

# LSP-160 Series

160W Slim Type with PFC Switching Power Supply



194 x 55 x 20mm

## Features

- Slim width and low profile (20mm)
- Fanless design for no noise environment
- Withstand 300VAC surge input for 5 seconds
- DC OK active signal function
- Semi-Potting for high moisture environment
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Current sharing for redundant function (5V/4.2V/3.3V only)
- Operating altitude up to 5000 metres
- LED indicator for power on
- 3 years warranty

TYPE	FUNCTION
Blank	Enclosed (DC voltage output) & Built-in DC OK active signal
R	Built-in DC OK active signal and current sharing function (3.3/4.2/5V)

**LSP - 160**     -         I: Terminal block connector  
 Series name    Rated wattage    Function Options    Output Voltage    W: Water connection (by Request)



## Specification

<b>INPUT</b>	<b>Voltage Range</b>	100 ~ 264VAC	141 ~ 370VDC						
	<b>Frequency Range</b>	47 ~ 63 Hz							
	<b>Power Factor</b>	PF≥0.94/230VAC    PF≥0.98/115VAC at full load							
	<b>AC Current</b>	2.2A/115VAC    1.1A/230VAC							
	<b>Inrush Current (Typ.)</b>	Cold start 45A/115VAC    85A/230VAC							
	<b>Leakage Current</b>	<0.75mA / 240VAC							
<b>OUTPUT</b>	<b>MODEL No.</b>	LSP-160 □ -3.3 □	LSP-160 □ -4.2 □	LSP-160 □ -5 □	LSP-160 □ -12 □	LSP-160 □ -24 □	LSP-160 □ -36 □	LSP-160 □ -48 □	
	<b>Voltage</b>	3.3V	4.2V	5V	12V	24V	36V	48V	
	<b>Rated Current</b>	32A	32A	32A	13.5A	6.75A	4.5A	3.4A	
	<b>Rated Power (convection)</b>	105.6W	134.4W	160W	162W	162W	162W	163.2W	
	<b>R&amp;N</b>	200mVp-p	200mVp-p	200mVp-p	240mVp-p	240mVp-p	240mVp-p	300mVp-p	
	<b>Voltage Adjustment Range</b>	3.2 - 3.5V	4 - 4.5V	4.7 - 5.3V	11.4 - 12.6V	22.8 - 25.2V	34.2 - 37.8V	45.6 - 50.4V	
	<b>Efficiency</b>	87.5%	88.5%	89.5%	92.5%	93.5%	93.5%	93.5%	
	<b>Voltage Tolerance</b>	±2.0%	±2.0%	±2.0%	±1.0%	±1.0%	+1.0%	+1.0%	
	<b>Line Regulation</b>	±0.5%	±0.5%	±0.5%	±0.3%	±0.3%	±0.3%	±0.3%	
	<b>Load Regulation</b>	±1.0%	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	
	<b>Setup Rise Time</b>	2000ms, 80ms/230VAC    3000ms, 80ms/115VAC at full load							
	<b>Hold Up Time</b>	10ms/230VAC    10ms/115VAC							
	<b>PROTECTION</b>	<b>Short Circuit</b>	Hiccup protection, recovers automatically after fault condition is removed						
		<b>Over Load</b>	110~140% rated output power Protection type : Constant current limiting, continuous increase of load will be hiccup protection, recovers automatically after fault condition is removed						
<b>Over Voltage</b>		3.8 - 4.6V    4.62 ~ 5.46V    5.75 ~ 6.75V    13.2 ~ 15.6V    26.4 ~ 31.2V    39.6 ~ 46.8V    52.8 ~ 62.4V Protection type : Shut down O/P voltage, re-power on to recover							
<b>Over Temperature</b>		Shut down O/P voltage, re-power on to recover after temperature goes down							
<b>FUNCTION</b>	<b>Current Sharing</b>	Please refer to the Function Manual							
	<b>DC OK Signal</b>	Contact rating(max.):15Vdc/10mA resistive load							
<b>ENVIRONMENT</b>	<b>Working Temperature</b>	-30 ~ +70°C (Refer to "Derating Curve")							
	<b>Working Humidity</b>	20 ~ 90% RH non-condensing							
	<b>Storage Temp. humidity</b>	-40 ~ +85°C, 10 ~ 95% RH non-condensing							
	<b>Temp Coefficient</b>	±0.03%/°C (0 ~ 50°C)							
	<b>Vibration</b>	10 ~ 500Hz, 5G 10 min./1cycle, period for 60 min. each along X, Y, Z axes							
<b>SAFETY &amp; EMC</b>	<b>Safety Standards</b>	UL62368, TUV EN62368, CCC GB4943, EAC TP TC 004, BSMI CNS14336-1 approved, Design refer to EN60335-1							
	<b>Withstand Voltage</b>	I/P-O/P:3.75KVAC    I/P-FG:2KVAC    O/P-FG:1.25KVAC							
	<b>Isolation Resistance</b>	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC/25°C / 70%RH							
	<b>EMC Emission</b>	Compliance to EN55032, GB9254, Class B, EN55014, EN61000-3-2,-3, EAC TP TC 020, BSMI CNS13438							
	<b>EMC Immunity</b>	Compliance to EN61000-4-2,3,4,5,6,8,11; EN61000-6-2 (EN50082-2), heavy industry level, criterial A, EAC TP TC 020							
	<b>OTHERS</b>	<b>M.T.B.F.</b>	699.54K hrs min. Telcordia TR/SR-332 (Bellcore); 282.71K hrs min. MIL-HDBK-217F (25°C)						
<b>Packing</b>		0.356kg;30pcs/11.68kg/0.6CUFT							

