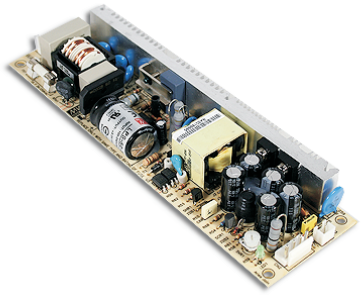
JAMECO ELECTRONICS

Jameco SKU Number: 2104778

MEAN WELL

50W Single Output Switching Power Supply

LPS-50 series



■ Features :

- Universal AC input / Full range
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- Small and compact size
- Built-in remote ON-OFF control
- LED indicator for power on
- 100% full load burn-in test
- Low profile:23mm thickness
- 2 years warranty

SPECIFICATION

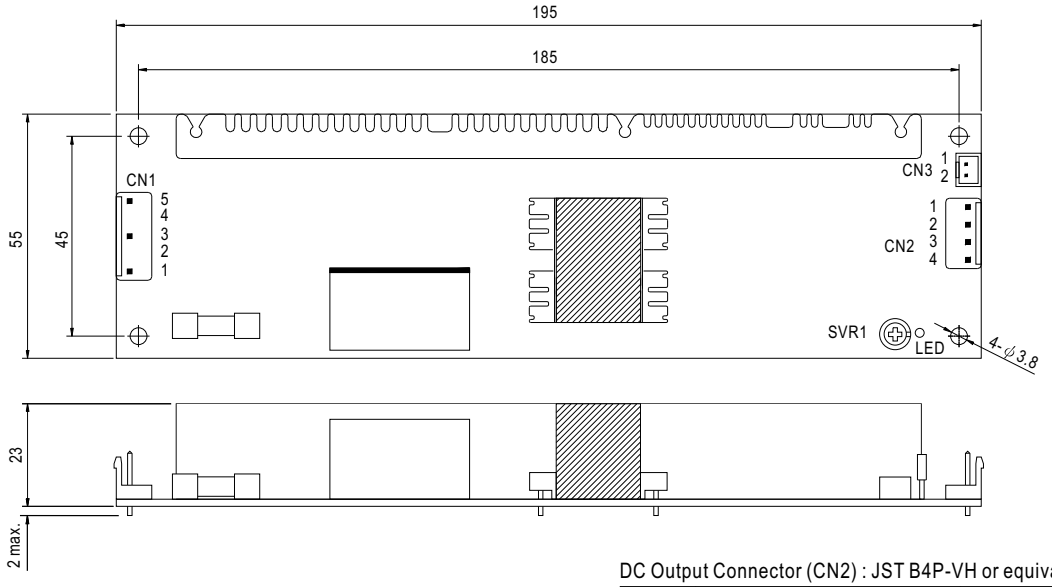
MODEL			LPS-50-3.3	LPS-50-5	LPS-50-12	LPS-50-15	LPS-50-24	LPS-50-48
OUTPUT	DC VOLTAGE		3.3V	5V	12V	15V	24V	48V
	RATED CURRENT		10A	10A	4.2A	3.4A	2.1A	1.1A
	CURRENT RANGE		0 ~ 12A	0 ~ 12A	0 ~ 5A	0 ~ 4.1A	0 ~ 2.5A	0 ~ 1.3A
	RATED POWER		33W	50W	50.4W	51W	50.4W	52.8W
	PEAK LOAD(10sec.)	Note.4	39.6W	60W	60W	61.5W	60W	62.4W
	RIPPLE & NOISE (max.)	Note.2	50mVp-p	50mVp-p	80mVp-p	80mVp-p	80mVp-p	100mVp-p
	VOLTAGE ADJ. RANGE		3 ~ 3.6V	4.5 ~ 5.5V	10.8 ~ 13.2V	13.5 ~ 16.5V	21.6 ~ 27.2V	43.2 ~ 52.8V
	VOLTAGE TOLERANCE	Note.3	±3.0%	±3.0%	±2.0%	±2.0%	±1.0%	±1.0%
	LINE REGULATION		±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LOAD REGULATION		±3.0%	±3.0%	±2.0%	±2.0%	±1.0%	±1.0%
	SETUP, RISE TIME		100ms, 40ms/230VAC 100ms, 40ms/115VAC at full load					
	HOLD UP TIME (Typ.)		70ms/230VAC 12ms/115VAC at full load					
INPUT	VOLTAGE RANGE		90 ~ 264VAC 127 ~ 370VDC					
	FREQUENCY RANGE		47 ~ 63Hz					
	EFFICIENCY(Typ.)		75%	81%	82%	84%	85%	86%
	AC CURRENT (Typ.)	115VAC	0.9A	1.2A				
		230VAC	0.6A	0.8A				
	INRUSH CURRENT (Typ.)		COLD START 18A/115VAC 35A/230VAC					
	LEAKAGE CURRENT		<1mA / 240VAC					
PROTECTION	OVERLOAD		122 ~ 160% rated output power					
			Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE		3.8 ~ 4.45V	5.75 ~ 6.75V	13.8 ~ 16.2V	17.25 ~ 20.25V	27.6 ~ 32.4V	57.6 ~ 67.2V
			Protection type : Hiccup mode, recovers automatically after fault condition is removed					
FUNCTION	REMOTE ON/OFF		RC+/RC- : 0 ~ 0.8V power on ; 4 ~ 10V power off					
ENVIRONMENT	WORKING TEMP.		-20 ~ +70℃ (Refer to output load derating curve)					
	WORKING HUMIDITY		20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY		-20 ~ +85℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT		±0.04%/℃ (0 ~ 50℃)					
	VIBRATION		10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 5)	SAFETY STANDARDS		UL60950-1, TUV EN60950-1 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					
	EMI CONDUCTION & RADIATION		Compliance to EN55022 (CISPR22) Class B					
	HARMONIC CURRENT		Compliance to EN61000-3-2,-3					
	EMS IMMUNITY		Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, EN61000-6-2 (EN50082-2), heavy industry level, criteria A					
OTHERS	MTBF		341.7Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION		195*55*23mm (L*W*H)					
	PACKING		0.24Kg; 48pcs/12.5Kg/0.84CUFT					

