



60W AC-DC Single Output Desktop

GS60 series



■ Features :

- Universal AC input / Full range
- 3 pole AC inlet IEC320-C14
- Protections: Short circuit / Overload / Over voltage/ Over temperature
- Fully enclosed plastic case
- Approvals: UL / CUL / TUV / BSMI / CCC / CB / FCC / CE
- Class I power (with earth pin)
- Pass LPS
- LED indicator for power on
- No load power consumption<0.3W
- ENERGY STAR level V compliant
- Meet EISA 2007(Energy Independence and Security Act)
- 2 years warranty

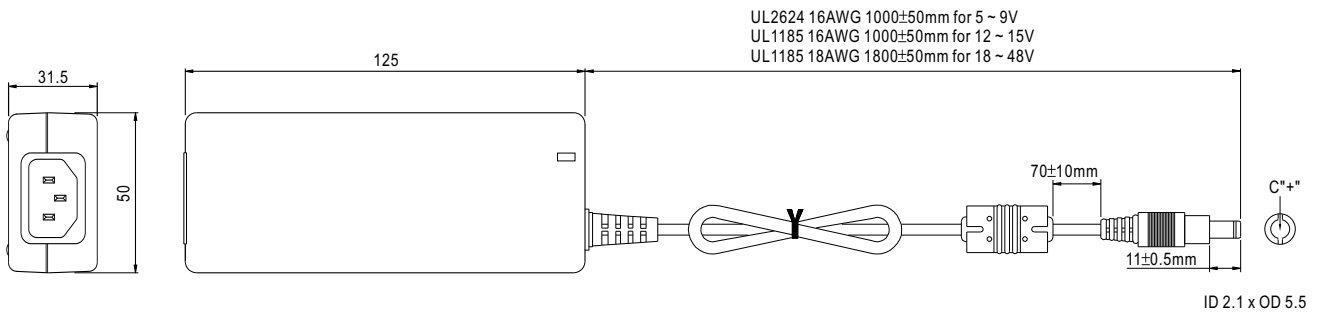


SPECIFICATION

ORDER NO.		GS60A05-P1J	GS60A07-P1J	GS60A09-P1J	GS60A12-P1J	GS60A15-P1J	GS60A18-P1J	GS60A24-P1J	GS60A48-P1J
OUTPUT	SAFETY MODEL NO.	GS60A05	GS60A07	GS60A09	GS60A12	GS60A15	GS60A18	GS60A24	GS60A48
	DC VOLTAGE Note.2	5V	7.5V	9V	12V	15V	18V	24V	48V
	RATED CURRENT	6A	6A	6A	5A	4A	3.33A	2.5A	1.25A
	CURRENT RANGE	0 ~ 6A	0 ~ 6A	0 ~ 6A	0 ~ 5A	0 ~ 4A	0 ~ 3.33A	0 ~ 2.5A	0 ~ 1.25A
	RATED POWER (max.)	30W	45W	54W	60W	60W	60W	60W	60W
	RIPPLE & NOISE (max.) Note.3	100mVp-p	100mVp-p	100mVp-p	100mVp-p	100mVp-p	150mVp-p	180mVp-p	240mVp-p
	VOLTAGE TOLERANCE Note.4	±5.0%	±5.0%	±5.0%	±3.0%	±3.0%	±3.0%	±3.0%	±2.5%
	LINE REGULATION Note.5	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LOAD REGULATION	±5.0%	±5.0%	±5.0%	±3.0%	±3.0%	±3.0%	±3.0%	±2.5%
	SETUP, RISE TIME Note.7	600ms, 30ms / 230VAC 600ms, 30ms / 115VAC at full load							
HOLD UP TIME (Typ.)	50ms / 230VAC 15ms / 115VAC at full load								
INPUT	VOLTAGE RANGE	90 ~ 264VAC 135 ~ 370VDC							
	FREQUENCY RANGE	47 ~ 63Hz							
	EFFICIENCY (Typ.)	81%	85.5%	87.5%	88%	88.5%	88.5%	90%	92%
	AC CURRENT	1.4A / 115VAC 1A / 230VAC							
	INRUSH CURRENT (max.)	65A / 230VAC							
	LEAKAGE CURRENT(max.)	0.75mA / 240VAC							
PROTECTION	OVERLOAD	105 ~ 150% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed							
	OVER VOLTAGE	5.25 ~ 6.75V	7.88 ~ 10.13V	9.45 ~ 12.15V	12.6 ~ 16.2V	15.75 ~ 20.25V	18.9 ~ 24.3V	25.2 ~ 32.4V	50.4 ~ 64.8V
		Protection type : Shut down o/p voltage, re-power on to recover							
	OVER TEMPERATURE	RTH2 > 70℃ Protection type : Shut down o/p voltage, re-power on to recover							
ENVIRONMENT	WORKING TEMP.	-10 ~ +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% / °C (0 ~ 50℃)							
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes							
SAFETY & EMC (Note. 6)	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	711Khrs min. MIL-HDBK-217F(25℃)							
	DIMENSION	125*50*31.5mm (L*W*H)							
	PACKING	0.305Kg; 40pcs/13.02Kg/1.05CUFT							
CONNECTOR	PLUG	Standard type P1J: 2.1φ * 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. The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. 7. 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.								

