



# Test Report: NGE90U48-P1J

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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

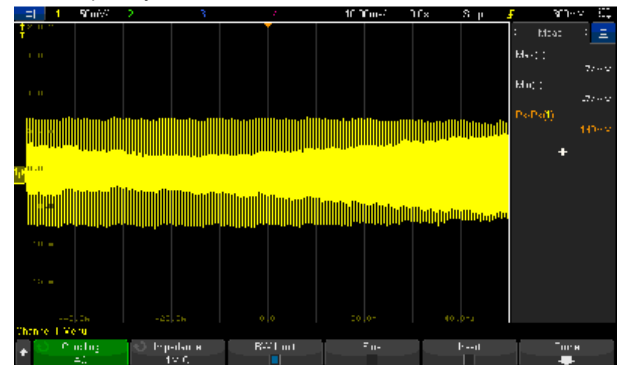
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE	V1: -3%~ +3%	I/P: 80VAC~264VAC O/P:FULL~MIN. LOAD Ta:25°C	V1: -0.107%~0.112%
2	LINE REGULATION	V1: -1%~ +1%	I/P: 80VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.0063%~-0.036%
3	LOAD REGULATION	V1: -2%~ +2%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.107%~0.112%
4	OVER/UNDERSHOOT TEST	<± 5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	1.3%
5	RIPPLE & NOISE (Max )	V1: 240mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 115mVp-p / high frequency 149mVp-p / low frequency

high frequency :



low frequency :

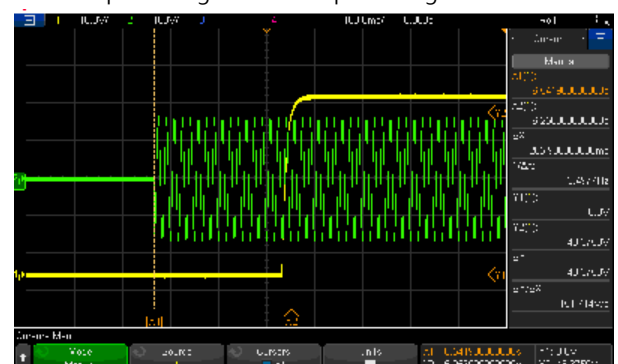


6	SET UP TIME(Max)	230VAC/1000ms 115VAC/1000ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 299.40ms 115VAC/ 285.90ms
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INPUT=230VAC/50HZ @ FULL LOAD  
CH1: Output Voltage CH2: AC Input Voltage



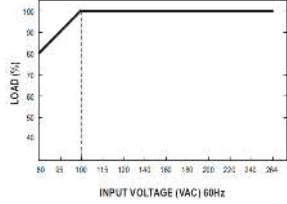
INPUT=115VAC/60HZ @ FULL LOAD  
CH1: Output Voltage CH2: AC Input Voltage



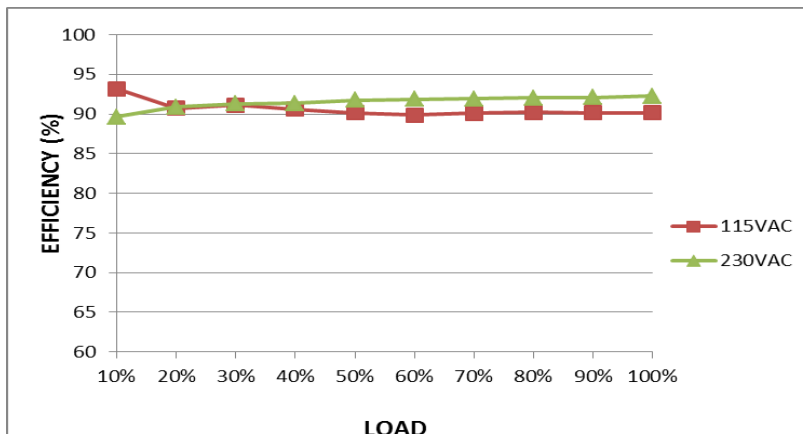
7	RISE TIME (Max)	230VAC/60ms 115VAC/60ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/21.00ms 115VAC/17.81ms
INPUT=230VAC/50HZ @ FULL LOAD		INPUT=115VAC/60HZ @ FULL LOAD		
CH1: Output Voltage		CH1: Output Voltage		
8	HOLD UP TIME (Typ.)	230VAC/30ms 115VAC/10ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 74.6ms 115VAC/ 15.2ms
INPUT=230VAC/50HZ @ FULL LOAD		INPUT=115VAC/60HZ @ FULL LOAD		
CH1: Output Voltage CH2: AC Input Voltage		CH1: Output Voltage CH2: AC Input Voltage		
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	740mVp-p 680mVp-p
FULL /0% LOAD 50%DUTY / 120HZ		FULL /0% LOAD 50%DUTY / 1KHZ		

