



# Test Report: GST40A15-P1J

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40W AC-DC Reliable Green Industrial Adaptor

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection 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	VERDICT
1	RIPPLE & NOISE(Max)	V1: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 42.0mVp-p	P
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -3%~ 3%	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -0.335 %~ 0.335 %	P
3	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0 %~ 0.04 %	P
4	LOAD REGULATION(Max)	V1: -3%~ 3%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.335 %~ 0.335 %	P
5	SET UP TIME(Max)	230VAC/1000ms 115VAC/1000ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 135.685 ms 115VAC/ 216.008 ms	P
6	RISE TIME (Max)	230VAC/50ms 115VAC/50ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 23.190 ms 115VAC/ 23.045 ms	P
7	HOLD UP TIME(Typ)	230VAC/50ms 115VAC/15ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 135.218 ms 115VAC/ 27.418 ms	P
8	OVER/UNDERSHOOT TEST	< +5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	< +5%	P
9	DYNAMIC LOAD	V1: 1500mVp-p	I/P: 230VAC O/P(1)FULL /Min LOAD 90%DUTY / 1KHZ (2) (1)FULL /Min LOAD 90%DUTY / 3KHZ (3)FULL /Min LOAD 90%DUTY / 5KHZ (4)FULL /Min LOAD 50%DUTY / 120HZ Ta:25°C	(1)480mVp-p (2)240mVp-p (3)241mVp-p (4)550mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
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1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	64.243 V~264V	P
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230Vac ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3)230Vac ON:3Sec OFF:3Sec 12HOURS (POWER ON/OFF NO DAMAGE)	TEST:OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:100 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
4	EFFICIENCY(TYP)	90%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	90.50%	P
5	INPUT CURRENT (Typ)	230V/ 0.5A 115V/ 1A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.317A/ 230VAC I = 0.620A/ 115VAC	P
6	INRUSH CURRENT(Typ)	230V/65A 115V/35A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =44.265A/ 230VAC I =23.465A/ 115VAC	P
7	LEAKAGE CURRENT	< 0.75 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.396 mA N-FG : 0.396 mA	P
8	NO LOAD CONSUMPTION	< 0.075 W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25°C	< 0.0268 W < 0.0268 W	P

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~ 150%	I/P: 230VAC I/P: 115VAC O/P: TESTING Ta: 25°C	140.07%/ 230VAC 136.33%/115VAC Protection type : Hiccup mode, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH: 15.7V~20.3V	I/P: 230VAC I/P: 115VAC O/P: MIN LOAD Ta: 25°C	20.0V/ 230VAC 20.1V/115VAC Protection type : Shut down o/p voltage, re-power on to recover	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup Mode	P

**COMPONENT STRESS TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 6A/ 800 V	I/P: High-Line +3V = 267V AC ON/OFF VDS: O/P: (1) Full Load (2) Output Short (3) Full Load Continue Ta: 25°C	VDS (1) 584V (2) 454V (3) 566V	P
2	Diode Peak Voltage	Q100 Rated : 20A/ 100 V	I/P: High-Line +3V = 267 V AC ON/OFF O/P: (1) Full Load (2) Output Short (3) Dynamic Load 100% Load/ Min. Load 50% Duty/120Hz (4) 0% → 400% Load. Ta: 25°C	Q100: (1) 53.8 V (2) 38.4V (3) 53.8V (4) 53.6V	P
3	Input Capacitor Voltage	C5 Rated: : 120 μ / 400V 105°C	I/P: High-Line +3V = 267 V O/P: (1) Full Load input on/off (2) Min load input on /Off (3) Full Load /Min load Change Ta: 25°C	(1) 356V (2) 358V (3) 358V	P
4	Control IC Voltage Test	PWM IC U1 Rated : 30V -0.4V(MIN.)	I/P: High-Line +3V = 267 V AC ON/OFF O/P: (1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P. (5) NO LOAD VR MIN LOW LINE Ta: 25°C	(1) 26.3V (2) 26.1V (3) 26.2V (4) 15.0V (5) 20.2V	P
5	Clamp Diode Peak Voltage	D1 Rated : 1000V 1A	I/P : High-Line +3V = 267 V AC ON/OFF O/P : (1) Dynamic Load 90% Duty/1KHz (2) Full load continue Ta : 25°C	(1) 552 V (2) 532 V	P

