



# Test Report: GST25U48-P1J

---

25W AC-DC Reliable Green 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: 150 mVp-p                    | I/P: 230VAC<br>O/P:FULL LOAD<br>Ta:25°C  | V1: 39.6mVp-p                                  | P       |
| 2  | OUTPUT VOLTAGE(Max)<br>TOLERANCE | V1: 2%~ -2%                      | I/P: 85VAC /264VAC<br>O/P:FULL/ MIN. LOAD<br>Ta:25°C   | V1:-0.08%~0%                                   | P       |
| 3  | LINE REGULATION (Max)            | V1: 1%~ -1%                      | I/P: 85VAC~ 264VAC<br>O/P:FULL LOAD<br>Ta:25°C   | V1: -0.04%~0.02%                               | P       |
| 4  | LOAD REGULATION(Max)             | V1: 2%~ -2%                      | I/P: 230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C   | V1: -0.004%~0%                                 | P       |
| 5  | SET UP TIME(Max)                 | 230VAC/1000 ms<br>115VAC/1500 ms | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | 230VAC/ 660 ms<br>115VAC /1030 ms              | P       |
| 6  | RISE TIME (Max)                  | 230VAC/30 ms<br>115VAC/30 ms     | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | 230VAC/13 ms<br>115VAC / 19.4ms                | P       |
| 7  | HOLD UP TIME(Typ)                | 230VAC/50 ms<br>115VAC/15 ms     | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | 230VAC/77.6 ms<br>115VAC /20 ms                | P       |
| 8  | OVER/UNDERSHOOT TEST             | < ±5%                            | I/P: 230VAC<br>O/P:FULL LOAD<br>Ta:25°C  | <5%  | P       |
| 9  | DYNAMIC LOAD                     | V1: 4800 mVp-p                   | I/P: 230VAC<br>O/P(1)FULL /Min LOAD<br>90%DUTY / 1KHZ<br>(2) (1)FULL /Min LOAD<br>90%DUTY / 3KHZ<br>(3)FULL /Min LOAD<br>90%DUTY / 5KHZ<br>(4)FULL /Min LOAD<br>50%DUTY / 120HZ<br>Ta:25°C | 227mVp-p<br>216 mVp-p<br>224mVp-p<br>302 mVp-p | P       |

**INPUT FUNCTION TEST**

| NO | TEST ITEM             | SPECIFICATION                         | TEST CONDITION   | RESULT                                   | VERDICT |
|----|-----------------------|---------------------------------------|--|--|---------|
| 1  | INPUT VOLTAGE RANGE   | 85VAC~264VAC                          | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25°C  | 75 ~264V                                 | P       |
|    |                       |                                       | I/P:<br>(1)LOW-LINE-3V=82V<br>HIGH-LINE+15%=300 V<br>O/P:FULL/MIN LOAD<br>ON: 30 Sec OFF: 30 Sec 10MIN<br>(2)230Vac<br>ON: 0.5 Sec OFF: 0.5 Sec 20MIN<br>(3)230Vac<br>ON:3Sec OFF:3Sec 12HOURS<br>(POWER ON/OFF NO DAMAGE) | TEST:OK                                  |         |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE              | I/P:85 VAC ~264 VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C  | TEST: OK                                 | P       |
| 3  | EFFICIENCY(TYP)       | 89%                                   | I/P:230 VAC<br>I/P:115 VAC<br>O/P:FULL LOAD<br>Ta:25°C   | 91.3%                                    | P       |
| 4  | INPUT CURRENT (Typ)   | 230V/ 0.35 A<br>115V/ 0.60 A          | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | I= 0.231 A/ 230VAC<br>I= 0.464 A/ 115VAC | P       |
| 5  | INRUSH CURRENT(Typ)   | 230V/ 65 A<br>115V/ 35A<br>COLD START | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | I= 60.7 A/ 230VAC<br>I= 32.5 A/ 115VAC   | P       |
| 6  | LEAKAGE CURRENT       | < 0.25 mA / 240 VAC                   | I/P : 240 VAC<br>O/P : Min LOAD<br>Ta : 25°C   | L-FG : 0.001 mA<br>N-FG : 0.001 mA       | P       |
| 7  | NO LOAD CONSUMPTION   | < 0.075 W                             | I/P : 115VAC<br>I/P : 230VAC<br>O/P : NO LOAD<br>Ta : 25°C   | < 0.0615 W<br>< 0.0687 W                 | P       |