10	TRANSIENT RECOVERY TIME	V1: 2400mVp-p < 500us	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	418mVp-p 0us
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### 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%=300V O/P:FULL LOAD /MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN ( POWER ON/OFF NO DAMAGE )	(1) 79.4V~264V/ FULL LOAD 79.6V~264V/ 80% LOAD (2) 112.5Vdc~370Vdc/FULL LOAD 112.2Vdc~370Vdc/80% LOAD (3) 112.5Vdc~370Vdc/FULL LOAD 112.2Vdc~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/ 0.9A 115V/ 1.8A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =0.833A/ 230VAC I =1.4599A/ 115VAC
4	LEAKAGE CURRENT	100uA/ 264 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	81.4uA
5	NO LOAD CONSUMPTION	< 0.1W/240V	I/P : 240VAC O/P : NO LOAD Ta : 25°C	0.0715W
6	EFFICIENCY(Typ.)	92%	I/P:230VAC O/P:FULL LOAD Ta:25°C	92.29%/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°C	I =61.8A/ 230VAC I =29.7A/ 115VAC T50=520us/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: Shut down and latch off o/p voltage, re-power on to recover.	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P:TESTING Ta:25°C	124.91%/ 264VAC 132.70%/ 230VAC 124.71%/100VAC PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover.
2	OVER VOLTAGE PROTECTION	52.8V~64.8V Protection type: Shout down O/P vltage, re-power on to removed	I/P: 264VAC I/P: 80VAC O/P:MIN LOAD Ta:25°C	56.6V/ 264VAC 56.6V/ 80VAC PROTECTION TYPE : Shout down O/P vltage, re-power on to removed
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Protection type: Shut down and latch off o/p voltage, re-power on to recover.	I/P: 264VAC I/P: 80VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE OK PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover.