**SAFETY TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
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1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG :2KVAC/min O/P-FG:0.5KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:0.6 KVAC/min Ta:25°C	I/P-O/P:1.404mA I/P-FG:3.443mA O/P-FG:0.463mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 9999MΩ I/P-FG: 9999MΩ O/P-FG: 9999MΩ NO DAMAGE	P

### E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	BS EN/EN61000-3-2,GB9254 CLASS A	I/P:230VAC/50HZ O/P:100%OAD Ta:25°C	PASS	P
2	CONDUCTION	BS EN/EN55032(CISPR32), FCC PART 15 / CISPR22 CAN ICES-3(B)/NMB-3(B),CNS13438,GB17625.1 EAC TP TC 020,MSIP KN32 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	BS EN/EN55032(CISPR32), FCC PART 15 / CISPR22 CAN ICES-3(B)/NMB-3(B),CNS13438,GB17625.1 EAC TP TC 020,MSIP KN32 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	BS EN/EN61000-4-2 LIGHT INDUSTRY AIR : 15KV / Contact : 8KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	BS EN/EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	BS EN/EN61000-4-5 LIGHT INDUSTRY L-N : 1KV L,N-PE : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

## ■ RELIABILITY TEST

## ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																				
1	TEMPERATURE RISE TEST	MODEL : GST40A24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 17.5 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 47.5 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 17.5 °C</th> <th>HIGH AMBIENT Ta= 47.5 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>39.3°C</td><td>70.9°C</td></tr> <tr><td>2</td><td>LF2</td><td>42.3°C</td><td>73.5°C</td></tr> <tr><td>3</td><td>BD1</td><td>47.7°C</td><td>77.5°C</td></tr> <tr><td>4</td><td>C5</td><td>42.3°C</td><td>73.7°C</td></tr> <tr><td>5</td><td>C15</td><td>45.3°C</td><td>77.3°C</td></tr> <tr><td>6</td><td>R22</td><td>42.6°C</td><td>74.0°C</td></tr> <tr><td>7</td><td>T1</td><td>49.1°C</td><td>80.3°C</td></tr> <tr><td>8</td><td>Q1</td><td>42.2°C</td><td>74.7°C</td></tr> <tr><td>9</td><td>C104</td><td>38.9°C</td><td>70.8°C</td></tr> <tr><td>10</td><td>U1</td><td>41.6°C</td><td>72.9°C</td></tr> <tr><td>11</td><td>D1</td><td>57.3°C</td><td>90.9°C</td></tr> <tr><td>12</td><td>R6</td><td>61.0°C</td><td>92.4°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 17.5 °C	HIGH AMBIENT Ta= 47.5 °C	1	LF1	39.3°C	70.9°C	2	LF2	42.3°C	73.5°C	3	BD1	47.7°C	77.5°C	4	C5	42.3°C	73.7°C	5	C15	45.3°C	77.3°C	6	R22	42.6°C	74.0°C	7	T1	49.1°C	80.3°C	8	Q1	42.2°C	74.7°C	9	C104	38.9°C	70.8°C	10	U1	41.6°C	72.9°C	11	D1	57.3°C	90.9°C	12	R6	61.0°C	92.4°C		P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 120 % LOAD Ta : 25°C	TEST : OK	P																																																				
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30 °C	TEST : OK	P																																																				
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50.1 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																				
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.004 %/°C (0~50°C)	P																																																				
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40°C~ +85°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P																																																				
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30°C~ +70°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 : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P																																																				
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	P																																																				



9	CAPACITOR LIFE CYCLE	SUPPOSE C104 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= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME	(1) 500068HRS (2) 89027HRS (3) 128547HRS (4) 131216HRS	P
10	MTBF	3493.6K hrs min. Telcordia SR-332 (Bellcore) ; 728.2K hrs min. MIL-HDBK-217F (25°C)		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C		P

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ

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