



Test Report: NGE12U24-P1J

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

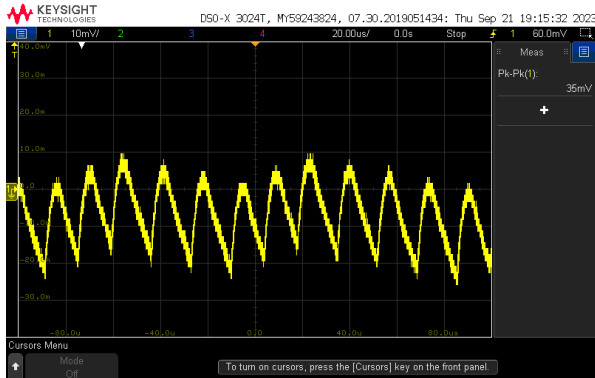
ENVIRONMENT TEST

■ DESIGN VERIFY TEST

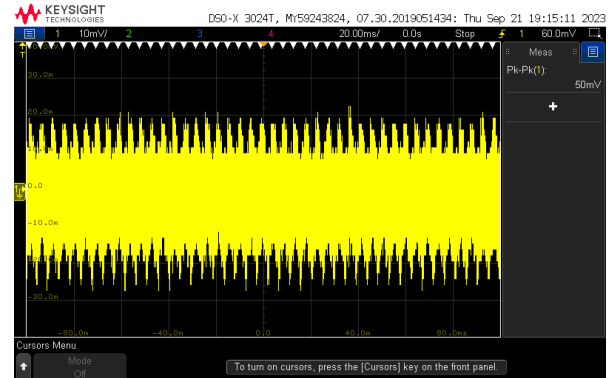
OUTPUT FUNCTION TEST

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: -0.16%~0.16%
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: -0.16%~0.16%
4	OVER/UNDERSHOOT TEST	<± 5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	0.7%
5	RIPPLE & NOISE (Max)	V1: 240mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 35mVp-p / high frequency 50mVp-p / low frequency

high frequency :



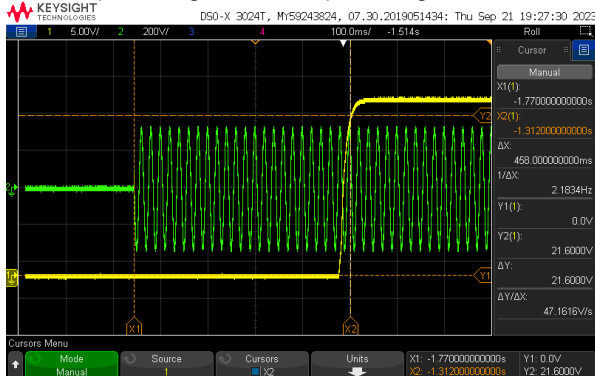
low frequency :



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/458ms 115VAC/962ms
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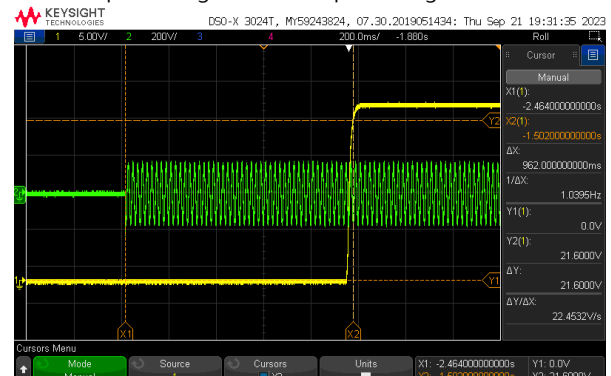
INPUT=230VAC/50HZ @ FULL LOAD