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. 33.3% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.
5. 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.

■ Mechanical Specification

Unit:mm



AC Input Connector (CN1) : JST B5P-VH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	AC/L	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
2,4	No Pin		
3	AC/N		
5	FG ⏚		

DC Output Connector (CN2) : JST B4P-VH or equivalent

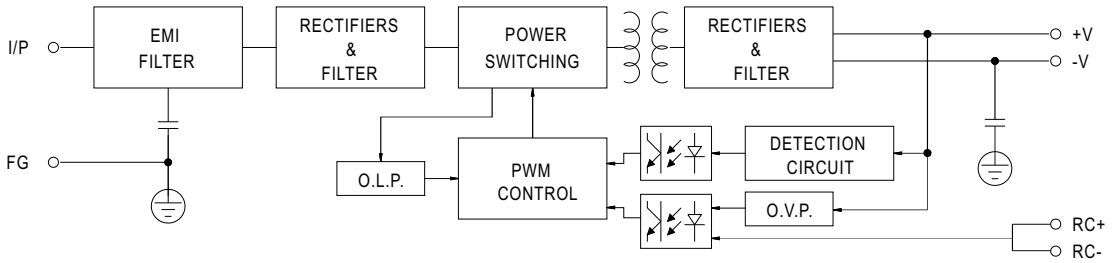
Pin No.	Assignment	Mating Housing	Terminal
1,2	-V	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
3,4	+V		

