



Features

- 4:1 Wide input voltage range
- High efficiency up to 87.0%
- No-load power loss as low as 0.12W
- Isolation voltage:3000Vdc
- Input under-voltage, output over-voltage, over-current and short-circuit protections
- Operating temperature range: -40 to +85 °C
- Industry standard pin-out
- UL 60950-1 2nd edition recognized

Part Numbering System

LM	x	x	xxx	P	10W	3	LP	C
Series Name	No. of Output	Input Range	Output Voltage	Enable Logic	Output Power	Isolation Voltage	Package	Version No.
	B: Dual S: Single	1: 9-36V 3: 18-75V	Example: 050: 5V	P: Positive	10W: 10W	3: 3000Vdc	LP: LP package	C: Version No.

Selection Guide

Part No.	Input Voltage (Vdc)	Output		Efficiency(%) at typical input & full load	Max. Load Capacitance (μF)
		Voltage(Vdc)	Current(mA)		
LMB1050P10W3LPC	24 (9-36)	±5	±1000	81.0	1000
LMB1120P10W3LPC		±12	±416	85.0	330
LMB1150P10W3LPC		±15	±333	87.0	220
LMS1033P10W3LPC		3.3	2400	78.0	5400
LMS1050P10W3LPC		5	2000	82.0	5400
LMS1090P10W3LPC		9	1111	84.0	680
LMS1120P10W3LPC		12	833	84.0	470
LMS1150P10W3LPC		15	667	87.0	330
LMS1240P10W3LPC		24	416	86.0	100
LMB3050P10W3LPC	48 (18-75)	±5	±1000	82.0	1000
LMB3120P10W3LPC		±12	±416	86.0	330
LMB3150P10W3LPC		±15	±333	87.0	220
LMS3033P10W3LPC		3.3	2400	79.0	5400
LMS3050P10W3LPC		5	2000	82.0	5400
LMS3120P10W3LPC		12	833	86.0	470
LMS3150P10W3LPC		15	667	87.0	330
LMS3240P10W3LPC		24	416	87.0	100

Electrical Specifications

These specifications are valid over the converter's full range of input voltage, resistive load, and operating temperature unless noted otherwise.

Input Specifications

Parameter	Notes & Conditions		Min	Typical	Max	Unit
Input Current(full load)	24Vdc input series	3.3V output	-	423	434	mA
		Others	-	514	527	
	48Vdc input series	3.3V output	-	208	214	
		Others	-	254	260	
Input Current (zero load)	Full input range		-	5	12	
Reflected Ripple Current	24Vdc input series		-	40	-	
	48Vdc input series		-	30	-	
Surge Voltage (1sec. max.)	24Vdc input series		-0.7	-	50	Vdc
	48Vdc input series		-0.7	-	100	
Starting Voltage	24Vdc input series		-	-	9	
	48Vdc input series		-	-	18	
Input Under-voltage protection	24Vdc input series		5.5	6.5	-	
	48Vdc input series		12	15.5	-	
Starting Time	Nominal input voltage & constant resistive load		-	10	-	ms
Ctrl*	Module turn-on		Ctrl pin floating or connected to TTL high level(3.5-12Vdc)			
	Module turn-off		Ctrl pin connected to Vin(-) or low level(0-1.2Vdc)			
	Current for turn-off		-	5	10	mA
Hot Plugging	Not supported					

*The voltage at Ctrl is referenced to Vin(-).

Output Specifications

Parameter	Notes & Conditions		Min	Typical	Max	Unit
Output Voltage Accuracy*	zero load to full load		-	±1	±3	%Vo
Line Regulation	Full range input voltage, full load	+Vout	-	±0.2	±0.5	
		-Vout	-	±0.5	±1	
Load Regulation	5% load to full load, nominal input	+Vout	-	±0.5	±1	
		-Vout	-	±0.5	±1.5	
Cross Regulation	Dual output, main circuit with 50% load, auxiliary circuit with 10%-100% load		-	-	±5	
Temperature Coefficient	Full load		-	-	0.03	%/°C
Transient Recovery Time	25% load step, nominal input voltage		-	300	500	μs
Transient Response Deviation			-	±3	±5	%Vo
Ripple & Noise	20MHz bandwidth		-	60	120	mVp-p
Ripple Frequency**			-	350	-	kHz
Over-voltage Protection	Full input range		110	130	160	%Vo
Over-current Protection			110	140	190	%Io
Short circuit Protection			Hiccup mode, continuous, auto-recovery			

*Output voltage accuracy of ±5Vdc output converter for 0%-5% load is ±5% max.