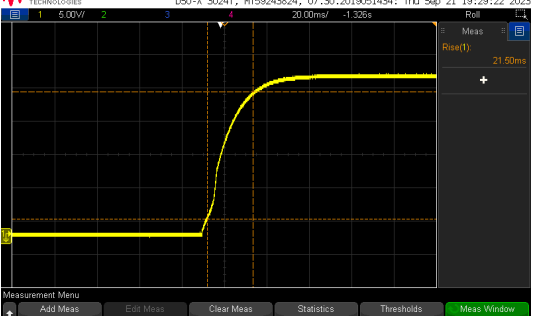
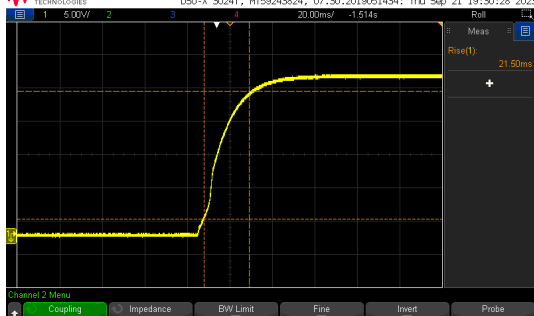
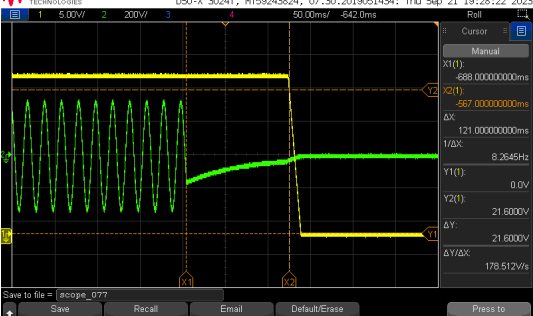
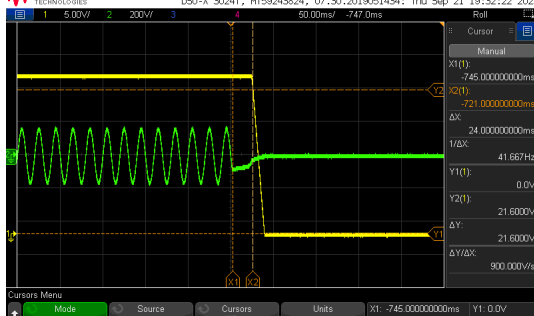
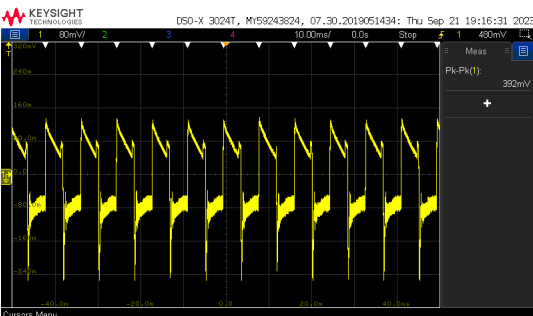
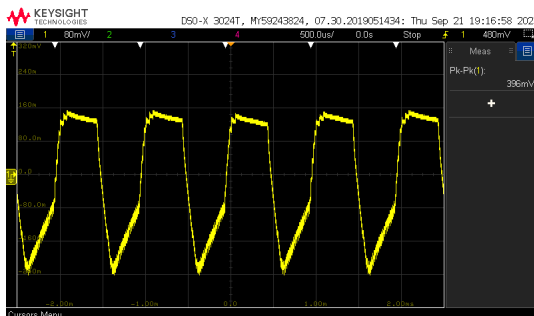
CH1: Output Voltage CH3: AC Input Voltage



