



Test Report: GST120A24-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)	V1:180mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	V1: 21.8mVp-p	P
3	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -3%~ 3%	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25℃	V1: -0.68%~ 0.7%	P
4	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: 0%~ 0.025%	P
5	LOAD REGULATION(Max)	V1: -3%~ 3%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.68%~ 0.7%	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/ 346.455ms 115VAC/ 581.485ms	P
7	RISE TIME (Max)	230VAC/30ms 115VAC/30ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	230VAC/ 20.580ms 115VAC/ 21.193ms	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/ 41.847ms 115VAC/ 25.910ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	< ±5%	P
10	DYNAMIC LOAD	V1: 2400mVp-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℃	720mVp-p 852mVp-p 876mVp-p 968mVp-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℃	65.225V~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= 0.944/230VAC PF=0.989 /115VAC	P
4	EFFICIENCY(TYP)	90.5%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	90.51%	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 = 0.599A/ 230VAC I = 1.154A/ 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 = 46.039A/ 230VAC I = 23.565A/ 115VAC	P
7	LEAKAGE CURRENT	< 0.75 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25℃	L-FG : 0.419mA N-FG : 0.419mA	P
8	NO LOAD CONSUMPTION	< 0.15 W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25℃	< 0.0682W < 0.1043W	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	138.2%/ 230VAC 129.4%/115VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH: 25.2V~32.4V	I/P: 230VAC I/P: 115VAC O/P: MIN LOAD Ta: 25°C	29.1V/ 230VAC 29.0V/ 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) 588V (2) 480V (3) 568V	P
2	Diode Peak Voltage	Q102 Rated 104A/150V	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) 132V (2) 118V (3) 137V (4) 142V	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) 394V (2) 398V (3) 405V	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) 21.2V (2) 15.3V (3) 20.9V	P
6	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 (3) Full Load Continue Ta: 25°C	(1) 448V (2) 418V (3) 452V	P

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) 428V (2) 408V (3) 432V	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) 546V (2) 538V	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: 3.179mA 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%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 : GST120A24-R7B 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=24.7℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=44.4 ℃ <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=24.7℃</th><th>HIGH AMBIENT Ta=44.4℃</th></tr></thead><tbody><tr><td>1</td><td>ZNR1</td><td>61.5℃</td><td>77.1℃</td></tr><tr><td>2</td><td>RTH30</td><td>68.1℃</td><td>85.0℃</td></tr><tr><td>3</td><td>LF2</td><td>62.1℃</td><td>79.0℃</td></tr><tr><td>4</td><td>L1</td><td>62.8℃</td><td>79.5℃</td></tr><tr><td>5</td><td>L2</td><td>64.2℃</td><td>81.1℃</td></tr><tr><td>6</td><td>D6</td><td>65.4℃</td><td>81.9℃</td></tr><tr><td>7</td><td>D30</td><td>75.9℃</td><td>92.2℃</td></tr><tr><td>8</td><td>C5</td><td>67.1℃</td><td>83.1℃</td></tr><tr><td>9</td><td>C52</td><td>74.6℃</td><td>90.9℃</td></tr><tr><td>10</td><td>T1</td><td>85.0℃</td><td>101.5℃</td></tr><tr><td>11</td><td>BD1</td><td>64.1℃</td><td>80.5℃</td></tr><tr><td>12</td><td>D1</td><td>65.1℃</td><td>81.6℃</td></tr><tr><td>13</td><td>Q31</td><td>65.2℃</td><td>82.0℃</td></tr><tr><td>14</td><td>Q32</td><td>66.7℃</td><td>83.5℃</td></tr><tr><td>15</td><td>Q102</td><td>69.3℃</td><td>86.1℃</td></tr><tr><td>16</td><td>C110</td><td>69.0℃</td><td>85.5℃</td></tr><tr><td>17</td><td>LF1</td><td>62.8℃</td><td>78.7℃</td></tr><tr><td>18</td><td>U2</td><td>71.2℃</td><td>85.9℃</td></tr><tr><td>19</td><td>D33</td><td>82.1℃</td><td>100.6℃</td></tr><tr><td>20</td><td>CASE</td><td>53.5℃</td><td>70.3℃</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta=24.7℃	HIGH AMBIENT Ta=44.4℃	1	ZNR1	61.5℃	77.1℃	2	RTH30	68.1℃	85.0℃	3	LF2	62.1℃	79.0℃	4	L1	62.8℃	79.5℃	5	L2	64.2℃	81.1℃	6	D6	65.4℃	81.9℃	7	D30	75.9℃	92.2℃	8	C5	67.1℃	83.1℃	9	C52	74.6℃	90.9℃	10	T1	85.0℃	101.5℃	11	BD1	64.1℃	80.5℃	12	D1	65.1℃	81.6℃	13	Q31	65.2℃	82.0℃	14	Q32	66.7℃	83.5℃	15	Q102	69.3℃	86.1℃	16	C110	69.0℃	85.5℃	17	LF1	62.8℃	78.7℃	18	U2	71.2℃	85.9℃	19	D33	82.1℃	100.6℃	20	CASE	53.5℃	70.3℃		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℃	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 CONTROL45℃ 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°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	MIL-HDBK-217F TOTAL FAILURE RATE : 368.75 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 45°C		P-

TEST RESULT	TESTER	APPROVAL
PASS	Frank	Wangdz

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