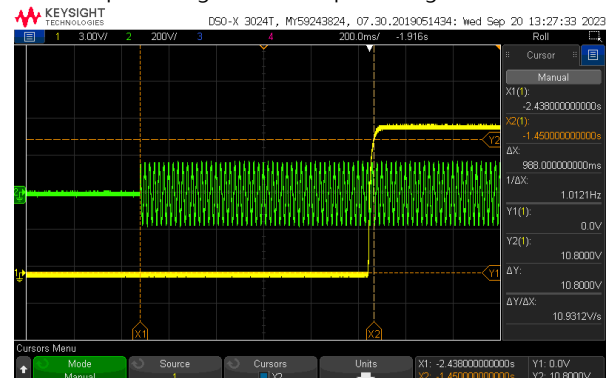
INPUT=230VAC/50HZ @ FULL LOAD

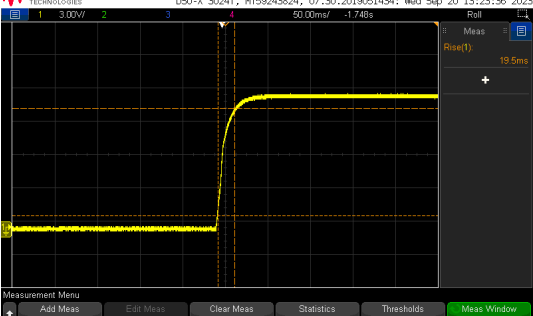
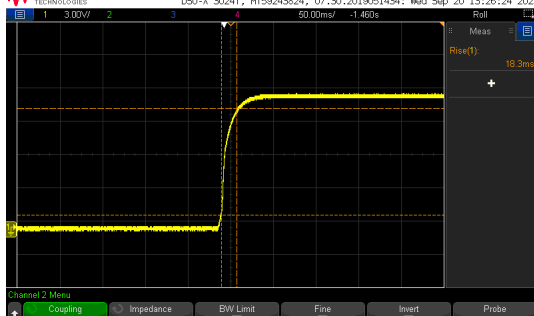
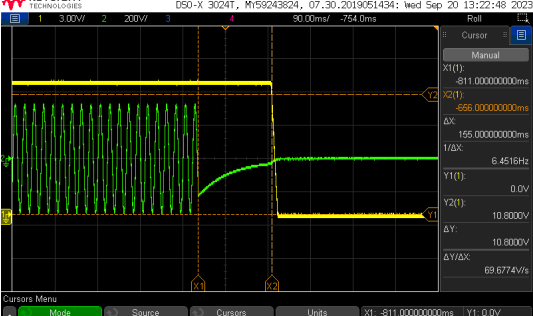
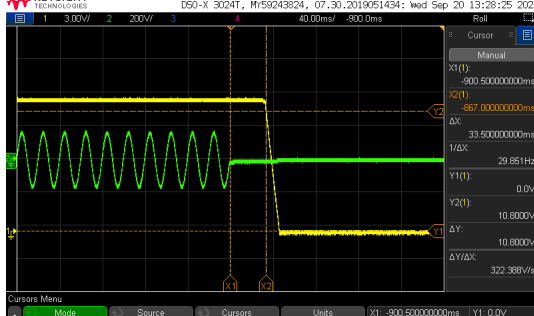
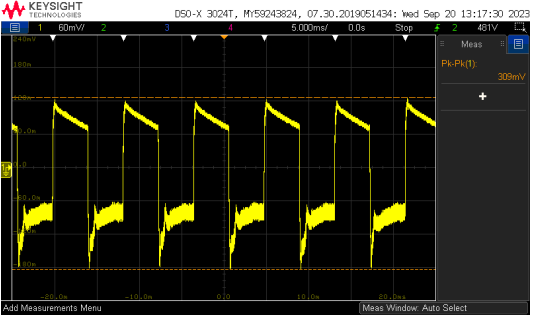
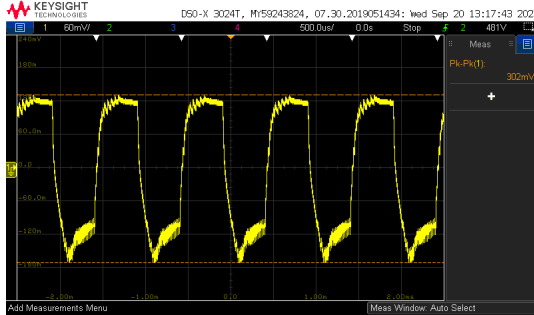
CH1: Output Voltage CH3: AC Input Voltage



