



Test Report: GST280A24-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	V1 : 200mVp-p	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 25.6mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1 : 3%~ -3 %	I/P : 100 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : 1.1%~-1.1%	P
3	LINE REGULATION	V1 : 1 %~ -1 %	I/P : 100VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0.03%~-0.03%	P
4	LOAD REGULATION	V1 : 3 %~ -3 %	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : 1.1%~-1.1%	P
5	SET UP TIME	230VAC : 2000ms 115VAC : 2000ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 418ms 115VAC/ 980ms	P
6	RISE TIME	230VAC : 20ms 115VAC : 20ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 13ms 115VAC/ 14ms	P
7	HOLD UP TIME	230VAC : 16ms 115VAC : 16ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 19ms 115VAC/ 19ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5%	P
9	DYNAMIC LOAD	V1 : 2400mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 90%DUTY/ 3KHZ (3).O/P : FULL /Min LOAD 90%DUTY/ 5KHZ (4).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1)732 mVp-p (2)708 mVp-p (3)668 mVp-p (4)1060mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	100VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C I/P : LOW-LINE-3V= 97V HIGH-LINE+15%=300 V O/P : FULL/MIN LOAD ON : 30 Sec. OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	68V~264V TEST : OK	P
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 100VAC ~ 264 VAC O/P : FULL -MIN LOAD Ta : 25°C	TEST : OK	P
3	POWER FACTOR	0.95/ 230 VAC 0.98/ 115 VAC	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF=0.972/ 230 VAC PF=0.997/ 115 VAC	P
4	EFFICIENCY	93%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	93.21%	P
5	INPUT CURRENT	230V/ 1.5A 115V/ 3A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I=1.32A/ 230 VAC I=2.65A/ 115 VAC	P
6	INRUSH CURRENT	230VAC/ 120A 230VAC/ 60A COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I=110A/ 230 VAC I=56A/ 115 VAC	P
7	LEAKAGE CURRENT	<1.5mA / 240 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.86mA N-FG : 0.80mA	P
8	NO LOAD CONSUMPTION	<0.5W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25°C	< 0.45 W < 0.42W	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105% ~ 135 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	118.8 %/ 230 VAC 118.8 %/ 115 VAC Hiccup mode, recovers automatically after fault condition is removed.	P
2	OVER VOLTAGE PROTECTION	CH1 : 25.2V-32.4V rated output voltage	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	28.8V/ 230 VAC 28.8V/ 115 VAC 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 : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed.	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 5 Rated : 16A/600V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1)436V (2)442V (3)432V	P
2	Diode Peak Voltage	Q102 Rated : 80A/75V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1)70V (2)19.2V (3)67.2V	P
4	Input Capacitor Voltage	C 5 Rated : 220u/450V 105°C	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1)424V (2)434V (3)436V	P
5	Control IC Voltage Test	U900 Rated : 8.85V 16V(MIN)	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1)15.3V (2)15.3V (3)14.4V	P
6	Power Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated : 20A/600V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1)448V (2)452V (3)440V	P

■ SAFETY & E.M.C. TEST

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°C	I/P-O/P : 7.88 mA I/P-FG : 3.61mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ	I/P-O/P : 500 VDC Ta : 25°C /70%RH	I/P-O/P : 18.1 GΩ 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°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 : GST280A20-C6P 1. ROOM AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta=25.7 °C 2. HIGH AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta=40.3 °C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=25.7 °C</th> <th>HIGH AMBIENT Ta= 40.3 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF2</td><td>72.2°C</td><td>76.3°C</td></tr> <tr><td>2</td><td>L2</td><td>78.5°C</td><td>82.3°C</td></tr> <tr><td>3</td><td>Q2</td><td>81.0°C</td><td>86.3°C</td></tr> <tr><td>4</td><td>BD1</td><td>78.6°C</td><td>84.5°C</td></tr> <tr><td>5</td><td>Q5</td><td>82.5°C</td><td>87.6°C</td></tr> <tr><td>6</td><td>Q6</td><td>81.9°C</td><td>87.1°C</td></tr> <tr><td>7</td><td>T1</td><td>89.6°C</td><td>93.1°C</td></tr> <tr><td>8</td><td>C5</td><td>83.3°C</td><td>86.4°C</td></tr> <tr><td>9</td><td>RTH2</td><td>73.2°C</td><td>79.0°C</td></tr> <tr><td>10</td><td>L1</td><td>83.4°C</td><td>87.4°C</td></tr> <tr><td>11</td><td>Q101</td><td>86.4°C</td><td>91.7°C</td></tr> <tr><td>12</td><td>Q102</td><td>84.9°C</td><td>90.5°C</td></tr> <tr><td>13</td><td>C101</td><td>85.6°C</td><td>90.8°C</td></tr> <tr><td>14</td><td>LF101</td><td>89.8°C</td><td>95.6°C</td></tr> <tr><td>15</td><td>U1</td><td>77.6°C</td><td>82.2°C</td></tr> <tr><td>16</td><td>U900</td><td>81.8°C</td><td>86.1°C</td></tr> <tr><td>17</td><td>U201</td><td>89.5°C</td><td>94.0°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=25.7 °C	HIGH AMBIENT Ta= 40.3 °C	1	LF2	72.2°C	76.3°C	2	L2	78.5°C	82.3°C	3	Q2	81.0°C	86.3°C	4	BD1	78.6°C	84.5°C	5	Q5	82.5°C	87.6°C	6	Q6	81.9°C	87.1°C	7	T1	89.6°C	93.1°C	8	C5	83.3°C	86.4°C	9	RTH2	73.2°C	79.0°C	10	L1	83.4°C	87.4°C	11	Q101	86.4°C	91.7°C	12	Q102	84.9°C	90.5°C	13	C101	85.6°C	90.8°C	14	LF101	89.8°C	95.6°C	15	U1	77.6°C	82.2°C	16	U900	81.8°C	86.1°C	17	U201	89.5°C	94.0°C		P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 120 % 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	± 0.013 %/°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°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	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°C	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 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 40 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 40 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 40°C LIFE TIME	(1) 59395.4HRS (2) 40288.1HRS (3) 71355.1HRS (4) 207975.8HRS	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°C		P

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