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ELECTRONICS

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Jameco Part Number 2078291


**■ Features :**

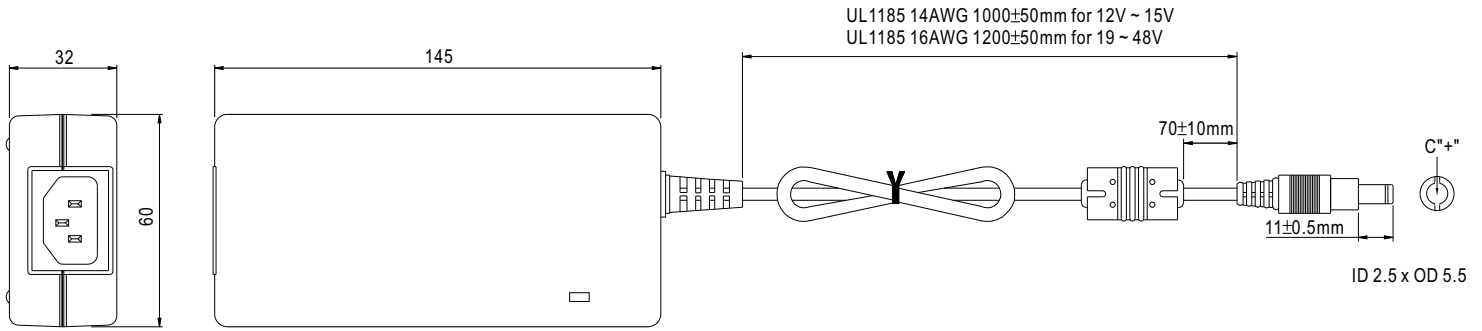
- Universal AC input / Full range
- Built-in active PFC function, PF>0.91
- No load power consumption<0.5W
- Energy star(CEC) level IV compliant
- Meet energy star (CEC) draft V2.0 level V
- Meet EISA 2007(Energy Independence and Security Act)
- 3 pole AC inlet IEC320-C14
- Class I power ( with earth pin)
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Pass LPS
- Fully enclosed plastic case
- LED indicator for power on
- Approvals: UL / CUL / TUV / BSMI / CCC / CB / FCC / CE
- 2 years warranty