Remote ON/OFF Connector(CN3):JST B2B-XH or equivalent

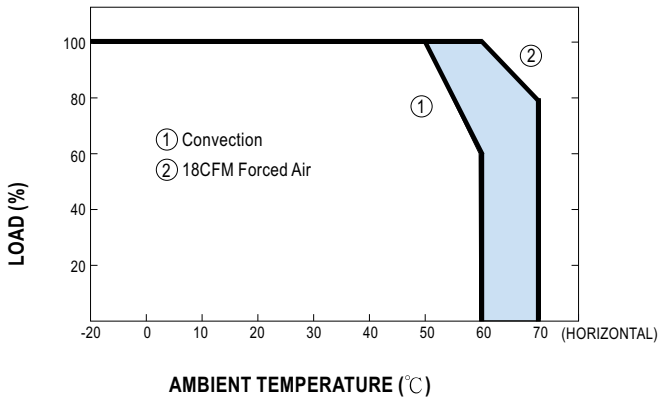
Pin No.	Assignment	Mating Housing	Terminal
1	RC+	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2	RC-		

■ Block Diagram

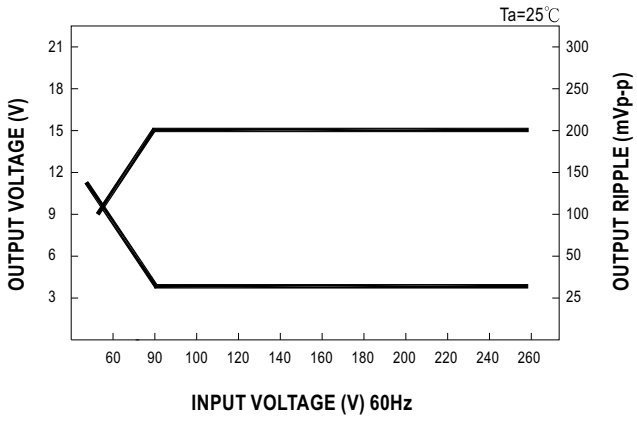
fosc : 60KHz



■ Derating Curve



■ Static Characteristics (15V)