### 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) 555V (2) 551V (3) 555V

			<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) 555V</p> <p>(5) 551V</p> <p>(6) 555V</p> <p>(7) 567V</p>
2	Diode Peak Voltage	D101 Rated: 20A/300V	<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>D101:</p> <p>VDS:</p> <p>(1) 219V</p> <p>(2) 212V</p> <p>(3) 221V</p> <p>(4) 221V</p> <p>(5) 221V</p> <p>(6) 221V</p> <p>(7) 221V</p> <p>(8) 221V</p>
3	Input Capacitor Voltage	C5 Rated: 150μ /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) 378V</p> <p>(2) 378V</p> <p>(3) 378V</p> <p>(4) 374V</p>
4	Control IC Voltage Test	PWM IC U2 Rated: 9V~ 28V	<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) O.V.P</p> <p>(5) NO LOAD VRmin (LOW LINE)</p> <p>Ta:25°C</p>	<p>U2</p> <p>(1) 18.09V</p> <p>(2) 18.05V</p> <p>(3) 18.01V</p> <p>(4) 20.02V</p> <p>(5) 17.37V</p>
5	Clamp Diode Peak Voltage	D1 Rated : 620V/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) 483V</p> <p>(2) 483V</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: 1.633mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 600 VDC Ta:25°C	I/P-O/P: 9999MΩ 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, GB/T 9254.1-2021 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	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°C	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°C	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°C	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°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 : NGE90U48-P1J 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 27.3 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 40.0 °C																																																																																																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=27.3 °C</th> <th>HIGH AMBIENT Ta=40.0 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTH1</td><td>82.7°C</td><td>92.9°C</td></tr> <tr><td>2</td><td>R4</td><td>75.4°C</td><td>86.0°C</td></tr> <tr><td>3</td><td>LF1</td><td>68.0°C</td><td>80.3°C</td></tr> <tr><td>4</td><td>ZNR1</td><td>62.2°C</td><td>75.0°C</td></tr> <tr><td>5</td><td>C1</td><td>62.5°C</td><td>75.5°C</td></tr> <tr><td>6</td><td>LF2</td><td>61.6°C</td><td>74.8°C</td></tr> <tr><td>7</td><td>BD1</td><td>70.8°C</td><td>83.3°C</td></tr> <tr><td>8</td><td>C5</td><td>70.8°C</td><td>83.2°C</td></tr> <tr><td>9</td><td>D1</td><td>83.4°C</td><td>96.0°C</td></tr> <tr><td>10</td><td>D3</td><td>83.2°C</td><td>95.8°C</td></tr> <tr><td>11</td><td>RTH2</td><td>76.3°C</td><td>88.8°C</td></tr> <tr><td>12</td><td>C11</td><td>75.3°C</td><td>87.8°C</td></tr> <tr><td>13</td><td>T1 coil</td><td>84.0°C</td><td>96.2°C</td></tr> <tr><td>14</td><td>T1core</td><td>77.3°C</td><td>89.5°C</td></tr> <tr><td>15</td><td>D101</td><td>86.3°C</td><td>98.2°C</td></tr> <tr><td>16</td><td>C105</td><td>71.1°C</td><td>83.3°C</td></tr> <tr><td>17</td><td>C107</td><td>64.4°C</td><td>76.7°C</td></tr> <tr><td>18</td><td>R101</td><td>83.9°C</td><td>95.9°C</td></tr> <tr><td>19</td><td>U3</td><td>65.1°C</td><td>77.4°C</td></tr> <tr><td>20</td><td>Q1</td><td>83.3°C</td><td>96.3°C</td></tr> <tr><td>21</td><td>D2</td><td>79.6°C</td><td>92.2°C</td></tr> <tr><td>22</td><td>U1</td><td>59.1°C</td><td>71.8°C</td></tr> <tr><td>23</td><td>U2</td><td>74.1°C</td><td>86.5°C</td></tr> <tr><td>24</td><td>R27</td><td>75.1°C</td><td>87.7°C</td></tr> <tr><td>25</td><td>CASE</td><td>60.7°C</td><td>71.9°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=27.3 °C	HIGH AMBIENT Ta=40.0 °C	1	RTH1	82.7°C	92.9°C	2	R4	75.4°C	86.0°C	3	LF1	68.0°C	80.3°C	4	ZNR1	62.2°C	75.0°C	5	C1	62.5°C	75.5°C	6	LF2	61.6°C	74.8°C	7	BD1	70.8°C	83.3°C	8	C5	70.8°C	83.2°C	9	D1	83.4°C	96.0°C	10	D3	83.2°C	95.8°C	11	RTH2	76.3°C	88.8°C	12	C11	75.3°C	87.8°C	13	T1 coil	84.0°C	96.2°C	14	T1core	77.3°C	89.5°C	15	D101	86.3°C	98.2°C	16	C105	71.1°C	83.3°C	17	C107	64.4°C	76.7°C	18	R101	83.9°C	95.9°C	19	U3	65.1°C	77.4°C	20	Q1	83.3°C	96.3°C	21	D2	79.6°C	92.2°C	22	U1	59.1°C	71.8°C	23	U2	74.1°C	86.5°C	24	R27	75.1°C	87.7°C	25	CASE	60.7°C	71.9°C
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 134.50% 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 40°C/95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 40°C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C(0~45°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.008 %/°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	-30~40°C	1. Thermal shock Temperature : -35°C~ +45°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= 40 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 40 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 40 °C LIFE TIME	(1) 149536.7 HRS (2) 54733.6 HRS (3) 105827.7 HRS (4) 205712.8 HRS	
10	MTBF	Conducted by Parts Stress Analysis Prediction 605.3 Khrs min. MIL-HDBK-217F (25°C) 5120.6 Khrs min. Telcordia TR/SR-332(Bellcore) (25°C)		
11	Ongoing Reliability Test	I/P : 230VAC O/P : 100% 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