1. All parameters NOT specially mentioned are measured at 347VAC input, rated load and 25°C of ambient temperature.
2. Ripple and Noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with 0.1uf & 47uf parallel capacitor.
3. Tolerance: includes set up tolerance, line regulation and load regulation.
4. Derating maybe needed for low input voltages. Please check the derating curve for more details.
5. The ambient temperature of 5°C/1000m is needed for operating altitude greater than 2000m (6500ft).
6. The power supply is considered as a component that will be operated in combination with final equipment. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to 'EMI testing of component power supplies'

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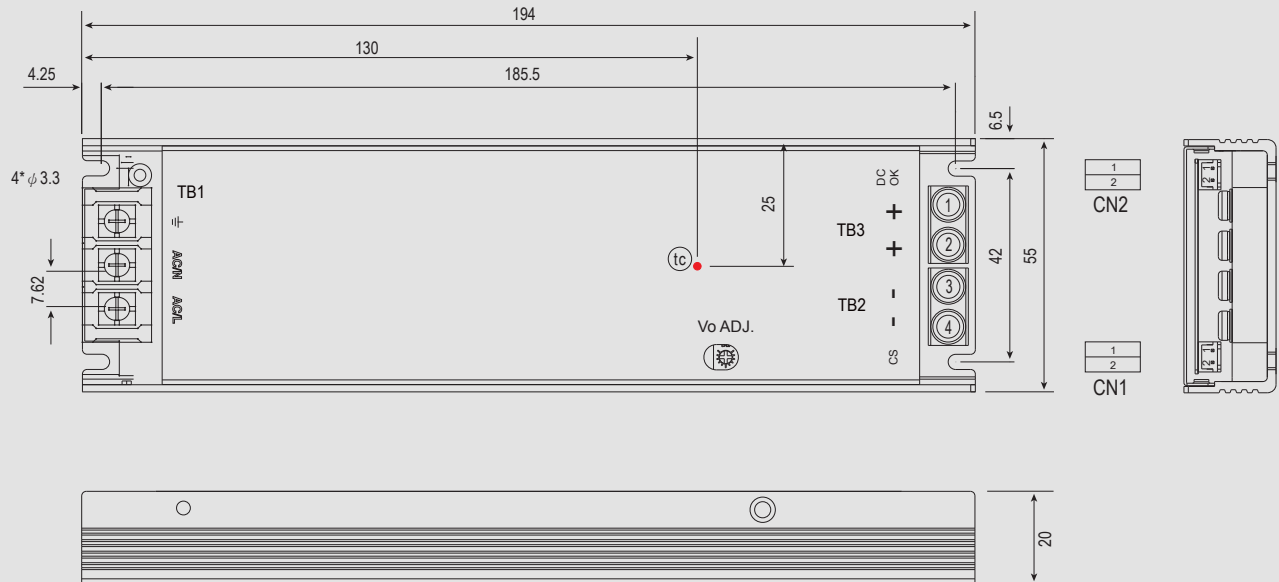