**SPECIFICATION**

| ORDER NO.                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | GS90A12-P1M                                                                                                                     | GS90A15-P1M | GS90A19-P1M | GS90A24-P1M | GS90A48-P1M |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|
| OUTPUT                    | SAFETY MODEL NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | GS90A12                                                                                                                         | GS90A15     | GS90A19     | GS90A24     | GS90A48     |
|                           | DC VOLTAGE      Note.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 12V                                                                                                                             | 15V         | 19V         | 24V         | 48V         |
|                           | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6.67A                                                                                                                           | 6A          | 4.74A       | 3.75A       | 1.87A       |
|                           | CURRENT RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0 ~ 6.67A                                                                                                                       | 0 ~ 6A      | 0 ~ 4.74A   | 0 ~ 3.75A   | 0 ~ 1.87A   |
|                           | RATED POWER (max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 80W                                                                                                                             | 90W         | 90W         | 90W         | 90W         |
|                           | RIPPLE & NOISE (max.) Note.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 80mVp-p                                                                                                                         | 100mVp-p    | 150mVp-p    | 180mVp-p    | 240mVp-p    |
|                           | VOLTAGE TOLERANCE Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ±5.0%                                                                                                                           | ±5.0%       | ±4.0%       | ±3.0%       | ±2.0%       |
|                           | LINE REGULATION      Note.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ±1.0%                                                                                                                           | ±1.0%       | ±1.0%       | ±1.0%       | ±1.0%       |
|                           | LOAD REGULATION      Note.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ±5.0%                                                                                                                           | ±5.0%       | ±4.0%       | ±3.0%       | ±2.0%       |
|                           | SETUP, RISE TIME      Note.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1000ms, 20ms / 230VAC      1000ms, 20ms / 115VAC at full load                                                                   |             |             |             |             |
|                           | HOLD UP TIME (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 20ms / 230VAC      20ms / 115VAC at full load                                                                                   |             |             |             |             |
| INPUT                     | VOLTAGE RANGE      Note.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 90 ~ 264VAC    135 ~ 370VDC                                                                                                     |             |             |             |             |
|                           | FREQUENCY RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 47 ~ 63Hz                                                                                                                       |             |             |             |             |
|                           | POWER FACTOR (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PF>0.91 / 230VAC      PF>0.95 / 115VAC at full load                                                                             |             |             |             |             |
|                           | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 88%                                                                                                                             | 89%         | 89%         | 89.5%       | 91%         |
|                           | AC CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2A / 115VAC      1A / 230VAC                                                                                                    |             |             |             |             |
|                           | INRUSH CURRENT (max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 70A / 230VAC                                                                                                                    |             |             |             |             |
|                           | LEAKAGE CURRENT(max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1mA / 240VAC                                                                                                                    |             |             |             |             |
| PROTECTION                | OVERLOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 110 ~ 150% rated output power<br>Protection type : Hiccup mode, recovers automatically after fault condition is removed         |             |             |             |             |
|                           | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 105 ~ 135% rated output voltage<br>Protection type : Shut down o/p voltage, re-power on to recover                              |             |             |             |             |
|                           | OVER TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | RTH30 > 100℃<br>Protection type : Shut down o/p voltage, re-power on to recover                                                 |             |             |             |             |
|                           | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0 ~ +50℃ (Refer to output load derating curve)                                                                                  |             |             |             |             |
|                           | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20% ~ 90% RH non-condensing                                                                                                     |             |             |             |             |
| ENVIRONMENT               | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -20 ~ +85℃, 10 ~ 95% RH                                                                                                         |             |             |             |             |
|                           | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ±0.03% / °C (0~50℃)                                                                                                             |             |             |             |             |
|                           | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes                                                         |             |             |             |             |
|                           | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | UL60950-1, TUV EN60950-1, BSMI CNS14336, CCC GB4943 approved                                                                    |             |             |             |             |
|                           | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | I/P-O/P: 3KVAC    I/P-FG:1.5KVAC    O/P-FG:0.5KVAC                                                                              |             |             |             |             |
| SAFETY & EMC<br>(Note. 7) | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃ / 70% RH                                                                       |             |             |             |             |
|                           | EMI CONDUCTION & RADIATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Compliance to EN55022 class B, FCC PART 15 / CISPR22 class B, CNS13438 class B, GB9254 class B                                  |             |             |             |             |
|                           | HARMONIC CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Compliance to EN61000-3-2,3, GB17625.1                                                                                          |             |             |             |             |
|                           | EMS IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Compliance to EN61000-4-2,3,4,5,6,8,11, light industry level, criteria A                                                        |             |             |             |             |
|                           | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 348.7Khrs min. MIL-HDBK-217F(25℃)                                                                                               |             |             |             |             |
| OTHERS                    | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 145*60*32mm (L*W*H)                                                                                                             |             |             |             |             |
|                           | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.45Kg; 30pcs/14.5Kg/0.85CUFT                                                                                                   |             |             |             |             |
|                           | PLUG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Standard type P1M: 2.5φ * 5.5φ * 11mm, tuning fork type, center positive for stock ; Other type available by customer requested |             |             |             |             |
| CONNECTOR                 | CABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | See page 2 ; Other type available by customer requested                                                                         |             |             |             |             |
| NOTE                      | 1.All parameters are specified at 230VAC input, rated load, 25℃ 70% RH ambient.<br>2.DC voltage: The output voltage set at point measure by plug terminal & 50% load.<br>3.Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1uf & 47uf capacitor.<br>4.Tolerance: includes set up tolerance, line regulation, load regulation.<br>5.Line regulation is measured from low line to high line at rated load.<br>6.Load regulation is measured from 10% to 100% rated load<br>7.The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.<br>8. Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time.<br>9. Derating may be needed under low input voltages. Pleas check the derating curve for more details. |                                                                                                                                 |             |             |             |             |