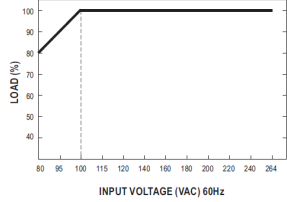
INPUT=115VAC/60HZ @ FULL LOAD

CH1: Output Voltage CH3: AC Input Voltage

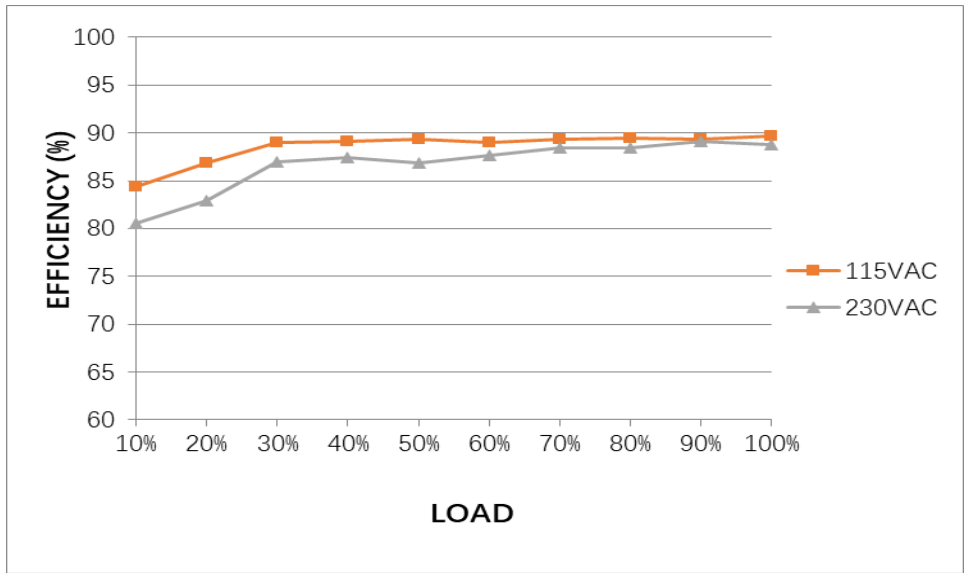


7	RISE TIME (Max)	230VAC/30ms 115VAC/30ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 21.5ms 115VAC/ 21.5ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1: Output Voltage</p> 		
8	HOLD UP TIME (Typ.)	230VAC/30ms 115VAC/10ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 121ms 115VAC/ 24.0ms
<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: 2400mVp-p	I/P: 230VAC O/P: (1) FULL/0% LOAD 50%DUTY/ 120HZ (2) FULL/0% LOAD 50%DUTY / 1KHZ Ta:25°C	392mVp-p 396mVp-p
<p>FULL /0% LOAD 50%DUTY / 120HZ</p> 		<p>FULL /0% LOAD 50%DUTY / 1KHZ</p> 		
10	TRANSIENT RECOVERY TIME	V1: 2400mVp-p < 500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	133mVp-p 0us

INPUT FUNCTION TEST

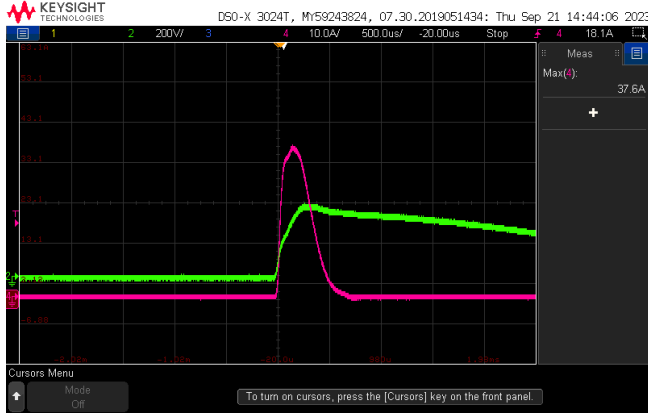
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	80VAC~264VAC 113VDC~ 370VDC 	(1) I/P: TESTING O/P: FULL LOAD/ 80% LOAD (2) I/P: DC TESTING (L: + N:-) O/P: FULL LOAD/ 80% LOAD (3) I/P: DC TESTING (L: - N: +) O/P: FULL LOAD/ 80% LOAD Ta:25°C I/P: HIGH-LINE+15%=300 V O/P:FULL LOAD /MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	(1) 71.1V~264V/ FULL LOAD 70.1V~264V/ 80% LOAD (2) 98.65Vdc~370Vdc/FULL LOAD 98.63Vdc~370Vdc/80% LOAD (3) 98.65Vdc~370Vdc/FULL LOAD 98.63Vdc~370Vdc/80% LOAD
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 =0.18A/ 230VAC I =0.27A/ 115VAC
4	LEAKAGE CURRENT	Touch current : < 100uA / 264 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	47.6uA
5	NO LOAD CONSUMPTION	< 0.075W/240V	I/P : 240VAC O/P : NO LOAD Ta : 25°C	53.1mW
6	EFFICIENCY(Typ.)	88.5%	I/P:230VAC O/P:FULL LOAD Ta:25°C	88.98%/230VAC

