Jameco Part Number 2078338

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

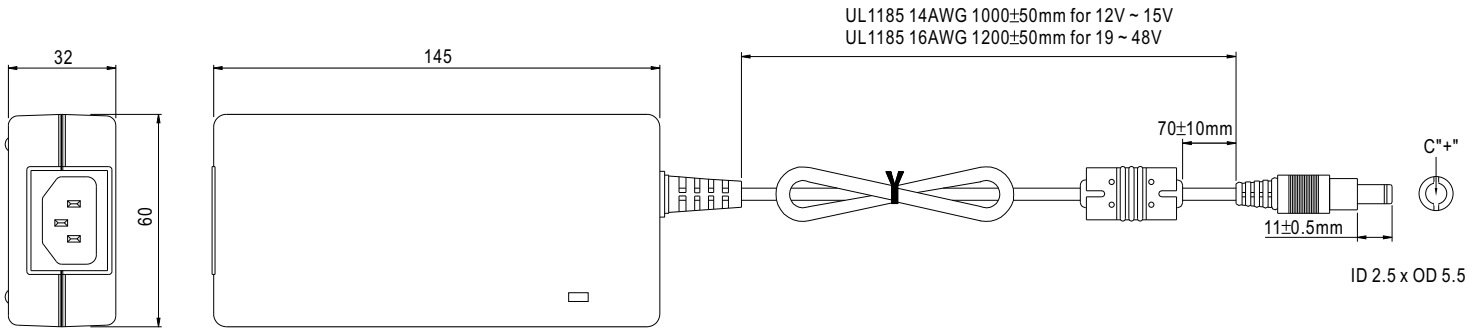
ORDER NO.		GS90A12-P1M	GS90A15-P1M	GS90A19-P1M	GS90A24-P1M	GS90A48-P1M
OUTPUT	SAFETY MODEL NO.	GS90A12	GS90A15	GS90A19	GS90A24	GS90A48
	DC VOLTAGE Note.2	12V	15V	19V	24V	48V
	RATED CURRENT	6.67A	6A	4.74A	3.75A	1.87A
	CURRENT RANGE	0 ~ 6.67A	0 ~ 6A	0 ~ 4.74A	0 ~ 3.75A	0 ~ 1.87A
	RATED POWER (max.)	80W	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				
		Protection type : Hiccup mode, recovers automatically after fault condition is removed				
	OVER VOLTAGE	105 ~ 135% rated output voltage				
		Protection type : Shut down o/p voltage, re-power on to recover				
	OVER TEMPERATURE	RTH30 > 100℃				
		Protection type : Shut down o/p voltage, re-power on to recover				
ENVIRONMENT	WORKING TEMP.	0 ~ +50℃ (Refer to output load derating curve)				
	WORKING HUMIDITY	20% ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-20 ~ +85℃, 10 ~ 95% RH				
	TEMP. COEFFICIENT	±0.03% / ℃ (0~50℃)				
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes				
SAFETY & EMC (Note. 7)	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				
	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				
OTHERS	MTBF	348.7Khrs min. MIL-HDBK-217F(25℃)				
	DIMENSION	145*60*32mm (L*W*H)				
	PACKING	0.45Kg; 30pcs/14.5Kg/0.85CUFT				
CONNECTOR	PLUG	Standard type P1M: 2.5ϕ * 5.5ϕ * 11mm, tuning fork type, center positive for stock ; Other type available by customer requested				
	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.
2.DC voltage: The output voltage set at point measure by plug terminal & 50% load.
3.Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1uf & 47uf capacitor.
4.Tolerance: includes set up tolerance, line regulation, load regulation.
5.Line regulation is measured from low line to high line at rated load.
6.Load regulation is measured from 10% to 100% rated load
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.
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.
9. Derating may be needed under low input voltages. Pleas check the derating curve for more details.

