全漢企業股份有限公司

電氣規格書

料號	:	9PA250D600(,PILOT RUN(B OK+P-REPORT OK),G.P,FSP250-50LC(PLB),IPC,EPS1U(85PLUS),ErP,2 BALL,W/NK,WO/IO,WO/O,WO/SS,FSP,W/PFC(A),3L1S,INTEL,FULL RANGE,RD2,)
版次	:	1
文件編號	:	ESD10024093
附件版本	:	1.0
研發部門	:	RD2
作者	:	joanna718/李憶芬
Model No/Type	:	
機密	:	N
發行日期	:	2010/4/19-14:49:4
備註	:	

單位	姓名	單位	姓名	單位	姓名
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FSP GROUP

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SPECIFICATION

FSP250-50LC(PLB)

9PA250D600

Main Feature
Active PFC Circuit
Full Range Input

NOV 19, 2009
REV:1.0

全漢企業股份有限公司
FSP GROUP FSP TECHNOLOGY INC.

MODEL: FSP250-50LC(PLB)

Revision History

Rev	Description	Date	Author

1. GENERAL DESCRIPTION AND SCOPE

This is the specification of Model FSP250-50LC(PLB); AC-line powered switching power supply with active PFC (Power Factor Correction) circuit, meet EN61000-3-2 and with Full Range Input features. Designed and manufactured by FSP GROUP.

The 5Vsb power is less than $1W_{input}$ at power off mode (PS_ON input at high state) which is comply with EuP Lot 6 year 2010 requirement.

The specification below is intended to describe as detailedly as possible the functions and performance of the subject power supply. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as a new target for us to approach.

2. REFERENCE DOCUMENTS

The subject power supply will meet the EMI requirements and obtain main safety approvals as following:

2.1 EMI REGULATORY

- FCC Part 15 Subpart J, Class 'B' 115 Vac operation.
- CISPR 22 Class 'B' 230 Vac operation.

3. PHYSICAL REQUIREMENTS

3.1 MECHANICAL SPECIFICATIONS

The mechanical drawing of the subject power supply, which indicate the form factor, location of the mounting holes, location, the length of the connectors, and other physical specifications of the subject power supply. Please refer to the attachment drawing.

3.2 CONNECTOR SPECIFICATIONS

The power supply connectors are:

AC Inlet	: Standard inlet socket 10A/250V, UL/CSA/VDE approved.
P1	: The equivalent of MOLEX 39-01-2240, 24 pin connector.
PB	: The equivalent of JWT A3961H02-8P, 8 pin connector.
PE	: The equivalent of MOLEX 39-01-2040, 4 pin connector.

3.3 CONNECTOR PIN DESIGNATIONS

The pin designations and color codes are defined as follows:

	P1 SYSTEM BOARD				PB DISK DRIVER		PE DISK DRIVER	
PIN1	+3.3V	ORANGE			COM	BLACK	COM	BLACK
PIN2	+3.3V	ORANGE			COM	BLACK	COM	BLACK
PIN3	COM	BLACK			COM	BLACK	+12V	YELLOW
PIN4	+5V	RED			COM	BLACK	+12V	YELLOW
PIN5	COM	BLACK			+5V	RED		
PIN6	+5V	RED			+5V	RED		
PIN7	COM	BLACK			+12V	YELLOW		
PIN8	PWR- OK	GRAY			+12V	YELLOW		
PIN9	+5VSB	PURPLE						
PIN10	+12V	YELLOW						
PIN11	+12V	YELLOW						
PIN12	+3.3V	ORANGE						
PIN13	+3.3V	ORANGE						
	+3.3VS	BROWN						
PIN14	-12V	BLUE						
PIN15	COM	BLACK						
PIN16	PS_ON	GREEN						
PIN17	COM	BLACK						
PIN18	COM	BLACK						
PIN19	COM	BLACK						
PIN20	NC	NC						
PIN21	+5V	RED						
PIN22	+5V	RED						
PIN23	+5V	RED						
PIN24	COM	BLACK						

4. ELECTRICAL REQUIREMENTS

4.1 OUTPUT ELECTRICAL REQUIREMENTS

The subject power supply will meet all electrical specifications below, over the full operation temperature range and dynamic load regulation.