**PROTECTION FUNCTION TEST**

| NO | TEST ITEM               | SPECIFICATION   | TEST CONDITION  | RESULT   | VERDICT |
|----|-------------------------|---|---|--|---------|
| 1  | OVER LOAD PROTECTION    | 110 %~ 150 %  | I/P: 230VAC<br>I/P: 115VAC<br>O/P: TESTING<br>Ta: 25°C  | 135.7 %/ 230VAC<br>135.7%/115VAC<br>Hiccup mode, recovers automatically after fault condition is removed | P       |
| 2  | OVER VOLTAGE PROTECTION | 110 ~ 140% rated output voltage<br>Clamp by zener diode | I/P: 230VAC<br>I/P: 115VAC<br>O/P: MIN LOAD<br>Ta: 25°C | 123.75%/ 230VAC<br>123.75%/115VAC<br>Clamp by zener diode  | P       |
| 3  | SHORT PROTECTION        | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE                  | I/P: 264VAC<br>O/P: FULL LOAD<br>Ta: 25°C               | NO DAMAGE<br>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 | Q1 Rated<br>6A/600V                      | I/P: High-Line +3V = 267V<br>AC ON/OFF<br>VDS:<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) Full Load Continue<br>Ta: 25°C                           | Q1<br>VDS:<br>(1) 496 V<br>(2) 504 V<br>(3) 478 V | P       |
| 2  | Diode Peak Voltage                               | D100 Rated<br>10A/400V                   | I/P: High-Line +3V = 267 V<br>AC ON/OFF<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) Dynamic Load 100% Load/<br>Min. Load 50% Duty/120Hz<br>Ta: 25°C | D100 :<br>(1) 261V<br>(2) 287V<br>(3) 260V        | P       |
| 3  | Input Capacitor Voltage                          | C5 Rated:<br>47u/400V 105°C              | I/P: High-Line +3V = 267 V<br>O/P: (1) Full Load input on/off<br>(2) Min load input on /Off<br>(3) Full Load /Min load Change<br>Ta: 25°C                | (1) 382 V<br>(2) 358 V<br>(3) 360 V               | P       |
| 4  | Control IC Voltage Test                          | PWM IC U1 Rated<br>:<br>27V<br>10V(MIN.) | I/P: High-Line +3V = 267 V<br>AC ON/OFF<br>O/P: (1) FULL LOAD<br>(2) Output Short<br>(3) O.L.P<br><br>Ta: 25°C   |   | P       |

|   |                          |                    |   |                        |   |
|---|--------------------------|--------------------|---|------------------------|---|
| 5 | Clamp Diode Peak Voltage | D1 Rated : 2A/800V | I/P : High-Line +3V = 267 V<br>AC ON/OFF<br>O/P : (1) Dynamic Load<br>90%Duty/1KHz<br>(2) Full load continue<br>Ta : 25°C | (1) 464 V<br>(2) 464 V | P |
|---|--------------------------|--------------------|---|------------------------|---|

**SAFETY TEST**

| NO | TEST ITEM            | SPECIFICATION           | TEST CONDITION                     | RESULT                       | VERDICT |
|----|----------------------|-------------------------|------------------------------------|------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 4.242 KVDC/min | I/P-O/P: 4.666 KVDC/min<br>Ta:25°C | I/P-O/P:0.002mA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ    | I/P-O/P: 500 VDC<br>Ta:25°C        | I/P-O/P: 9999MΩ<br>NO DAMAGE | P       |

**E.M.C TEST**

| NO | TEST ITEM                                   | SPECIFICATION   | TEST CONDITION   | RESULT                        | VERDICT |
|----|---|---|--|-------------------------------|---------|
| 1  | CONDUCTION                                  | FCC PART 15 / CISPR22, CAN ICES-3(B)/NMB-3(B)<br>CNS13438, EAC TP TC 020<br>CLASS B | I/P : 230 VAC (50HZ)<br>O/P : FULL/50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab | P       |
| 2  | RADIATION                                   | FCC PART 15 / CISPR22, CAN ICES-3(B)/NMB-3(B)<br>CNS13438, EAC TP TC 020<br>CLASS B | I/P : 230 VAC (50HZ)<br>O/P : FULL LOAD<br>Ta : 25°C     | PASS<br>Test by certified Lab | P       |
| 3  | Test by certified Lab & Test Report Prepare |   |  |                               |         |