■ Mechanical Specification

Case No. 978A Unit:mm

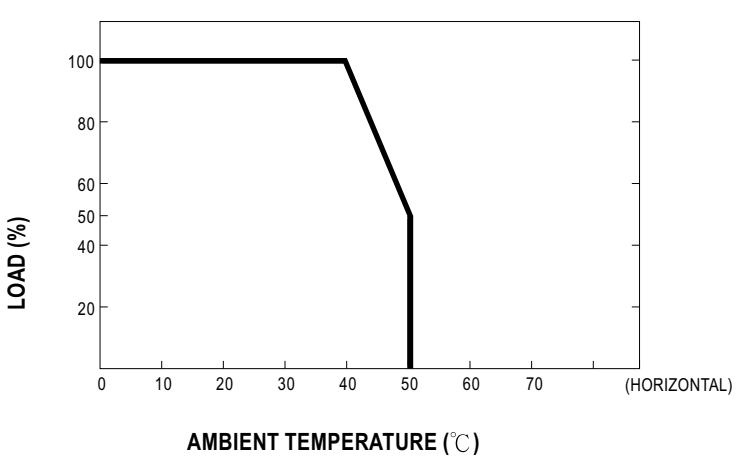


■ Plug Assignment

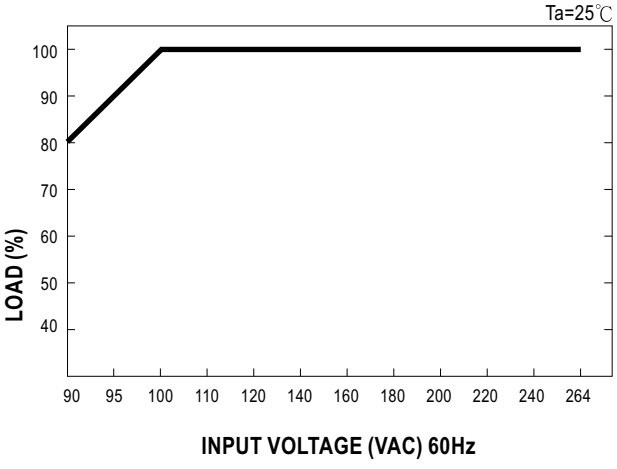
Standard plug: P1M (option)