Mechanical Specification

Case No. 974A Unit:mm

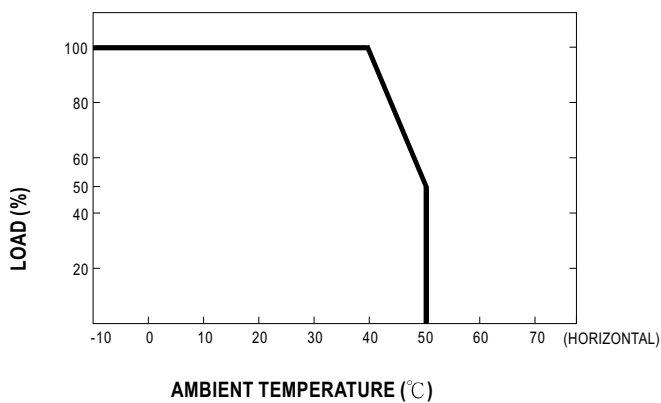


Plug Assignment

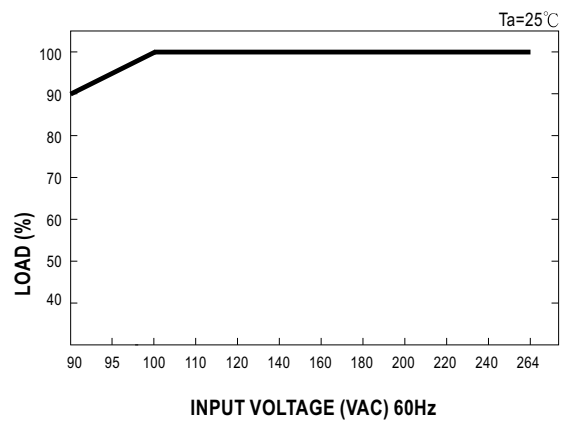
Standard plug: P1J (option)