## Mechanical Specification

Case No. 978A Unit:mm

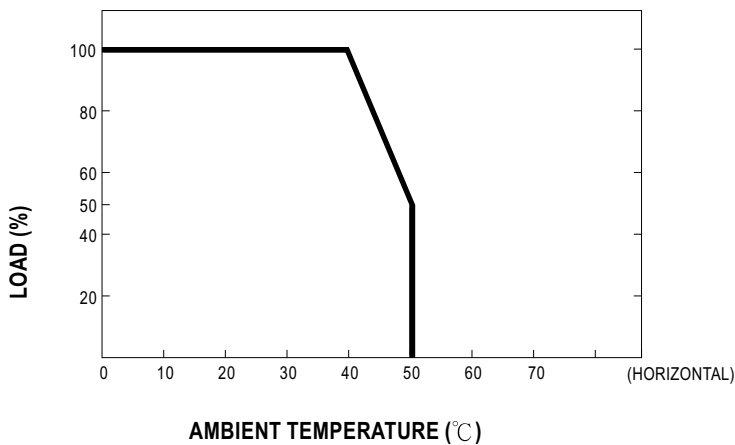


## Plug Assignment

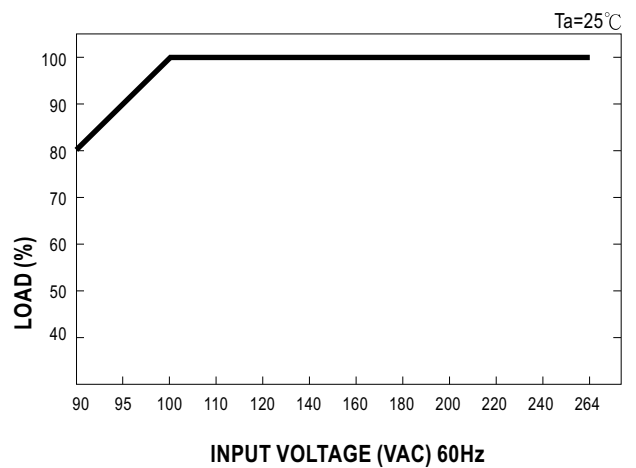
Standard plug: P1M (option)

| P1M    |        |
|--------|--------|
| P/N    | OUTPUT |
| CENTER | +      |

## Derating Curve



## Static Characteristics



MODEL : GS90A12-P1J

## OUTPUT FUNCTION TEST

| NO | TEST ITEM                | SPECIFICATION                                   | TEST CONDITION                                                | RESULT                             | VERDICT |
|----|--------------------------|-------------------------------------------------|---------------------------------------------------------------|------------------------------------|---------|
| 1  | RIPPLE & NOISE           | V1:80 mVp-p (Max )                              | I/P: 230VAC<br>O/P:FULL LOAD<br>Ta:25°C                       | V1: 55 mVp-p (Max )                | P       |
| 2  | OUTPUT VOLTAGE TOLERANCE | V1:5%~ -5 % (Max)                               | I/P: 100 VAC / 264 VAC<br>O/P:FULL/ MIN LOAD<br>Ta:25°C       | V1: 1.1 %~ -1.1 %                  | P       |
| 3  | LINE REGULATION          | V1: 1 %~ -1 % (Max)                             | I/P: 100 VAC ~ 264 VAC<br>O/P:FULL LOAD<br>Ta:25°C            | V1: 0 %~ 0 %                       | P       |
| 4  | LOAD REGULATION          | V1: 5 %~ -5% (Max)                              | I/P: 230 VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C                 | V1: 1.1 %~ -1.1 %                  | P       |
| 5  | SET UP TIME              | 230VAC: 1000 ms (Max)<br>115 VAC: 1000 ms (Max) | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25°C      | 230VAC/ 484 ms<br>115VAC/ 484 ms   | P       |
| 6  | RISE TIME                | 230VAC: 20 ms (Max)<br>115VAC: 20 ms (Max)      | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25°C      | 230VAC/ 7 ms<br>115VAC/ 8 ms       | P       |
| 7  | HOLD UP TIME             | 230VAC: 20 ms (TYP)<br>115VAC: 20 ms (TYP)      | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25°C      | 230VAC/ 83.2 ms<br>115VAC/ 35.9 ms | P       |
| 8  | OVER/UNDERSHOOT TEST     | < ±5%                                           | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25°C                      | TEST: <5 %                         | P       |
| 9  | DYNAMIC LOAD             | V1: 1200 mVp-p                                  | I/P: 230 VAC<br>O/P:FULL /Min LOAD<br>90%DUTY/1KHZ<br>Ta:25°C | 649 mVp-p                          | P       |

## INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                              | TEST CONDITION                                                                                                                         | RESULT                                     | VERDICT |
|----|-----------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------|
| 1  | INPUT VOLTAGE RANGE   | 90VAC~264 VAC                              | I/P: TESTING<br>O/P: FULL LOAD<br>Ta: 25°C                                                                                             | 65 V~264V                                  | P       |
|    |                       |                                            | I/P:<br>LOW-LINE-3V= 87 V<br>HIGH-LINE+15%=300 V<br>O/P: FULL/MIN LOAD<br>ON: 30 Sec. OFF: 30 Sec 10MIN<br>(AC POWER ON/OFF NO DAMAGE) | TEST: OK                                   |         |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE OSC               | I/P: 100 VAC ~ 264 VAC<br>O/P: FULL~MIN LOAD<br>Ta: 25°C                                                                               | TEST: OK                                   | P       |
| 3  | POWER FACTOR          | 0.91 / 230 VAC(TYP)<br>0.95 / 115 VAC(TYP) | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                             | PF= 0.915 / 230VAC<br>PF= 0.981 / 115VAC   | P       |
| 4  | EFFICIENCY            | 88 % (TYP)                                 | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                                             | 88.3 %                                     | P       |
| 5  | INPUT CURRENT         | 230V/ 1 A (TYP)<br>115V/ 2 A (TYP)         | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                             | I = 0.41 A/ 230 VAC<br>I = 0.79 A/ 115 VAC | P       |
| 6  | INRUSH CURRENT        | 230V/ 70 A (TYP)<br>COLD START             | I/P: 230 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                                             | I = 59 A/ 230 VAC                          | P       |
| 7  | LEAKAGE CURRENT       | < 1 mA / 240 VAC                           | I/P: 264 VAC<br>O/P: Min LOAD<br>Ta: 25°C                                                                                              | L-FG: 0.32 mA<br>N-FG: 0.32 mA             | P       |
| 8  | NO LOAD CONSUMPTION   | < 0.5 W/240VAC                             | I/P: 240 VAC<br>O/P: NO LOAD<br>Ta: 25°C                                                                                               | 0.3 W                                      | P       |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                            | TEST CONDITION                                            | RESULT                                                       | VERDICT |
|----|-----------------------------|------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|---------|
| 1  | OVER LOAD PROTECTION        | 110%~ 150 %                              | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P: TESTING<br>Ta: 25°C  | 138 %/ 230 VAC<br>133 %/ 115 VAC<br>Hiccup Mode              | P       |
| 2  | OVER VOLTAGE PROTECTION     | CH1: 12.6 V~ 16.2 V                      | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P: MIN LOAD<br>Ta: 25°C | 14.1 V/ 230 VAC<br>14.1 V/ 115 VAC<br>Shut down Re- power ON | P       |
| 3  | OVER TEMPERATURE PROTECTION | SPEC:<br>RTH30>100°C O.T.P.<br>NO DAMAGE | I/P: 230 VAC<br>O/P: FULL LOAD                            | O.T.P. Active<br>Shunt down Re-power ON                      | P       |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE   | I/P: 264 VAC<br>O/P: FULL LOAD<br>Ta: 25°C                | NO DAMAGE<br>Hiccup Mode                                     | P       |

