



# Test Report: GST18B18-P1J

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18W 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)              | V1:150 mVp-p                     | I/P : 230VAC<br>O/P:FULL LOAD<br>Ta:25°C   | V1: 42.4mVp-p  | P       |
| 2  | OUTPUT VOLTAGE(Max)<br>TOLERANCE | V1: 3%~-3%                       | I/P: 100VAC~264VAC<br>O/P:FULL~MIN. LOAD<br>Ta:25°C  | V1: 0.944%~0%  | P       |
| 3  | LINE REGULATION (Max)            | V1: 1%~-1%                       | I/P: 100VAC~264VAC<br>O/P:FULL LOAD<br>Ta:25°C   | V1: 0%~-0.055%   | P       |
| 4  | LOAD REGULATION(Max)             | V1:3%~-3%                        | I/P: 230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C   | V1: 0.387%~-0.387%                                       | 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/656ms<br>115VAC /1080ms                           | 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/8.4ms<br>115VAC /16 ms                            | 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/ 75.2 ms<br>115VAC /18.4 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: 1800 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 | 390mVp-p(1)<br>285mVp-p(2)<br>290mVp-p(1)<br>510mVp-p(2) | P       |

**INPUT FUNCTION TEST**

| NO | TEST ITEM             | SPECIFICATION                        | TEST CONDITION   | RESULT                                   | VERDICT |
|----|-----------------------|--------------------------------------|--|--|---------|
| 1  | INPUT VOLTAGE RANGE   | 100VAC~264VAC                        | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25°C  | 69 V ~264V                               | P       |
|    |                       |                                      | I/P:<br>(1)LOW-LINE-3V=97V<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:100 VAC ~264 VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C   | TEST: OK                                 | P       |
| 3  | EFFICIENCY(TYP)       | 87%                                  | I/P:230 VAC<br>I/P:115 VAC<br>O/P:FULL LOAD<br>Ta:25°C   | 89. 2%                                   | P       |
| 4  | INPUT CURRENT (Typ)   | 230V/ 0.30 A<br>115V/ 0.50 A         | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C   | I =0.238A/ 230VAC<br>I =0.392A/ 115VAC   | P       |
| 5  | INRUSH CURRENT(Typ)   | 230V/ 65A<br>115V/ 35A<br>COLD START | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | I = 62. 1A/ 230VAC<br>I = 32. 5A/ 230VAC | P       |
| 6  | LEAKAGE CURRENT       | < 0.25 mA / 240 VAC                  | I/P : 240 VAC<br>O/P : Min LOAD<br>Ta : 25°C   | L-FG : 0.001mA<br>N-FG : 0.001mA         | 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. 0303W<br>< 0. 0377W                  | 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  | 128. 98%/ 230VAC<br>168. 8%/115VAC<br><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 | 117. 78%/230VAC<br>117. 78%/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<br>( D to S) or (C to E) <b>Peak Voltage</b> | Q 1 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                           | VDS:<br>(1) 518 V<br>(2) 584 V<br>(3) 506V | P       |
| 2  | Diode <b>Peak Voltage</b>                                   | D100 Rated<br>10A/200V                   | 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) 115V<br>(2) 129V<br>(3) 114V | P       |
| 3  | <b>Input Capacitor Voltage</b>                              | 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) 370V<br>(2) 356V<br>(3) 356V           | P       |
| 4  | <b>Control IC Voltage Test</b>                              | 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>Ta:25°C   | (1) 17. 3V<br>(2) 17 V<br>(3) 17 V         | P       |
| 5  | Clamp Diode <b>Peak Voltage</b>                             | 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) 436V<br>(2) 432V                       | 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  | HARMONIC                                    | EN61000-3-2<br>CLASS A                                     | I/P:230VAC/50HZ<br>O/P:100%LOAD<br>Ta:25°C               | PASS                          | P       |
| 2  | CONDUCTION                                  | EN55022<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       |
| 3  | RADIATION                                   | EN55022<br>CLASS B   | I/P : 230 VAC (50HZ)<br>O/P : FULL LOAD<br>Ta : 25°C     | PASS<br>Test by certified Lab | P       |
| 4  | E.S.D                                       | EN61000-4-2<br>LIGHT INDUSTRY<br>AIR : 8KV / Contact : 4KV | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    | P       |
| 5  | E.F.T                                       | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT : 1KV               | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C       | CRITERIA A                    | P       |
| 6  | SURGE                                       | IEC61000-4-5<br>LIGHT INDUSTRY<br>L-N : 1KV                | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>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 : GST18B12-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   | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT<br/>Ta=31.0°C</th> <th>HIGH AMBIENT<br/>Ta=56.1°C</th> </tr> </thead> <tbody> <tr><td>1</td><td><b>C5</b></td><td>60.9°C</td><td>84.5°C</td></tr> <tr><td>2</td><td><b>BD1</b></td><td>66.1°C</td><td>88.2°C</td></tr> <tr><td>3</td><td><b>T1</b></td><td>78.4°C</td><td>101.7°C</td></tr> <tr><td>4</td><td><b>Q1</b></td><td>90.5°C</td><td>113.7°C</td></tr> <tr><td>5</td><td><b>C40</b></td><td>69.0°C</td><td>92.1°C</td></tr> <tr><td>6</td><td><b>D1</b></td><td>74.3°C</td><td>97.4°C</td></tr> <tr><td>7</td><td><b>C105</b></td><td>65.5°C</td><td>89.2°C</td></tr> <tr><td>8</td><td><b>D100</b></td><td>75.6°C</td><td>97.8°C</td></tr> <tr><td>9</td><td><b>LF1</b></td><td>61.8°C</td><td>83.2°C</td></tr> <tr><td>10</td><td><b>TC</b></td><td>49.9°C</td><td>77.9°C</td></tr> </tbody> </table> | 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 | 83.2°C | 10 | <b>TC</b> | 49.9°C | 77.9°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  | 83.2°C   |                 |          |                           |                           |   |           |        |        |   |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |        |    |           |        |        |  |   |
| 10 | <b>TC</b>   | 49.9°C  | 77.9°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       | P        |                           |                           |   |           |        |        |   |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |        |    |           |        |        |  |   |
| 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       | P        |                           |                           |   |           |        |        |   |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |        |    |           |        |        |  |   |
| 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       | P        |                           |                           |   |           |        |        |   |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |        |    |           |        |        |  |   |
| 5  | TEMPERATURE<br>COEFFICIENT  | ±0.03%/°C (0~50°C)  | I/P : 230 VAC<br>O/P : FULL LOAD   | ±0%/°C (0~50°C) | P        |                           |                           |   |           |        |        |   |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |        |    |           |        |        |  |   |
| 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              | P        |                           |                           |   |           |        |        |   |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |        |    |           |        |        |  |   |
| 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              | P        |                           |                           |   |           |        |        |   |            |        |        |   |           |        |         |   |           |        |         |   |            |        |        |   |           |        |        |   |             |        |        |   |             |        |        |   |            |        |        |    |           |        |        |  |   |



|    |                             |   |  |   |
|----|-----------------------------|---|--|---|
| 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  | P |
| 9  | CAPACITOR LIFE CYCLE        | SUPPOSE C105 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta=25°C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta=50°C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta=50°C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta=50°C LIFE TIME | (1) 257261HRS<br>(2) 50068HRS<br>(3) 76969HRS<br>(4) 129454HRS | P |
| 10 | MTBF                        | MIL-HDBK-217F<br>TOTAL FAILURE RATE : 500KHRS   |  | P |
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 50°C   |  | P |

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

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