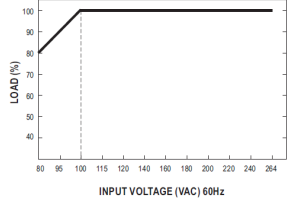
INPUT=115VAC/60HZ @ FULL LOAD

CH1: Output Voltage CH3: AC Input Voltage

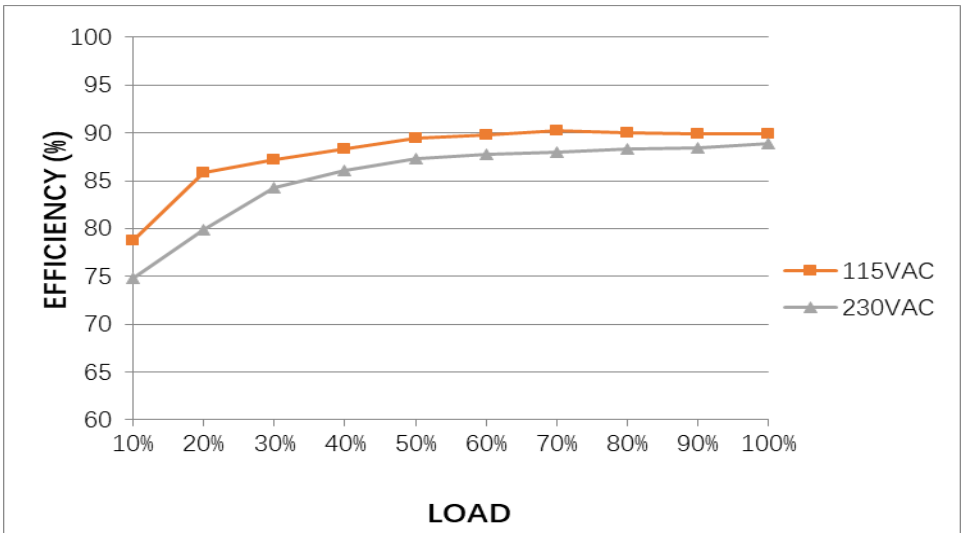


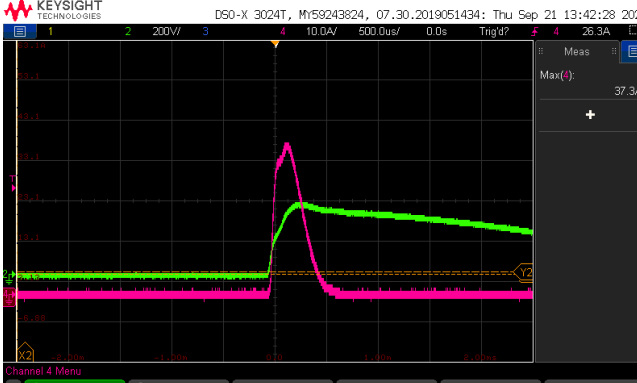
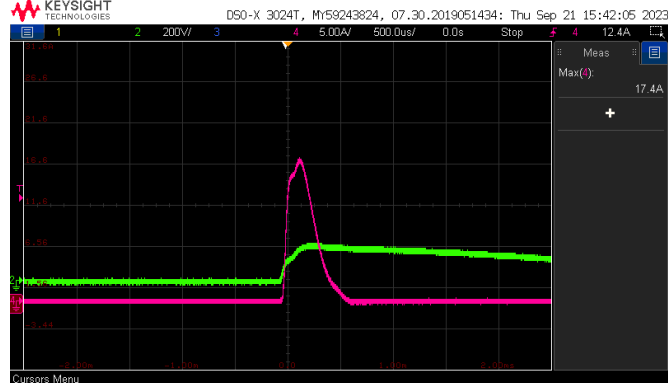
7	RISE TIME (Max)	230VAC/30ms 115VAC/30ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 19.5ms 115VAC/ 18.3ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p> 		
8	HOLD UP TIME (Typ.)	230VAC/30ms 115VAC/10ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 155ms 115VAC/33.5ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH3: AC Input Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage CH3: AC Input Voltage</p> 		
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°C	309mVp-p 302mVp-p
<p>FULL /0% LOAD 50%DUTY / 120HZ</p> 		<p>FULL /0% LOAD 50%DUTY / 1KHZ</p> 		
10	TRANSIENT RECOVERY TIME	V1: 1200mVp-p < 500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	117mVp-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 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 )	(1) 69.4V~264V/ FULL LOAD 69.3V~264V/ 80% LOAD (2) 97.2Vdc~370Vdc/FULL LOAD 96.92Vdc~370Vdc/80% LOAD (3) 97.2Vdc~370Vdc/FULL LOAD 96.92Vdc~370Vdc/80% LOAD 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 =0.15A/ 230VAC I =0.23A/ 115VAC
4	LEAKAGE CURRENT	Touch current : < 100uA / 264 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	48.7uA
5	NO LOAD CONSUMPTION	< 0.075W/240V	I/P : 240VAC O/P : NO LOAD Ta : 25°C	53.5mW
6	EFFICIENCY(Typ.)	87.5%	I/P:230VAC O/P:FULL LOAD Ta:25°C	88.1%/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 =37.3A/ 230VAC I =17.4A/ 115VAC T50=270us/230V
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: AC Input Voltage CH4: Input current</p> 		<p>INPUT=115VAC/ 60HZ @ FULL LOAD</p> <p>CH1: AC Input Voltage CH4: Input current</p> 		