**RELIABILITY TEST**

**ENVIRONMENT TEST**

| NO | TEST ITEM             | SPECIFICATION   | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------|---|----------------|--------|---------|
| 1  | TEMPERATURE RISE TEST | MODEL : GST25U12-P1J<br>1. ROOM AMBIENT BURN-IN : 1HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=31.0°C<br>2. HIGH AMBIENT BURN-IN : 1 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=56.1°C |                |        | P       |

|    |   |  | NO | Position      | ROOM AMBIENT<br>Ta=31.0°C  | HIGH AMBIENT<br>Ta=56.1°C |  |          |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
|----|---|--|----|---------------|--|---------------------------|--|----------|----------|------------|--------|--------|---|-----------|--------|---------|---|-----------|--------|---------|---|------------|--------|--------|---|-----------|--------|--------|---|-------------|--------|--------|---|-------------|--------|--------|---|------------|--------|
|    |   |  | 1  | <b>C5</b>     | 60.9°C   | 84.5°C                    |  |          | 2        | <b>BD1</b> | 66.1°C | 88.2°C | 3 | <b>T1</b> | 78.4°C | 101.7°C | 4 | <b>Q1</b> | 90.5°C | 113.7°C | 5 | <b>C40</b> | 69.0°C | 92.1°C | 6 | <b>D1</b> | 74.3°C | 97.4°C | 7 | <b>C105</b> | 65.5°C | 89.2°C | 8 | <b>D100</b> | 75.6°C | 97.8°C | 9 | <b>LF1</b> | 61.8°C |
| 2  | OVER LOAD BURN-IN TEST  | NO DAMAGE<br>1 HOUR ( MIN )  |    |               | I/P : 230 VAC<br>O/P : 132% LOAD<br>Ta : 25°C                    | TEST : OK                 |  |          | <b>P</b> |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR   |    |               | I/P : 264VAC/100VAC<br>O/P : 100 % LOAD<br>Ta=-35°C              | TEST : OK                 |  |          | <b>P</b> |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 50°C<br>NO DAMAGE   |    |               | I/P : 272 VAC<br>O/P : FULL LOAD<br>Ta=50°C<br>HUMIDITY= 95 %R.H | TEST : OK                 |  |          | <b>P</b> |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 5  | TEMPERATURE<br>COEFFICIENT  | ±0.03%/°C (0~50°C)   |    |               | I/P : 230 VAC<br>O/P : FULL LOAD                                 | ±0%/°C (0~50°C)           |  |          | <b>P</b> |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 6  | STORAGE TEMPERATURE TEST  | 1. Thermal shock Temperature : -40°C~ +85°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 5 CYCLE<br>5. Input/Output condition : STATIC  |    |               | OK   |                           |  | <b>P</b> |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 7  | THERMAL SHOCK TEST  | 1. Thermal shock Temperature : -30°C~ +70°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST<br>turn on 58sec ; turn off 2sec |    |               | OK   |                           |  | <b>P</b> |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 8  | VIBRATION TEST  | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Sweep Time : 12min/sweep cycle<br>(4) Acceleration : 2G<br>(5) Test Time : 60min in each axis (X.Y.Z)<br>(6) Ta : 25°C   |    |               | TEST : OK  |                           |  | <b>P</b> |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 9  | CAPACITOR<br>LIFE CYCLE   | SUPPOSE C105 IS THE MOST CRITICAL COMPONENT  |    |               |  |                           |  |          | <b>P</b> |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
|    |   | (1) I/P : 230VAC O/P : FULL LOAD Ta=25°C LIFE TIME   |    | (1) 257261HRS |  |                           |  |          |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
|    |   | (2) I/P : 230VAC O/P : FULL LOAD Ta=50°C LIFE TIME   |    | (2) 50068HRS  |  |                           |  |          |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
|    |   | (3) I/P : 230VAC O/P : 75% LOAD Ta=50°C LIFE TIME  |    | (3) 76969HRS  |  |                           |  |          |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
|    |   | (4) I/P : 230VAC O/P : 50% LOAD Ta=50°C LIFE TIME  |    | (4) 129454HRS |  |                           |  |          |          |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |
| 10 | MTBF  | 3879.7K hrs min. Telcordia SR-332 (Bellcore) ; 674.6K hrs min. MIL-HDBK-217F (25 )   |    |               |  |                           |  |          | <b>P</b> |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |



|    |                             |   |   |
|----|-----------------------------|---|---|
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C | P |
|----|-----------------------------|---|---|

| TEST RESULT | TESTER | REVIEW | APPROVAL |
|-------------|--------|--------|----------|
| PASS        | FRANK  | GESG   | WANGDZ   |

2007/3/20 A50-S014