



Test Report: GST120A12-R7B

120W AC-DC High Reliability 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℃	V1: 59.4mVp-p	P
3	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -5%~ 5%	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25℃	V1: -1.45%~ 1.45%	P
4	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: 0%~ 0%	P
5	LOAD REGULATION(Max)	V1: -5%~ 5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -1.45%~ 1.45%	P
6	SET UP TIME(Max)	230VAC/2000ms 115VAC/2500ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	230VAC/ 327.322ms 115VAC/ 547.693ms	P
7	RISE TIME (Max)	230VAC/30ms 115VAC/30ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	230VAC/ 15.846ms 115VAC/ 16.698ms	P
8	HOLD UP TIME(Typ)	230VAC/20ms 115VAC/20ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	230VAC/ 42.548ms 115VAC/ 28.256ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	< ±5%	P
10	DYNAMIC LOAD	V1: 1200mVp-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℃	556mVp-p 528mVp-p 572mVp-p 586mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	100VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	55.181V~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℃	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℃	PF= 0.948/230VAC PF= 0989/115VAC	P
4	EFFICIENCY(TYP)	88.5%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	89.90%	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℃	I = 0.529A/ 230VAC I = 1.008A/ 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℃	I = 44.257A/ 230VAC I = 22.831A/ 115VAC	P
7	LEAKAGE CURRENT	< 0.75 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25℃	L-FG : 0.415mA N-FG : 0.415mA	P
8	NO LOAD CONSUMPTION	< 0.15 W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25℃	< 0.0447W < 0.0891W	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	137.29%/ 230VAC 129.41%/115VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH:12.6V~16.2V	I/P: 230VAC I/P: 115VAC O/P: MIN LOAD Ta:25°C	14.9V/ 230VAC 14.9V/ 115VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p volotage , 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) Peak Voltage	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) 608V (2) 506V (3) 588V	P
2	Diode Peak Voltage	Q102 Rated 80A/75V	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) 67.2V (2) 50.4V (3) 67.6V (4) 68.0V	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) 403V (2) 400V (3) 401V	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) 19.3V (2) 15.2V (3) 17.7V	P
5	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q31 Rated 15.8A/600V	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1) Full Load (2) Output Short	(1) 444V (2) 422V (3) 436V	P

			(3) Full Load Continue Ta:25°C		
6	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) 432V (2) 414V (3) 432V	P
7	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) 556 V (2) 548 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: 3.144mA 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	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:100%,75%,50%OAD Ta:25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 AIR : 15KV / Contact : 8KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 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 : GST120A12-R7B 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=24.6℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=43.4℃ <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=24.6℃</th><th>HIGH AMBIENT Ta=43.4℃</th></tr></thead><tbody><tr><td>1</td><td>ZNR1</td><td>58.4℃</td><td>74.3℃</td></tr><tr><td>2</td><td>RTH1</td><td>70.9℃</td><td>88.7℃</td></tr><tr><td>3</td><td>LF2</td><td>58.8℃</td><td>75.9℃</td></tr><tr><td>4</td><td>L1</td><td>60.3℃</td><td>77.1℃</td></tr><tr><td>5</td><td>L2</td><td>61.4℃</td><td>78.2℃</td></tr><tr><td>6</td><td>D6</td><td>62.3℃</td><td>79.1℃</td></tr><tr><td>7</td><td>D30</td><td>71.9℃</td><td>88.8℃</td></tr><tr><td>8</td><td>C5</td><td>63.0℃</td><td>79.4℃</td></tr><tr><td>9</td><td>LF1</td><td>58.4℃</td><td>74.7℃</td></tr><tr><td>10</td><td>C52</td><td>67.9℃</td><td>84.7℃</td></tr><tr><td>11</td><td>T1</td><td>75.9℃</td><td>93.3℃</td></tr><tr><td>12</td><td>Q32</td><td>65.5℃</td><td>82.6℃</td></tr><tr><td>13</td><td>Q101</td><td>63.3℃</td><td>79.8℃</td></tr><tr><td>14</td><td>C110</td><td>70.1℃</td><td>87.2℃</td></tr><tr><td>15</td><td>BD1</td><td>61.2℃</td><td>77.9℃</td></tr><tr><td>16</td><td>Q31</td><td>63.9℃</td><td>80.8℃</td></tr><tr><td>17</td><td>D1</td><td>64.3℃</td><td>81.3℃</td></tr><tr><td>18</td><td>R63</td><td>75.7℃</td><td>92.6℃</td></tr><tr><td>19</td><td>U2</td><td>63.2℃</td><td>80.1℃</td></tr><tr><td>20</td><td>C12</td><td>60.2℃</td><td>77.0℃</td></tr><tr><td>21</td><td>U3</td><td>66.1℃</td><td>83.3℃</td></tr><tr><td>22</td><td>RTH30</td><td>63.2℃</td><td>80.2℃</td></tr><tr><td>23</td><td>CASE</td><td>51.0℃</td><td>68.1℃</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta=24.6℃	HIGH AMBIENT Ta=43.4℃	1	ZNR1	58.4℃	74.3℃	2	RTH1	70.9℃	88.7℃	3	LF2	58.8℃	75.9℃	4	L1	60.3℃	77.1℃	5	L2	61.4℃	78.2℃	6	D6	62.3℃	79.1℃	7	D30	71.9℃	88.8℃	8	C5	63.0℃	79.4℃	9	LF1	58.4℃	74.7℃	10	C52	67.9℃	84.7℃	11	T1	75.9℃	93.3℃	12	Q32	65.5℃	82.6℃	13	Q101	63.3℃	79.8℃	14	C110	70.1℃	87.2℃	15	BD1	61.2℃	77.9℃	16	Q31	63.9℃	80.8℃	17	D1	64.3℃	81.3℃	18	R63	75.7℃	92.6℃	19	U2	63.2℃	80.1℃	20	C12	60.2℃	77.0℃	21	U3	66.1℃	83.3℃	22	RTH30	63.2℃	80.2℃	23	CASE	51.0℃	68.1℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 135 % LOAD Ta : 25℃	TEST : OK	P																																																																																																
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30℃	TEST : OK	P																																																																																																
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 45℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																																																
5	TEMPERATURE COEFFICIENT	±0.03%/℃ (0~45℃)	I/P : 230 VAC O/P : FULL LOAD	±0.009%/℃ (0~45℃)	P																																																																																																

6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40℃~ +85℃ 2. Temperature change rate : 25℃ / 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℃~ +70℃ 2. Temperature change rate : 25℃ / 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℃	TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C110 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta=25℃ LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=45℃ LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=45℃ LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=45℃ LIFE TIME	(1) 133783HRS (2) 37576HRS (3) 75765HRS (4) 135619HRS	P
10	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE : 368.75KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 45℃		P

TEST RESULT	TESTER	APPROVAL
PASS	Frank	Wangdz

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