4.1.1. OUTPUT RATING

Output	Nominal	Regulation	Ripple/Noise	Min	Max
1	+3.3V	±5%	50mV	0.3A	12.0 A
2	+5V	±5%	50mV	0.5A	14.0 A
3	+12V	±5%	120mV	1.0A	18.0 A
4	-12V	±10%	120mV	0.0 A	0.3A
5	+5VSB	±5%	50mV	0.0 A	2.5A

※ –12V,+3.3V, +5V,+12V will have the regulation to ±10% when all load take off.

The +3.3V and +5V total output shall not exceed 80watts. The total output for this subject power supply is 250 watts. Ripple and noise measurements shall be made under all specified load conditions through a single pole low pass filter with 20MHz cutoff frequency. Outputs shall bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

4.1.2. LOAD CAPACITY SPECIFICATIONS

The cross regulation defined as follows, the voltage regulation limits DC include DC Output ripple & noise.

LOAD	STM	+3.3V	+5V	+12V	-12V	5VSB
ALL MAX	HHHH	7.02A	8.19A	14.42A	0.24A	2.0A
+5V MAX other MIN	LHLL	0.3A	14.0 A	2.0A	0.2A	1.0A
+3.3V MAX other MIN	HLLL	12.0 A	2.0 A	2.0A	0.1A	1.0A
+12V MAX other MIN	LLHL	0.3 A	2.0 A	18.0A	0.1A	0.5A
ALL MIN	LLLL	0.3 A	0.3 A	1.0A	0A	0A

4.1.3. HOLD-UP TIME

115V / 60Hz : ≧14mS

4.1.4.OUTPUT RISE TIME

(10% TO 90% OF FINAL OUTPUT VALUE)

115V-rms or 230V-rms +5Vdc：20ms Maximum
+3.3Vdc：20ms Maximum
+12Vdc：20ms Maximum
-12Vdc：20ms Maximum
+5Vsdc：20ms Maximum

4.1.5.OVER VOLTAGE PROTECTION

$+5V_{dc}$ output: $+5.7\ V_{dc}$ minimum, $+\ 6.5V_{dc}$ maximum
+12Vdc output: +13.3Vdc minimum, $+15.5V_{dc}$ maximum
$+\ 3.3V_{dc}$ output: +3.7Vdc minimum, $+\ 4.5V_{dc}$ maximum

4.1.6. OVER-CURRENT PROTECTION

OUTPUT VOLTAGE	Max. over current limit
+3.3V	45A
+5V	45A
+12V	22-28A
-12V	N.A.
+5Vsb	N.A.

4.1.7. OVER POWER PROTECTION

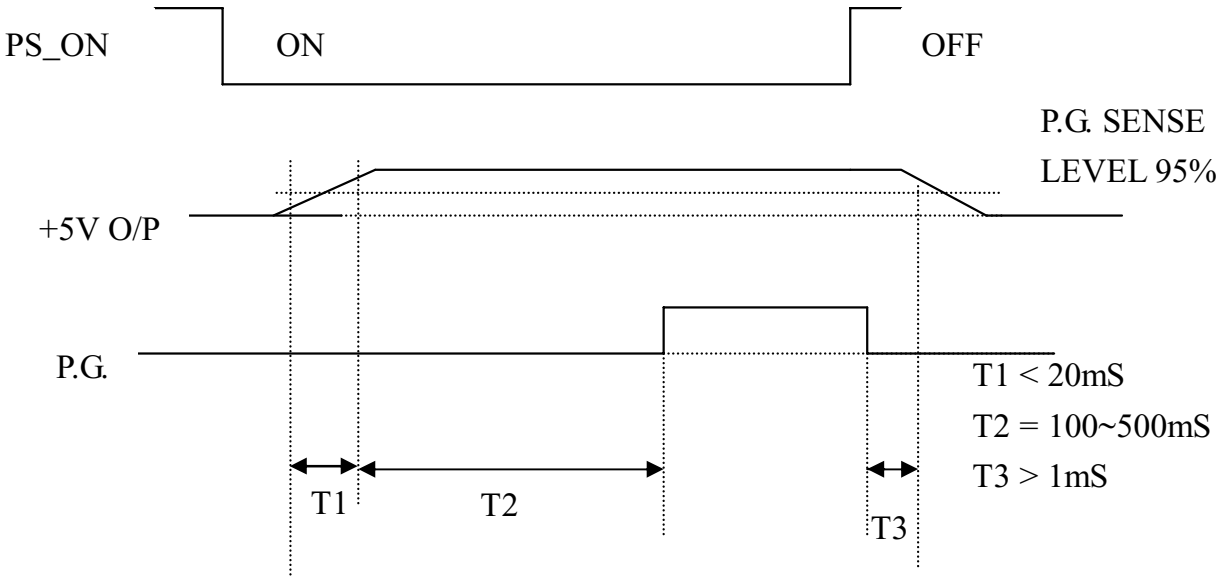
Total output shall not exceed 250 watts , in the event of an output total power condition on output , If the total exceed 150% , the power supply will shutdown and latch off without damage to the power supply.

