



# Test Report: GST120A12-R7B

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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°C	V1: 59.4mVp-p	P
3	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -5%~ 5%	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -1.45%~ 1.45%	P
4	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0%~ 0%	P
5	LOAD REGULATION(Max)	V1: -5%~ 5%	I/P: 230VAC O/P:FULL -MIN LOAD Ta:25°C	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°C	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°C	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°C	230VAC/ 42.548ms 115VAC/ 28.256ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	< ±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°C	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°C	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°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= 0.948/230VAC PF= 0.989/115VAC	P
4	EFFICIENCY(TYP)	88.5%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	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°C	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°C	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°C	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°C	< 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			P		
		1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=24.6°C					
		2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=43.4°C					
			NO	Position		ROOM AMBIENT Ta=24.6°C	HIGH AMBIENT Ta=43.4 °C
			1	ZNR1		58.4°C	74.3°C
			2	RTH1		70.9°C	88.7°C
			3	LF2		58.8°C	75.9°C
			4	L1		60.3°C	77.1°C
			5	L2		61.4°C	78.2°C
			6	D6		62.3°C	79.1°C
			7	D30		71.9°C	88.8°C
			8	C5		63.0°C	79.4°C
			9	LF1		58.4°C	74.7°C
			10	C52		67.9°C	84.7°C
			11	T1		75.9°C	93.3°C
			12	Q32		65.5°C	82.6°C
			13	Q101		63.3°C	79.8°C
			14	C110		70.1°C	87.2°C
			15	BD1		61.2°C	77.9°C
			16	Q31		63.9°C	80.8°C
			17	D1		64.3°C	81.3°C
			18	R63		75.7°C	92.6°C
			19	U2		63.2°C	80.1°C
			20	C12		60.2°C	77.0°C
	21	U3	66.1°C	83.3°C			
	22	RTH30	63.2°C	80.2°C			
	23	CASE	51.0°C	68.1°C			
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 135 % 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 45°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	<ol style="list-style-type: none"> <li>1. Thermal shock Temperature : -40°C~ +85°C</li> <li>2. Temperature change rate : 25°C / MIN</li> <li>3. Dwell time low and high temperature : 30 MIN/EACH</li> <li>4. Total test cycle : 5 CYCLE</li> <li>5. Input/Output condition : STATIC</li> </ol>	OK	P
7	THERMAL SHOCK TEST	<ol style="list-style-type: none"> <li>1. Thermal shock Temperature : -30°C~ +70°C</li> <li>2. Temperature change rate : 25°C / MIN</li> <li>3. Dwell time low and high temperature : 30 MIN/EACH</li> <li>4. Total test cycle : 10 CYCLE</li> <li>5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec</li> </ol>	OK	P
8	VIBRATION TEST	<p>1 Carton &amp; 1 Set</p> <ol style="list-style-type: none"> <li>(1) Waveform : Sine Wave</li> <li>(2) Frequency : 10-500Hz</li> <li>(3) Sweep Time : 12min/sweep cycle</li> <li>(4) Acceleration : 2G</li> <li>(5) Test Time : 60min in each axis (X.Y.Z)</li> <li>(6) Ta : 25°C</li> </ol>	TEST : OK	P
9	CAPACITOR LIFE CYCLE	<p>SUPPOSE C110 IS THE MOST CRITICAL COMPONENT</p> <ol style="list-style-type: none"> <li>(1) I/P : 230VAC O/P : FULL LOAD Ta=25°C LIFE TIME</li> <li>(2) I/P : 230VAC O/P : FULL LOAD Ta=45°C LIFE TIME</li> <li>(3) I/P : 230VAC O/P : 75% LOAD Ta=45°C LIFE TIME</li> <li>(4) I/P : 230VAC O/P : 50% LOAD Ta=45°C LIFE TIME</li> </ol>	<ol style="list-style-type: none"> <li>(1) 133783HRS</li> <li>(2) 37576HRS</li> <li>(3) 75765HRS</li> <li>(4) 135619HRS</li> </ol>	P
10	MTBF	<p>MIL-HDBK-217F TOTAL FAILURE RATE : 368.75KHRS</p>		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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