## Mechanical Diagram

T-type(Terminal block)

CASE NO.:279

Unit:mm



### AC Input Connector(TB1) pin NO. Assignment

Pin No.	Assignment	Terminal	Max mounting torque
1	AC/L	(DEGSON) DG28C-B-03P	5Kgf-cm
3	AC/N		
5	$\perp$		

### DC Output Connector(TB2/TB3)pin NO. Assignment

Pin No.	Assignment	Terminal	Max mounting torque
1,2	+V	(MW) TB-HTP-200-40A	8Kgf-cm
3,4	-V		

### DC OK Connector(CN2):JST B2B-PH-K-S or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	DC OK +V	JST SPH-002T-P0.5S or equivalent	JST PHR-2 or equivalent
2	DC COM		



CN mating cable: 1FF5LSP-160-CS

### CS+/CS- Connector(CN1):JST B2B-PH-K-S or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	CS+	JST PHR-2 or equivalent	JST SPH-002T-P0.5S or equivalent
2	CS-		

© CN1 and CN2 mating cable by request, please call Sunpower for details.

# LSP-160 Series

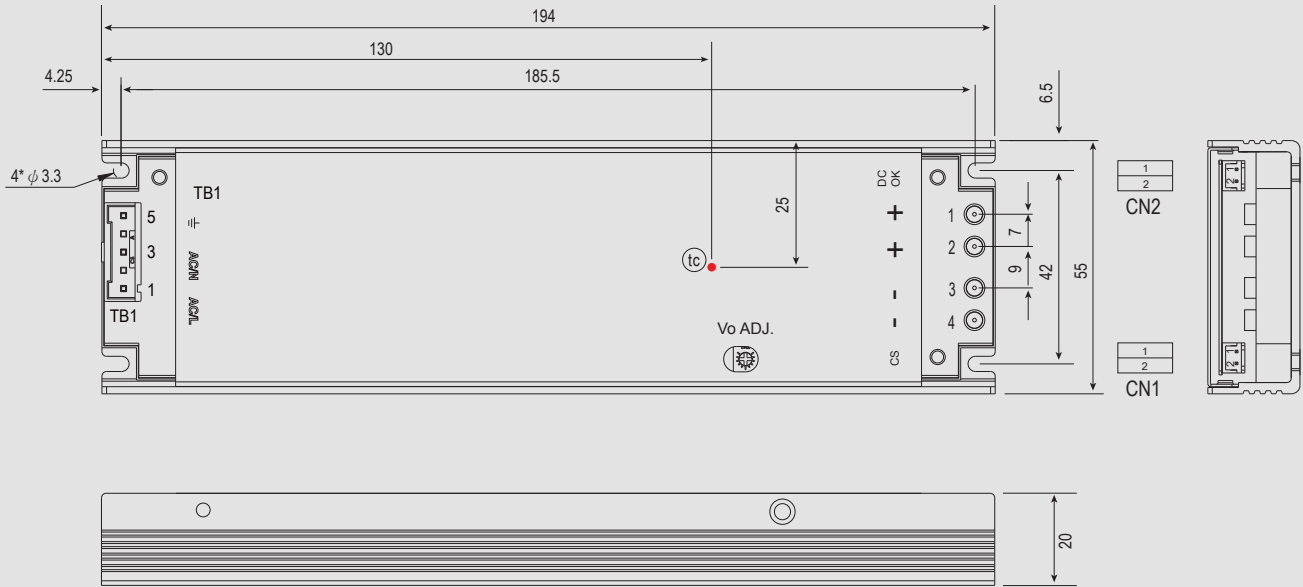
160W Slim Type with PFC Switching Power Supply



W-Type(Wafer connector type optional)

CASE NO.:279

Unit:mm



AC Input Connector(TB1) pin NO. Assignment

Pin No.	Assignment	Mating housing	Terminal
1	AC/L	JS-1391-05	JS-1390-05 and JS-2420-TL
3	AC/N		
5	⊥		

DC Output Connector(+V/-V)pin NO. Assignment

Pin No.	Assignment	Mating housing	Terminal
1,2	+V	1EE4LSP-160F	1EE4LSP-160M
3,4	-V		

DC OK Connector(CN2):JST B2B-PH-K-S or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	DC OK +V	JST SPH-002T-P0.5S or equivalent	JST PHR-2 or equivalent
2	DC COM		



CN mating cable: 1FF5LSP-160-CS

CS+/CS- Connector(CN1):JST B2B-PH-K-S or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	CS+	JST PHR-2 or equivalent	JST SPH-002T-P0.5S or equivalent
2	CS-		

© CN1 and CN2 mating cable by request, please call Sunpower for details.