4.1.8.POWER GOOD SIGNAL

The power good signal is a TTL compatible signal for the purpose of initiating an orderly star-up procedure under normal input operating conditions. This signal is asserted (low) until +5Vdc has reached 4.75 volts during power up. Characteristics:

TTL signal asserted (low state) : less than 0.5V while sinking 10mA.
TTL signal asserted (high state): greater than 4.75V while sourcing 500uA.
High state output impedance: less or equal to 1Kohm from output to common.

POWER GOOD @ 115/230V, Typical (50%) LOAD	100 –500mSec.
POWER FAIL @115/230V, Typical (50%) LOAD	1 mSec. minimum



4.2. OUTPUT TRANSIENT LOAD RESPONSE

+5V and +12V must be within specification for a step change in current as specified below. The outputs will be tested one section at a time with all other sections at maximum load. The test transition will be from IA to IB and IB to IA.

On TRANSIENT test, power good signal should be take with ch4.1.8.

+5Vdc:

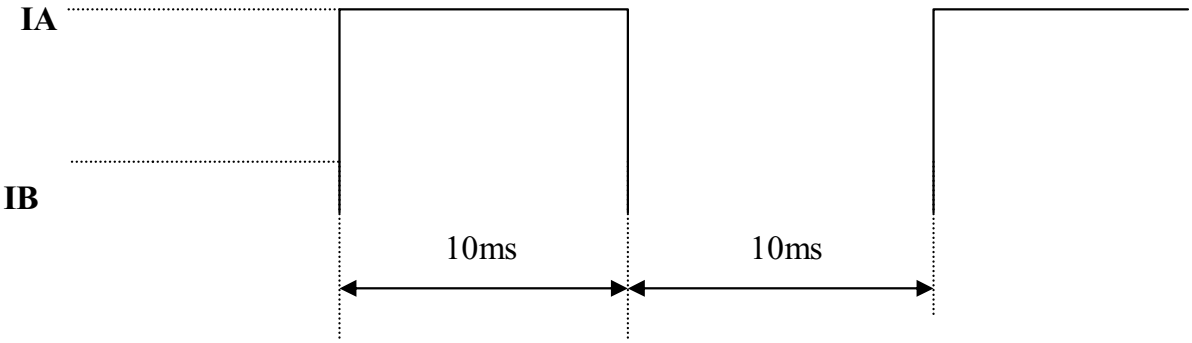
IA: 14.0 amps
IB: 9.8amps
Volts variation: +5V +-5%
Setting time: 10 ms max
+5Vsb: 1A , 12V: 5A , 3.3V: 0.3A , -12V: 0.2A

+12Vdc:

IA: 18.0 amps
IB: 12.6 amps
Volts variatio n: +12V +-5%
Setting time: 10 ms max
+5Vsb: 0.5A , 5V: 2A , 3.3V: 0.3A , -12V: 0.1A

+3.3Vdc:

IA: 12.0 amps
IB: 8.4 amps
Volts variation: +3.3V +-5%
Setting time: 10 ms max
+5Vsb: 1A , 5V: 0.5A , 12V:1A , -12V: 0.1A



Transient Load Requirements

Output	△ Step Load Size	Load Slew Rate	Capacitive Load
+3.3 V	30% of max load	0.1 A / s	3300 F
+5 V	30% of max load	0.1 A / s	3300 F
12V	30% of max load	0.1 A / s	3300 F