P1M	
P/N	OUTPUT
CENTER	+

■ Derating Curve



■ Static Characteristics



MODEL：GS90A24-P1J

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1:180 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25℃	V1: 72 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1:3%~ -3% (Max)	I/P: 100 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25℃	V1: 0.63 %~ -0.63 %	P
3	LINE REGULATION	V1: 1 %~ -1 % (Max)	I/P: 100 VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0.03 %~ -0.03 %	P
4	LOAD REGULATION	V1: 3 %~ -3% (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.63 %~ -0.63 %	P
5	SET UP TIME	230VAC: 1000 ms (Max) 115 VAC: 1000 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 484 ms 115VAC/ 484 ms	P
6	RISE TIME	230VAC: 20 ms (Max) 115VAC: 20 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 10.5 ms 115VAC/ 11.2 ms	P
7	HOLD UP TIME	230VAC: 20 ms (TYP) 115VAC: 20 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 75.4 ms 115VAC/ 30.6 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
9	DYNAMIC LOAD	V1: 2400 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	459 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	66 V~264V	P
			I/P: LOW-LINE-3V= 87 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P: 100 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK	P
3	POWER FACTOR	0.91 / 230 VAC(TYP) 0.95 / 115 VAC(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	PF= 0.922 / 230VAC PF= 0.985 / 115VAC	P
4	EFFICIENCY	89.5 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	90.5 %	P
5	INPUT CURRENT	230V/ 1 A (TYP) 115V/ 2 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 0.45 A/ 230 VAC I = 0.86 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 70 A (TYP) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	I = 57 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P: 264 VAC O/P:Min LOAD Ta:25℃	L-FG: 0.22 mA N-FG: 0.22 mA	P
8	NO LOAD CONSUMPTION	< 0.5 W/240VAC	I/P: 240 VAC O/P:NO LOAD Ta:25℃	0.4 W	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	110%~ 150 %	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25℃	123 %/ 230 VAC 119 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1:25.2 V~ 32.4 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	28.86 V/ 230 VAC 28.88 V/ 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: RTH30>100℃ O.T.P. NO DAMAGE	I/P: 230 VAC O/P:FULL LOAD	O.T.P. Active Shunt down Re-power ON	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P:FULL LOAD Ta:25℃	NO DAMAGE Hiccup Mode	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： GS90A24-P1J
1. ROOM AMBIENT BURN-IN：2 HRS
I/P: 230VAC O/P: FULL LOAD Ta=33℃
2. HIGH AMBIENT BURN-IN：13HRS
I/P: 230VAC O/P: FULL LOAD Ta=46.9℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta=33 ℃</th><th>HIGH AMBIENT Ta=46.9℃</th></tr>
<tr><td>1</td><td>U2</td><td>TEA1751</td><td>80.7℃</td><td>94.8℃</td></tr>
<tr><td>2</td><td>LF2</td><td>TR781</td><td>69.0℃</td><td>83.2℃</td></tr>
<tr><td>3</td><td>BD1</td><td>4A/800V US4KB80R-7000</td><td>76.1℃</td><td>90.1℃</td></tr>
<tr><td>4</td><td>L2</td><td>TF1814</td><td>81.2℃</td><td>95.8℃</td></tr>
<tr><td>5</td><td>Q31</td><td>2SK3683-01MR 19A/500V</td><td>83.2℃</td><td>97.4℃</td></tr>
<tr><td>6</td><td>D30</td><td>2A/800V GP20K</td><td>108.8℃</td><td>122.7℃</td></tr>
<tr><td>7</td><td>Q32</td><td>SPA07N60C3 7.3A/600V</td><td>85.8℃</td><td>100.2℃</td></tr>
<tr><td>8</td><td>C5</td><td>100U/400V 105℃ KMG</td><td>79.4℃</td><td>94.1℃</td></tr>
<tr><td>9</td><td>C11</td><td>474/450V 10% P=10 MMX</td><td>79.1℃</td><td>93.5℃</td></tr>
<tr><td>10</td><td>T1 COIL</td><td>TF1842</td><td>79.3℃</td><td>93.6℃</td></tr>
<tr><td>11</td><td>C52</td><td>47u/50V UL10Kh YXM</td><td>79.5℃</td><td>93.8℃</td></tr>
<tr><td>12</td><td>Q101</td><td>IRF3415 43A/150V</td><td>81.5℃</td><td>96.2℃</td></tr>
<tr><td>13</td><td>C102</td><td>470U/35V 105℃ KY</td><td>73.7℃</td><td>88.0℃</td></tr>
<tr><td>14</td><td>D1</td><td>MUR460 4A/600V</td><td>88.4℃</td><td>103.3℃</td></tr>
<tr><td>15</td><td>CASE</td><td>Lower CASE</td><td>67.2℃</td><td>81.1℃</td></tr>
<tr><td>16</td><td>RTH30</td><td>100K 1%</td><td>79.5℃</td><td>94.1℃</td></tr>
<tr><td>17</td><td>TA</td><td></td><td>33.0℃</td><td>46.9℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P: 230 VAC
O/P:128 % LOAD
Ta:25℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P: 230 VAC
O/P:100% LOAD
Ta=-5℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 40℃
NO DAMAGE</td><td>I/P: 272 VAC
O/P:FULL LOAD
Ta= 40 ℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>±0.03 %(0~50℃)</td><td>I/P: 230 VAC
O/P:FULL LOAD</td><td>± 0.006 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">1 Carton & 1 Set
(1) Waveform: Sine Wave
(2) Frequency:10~500Hz
(3) Sweep Time:10min/sweep cycle
(4) Acceleration:2G
(5) Test Time:1 hour in each axis (X.Y.Z)
(6) Ta:25℃</td><td>TEST：OK</td><td>P</td></tr>
</table>

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25℃	I/P-O/P: 2.670 mA I/P-FG: 2.001 mA O/P-FG: 0.496 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25℃ / 70%RH	I/P-O/P: 28.9 GΩ I/P-FG: 1.62 GΩ O/P-FG: 30 GΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO ：S50132045 UL: File NO ：E183223			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS D	I/P: 220VAC/230VAC/240VAC/ 50HZ O/P:100%/75%/50%LOAD Ta:25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	GS90A24-PJ1 : SUPPOSE C102 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta=25 ℃ LIFE TIME=156362 HRS I/P: 230VAC O/P:FULL LOAD Ta=40 ℃ LIFE TIME=53762 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 348.7K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 32Rated SPA07N60C3 7.3A/600V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Output Short Ta:25℃	(1) 580 V (2) 500 V	P
2	Diode Peak Voltage	Q 101 Rated IRF3415 43A/150V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25℃	(1) 132 V (2) 119 V	P
3	Clamp Diode Peak Voltage	D 30 Rated GP20K : 800 V 2 A	I/P:High-Line +3V = 267 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 524 V	P
4	Input Capacitor Voltage	C 5 Rated 120u/400V 105℃ KMG	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 396 V (2) 386 V (3) 394 V	P
5	Control IC Voltage Test	U 2Rated TEA1751T : 38 V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 23.6 V (2) 16.61 V (3) 23.6 V	P

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

2003/12/12 A50-F023