



Test Report: GST280A12-C6P

280W 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: 44.6mVp-p	P
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -5%~ 5%	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -1.914%~ 2.121%	P
3	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.05%~ 0 %	P
4	LOAD REGULATION(Max)	V1: -5%~ 5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -1.914%~ 2.121%	P
5	SET UP TIME(Max)	230VAC/2000ms 115VAC/2000ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 1218.827ms 115VAC/ 1209.423ms	P
6	RISE TIME (Max)	230VAC/20ms 115VAC/20ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 13.051ms 115VAC/ 12.749ms	P
7	HOLD UP TIME(Typ)	230VAC/16ms 115VAC/16ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 17.023ms 115VAC/ 16.466ms	P
8	OVER/UNDERSHOOT TEST	< $\pm 5\%$	I/P: 230VAC O/P:FULL LOAD Ta:25°C	< $\pm 5\%$	P
9	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	956mVp-p 1010mVp-p 1010mVp-p 1100mVp-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℃	71.387 V~264V	P
			I/P: (1)LOW-LINE-3V=97 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)	0.95/ 230VAC 0.98/115VAC	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	PF=0.955/230VAC PF=0.994/115VAC	P
4	EFFICIENCY(TYP)	89.5%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	89.68%	P
5	INPUT CURRENT (Typ)	230V/ 1.5A 115V/ 3A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	I =1.256A/ 230VAC I =2.494A/ 115VAC	P
6	INRUSH CURRENT(Typ)	230VAC/120A 115VAC/60A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	I = 114A/ 230VAC I = 57A/ 115VAC	P
7	LEAKAGE CURRENT	< 1.5 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25℃	L-FG : 0.794 mA N-FG : 0.794 mA	P
8	NO LOAD CONSUMPTION	< 0.5 W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25℃	< 0.37W < 0.43W	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~ 135%	I/P: 230VAC I/P: 115VAC O/P: TESTING Ta:25°C	117.1%/ 230VAC 117.1%/115VAC Hiccup mode, recovers automatically after fault condition is removed.	P
2	OVER VOLTAGE PROTECTION	CH:12.6V~16.2V	I/P: 230VAC I/P: 115VAC O/P: MIN LOAD Ta:25°C	14.7V/ 230VAC 14.6V/115VAC Shunt down o/p voltage, re-power on to recovers	P
3	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shunt down o/p voltage, re-power on to recovers	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta:25°C	Hiccup mode, recovers automatically after fault condition is removed.	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q5 Rated 16A/ 600V	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	(1) 484V (2) 488 V (3) 436V	P
2	Diode Peak Voltage	Q101 Rated 195A/60V	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	Q101: (1) 39.2V (2) 25.2V (3) 31.6V	P
3	Input Capacitor Voltage	C5 Rated: : 220 μ / 450V 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) 434V (2) 440V (3) 440V	P
4	Control IC Voltage Test	PWM IC U900 Rated : 16V 8.85V(MIN.)	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1) FULL LOAD (2) Output Short (3) O.L.P (4) NO LOAD VR MIN LOW LINE Ta:25°C	(1) 15.5V (2) 15.6V (3) 15.6V (4) 14.2V	
6	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 20 A/ 600V	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	(1) 510V (2) 506V (3) 506V	P

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG:2KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG:2.4KVAC/min Ta:25℃	I/P-O/P:3.15mA I/P-FG:2.34mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25℃	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:FULL LOAD Ta:25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25℃	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℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25℃	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℃	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 : GST280A12-C6P 1. ROOM AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta= 19.6 °C 2. HIGH AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta= 39.9°C <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 19.6 °C</th><th>HIGH AMBIENT Ta= 39.9 °C</th></tr></thead><tbody><tr><td>1</td><td>LF2</td><td>62.1 °C</td><td>82.3°C</td></tr><tr><td>2</td><td>L2</td><td>66.0 °C</td><td>86.2°C</td></tr><tr><td>3</td><td>Q2</td><td>69.0 °C</td><td>89.1°C</td></tr><tr><td>4</td><td>BD1</td><td>67.4 °C</td><td>86.5°C</td></tr><tr><td>5</td><td>Q5</td><td>70.1 °C</td><td>90.6°C</td></tr><tr><td>6</td><td>Q6</td><td>69.7 °C</td><td>90.1°C</td></tr><tr><td>7</td><td>L1</td><td>67.5 °C</td><td>87.5°C</td></tr><tr><td>8</td><td>C5</td><td>70.8 °C</td><td>90.9°C</td></tr><tr><td>9</td><td>RTH2</td><td>66.9 °C</td><td>86.7°C</td></tr><tr><td>10</td><td>TI Coil</td><td>77.3 °C</td><td>98.5°C</td></tr><tr><td>11</td><td>Q102</td><td>83.1 °C</td><td>104.1°C</td></tr><tr><td>12</td><td>Q101</td><td>79.4 °C</td><td>100.2°C</td></tr><tr><td>13</td><td>C101</td><td>82.6 °C</td><td>97.2°C</td></tr><tr><td>14</td><td>LF101</td><td>86.9 °C</td><td>108.3°C</td></tr><tr><td>15</td><td>U1</td><td>65.4 °C</td><td>85.2°C</td></tr><tr><td>16</td><td>U900</td><td>67.8 °C</td><td>87.4°C</td></tr><tr><td>17</td><td>U201</td><td>74.1 °C</td><td>94.0°C</td></tr><tr><td>18</td><td>T1core</td><td>81.7 °C</td><td>102.5°C</td></tr><tr><td>19</td><td>CASE</td><td>52.0 °C</td><td>71.3°C</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta= 19.6 °C	HIGH AMBIENT Ta= 39.9 °C	1	LF2	62.1 °C	82.3°C	2	L2	66.0 °C	86.2°C	3	Q2	69.0 °C	89.1°C	4	BD1	67.4 °C	86.5°C	5	Q5	70.1 °C	90.6°C	6	Q6	69.7 °C	90.1°C	7	L1	67.5 °C	87.5°C	8	C5	70.8 °C	90.9°C	9	RTH2	66.9 °C	86.7°C	10	TI Coil	77.3 °C	98.5°C	11	Q102	83.1 °C	104.1°C	12	Q101	79.4 °C	100.2°C	13	C101	82.6 °C	97.2°C	14	LF101	86.9 °C	108.3°C	15	U1	65.4 °C	85.2°C	16	U900	67.8 °C	87.4°C	17	U201	74.1 °C	94.0°C	18	T1core	81.7 °C	102.5°C	19	CASE	52.0 °C	71.3°C	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 111 % 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= -35 °C	TEST : OK	P																																																																																
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 40.6 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0~40°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.03 %/°C (0~40°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℃~ +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	TEST : 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 C 101 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= 40 ℃ LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 40 ℃ LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 40℃ LIFE TIME	(1) 39747HRS (2) 32776HRS (3) 59437HRS (4) 212679HRS	P
10	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE : 181.24 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 40℃		P

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ

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