** The switching frequency decreases as the load decreases at 50% or less of the full load.

Isolation and Environmental Specifications

Parameter	Notes & Conditions	Min	Typical	Max	Unit
Isolation Voltage	Input-Output, 1 minute, leakage current lower than 1mA	3,000	-	-	Vdc
Insulation Resistance	Input-Output, isolation voltage 500Vdc	1,000	-	-	MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V	-	500	-	pF

Isolation and Environmental Specifications (Continued)

Parameter	Notes & Conditions	Min	Typical	Max	Unit
Operating Temperature		-40	-	+85	°C
Storage Temperature		-55	-	+125	
Storage Humidity	Non-condensing	5	-	95	%RH
Vibration		10-55Hz, 2G, 30 Min along X, Y and Z			
MTBF	MIL-HDBK-217F@25°C	1	-	-	10 ⁶ hours

Mechanical Specifications

Parameter	Notes
Case Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)
Dimensions	51.50 x 26.50 x 12.00 mm
Weight	21.2g (Typ.)
Cooling Method	Free air convection

EMC Specifications

Parameter		Notes & Conditions	
EMI	CE	CISPR32/EN55032 CLASS A (Without extra components) / CLASS B (See Figure 6-②)	
	RE	CISPR32/EN55032 CLASS A (Without extra components) / CLASS B (See Figure 6-②)	
EMS	ESD	IEC/EN61000-4-2 Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (See Figure 6-①)	perf. Criteria B
	Surge	IEC/EN61000-4-5 Line to line ±2KV (See Figure 6-①)	perf. Criteria B
	CS	IEC/EN61000-4-6 3Vrms	perf. Criteria A
	Immunities of voltage dip, drop	IEC/EN61000-4-29 0%, 70%	perf. Criteria B

Note: Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity <75%RH with nominal input voltage and rated output load.

Characteristic Curves

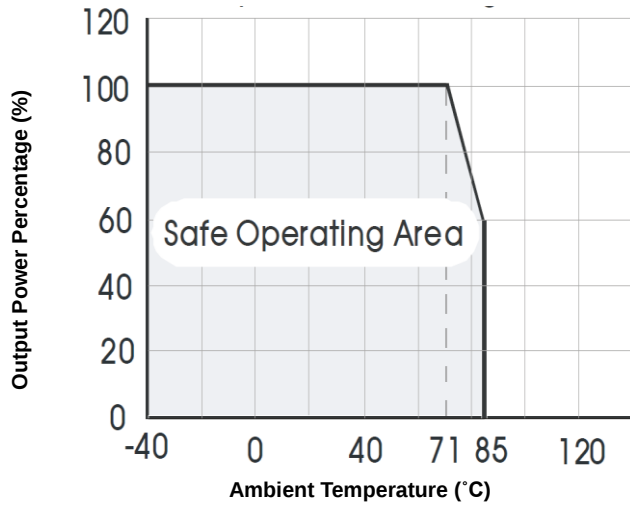


Figure 1. Temperature Derating Curve

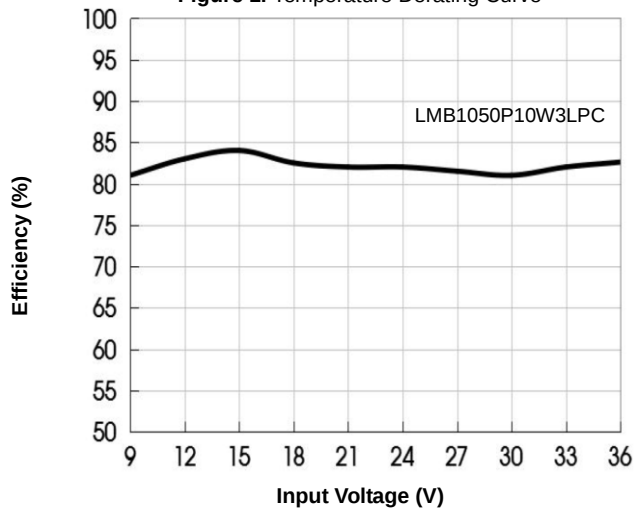


Figure 2. Efficiency vs. Input Voltage (full load)