4.3. INPUT ELECTRICAL SPECIFICATIONS

4.3.1. VOLTAGE RANGE

PARAMETER		UNITS
V-in Range	90 - 264	V-rms

4.3.2. INPUT FREQUENCY

INPUT FREQUENCY	47–63Hz

4.3.3. INRUSH CURRENT

(Cold start – 25 deg. C)

115V	No damage
230V	No damage

4.3.4. INPUT LINE CURRENT

115V	4.0 Amps – rms maximum
230V	2.0 Amps – rms maximum

4.4. EFFICIENCY

	Full load (100%)	Typical load (50%)	Light load (20%)
115VAC	82%	85%	82%
230VAC	82%	85%	82%

(loading shown in Amps)

Loading	+12V	+5V	+3.3V	-12V	+5Vsb
Full (100%)	14.42	8.19	7.02	0.24	2.00
Typical (50%)	7.21	4.09	3.51	0.12	1.00
Light (20%)	2.88	1.64	1.40	0.05	0.40

4.5. Standby Power Consumption (5Vsb):

Input Power < 1W @ 5Vsb/100mA & 230Vac input

PS_ON input signal @ High State

4.6. PS_ ON#

PS_ON# is an active-low, TTL-compatible signal that allows a motherboard to remotely control the power supply in conjunction with features such as soft on/off, Wake on LAN+, or wake-on-modem. When PS_ON# is pulled to TTL low, the power supply should turn on the five main DC output rails: +12VDC,+5VDC,+3.3VDC and –12VDC. When PS_ON# is pulled to TTL high or open-circuited, the DC output rails should not deliver current and should be held at zero potential with respect to ground. PS_ON# has no effect on the +5VSB output, which is always enabled whenever the AC power is present. (PS_ON# Signal Characteristics)

The power supply shall provide an internal pull-up to TTL high. The power supply shall also provide debounce circuitry on PS_ON# to prevent it from oscillating on/off at startup when activated by a mechanical switch. The DC output enable circuitry must be SELV-compliant.

PS_ON# Signal Characteristics

	Min.	Max.
VIL, Input Low Voltage	0.0V	0.8V
IIL, Input Low Current (Vin = 0.4V)		-1.6mA
VIH, Input High Voltage (lin = -200 μA)	2.0V	
VIH OPEN circuit, lin = 0		5.25V

5. ENVIRONMENTAL REQUIREMENTS

The power supply will be compliant with each item in this specification for the following Environmental conditions.

5.1. TEMPERATURE RANGE

Operating	0 to +50 deg. C FOR 250W
Storage	-20 to +80 deg. C

5.2. HUMIDITY

Operating	85% RH, Non-condensing
Storage	95% RH, Non-condensing

5.3. VIBRATION

The subject power supplies will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Vibration Operating – Sine wave excited, 0.5 G maximum acceleration, 10-250 Hz swept at one octave / min. Fifteen minute dwell at all resonant points, where resonance is defined as those exciting frequencies at which the device under test experiences excursions two times large than non-resonant excursions.

Plane of vibration to be along three mutually perpendicular axes.

5.4. SHOCK

The subject power supplies will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Storage 40G, 11 mSec. half-sine wave pulse in both directions on three mutually perpendicular axes.
Operating 10G, 11mSec. half-sine wave pulse in both directions on three mutually Perpendicular axes.

5.5 COOLING SPECIFICATIONS

5.5.1. The PSU is cooled by a self-contained FAN, 40mm, 12VDC.

6. SAFETY

6.1. LEAKAGE CURRENT

The leakage current from AC to safety ground will not exceed 3.5 mA-rms at 264Vac, 50 Hz.

7. ELECTORMAGNETIC COMPATIBILITY

7.1 LINE CONDUCTED EMI

The subject power supplies will meet FCC class B requirements .

7.2. RADIATED EMI

The subject power supplies will meet FCC and CISPR 22 requirements .

8. LABELLING

Label marking will be permanent, legible and complied with all agency requirements.

8.1. MODEL NUMBER LABEL

Labels will be affixed to the sides of the power supply showing the following:

- Manufacturer's name and logo.
- Model no., serial no., revision level, location of manufacturer.
- The total power output and the maximum load for each output.
- AC input rating.

8.2 DC OUTPUT IDENTIFICATION

Each output connector will be labeled.