EFFICIENCY vs LOAD

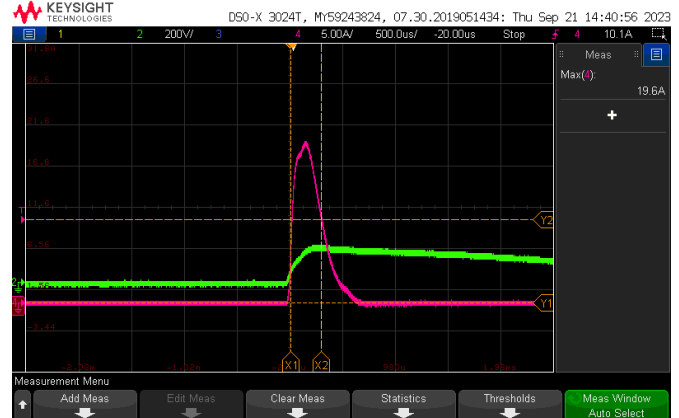


7	INRUSH CURRENT(Typ.)	230V/80A 115V/40A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =37.6A/ 230VAC I =19.6A/ 115VAC T50=310us/230V
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INPUT=230VAC/50HZ @ FULL LOAD
CH1: AC Input Voltage CH4: Input current



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	125.4%/ 264VAC 125.4%/ 230VAC 130.2%/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" style="font-size: small;"> <tr> <td>5V_{max}</td> <td>9V_{max}</td> <td>12V_{max}</td> <td>15V_{max}</td> <td>18V_{max}</td> <td>24V_{max}</td> </tr> <tr> <td>80mA_{max}</td> <td>50mA_{max}</td> <td>35mA_{max}</td> <td>30mA_{max}</td> <td>25mA_{max}</td> <td>26mA_{max}</td> </tr> </table>	5V _{max}	9V _{max}	12V _{max}	15V _{max}	18V _{max}	24V _{max}	80mA _{max}	50mA _{max}	35mA _{max}	30mA _{max}	25mA _{max}	26mA _{max}	I/P: TESTING O/P: MIN LOAD Ta:25°C	27.71V(DC Source 限流 30mA) Protection type: Clamp by zener diode
5V _{max}	9V _{max}	12V _{max}	15V _{max}	18V _{max}	24V _{max}											
80mA _{max}	50mA _{max}	35mA _{max}	30mA _{max}	25mA _{max}	26mA _{max}											
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) 533V (2) 505V (3) 533V (4) 529V (5) 533V (6) 533V (7) 529V
2	Diode Peak Voltage	D100 Rated: 5A/150V	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) 118.5V (2) 131.4V (3) 119.3V (4) 119.3V (5) 118.5V (6) 118.5V (7) 118.5V (8) 118.5V
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) 380 V (3) 380 V (4) 380 V
4	Control IC Voltage Test	PWM IC U3 Rated: 8V~ 26.5V	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) 8.5V