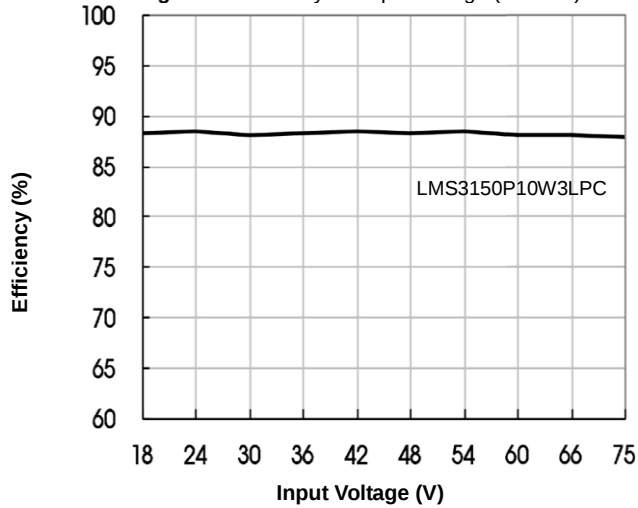
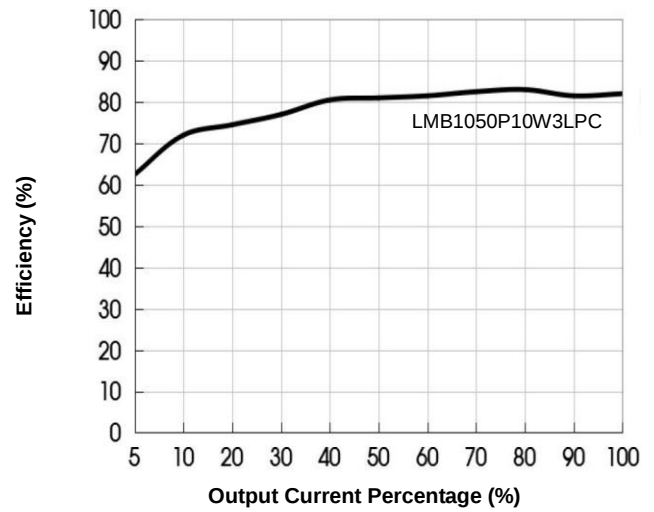
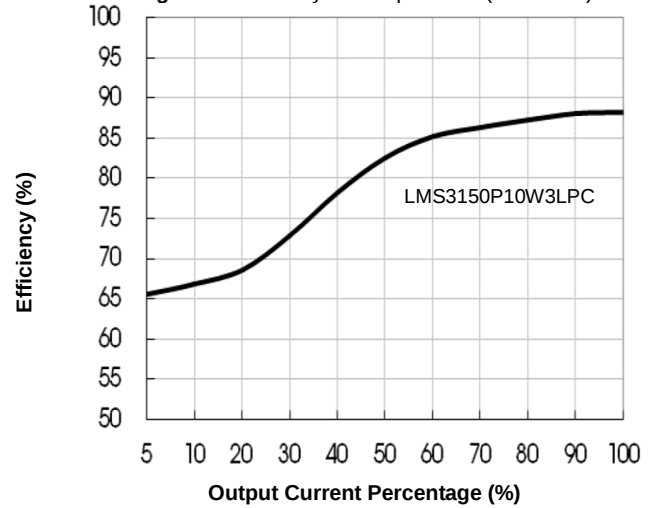
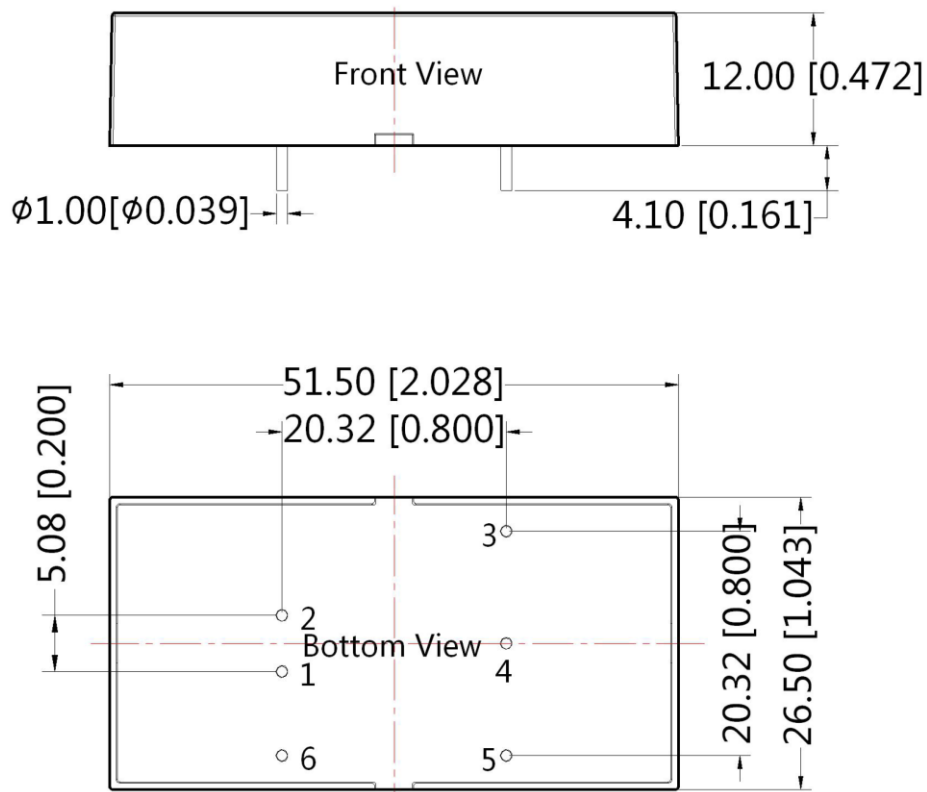