### 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	133.8%/ 264VAC 130.1%/ 230VAC 132.3%/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 <table border="1" data-bbox="443 1691 821 1765"> <tr> <td>5V<sub>max</sub></td> <td>9V<sub>max</sub></td> <td>12V<sub>max</sub></td> <td>15V<sub>max</sub></td> <td>18V<sub>max</sub></td> <td>24V<sub>max</sub></td> </tr> <tr> <td>80mA<sub>max</sub></td> <td>50mA<sub>max</sub></td> <td>35mA<sub>max</sub></td> <td>30mA<sub>max</sub></td> <td>25mA<sub>max</sub></td> <td>26mA<sub>max</sub></td> </tr> </table>	5V <sub>max</sub>	9V <sub>max</sub>	12V <sub>max</sub>	15V <sub>max</sub>	18V <sub>max</sub>	24V <sub>max</sub>	80mA <sub>max</sub>	50mA <sub>max</sub>	35mA <sub>max</sub>	30mA <sub>max</sub>	25mA <sub>max</sub>	26mA <sub>max</sub>	I/P: TESTING O/P: MIN LOAD Ta:25°C	15.64V(DC Source 限流 26mA) Protection type: Clamp by zener diode
5V <sub>max</sub>	9V <sub>max</sub>	12V <sub>max</sub>	15V <sub>max</sub>	18V <sub>max</sub>	24V <sub>max</sub>											
80mA <sub>max</sub>	50mA <sub>max</sub>	35mA <sub>max</sub>	30mA <sub>max</sub>	25mA <sub>max</sub>	26mA <sub>max</sub>											
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 (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°C	Q1 VDS: (1) 536V (2) 532V (3) 532V (4) 528V (5) 532V (6) 536V (7) 528V
2	Diode Peak Voltage	U100 Rated: 25A/100V	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°C	(1) 60.6V (2) 69.6V (3) 59.4V (4) 59.4V (5) 60.0V (6) 58.2V (7) 70.8V (8) 57.6V
3	Input Capacitor Voltage	C5 Rated: 27μ /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°C	(1) 380V (2) 380V (3) 380V (4) 376V
4	Control IC Voltage Test	PWM IC U3 Rated: 8V~ 26.5V  O/P IC U100 Rated: 3V~ 6.3V	AC ON/OFF I/P: High-Line +3V =267 V O/P:(1) FULL LOAD (2) Output Short (3) O.L.P (4) NO LOAD VRmin (LOW LINE) Ta:25°C	U3 (1) 16.4V (2) 16.4V (3) 16.4V (4) 8.6V  U100 (1) 5.58V (2) 5.42V (3) 5.85V (4) 5.66V