9. RELIABILITY

9.1. MTBF

The power supply have a minimum predicted MTBF(MIL-HDBK-217) of 100,000 hours of continuous operation at 25℃, maximum-output load, and nominal AC input voltage.

全漢企業股份有限公司

外觀圖

料號	:	9PA250D600(,PILOT RUN,G.P,FSP250-50LC(PLB),IPC,EPS1U(85PLUS),ErP,2 BALL,W/NK,WO/IO,WO/O,WO/SS,FSP,W/PFC(A),3L1S,INTEL,FULL RANGE,RD2,)
版次	:	1
文件編號	:	OAD10001556
附件版本	:	01
研發部門	:	RD2
作者	:	angus/樂家龍
Model No/Type	:	FSP250-50LC(PLB)
機密	:	N
表單編號	:	7000P-0111
發行日期	:	2010/1/12-10:21:22
備註	:	

單位	姓名	單位	姓名	單位	姓名
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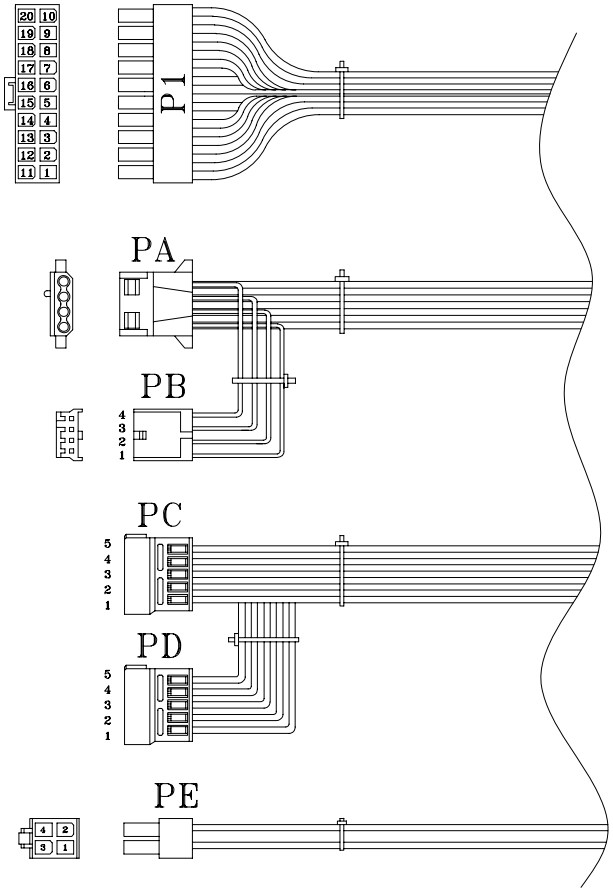