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) 477V
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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: 0.54mA 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 : NGE12U24-P1J 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 26.5 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 45.1 °C																																																																																																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 26.5°C</th> <th>HIGH AMBIENT Ta=45.1°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>D2</td><td>52.4°C</td><td>71.5°C</td></tr> <tr><td>2</td><td>R40</td><td>57.6°C</td><td>76.7°C</td></tr> <tr><td>3</td><td>BD1</td><td>56.8°C</td><td>75.9°C</td></tr> <tr><td>4</td><td>R7</td><td>63.6°C</td><td>82.7°C</td></tr> <tr><td>5</td><td>C8</td><td>63.5°C</td><td>82.6°C</td></tr> <tr><td>6</td><td>R8</td><td>64.8°C</td><td>83.9°C</td></tr> <tr><td>7</td><td>D5</td><td>67.1°C</td><td>86.2°C</td></tr> <tr><td>8</td><td>Q1</td><td>72.6°C</td><td>91.7°C</td></tr> <tr><td>9</td><td>C49</td><td>68.6°C</td><td>87.7°C</td></tr> <tr><td>10</td><td>R42</td><td>66.7°C</td><td>85.8°C</td></tr> <tr><td>11</td><td>U2</td><td>53.4°C</td><td>72.5°C</td></tr> <tr><td>12</td><td>D100</td><td>70.9°C</td><td>90.0°C</td></tr> <tr><td>13</td><td>R102</td><td>73.3°C</td><td>92.4°C</td></tr> <tr><td>14</td><td>C102</td><td>69.2°C</td><td>88.3°C</td></tr> <tr><td>15</td><td>C105</td><td>56.8°C</td><td>75.9°C</td></tr> <tr><td>16</td><td>C106</td><td>51.8°C</td><td>70.9°C</td></tr> <tr><td>17</td><td>C40</td><td>52.9°C</td><td>72.0°C</td></tr> <tr><td>18</td><td>C1</td><td>43.9°C</td><td>63.0°C</td></tr> <tr><td>19</td><td>LF1</td><td>51.7°C</td><td>70.8°C</td></tr> <tr><td>20</td><td>RTH1</td><td>44.6°C</td><td>63.7°C</td></tr> <tr><td>21</td><td>C5</td><td>53.8°C</td><td>72.9°C</td></tr> <tr><td>22</td><td>U3</td><td>66.2°C</td><td>85.3°C</td></tr> <tr><td>23</td><td>L1</td><td>51.8°C</td><td>70.9°C</td></tr> <tr><td>24</td><td>T1 coil</td><td>62.6°C</td><td>81.7°C</td></tr> <tr><td>25</td><td>T1 core</td><td>61.6°C</td><td>80.7°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 26.5°C	HIGH AMBIENT Ta=45.1°C	1	D2	52.4°C	71.5°C	2	R40	57.6°C	76.7°C	3	BD1	56.8°C	75.9°C	4	R7	63.6°C	82.7°C	5	C8	63.5°C	82.6°C	6	R8	64.8°C	83.9°C	7	D5	67.1°C	86.2°C	8	Q1	72.6°C	91.7°C	9	C49	68.6°C	87.7°C	10	R42	66.7°C	85.8°C	11	U2	53.4°C	72.5°C	12	D100	70.9°C	90.0°C	13	R102	73.3°C	92.4°C	14	C102	69.2°C	88.3°C	15	C105	56.8°C	75.9°C	16	C106	51.8°C	70.9°C	17	C40	52.9°C	72.0°C	18	C1	43.9°C	63.0°C	19	LF1	51.7°C	70.8°C	20	RTH1	44.6°C	63.7°C	21	C5	53.8°C	72.9°C	22	U3	66.2°C	85.3°C	23	L1	51.8°C	70.9°C	24	T1 coil	62.6°C	81.7°C	25	T1 core	61.6°C	80.7°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 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) 262075.4 HRS (2) 63287 HRS (3) 95316.9HRS (4) 162390.4HRS	
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