5	Clamp Diode Peak Voltage	D5 Rated : 600V/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°C	(1) 481V (2) 481 V
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## ■ 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: 0.721mA 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 : NGE12U09-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>49.6°C</td><td>67.7°C</td></tr> <tr><td>2</td><td>BD1</td><td>55.3°C</td><td>73.2°C</td></tr> <tr><td>3</td><td>R40</td><td>53.5°C</td><td>71.6°C</td></tr> <tr><td>4</td><td>U100</td><td>54.3°C</td><td>73.2°C</td></tr> <tr><td>5</td><td>R7</td><td>60.8°C</td><td>78.6°C</td></tr> <tr><td>6</td><td>C8</td><td>61.5°C</td><td>79.2°C</td></tr> <tr><td>7</td><td>R8</td><td>62.9°C</td><td>80.7°C</td></tr> <tr><td>8</td><td>D5</td><td>65.0°C</td><td>82.6°C</td></tr> <tr><td>9</td><td>Q1</td><td>70.1°C</td><td>86.8°C</td></tr> <tr><td>10</td><td>R42</td><td>61.0°C</td><td>78.4°C</td></tr> <tr><td>11</td><td>U2</td><td>49.4°C</td><td>68.2°C</td></tr> <tr><td>12</td><td>C105</td><td>49.2°C</td><td>68.0°C</td></tr> <tr><td>13</td><td>C106</td><td>48.4°C</td><td>67.3°C</td></tr> <tr><td>14</td><td>C49</td><td>66.8°C</td><td>83.8°C</td></tr> <tr><td>15</td><td>C5</td><td>53.8°C</td><td>71.8°C</td></tr> <tr><td>16</td><td>C4</td><td>51.2°C</td><td>69.4°C</td></tr> <tr><td>17</td><td>LF1</td><td>49.7°C</td><td>67.8°C</td></tr> <tr><td>18</td><td>RTH1</td><td>53.6°C</td><td>71.1°C</td></tr> <tr><td>19</td><td>L1</td><td>50.5°C</td><td>68.9°C</td></tr> <tr><td>20</td><td>C40</td><td>52.0°C</td><td>69.8°C</td></tr> <tr><td>21</td><td>R102</td><td>55.7°C</td><td>74.3°C</td></tr> <tr><td>22</td><td>C102</td><td>53.2°C</td><td>71.9°C</td></tr> <tr><td>23</td><td>U3</td><td>60.1°C</td><td>77.7°C</td></tr> <tr><td>24</td><td>T1 coil</td><td>59.7°C</td><td>77.7°C</td></tr> <tr><td>25</td><td>T1 core</td><td>59.9°C</td><td>77.6°C</td></tr> <tr><td>26</td><td>SHR1</td><td>46.0°C</td><td>65.1°C</td></tr> <tr><td>27</td><td>C1</td><td>42.1°C</td><td>61.1°C</td></tr> <tr><td>28</td><td>CASE</td><td>37.9°C</td><td>56.8°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=24.9°C	HIGH AMBIENT Ta=45.5°C	1	D2	49.6°C	67.7°C	2	BD1	55.3°C	73.2°C	3	R40	53.5°C	71.6°C	4	U100	54.3°C	73.2°C	5	R7	60.8°C	78.6°C	6	C8	61.5°C	79.2°C	7	R8	62.9°C	80.7°C	8	D5	65.0°C	82.6°C	9	Q1	70.1°C	86.8°C	10	R42	61.0°C	78.4°C	11	U2	49.4°C	68.2°C	12	C105	49.2°C	68.0°C	13	C106	48.4°C	67.3°C	14	C49	66.8°C	83.8°C	15	C5	53.8°C	71.8°C	16	C4	51.2°C	69.4°C	17	LF1	49.7°C	67.8°C	18	RTH1	53.6°C	71.1°C	19	L1	50.5°C	68.9°C	20	C40	52.0°C	69.8°C	21	R102	55.7°C	74.3°C	22	C102	53.2°C	71.9°C	23	U3	60.1°C	77.7°C	24	T1 coil	59.7°C	77.7°C	25	T1 core	59.9°C	77.6°C	26	SHR1	46.0°C	65.1°C	27	C1	42.1°C	61.1°C	28	CASE	37.9°C	56.8°C
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21	R102	55.7°C	74.3°C																																																																																																																					
22	C102	53.2°C	71.9°C																																																																																																																					
23	U3	60.1°C	77.7°C																																																																																																																					
24	T1 coil	59.7°C	77.7°C																																																																																																																					
25	T1 core	59.9°C	77.6°C																																																																																																																					
26	SHR1	46.0°C	65.1°C																																																																																																																					
27	C1	42.1°C	61.1°C																																																																																																																					
28	CASE	37.9°C	56.8°C																																																																																																																					
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 125% 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	± 0.013 %/°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 C105 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) 351727.6 HRS (2) 99616.6 HRS (3) 133466.6 HRS (4) 182502.9 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