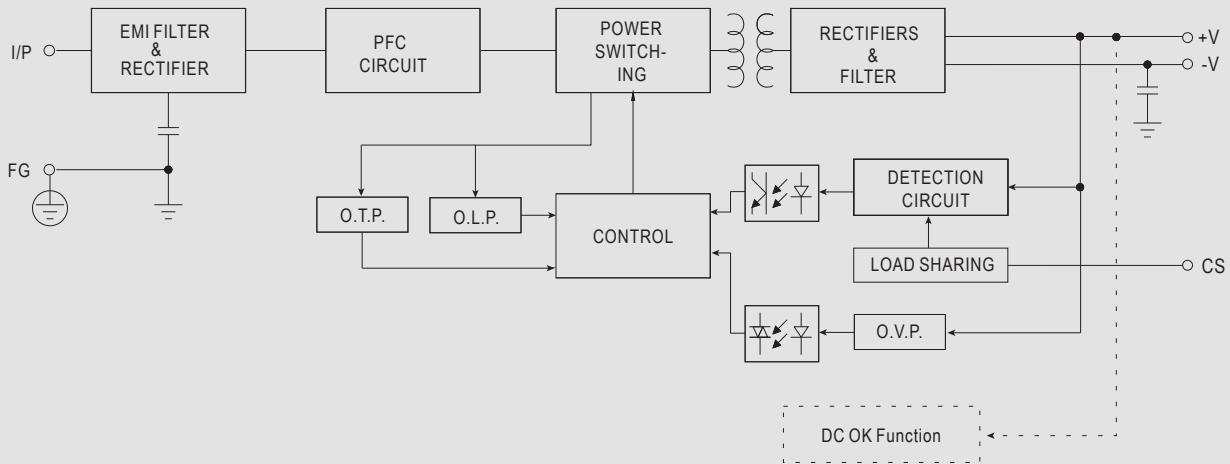
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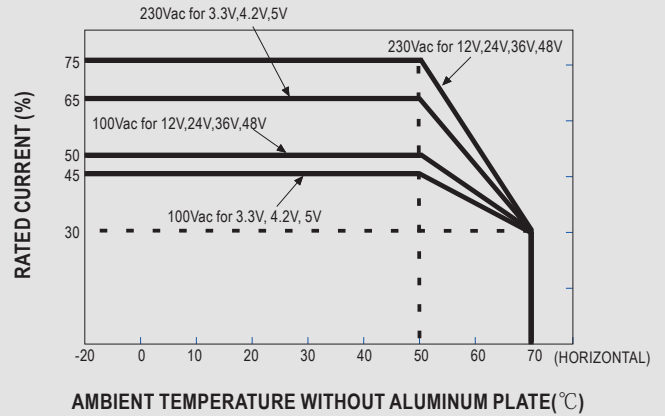
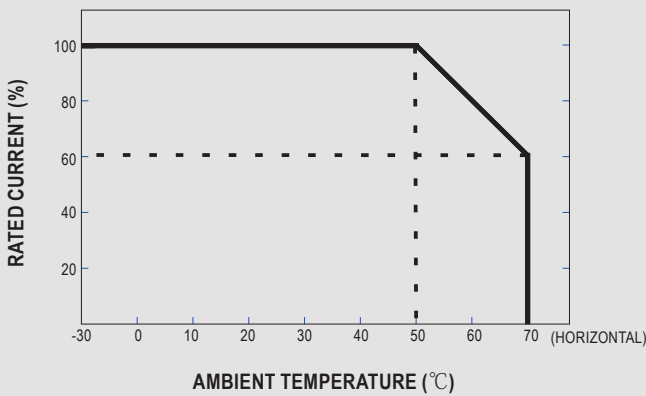