## ENVIRONMENT TEST

| NO | TEST ITEM                                                         | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | TEST CONDITION                                                | RESULT                   | VERDICT |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
|----|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------|---------|----------|-----|--------------------------|--------------------------|---|----|---------|-------|-------|---|-----|-------|-------|-------|---|-----|-----------------------|-------|-------|---|----|--------|-------|-------|---|-----|-----------------------|-------|-------|---|-----|---------------|-------|--------|---|-----|----------------------|-------|-------|---|----|--------------------|-------|-------|---|-----|-----------------------|-------|-------|----|---------|--------|-------|-------|----|-----|--------------------|-------|-------|----|------|-------------------|-------|-------|----|------|----------------------|-------|-------|----|----|----------------|-------|--------|----|------|-------------|-------|-------|----|------|------------|-------|-------|----|-------|---------|-------|-------|----|----|--|-------|-------|---|
| 1  | TEMPERATURE RISE TEST                                             | <div>MODEL : GS90A12-P1J</div> <div>1. ROOM AMBIENT BURN-IN : 2 HRS</div> <div>I/P: 230VAC O/P: FULL LOAD Ta=33℃</div> <div>2. HIGH AMBIENT BURN-IN : 13HRS</div> <div>I/P: 230VAC O/P: FULL LOAD Ta=46.9℃</div> <div><table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT<br/>Ta= 33 ℃</th><th>HIGH AMBIENT<br/>Ta=46.9℃</th></tr><tr><td>1</td><td>U2</td><td>TEA1751</td><td>78.6℃</td><td>92.6℃</td></tr><tr><td>2</td><td>LF2</td><td>TR781</td><td>66.2℃</td><td>79.9℃</td></tr><tr><td>3</td><td>BD1</td><td>4A/800V US4KB80R-7000</td><td>76.1℃</td><td>90.5℃</td></tr><tr><td>4</td><td>L2</td><td>TF1814</td><td>77.9℃</td><td>92.4℃</td></tr><tr><td>5</td><td>Q31</td><td>2SK3683-01MR 19A/500V</td><td>80.6℃</td><td>94.7℃</td></tr><tr><td>6</td><td>D30</td><td>2A/800V GP20K</td><td>98.8℃</td><td>112.8℃</td></tr><tr><td>7</td><td>Q32</td><td>SPA07N60C3 7.3A/600V</td><td>78.2℃</td><td>86.6℃</td></tr><tr><td>8</td><td>C5</td><td>100U/400V 105℃ KMG</td><td>77.7℃</td><td>91.9℃</td></tr><tr><td>9</td><td>C11</td><td>474/450V 10% P=10 MMX</td><td>76.2℃</td><td>90.5℃</td></tr><tr><td>10</td><td>T1 COIL</td><td>TF1839</td><td>79.4℃</td><td>93.3℃</td></tr><tr><td>11</td><td>C52</td><td>47u/50V UL10Kh YXM</td><td>76.0℃</td><td>90.2℃</td></tr><tr><td>12</td><td>Q101</td><td>STP75NF75 80A/75V</td><td>72.4℃</td><td>86.3℃</td></tr><tr><td>13</td><td>C102</td><td>1500u/16V UL10Kh ZLH</td><td>72.4℃</td><td>86.8℃</td></tr><tr><td>14</td><td>D1</td><td>MUR460 4A/600V</td><td>86.9℃</td><td>101.8℃</td></tr><tr><td>15</td><td>J100</td><td>□ type jnmp</td><td>84.8℃</td><td>99.0℃</td></tr><tr><td>16</td><td>CASE</td><td>Lower CASE</td><td>66.2℃</td><td>79.8℃</td></tr><tr><td>17</td><td>RTH30</td><td>100K 1%</td><td>74.7℃</td><td>88.7℃</td></tr><tr><td>18</td><td>TA</td><td></td><td>33.0℃</td><td>46.9℃</td></tr></table></div> |                                                               |                          | NO      | Position | P/N | ROOM AMBIENT<br>Ta= 33 ℃ | HIGH AMBIENT<br>Ta=46.9℃ | 1 | U2 | TEA1751 | 78.6℃ | 92.6℃ | 2 | LF2 | TR781 | 66.2℃ | 79.9℃ | 3 | BD1 | 4A/800V US4KB80R-7000 | 76.1℃ | 90.5℃ | 4 | L2 | TF1814 | 77.9℃ | 92.4℃ | 5 | Q31 | 2SK3683-01MR 19A/500V | 80.6℃ | 94.7℃ | 6 | D30 | 2A/800V GP20K | 98.8℃ | 112.8℃ | 7 | Q32 | SPA07N60C3 7.3A/600V | 78.2℃ | 86.6℃ | 8 | C5 | 100U/400V 105℃ KMG | 77.7℃ | 91.9℃ | 9 | C11 | 474/450V 10% P=10 MMX | 76.2℃ | 90.5℃ | 10 | T1 COIL | TF1839 | 79.4℃ | 93.3℃ | 11 | C52 | 47u/50V UL10Kh YXM | 76.0℃ | 90.2℃ | 12 | Q101 | STP75NF75 80A/75V | 72.4℃ | 86.3℃ | 13 | C102 | 1500u/16V UL10Kh ZLH | 72.4℃ | 86.8℃ | 14 | D1 | MUR460 4A/600V | 86.9℃ | 101.8℃ | 15 | J100 | □ type jnmp | 84.8℃ | 99.0℃ | 16 | CASE | Lower CASE | 66.2℃ | 79.8℃ | 17 | RTH30 | 100K 1% | 74.7℃ | 88.7℃ | 18 | TA |  | 33.0℃ | 46.9℃ | P |
| NO | Position                                                          | P/N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ROOM AMBIENT<br>Ta= 33 ℃                                      | HIGH AMBIENT<br>Ta=46.9℃ |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 1  | U2                                                                | TEA1751                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 78.6℃                                                         | 92.6℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 2  | LF2                                                               | TR781                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 66.2℃                                                         | 79.9℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 3  | BD1                                                               | 4A/800V US4KB80R-7000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 76.1℃                                                         | 90.5℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 4  | L2                                                                | TF1814                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 77.9℃                                                         | 92.4℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 5  | Q31                                                               | 2SK3683-01MR 19A/500V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 80.6℃                                                         | 94.7℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 6  | D30                                                               | 2A/800V GP20K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 98.8℃                                                         | 112.8℃                   |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 7  | Q32                                                               | SPA07N60C3 7.3A/600V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 78.2℃                                                         | 86.6℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 8  | C5                                                                | 100U/400V 105℃ KMG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 77.7℃                                                         | 91.9℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 9  | C11                                                               | 474/450V 10% P=10 MMX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 76.2℃                                                         | 90.5℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 10 | T1 COIL                                                           | TF1839                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 79.4℃                                                         | 93.3℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 11 | C52                                                               | 47u/50V UL10Kh YXM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 76.0℃                                                         | 90.2℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 12 | Q101                                                              | STP75NF75 80A/75V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 72.4℃                                                         | 86.3℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 13 | C102                                                              | 1500u/16V UL10Kh ZLH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 72.4℃                                                         | 86.8℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 14 | D1                                                                | MUR460 4A/600V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 86.9℃                                                         | 101.8℃                   |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 15 | J100                                                              | □ type jnmp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 84.8℃                                                         | 99.0℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 16 | CASE                                                              | Lower CASE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 66.2℃                                                         | 79.8℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 17 | RTH30                                                             | 100K 1%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 74.7℃                                                         | 88.7℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 18 | TA                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 33.0℃                                                         | 46.9℃                    |         |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 2  | OVER LOAD BURN-IN TEST                                            | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | I/P: 230 VAC<br>O/P:136 % LOAD<br>Ta:30.7℃                    | TEST : OK                | P       |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | I/P:264 VAC<br>O/P:100% LOAD<br>Ta=-5℃                        | 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 40 ℃<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | I/P: 272 VAC<br>O/P:FULL LOAD<br>Ta=40 ℃<br>HUMIDITY= 95 %R.H | TEST : OK                | P       |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ±0.03 %(0-50℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | I/P: 230 VAC<br>O/P:FULL LOAD                                 | ± 0.006 %(0-50℃)         | P       |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |
| 6  | VIBRATION TEST                                                    | 1 Carton & 1 Set<br>(1) Waveform: Sine Wave<br>(2) Frequency:10-500Hz<br>(3) Sweep Time:10min/sweep cycle<br>(4) Acceleration:2G<br>(5) Test Time:1 hour in each axis (X.Y.Z)<br>(6) Ta:25℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                               | TEST : OK                | P       |          |     |                          |                          |   |    |         |       |       |   |     |       |       |       |   |     |                       |       |       |   |    |        |       |       |   |     |                       |       |       |   |     |               |       |        |   |     |                      |       |       |   |    |                    |       |       |   |     |                       |       |       |    |         |        |       |       |    |     |                    |       |       |    |      |                   |       |       |    |      |                      |       |       |    |    |                |       |        |    |      |             |       |       |    |      |            |       |       |    |       |         |       |       |    |    |  |       |       |   |

## SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                       | TEST CONDITION                                                                   | RESULT                                                                 | VERDICT |
|----|----------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 3 KVAC/min<br>I/P-FG: 1.5 KVAC/min<br>O/P-FG: 0.5 KVAC/min | I/P-O/P: 3.6 KVAC/min<br>I/P-FG: 1.8 KVAC/min<br>O/P-FG: 0.6 KVAC/min<br>Ta:25°C | I/P-O/P: 2.657 mA<br>I/P-FG: 1.994 mA<br>O/P-FG: 0.500 mA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ<br>I/P-FG: 500VDC>100MΩ<br>O/P-FG:500VDC>100MΩ | I/P-O/P: 500 VDC<br>I/P-FG: 500 VDC<br>O/P-FG: 500 VDC<br>Ta:25°C / 70%RH        | I/P-O/P: 30 GΩ<br>I/P-FG: 1.67 GΩ<br>O/P-FG: 6.66 GΩ<br>NO DAMAGE      | P       |
| 3  | APPROVAL             | TUV: Certificate NO : S50132045<br>UL: File NO : E183223            |                                                                                  |                                                                        | P       |

## E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION                                            | TEST CONDITION                                                        | RESULT                        | VERDICT |
|----|---------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------|---------|
| 1  | HARMONIC                                    | EN61000-3-2<br>CLASS A<br>CLASS D                        | I/P: 220VAC/230VAC/240VAC/<br>50HZ<br>O/P:100%/75%/50%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<br>L,N-PE:2KV | 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 |                                                          |                                                                       |                               |         |

## M.T.B.F & LIFE CYCLE CALCULATION

| NO | TEST ITEM               | SPECIFICATION                                                                                                                                   | TEST CONDITION                 | RESULT | VERDICT |
|----|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|---------|
| 1  | CAPACITOR<br>LIFE CYCLE | GS90A12-PJ1 : SUPPOSE C102<br>I/P: 230VAC O/P:FULL LOAD Ta=25 °C LIFE TIME=142447 HRS<br>I/P: 230VAC O/P:FULL LOAD Ta=40 °C LIFE TIME=48678 HRS | IS THE MOST CRITICAL COMPONENT |        | P       |
| 2  | MTBF                    | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE: 348.7K HRS                                                                            |                                |        | P       |

## COMPONENT STRESS TEST

| NO | TEST ITEM                                              | SPECIFICATION                     | TEST CONDITION                                                                                                                       | RESULT                                 | VERDICT |
|----|--------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------|
| 1  | Power Transistor<br>( D to S) or (C to E) Peak Voltage | Q 32Rated<br>SPA07N60C3 7.3A/600V | I/P:High-Line +3V = 267 V<br>O/P: (1)Full Load Turn on<br>(2) Output Short<br>Ta:25°C                                                | (1) 582 V<br>(2) 580 V                 | P       |
| 2  | Diode Peak Voltage                                     | Q 101 Rated<br>STP75NF75 80A/75V  | I/P:High-Line +3V = 267 V<br>O/P: (1)Full Load Turn on<br>(2)Output Short<br>Ta:25°C                                                 | (1) 67.4 V<br>(2) 54.8 V               | P       |
| 3  | Clamp Diode Peak Voltage                               | D 30 Rated<br>GP20K : 800 V 2 A   | I/P:High-Line +3V = 267 V<br>O/P: (1) Dynamic Load<br>90%Duty/1KHz<br>Ta:25°C                                                        | (1) 536 V                              | P       |
| 4  | Input Capacitor Voltage                                | C 5 Rated<br>120u/400V 105°C KMG  | I/P:High-Line +3V = 267 V<br>O/P: (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load Change<br>Ta:25°C | (1) 396 V<br>(2) 380 V<br>(3) 396 V    | P       |
| 5  | Control IC Voltage Test                                | U 2Rated<br>TEA1751T : 38 V       | I/P:High-Line +3V = 267 V<br>O/P: (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load Change<br>Ta:25°C | (1) 24.42 V<br>(2) 17 V<br>(3) 24.42 V | P       |

| DATE      | SAMPLE                     | TEST RESULT | TESTER     | APPROVAL      |
|-----------|----------------------------|-------------|------------|---------------|
| 2008/5/16 | RD SAMPLE                  | PASS        | SANFORD SU | VINCENT TSENG |
| 2008/8/7  | PRODUCT SAMPLE<br>W0806B60 | PASS        | SANFORD SU | VINCENT TSENG |
| 2008/9/16 | PRODUCT SAMPLE<br>W0808C62 | PASS        | SANFORD SU | VINCENT TSENG |

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