P1J	
P/N	OUTPUT
CENTER	+

Derating Curve



Static Characteristics



MODEL : GS60A07-P1J

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1:100 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 60 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1: 5 %~ -5 % (Max)	I/P: 100 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 2.5 %~ 2.5 %	P
3	LINE REGULATION	V1: 1 %~ -1 % (Max)	I/P: 100 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0.04 %~ -0.04 %	P
4	LOAD REGULATION	V1: 5 %~ -5 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 2.5 %~ -2.5 %	P
5	SET UP TIME	230VAC: 600 ms (Max) 115 VAC: 600 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 392 ms 115VAC/ 392 ms	P
6	RISE TIME	230VAC: 30 ms (Max) 115VAC: 30 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 9 ms 115VAC/ 8.6 ms	P
7	HOLD UP TIME	230VAC: 50 ms (TYP) 115VAC: 15 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 110 ms 115VAC/ 21 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: <5 %	P
9	DYNAMIC LOAD	V1: 700 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	421 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°C	70 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°C	TEST: OK	P
3	EFFICIENCY	84 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	84.6 %	P
4	INPUT CURRENT	230V/ 1 A (TYP) 115V/ 1.4 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 0.48 A/ 230 VAC I = 0.48 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 65 A (TYP) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 55 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 0.75 mA / 240 VAC	I/P: 264 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.04 mA N-FG: 0.04 mA	P
7	NO LOAD CONSUMPTION	< 0.3 W/240VAC	I/P: 240 VAC O/P:NO LOAD Ta:25°C	0.20 W	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 150 %	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C	123 %/ 230 VAC 117 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 7.88 V~ 10.13 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	8.86 V/ 230 VAC 8.87 V/ 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: RTH2>70°C 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°C	NO DAMAGE Hiccup Mode	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																						
1	TEMPERATURE RISE TEST	MODEL : GS60A12-P1J 1. ROOM AMBIENT BURN-IN : 12 HRS I/P: 230VAC O/P: FULL LOAD Ta=27.1℃ 2. HIGH AMBIENT BURN-IN : 2.5HRS I/P: 230VAC O/P: FULL LOAD Ta=43.7℃ <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 27.1 ℃</th><th>HIGH AMBIENT Ta=43.7℃</th></tr><tr><td>1</td><td>BD1</td><td>UD4KB80 4A/800V</td><td>69.3℃</td><td>81.2℃</td></tr><tr><td>2</td><td>LF2</td><td>TR-367</td><td>66.8℃</td><td>78.6℃</td></tr><tr><td>3</td><td>C5</td><td>120U/400V 105℃ KMG</td><td>67.2℃</td><td>79.0℃</td></tr><tr><td>4</td><td>D1</td><td>2A/800V GP20K</td><td>84.2℃</td><td>96.2℃</td></tr><tr><td>5</td><td>D40</td><td>1A/1KV 1N4007GP</td><td>72.4℃</td><td>84.1℃</td></tr><tr><td>6</td><td>D100</td><td>STPS30H60CT 30A/60V</td><td>83.1℃</td><td>94.2℃</td></tr><tr><td>7</td><td>T1 COIL</td><td>TF-1741</td><td>70.7℃</td><td>82.2℃</td></tr><tr><td>8</td><td>Q1</td><td>2SK3673-01MR 10A/700V</td><td>72.3℃</td><td>84.5℃</td></tr><tr><td>9</td><td>C105</td><td>1500U/16V 105℃ ZLH</td><td>67.3℃</td><td>78.6℃</td></tr><tr><td>10</td><td>C40</td><td>100U/25V 105℃ YXG</td><td>70.4℃</td><td>82.5℃</td></tr><tr><td>11</td><td>RTH1</td><td>330K ± 1%</td><td>64.7℃</td><td>76.2℃</td></tr><tr><td>12</td><td>ZD1</td><td>P6KE250A</td><td>75.5℃</td><td>87.4℃</td></tr><tr><td>13</td><td>U1</td><td>NCP1230D65R2G</td><td>64.0℃</td><td>77.1℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 27.1 ℃	HIGH AMBIENT Ta=43.7℃	1	BD1	UD4KB80 4A/800V	69.3℃	81.2℃	2	LF2	TR-367	66.8℃	78.6℃	3	C5	120U/400V 105℃ KMG	67.2℃	79.0℃	4	D1	2A/800V GP20K	84.2℃	96.2℃	5	D40	1A/1KV 1N4007GP	72.4℃	84.1℃	6	D100	STPS30H60CT 30A/60V	83.1℃	94.2℃	7	T1 COIL	TF-1741	70.7℃	82.2℃	8	Q1	2SK3673-01MR 10A/700V	72.3℃	84.5℃	9	C105	1500U/16V 105℃ ZLH	67.3℃	78.6℃	10	C40	100U/25V 105℃ YXG	70.4℃	82.5℃	11	RTH1	330K ± 1%	64.7℃	76.2℃	12	ZD1	P6KE250A	75.5℃	87.4℃	13	U1	NCP1230D65R2G	64.0℃	77.1℃	P
NO	Position	P/N	ROOM AMBIENT Ta= 27.1 ℃	HIGH AMBIENT Ta=43.7℃																																																																							
1	BD1	UD4KB80 4A/800V	69.3℃	81.2℃																																																																							
2	LF2	TR-367	66.8℃	78.6℃																																																																							
3	C5	120U/400V 105℃ KMG	67.2℃	79.0℃																																																																							
4	D1	2A/800V GP20K	84.2℃	96.2℃																																																																							
5	D40	1A/1KV 1N4007GP	72.4℃	84.1℃																																																																							
6	D100	STPS30H60CT 30A/60V	83.1℃	94.2℃																																																																							
7	T1 COIL	TF-1741	70.7℃	82.2℃																																																																							
8	Q1	2SK3673-01MR 10A/700V	72.3℃	84.5℃																																																																							
9	C105	1500U/16V 105℃ ZLH	67.3℃	78.6℃																																																																							
10	C40	100U/25V 105℃ YXG	70.4℃	82.5℃																																																																							
11	RTH1	330K ± 1%	64.7℃	76.2℃																																																																							
12	ZD1	P6KE250A	75.5℃	87.4℃																																																																							
13	U1	NCP1230D65R2G	64.0℃	77.1℃																																																																							
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P:138% LOAD Ta:25℃	TEST : OK	P																																																																						
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P:100% LOAD Ta=-15℃	TEST : OK	P																																																																						
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40℃ NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta=40℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																						
5	TEMPERATURE COEFFICIENT	± 0.03 %(0-50℃)	I/P: 230 VAC O/P:FULL LOAD	± 0.015 %(0-50℃)	P																																																																						
6	VIBRATION TEST	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℃		TEST : OK	P																																																																						

