Test Report: GST280A15-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℃	V1: 11.6mVp-p	P
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -5%~ 5%	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25℃	V1: -1.841%~ 2.003%	P
3	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: 0 %~ 0.04 %	P
4	LOAD REGULATION(Max)	V1: -5%~ 5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -1.841%~ 2.003%	P
5	SET UP TIME(Max)	230VAC/2000ms 115VAC/2000ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 1230.566ms 115VAC/ 1132.828ms	P
6	RISE TIME (Max)	230VAC/20ms 115VAC/20ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 9.148ms 115VAC/ 9.498ms	P
7	HOLD UP TIME(Typ)	230VAC/16ms 115VAC/16ms	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 23.932ms 115VAC/ 23.750ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	< ±5%	P
9	DYNAMIC LOAD	V1: 1500mVp-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℃	1020mVp-p 1000mVp-p 1020mVp-p 988mVp-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℃	54.987 V~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)	0.95/ 230VAC 0.98/115VAC	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	PF=0.957/230VAC PF=0.995/115VAC	P
4	EFFICIENCY(TYP)	90%	I/P:230 VAC O/P:FULL LOAD Ta:25℃	90.85%	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 =1.26A/ 230VAC I =2.51A/ 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 = 113 A/ 230VAC I = 57 A/ 115VAC	P
7	LEAKAGE CURRENT	< 1.5 mA / 240 VAC	I/P： 240 VAC O/P：Min LOAD Ta：25℃	L-FG： 0.780 mA N-FG： 0.780 mA	P
8	NO LOAD CONSUMPTION	< 0.5 W	I/P：115VAC I/P：230VAC O/P：NO LOAD Ta：25℃	< 0.33 W < 0.43 W	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℃	118.52%/ 230VAC 118.12%/115VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH:15.75V~20.25V	I/P: 230VAC I/P: 115VAC O/P:MIN LOAD Ta:25℃	18.5V/ 230VAC 18.5V/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 Shunt down Re-power ON	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta:25℃	NO DAMAGE (1) 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**	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℃	(1) 484V (2) 510V (3) 452V	P
2	Diode Peak **Voltage**	Q101 Rated 183A/75V	I/P:High-Line +3V =267V AC ON/OFF VDS: O/P: (1)Full Load (2)Output Short (3) Full Load Continue Ta:25℃	Q101: (1)60.6V (2) 18.3V (3) 40.6V	P
3	**Input Capacitor Voltage**	C5 Rated: : 220μ/ 450V 105℃	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℃	(1) 432V (2) 436V (3) 436V	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℃	(1) 15.6V (2) 15.5V (3) 15.5V (4) 15.2V	P
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℃	(1) 506V (2) 506V (3) 508V	P

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG:2KVAX\C/min	I/P-O/P: 3.6 KVAC/min I/P-FG:2.4KVAX\C/min Ta:25℃	I/P-O/P:3.101mA I/P-FG:2.52mA 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 LIGHT INDUSTRY AIR：8KV / Contact：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT： 1KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY 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

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： GST280A15-C6P
1. ROOM AMBIENT BURN-IN： 1HRS
I/P： 230VAC O/P： FULL LOAD Ta=17.8 ℃
2. HIGH AMBIENT BURN-IN： 1HRS
I/P： 230VAC O/P： FULL LOAD Ta=38.4 ℃
<table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 17.8 ℃</th><th>HIGH AMBIENT Ta= 38.4 ℃</th></tr><tr><td>1</td><td>LF2</td><td>60.0℃</td><td>79.1℃</td></tr><tr><td>2</td><td>Q2</td><td>66.1℃</td><td>85.1℃</td></tr><tr><td>3</td><td>Q1</td><td>64.3℃</td><td>83.3℃</td></tr><tr><td>4</td><td>BD1</td><td>63.5℃</td><td>82.2℃</td></tr><tr><td>5</td><td>D2</td><td>66.3℃</td><td>85.2℃</td></tr><tr><td>6</td><td>Q5</td><td>66.0℃</td><td>85.3℃</td></tr><tr><td>7</td><td>Q6</td><td>65.7℃</td><td>85.0℃</td></tr><tr><td>8</td><td>L1</td><td>66.1℃</td><td>84.9℃</td></tr><tr><td>9</td><td>C5</td><td>67.2℃</td><td>86.2℃</td></tr><tr><td>10</td><td>RTH2</td><td>62.4℃</td><td>81.4℃</td></tr><tr><td>11</td><td>TI Coil</td><td>73.6℃</td><td>93.3℃</td></tr><tr><td>12</td><td>Q102</td><td>73.2℃</td><td>93.0℃</td></tr><tr><td>13</td><td>C101</td><td>74.2℃</td><td>94.4℃</td></tr><tr><td>14</td><td>LF101</td><td>78.5℃</td><td>99.5℃</td></tr><tr><td>15</td><td>U1</td><td>62.8℃</td><td>81.8℃</td></tr><tr><td>16</td><td>U900</td><td>65.6℃</td><td>84.9℃</td></tr><tr><td>17</td><td>U201</td><td>69.1℃</td><td>88.9℃</td></tr><tr><td>18</td><td>T1core</td><td>80.5℃</td><td>101.9℃</td></tr><tr><td>19</td><td>CASE</td><td>49.0℃</td><td>67.6℃</td></tr></table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P： 230 VAC
O/P： 120 % LOAD
Ta：25℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 264VAC/100VAC
O/P： 100 % LOAD
Ta= -35 ℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 40 ℃
NO DAMAGE</td><td>I/P： 272 VAC
O/P：FULL LOAD
Ta= 40.6 ℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %/℃(0~40℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>± 0.013 %/℃(0~40℃)</td><td>P</td></tr>
<tr><td>6</td><td>STORAGE TEMPERATURE TEST</td><td>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</td><td></td><td>OK</td><td>P</td></tr>
</table>

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 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) 62893HRS (2) 22926HRS (3) 80180HRS (4) 271681HRS	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 50,000 hours @ TA 50℃		P

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ

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