## Block Diagram

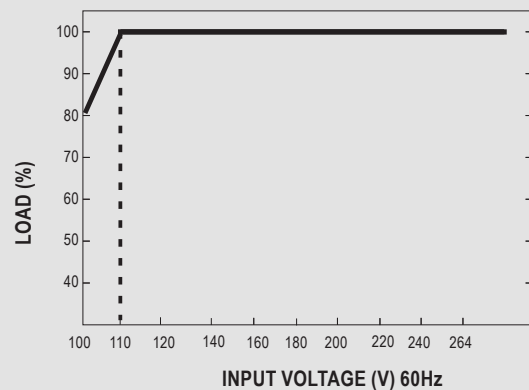
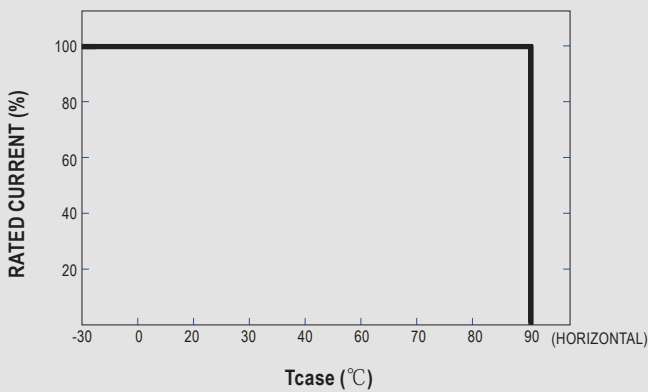
PFC fosc:133KHz  
PWM fosc:70KHz~110KHz



## Derating Curve



## Static Characteristic



# LSP-160 Series

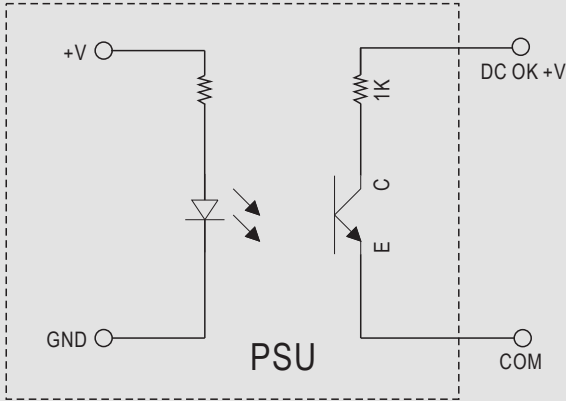
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## Function Manual

### 1. DC\_OK Signal

DC\_OK is a collector shorted signal. It is used by an optocoupler in the power supply which indicates the output status of the power supply as exhibited below.



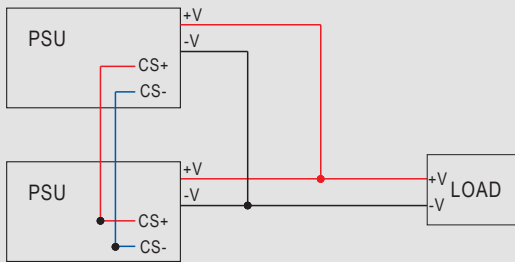
Optocoupler C-E Pin Conduction	PSU turns on	DC ok
Optocoupler C-E Pin Open	PSU turns off	DC fail
Optocoupler Rating(max.)	15Vdc/10mA resistive load	

Power Status	DC_OK signal
Normal	Low
Short circuit/OLP	Hiccup
OVP/OTP/Breakingdown	High

### 2. Redundant function (Current sharing):

LSP-160 has the built-in active current sharing function and can be connected in parallel, up to 2 units, to provide higher output power as exhibited below :

- ※ The power supplies should be paralleled using short and large diameter wiring and then connected to the load.
- ※ Difference of output voltages among parallel units should be less than 40mV(Can Fine tune by SVR1).
- ※ When in parallel operation the maximum load should not be greater than the rated power of any PSU.
- ※ When out current <math>< 30\% \text{ rate current}</math> And the LED indicator maybe flash of one of them, but not effecting normal working.



© CS+/CS- on CN1 are connected mutually in parallel(Note:CS+/CS- do not reverse connection).

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## Installation

### 1. Operate with additional aluminum plate

In order to meet the "Derating Curve" and the "Static Characteristics, LSP-160 series must be installed onto an aluminum plate (or the cabinet of the same size) on the bottom. The size of the suggested aluminum plate is shown as below. And for optimizing thermal performance, the aluminum plate must have an even and smooth surface (or coated with thermal grease), and LSP-160 series must be firmly mounted at the center of the aluminum plate.