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°C	I/P-O/P: 1.762 mA I/P-FG: 0.662 mA O/P-FG: 1.66 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°C / 70%RH	I/P-O/P: 30 GΩ I/P-FG: 1.73 GΩ O/P-FG: 12.1 GΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO : S50127275 UL: File NO :			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C	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°C	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°C	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°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 LIFE CYCLE	GS-60A-12 : SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25°C LIFE TIME= 180523 HRS I/P: 230VAC O/P:FULL LOAD Ta= 40°C LIFE TIME= 92206 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 711K HRS			P
3	ORT (Ongoing Reliability test)	GS60A24-P1J:I/P : 230VAC O/P : 50% LOAD TA=50°C Sample=10pcs TEST TIME=1248HRS			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 1 Rated 2SK3673-01MR 10A/700V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Output Short Ta:25°C	(1) 610 V (2) 535 V	P
2	Diode Peak Voltage	D 100 Rated STPS40L45CT 40A/45V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 39 V (2) 32.5 V	P
3	Clamp Diode Peak Voltage	D 1 Rated GP20K : 800 V 2 A	I/P:High-Line +3V = 267 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 495 V	P
4	Input Capacitor Voltage	C 5 Rated 120u/400V 105°C	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°C	(1) 395 V (2) 400 V (3) 400 V	P
5	Control IC Voltage Test	U 1Rated NCP1230D65R2G : 18 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°C	(1) 10.28 V (2) 8.54 V (3) 10.28 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/1/22	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2008/4/18	PRODUCT SAMPLE W0803A73	PASS	SANFORD SU	VINCENT TSENG
2008/7/15	PRODUCT SAMPLE W0806C64	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023