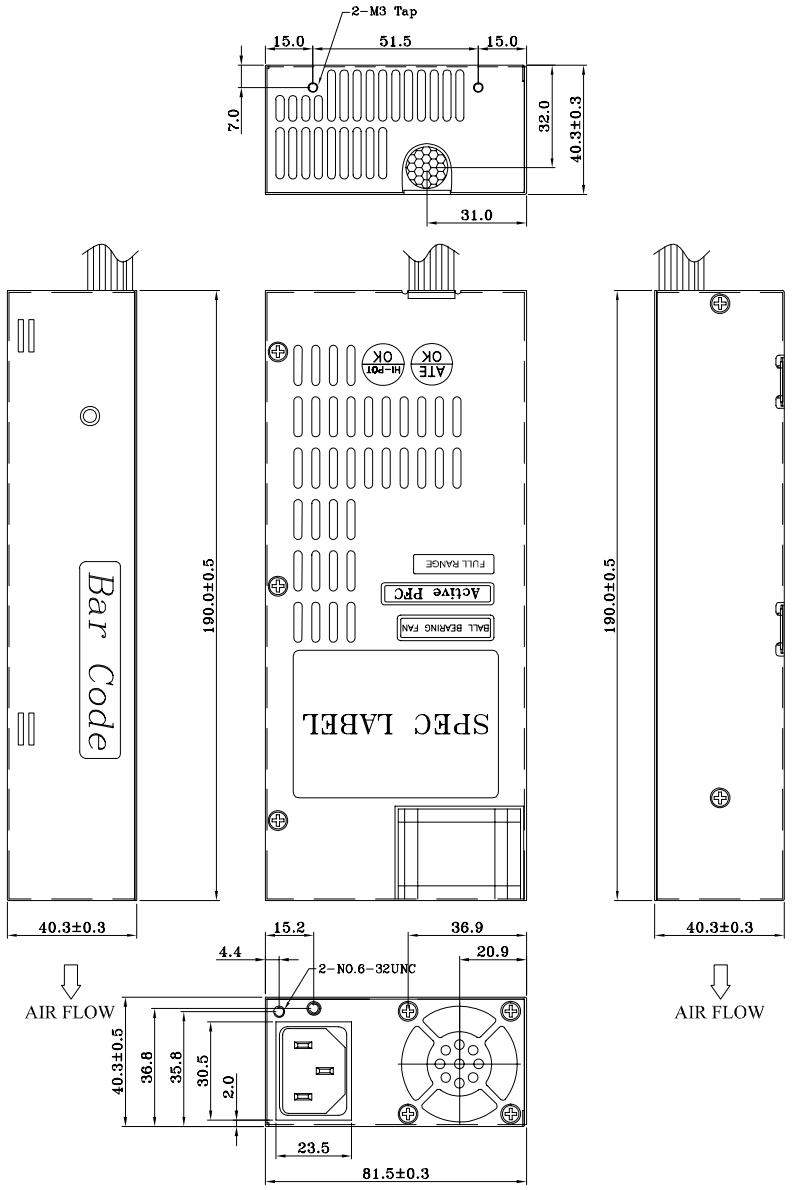

REF. D.	PIN NO.	SIGNAL	WIRE COLOR	GAUGE	CONNECTOR TYPE	LENGTH
P1	1	+3.3V	ORANGE	20	MOLEX 39-01-2200 or EQUIV.	200±15 mm
	2	+3.3V	ORANGE	20		
	3	COM	BLACK	20		
	4	+5V	RED	20		
	5	COM	BLACK	20		
	6	+5V	RED	20		
	7	COM	BLACK	20		
	8	PW-OK	GRAY	22		
	9	+5Vsb	PURPLE	20		
	10	+12V	YELLOW	20		
	11	+3.3V	ORANGE	20		
		+3.3VS	BROWN	22		
	12	-12V	BLUE	22		
	13	COM	BLACK	20		
	14	PS-ON	GREEN	22		
	15	COM	BLACK	20		
	16	COM	BLACK	20		
	17	COM	BLACK	20		
	18					
	19	+5V	RED	20		
	20	+5V	RED	20		
PA	1	+12V	YELLOW	20	AMP 1-480424-0 or EQIV.	250±15 mm
	2	COM	BLACK	20		
	3	COM	BLACK	20		
	4	+5V	RED	20		
PB	1	+5V	RED	20	AMP 171822-4 or EQIV.	150±10 mm
	2	COM	BLACK	20		
	3	COM	BLACK	20		
	4	+12V	YELLOW	20		
PC	1	+3.3V	ORANGE	20	CL1270H00-15P or EQUIV.	310±15 mm
	2	COM	BLACK	20		
	3	+5V	RED	20		
	4	COM	BLACK	20		
	5	+12V	YELLOW	20		
PD	1	+3.3V	ORANGE	20	CL1270H00-15P or EQUIV.	150±10 mm
	2	COM	BLACK	20		
	3	+5V	RED	20		
	4	COM	BLACK	20		
	5	+12V	YELLOW	20		
PE	1	COM	BLACK	20	MOLEX 39-01-2040 or EQUIV.	310±15 mm
	2	COM	BLACK	20		
	3	+12V	YELLOW	20		
	4	+12V	YELLOW	20		

NOTE:

1. ALL THE LENGTH OF OUTPUT WIRES EXCLUDE HOUSING.
2. 產地標籤依業務指示加貼.

UNIT:mm

P/N.:9PA250D600

MODEL NO. : FSP250-50LC(PLB)		TITLE: ASSY	SHEET: 1 OF 1	REV:01
R&D(2)	PE	DRAWN	DATE	
		樂家龍	Jan.08.2010	
INTERIOR COUNTERSIGN:				