



# Test Report: GST120A20-R7B

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120W 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)	V1:150mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 34.9mVp-p	P
3	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -5%~ 5%	I/P: 85VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -1.04%~ 1.01%	P
4	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 85VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.03%~ 0%	P
5	LOAD REGULATION(Max)	V1: -4%~ 4%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -1.04%~ 1.01%	P
6	SET UP TIME(Max)	230VAC/2000ms 115VAC/2500ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 343.318ms 115VAC/ 642.832ms	P
7	RISE TIME (Max)	230VAC/30ms 115VAC/30ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 21.795ms 115VAC/ 21.784ms	P
8	HOLD UP TIME(Typ)	230VAC/20ms 115VAC/20ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 41.485ms 115VAC/ 25.154ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	< ±5%	P
10	DYNAMIC LOAD	V1: 2000mVp-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	932mVp-p 998mVp-p 1030mVp-p 1020mVp-p	P

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
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1	INPUT VOLTAGE RANGE	85VAC~264VAC 120VDC~370VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD Ta:25°C	(1) 62.187V~264V (2) 110.9Vdc~370Vdc/FULL LOAD 110.9Vdc~370Vdc/50% LOAD (3) 110.9Vdc~370Vdc/FULL LOAD 110.9Vdc~370Vdc/50% LOAD	P
			I/P: (1)LOW-LINE-3V=82 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:85 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
3	POWER FACTOR(TYP)	0.93/ 230VAC 0.97/115VAC	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.941/230VAC PF= 0.988/115VAC	P
4	EFFICIENCY(TYP)	90%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	91.08%	P
5	INPUT CURRENT (Typ)	230V/ 0.7A 115V/ 1.4A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.597A/ 230VAC I = 1.153A/ 115VAC	P
6	INRUSH CURRENT(Typ)	230VAC/70A 115VAC/35A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 46.664A/ 230VAC I = 24.122A/ 115VAC	P
7	LEAKAGE CURRENT	< 0.75 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.413mA N-FG : 0.413mA	P
8	NO LOAD CONSUMPTION	< 0.15 W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25°C	< 0.0607W < 0.0960W	P

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~ 160%	I/P: 230VAC I/P: 115VAC O/P: TESTING Ta:25°C	139.33%/ 230VAC 130.67%/115VAC Protection type : Hiccup mode, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH:21V~27V	I/P: 230VAC I/P: 115VAC O/P: MIN LOAD Ta:25°C	24.5V/ 230VAC 24.3V/ 115VAC Protection type : Shut down o/p voltage, re-power on to recover	P
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recover	P
4	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) <b>Peak Voltage</b>	Q32 Rated 11A/700V	I/P: High-Line +3V =267V AC ON/OFF O/P: (1) Full Load (2) Output Short (3) Full Load Continue Ta:25°C	(1) 592V (2) 486V (3) 612V	P
2	Diode <b>Peak Voltage</b>	Q102 Rated 75A/120V	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1) Full Load (2) Output Short (3) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25°C	Q101: (1) 107V (2) 94.4V (3) 114V (4) 119V	P
3	Input Capacitor Voltage	C5 Rated: : 120u/420V 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) 405V (2) 408V (3) 406V	P
4	Control IC Voltage Test	PWM IC U1 Rated 28 V	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1) FULL LOAD (2) Output Short (3) NO LOAD VR MIN LOW LINE Ta:25°C	(1) 20.7V (2) 15.2V (3) 19.4V	P
6	P.F.C Transistor ( D to S) or (C to E) <b>Peak Voltage</b>	Q31 Rated 15.8A/600V	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1) Full Load (2) Output Short (3) Full Load Continue	(1) 446V (2) 424V (3) 462V	P

				Ta:25°C			
7	P.F.C DIODE	D1	Rated 9A/600V	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 Ta:25°C	(1) 434V (2) 412V (3) 438V	P	
8	Clamp Diode Peak Voltage	D30	Rated : 800V/ 3A	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) 542 V	P	

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min	I/P-O/P: 3.6 KVAC/min Ta:25°C	I/P-O/P: 3.185mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25°C	I/P-O/P: 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%,75%,50%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 : GST120A24-R7B 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=24.7°C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=44.4 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=24.7°C</th> <th>HIGH AMBIENT Ta=44.4°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>ZNR1</td><td>61.5°C</td><td>77.1°C</td></tr> <tr><td>2</td><td>RTH30</td><td>68.1°C</td><td>85.0°C</td></tr> <tr><td>3</td><td>LF2</td><td>62.1°C</td><td>79.0°C</td></tr> <tr><td>4</td><td>L1</td><td>62.8°C</td><td>79.5°C</td></tr> <tr><td>5</td><td>L2</td><td>64.2°C</td><td>81.1°C</td></tr> <tr><td>6</td><td>D6</td><td>65.4°C</td><td>81.9°C</td></tr> <tr><td>7</td><td>D30</td><td>75.9°C</td><td>92.2°C</td></tr> <tr><td>8</td><td>C5</td><td>67.1°C</td><td>83.1°C</td></tr> <tr><td>9</td><td>C52</td><td>74.6°C</td><td>90.9°C</td></tr> <tr><td>10</td><td>T1</td><td>85.0°C</td><td>101.5°C</td></tr> <tr><td>11</td><td>BD1</td><td>64.1°C</td><td>80.5°C</td></tr> <tr><td>12</td><td>D1</td><td>65.1°C</td><td>81.6°C</td></tr> <tr><td>13</td><td>Q31</td><td>65.2°C</td><td>82.0°C</td></tr> <tr><td>14</td><td>Q32</td><td>66.7°C</td><td>83.5°C</td></tr> <tr><td>15</td><td>Q102</td><td>69.3°C</td><td>86.1°C</td></tr> <tr><td>16</td><td>C110</td><td>69.0°C</td><td>85.5°C</td></tr> <tr><td>17</td><td>LF1</td><td>62.8°C</td><td>78.7°C</td></tr> <tr><td>18</td><td>U2</td><td>71.2°C</td><td>85.9°C</td></tr> <tr><td>19</td><td>D33</td><td>82.1°C</td><td>100.6°C</td></tr> <tr><td>20</td><td>CASE</td><td>53.5°C</td><td>70.3°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=24.7°C	HIGH AMBIENT Ta=44.4°C	1	ZNR1	61.5°C	77.1°C	2	RTH30	68.1°C	85.0°C	3	LF2	62.1°C	79.0°C	4	L1	62.8°C	79.5°C	5	L2	64.2°C	81.1°C	6	D6	65.4°C	81.9°C	7	D30	75.9°C	92.2°C	8	C5	67.1°C	83.1°C	9	C52	74.6°C	90.9°C	10	T1	85.0°C	101.5°C	11	BD1	64.1°C	80.5°C	12	D1	65.1°C	81.6°C	13	Q31	65.2°C	82.0°C	14	Q32	66.7°C	83.5°C	15	Q102	69.3°C	86.1°C	16	C110	69.0°C	85.5°C	17	LF1	62.8°C	78.7°C	18	U2	71.2°C	85.9°C	19	D33	82.1°C	100.6°C	20	CASE	53.5°C	70.3°C		P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 136% 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 CONTROL45°C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 45 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																				
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0~45°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.009%/°C (0~45°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 : 12min/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 C110 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) 145886HRS (2) 45558HRS (3) 80925HRS (4) 121817HRS	P
10	MTBF	2250.5K hrs min. Telcordia SR-332 (Bellcore) ; 368.5K 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	APPROVAL
PASS	Frank	Wangdz

2007/3/20 A50-S014