MODEL : LPS-50-48

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 100 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1: 51 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 43.2V~ 52.8 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	39.7V~ 55.32 V/230VAC 39.75V~ 55.32 V/115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: -1 %~ 1 % (Max)	I/P: 90 VAC / 264 VAC O/P:FULL/ 0 % LOAD Ta:25℃	V1: 0.01 %~ -0.01 %	P
4	LINE REGULATION	V1: -1 %~ 1 % (Max)	I/P: 90 VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0 %~ -0.02 %	P
5	LOAD REGULATION	V1: -1 %~ 1 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.02 %~ 0 %	P
6	SET UP TIME	230 VAC/ 100 ms (Max) 115 VAC/ 100 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230 VAC/ 35 ms 115 VAC/ 32 ms	P
7	RISE TIME	230 VAC/ 40 ms (Max) 115 VAC/ 40 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230 VAC/ 25 ms 115 VAC/ 26 ms	P
8	HOLD UP TIME	230VAC/ 50 ms (TYP) 115VAC/ 12 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230 VAC/ 84 ms 115 VAC/ 19 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
10	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	176 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90 VAC~ 264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	56V~ 264 V	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	47 HZ ~ 63 HZ NO DAMAGE OSC	I/P: 90 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK	P
3	EFFICIENCY	86 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	87.2 %	P
4	INPUT CURRENT	230 V/ 0.8 A(TYP) 115 V/ 1.2 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 0.56 A/ 230 VAC I = 0.91 A/ 115VAC	P
5	INRUSH CURRENT	230 V/ 35 A (TYP) 115 V/ 25 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 33.6 A / 230 VAC I = 19 A / 115 VAC	P
6	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P: 254 VAC O/P:Min LOAD Ta:25℃	L-FG: 0.7 mA N-FG: 0.72 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	122 %~ 160 %	I/P: 230 VAC I/P: 115VAC O/P:TESTING Ta:25℃	150%/230VA 140%/115VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 57.6 V~ 67.2 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	62.4V/230VAC 62.4V/115VAC Hiccup Model	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: Full LOAD Ta:25℃	NO DAMAGE Hiccup Mode	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE CONTROL	Rc+ / Rc- 0 V~ 0.8 V POWER ON 4 V~ 10 V POWER OFF	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	0 V ~ 3 V POWER ON 3.5V ~ 10 V POWER OFF	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECICATION</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： LPS-50-48
1. ROOM AMBIENT BURN-IN：1 HRS
I/P: 230 VAC O/P: 100% LOAD Ta= 28.3 ℃
2. HIGH AMBIENT BURN-IN： 62 HRS
I/P: 230 VAC O/P: 100% LOAD Ta= 44.7 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 28.3℃</th><th>HIGH AMBIENT Ta=44.7 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>KBJ406G 4A/600V</td><td>45.2℃</td><td>62.9℃</td></tr>
<tr><td>2</td><td>U1</td><td>1203</td><td>43.2℃</td><td>59.5℃</td></tr>
<tr><td>3</td><td>C5</td><td>100 μ/400V 105℃</td><td>39.7℃</td><td>56.5℃</td></tr>
<tr><td>4</td><td>LF1</td><td>21070H</td><td>42.8℃</td><td>59.6℃</td></tr>
<tr><td>5</td><td>Q1</td><td>K2645 9A/600V</td><td>72.2℃</td><td>89.3℃</td></tr>
<tr><td>6</td><td>D1</td><td>EGP20J 2A/600V</td><td>58.1℃</td><td>73.7℃</td></tr>
<tr><td>7</td><td>C12</td><td>22 μ/50V 105℃</td><td>41.2℃</td><td>56.7℃</td></tr>
<tr><td>8</td><td>D51</td><td>F10LC40 10A/400V</td><td>57.2℃</td><td>71.9℃</td></tr>
<tr><td>9</td><td>T1 COIL</td><td>TF-901C</td><td>54.2℃</td><td>69.4℃</td></tr>
<tr><td>10</td><td>T1 CORE</td><td>TF-901C</td><td>49.7℃</td><td>64.5℃</td></tr>
<tr><td>11</td><td>C52</td><td>220 μ/63V 105℃</td><td>42.8℃</td><td>60.2℃</td></tr>
<tr><td>12</td><td>C57</td><td>220 μ/63V 105℃</td><td>43.1℃</td><td>59.2℃</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: 154%
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= -20 ℃</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 50℃
NO DAMAGE</td><td>I/P: 272 VAC
O/P:FULL LOAD
Ta= 50 ℃
HUMIDITY= 95 %R.H</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.04 %(0~50℃)</td><td>I/P: 230 VAC
O/P:FULL LOAD</td><td>0.01 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">1 Carton & 1 Set Operating at I/P: 230 VAC NO LOAD
(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	SPECICATION	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: 3.82 mA I/P-FG: 4.05 mA O/P-FG: 2.15 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℃	I/P-O/P: 24.6G Ω I/P-FG: 13.9G Ω O/P-FG: 24.9G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	18 mΩ	P
4	APPROVAL	TUV: Certificate NO ：R50033909 UL: File NO ：E183223			P

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL 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 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 INDUSTRY INPUT: 2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	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	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C 52 IS THE MOST CRITICAL COMPONENT I/P:230VAC O/P:FULL LOAD Ta=25℃ LIFE TIME= 119659 HRS I/P:230VAC O/P:FULL LOAD Ta=50℃ LIFE TIME= 28706 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 341.7K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) **Peak Voltage**	Q 1 Rated K2645: 600 V 9 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 438 V (2) 436 V (3) 508 V	P
2	Diode Peak **Voltage**	D51 Rated F10P40F : 400 V 10 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 270 V (2) 314 V (3) 270 V	P
3	Clamp Diode Peak **Voltage**	D1 Rated EGP20J : 600 V 2 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 446 V (2) 446 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2003/9/24	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2003/11/21	PRODUCT SAMPLE A310B03	PASS	VINCENT TSENG	MAX LIN
2004/3/12	PRODUCT SAMPLE A402B03	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023