Figure 4. Efficiency vs. Input Voltage (full load)

Figure 3. Efficiency vs. Output Load ($V_{in} = 24V$)Figure 5. Efficiency vs. Output Load ($V_{in} = 48V$)

Mechanical Drawing



Single output		
Pin	Name	Function
1	Vin(-)	Negative input voltage
2	Vin(+)	Positive input voltage
3	Vout(+)	Positive output voltage
4	NC	No connection
5	Vout(-)	Negative output voltage
6	Ctrl	On/Off control
Dual output		
Pin	Name	Function
1	Vin(-)	Negative input voltage
2	Vin(+)	Positive input voltage
3	+Vout	Positive output voltage
4	COM	Output common GND
5	-Vout	Negative output voltage
6	Ctrl	On/Off control

Notes:

- 1) All dimension in mm (inches)
- 2) Pin selection tolerances : ± 0.10 (± 0.004)
- 3) General tolerances: ± 0.50 (± 0.020)

EMC Typical Application Circuit

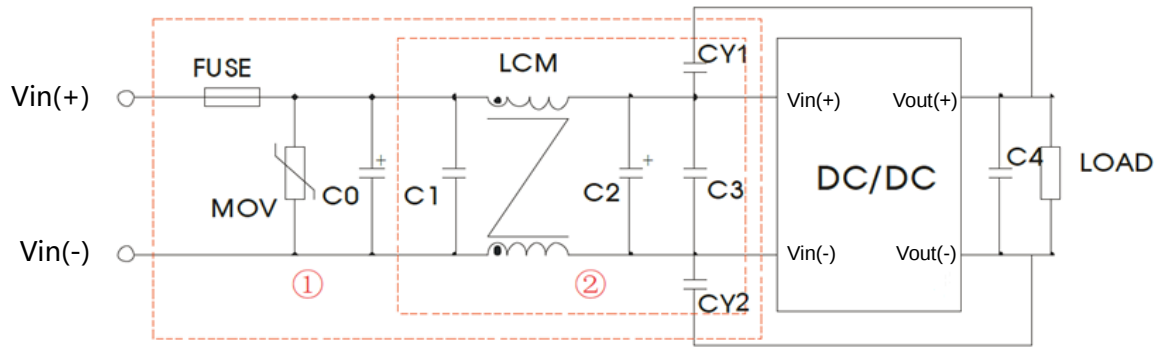


Figure 6. EMC Recommended Circuit

Component	Recommended Value	
	24Vin	48Vin
FUSE	Choose according to the actual input current	
MOV	S20K30	S14K60
C0	680 μ F/50V	680 μ F/100V
C1	1 μ F/50V	1 μ F/100V
C2	330 μ F/50V	330 μ F/100V
C3	4.7 μ F/50V	4.7 μ F/100V
LCM	4.7mH	4.7mH(dual output) / 6.8mH
C4	10 μ F	
CY1, CY2	1nF/3KV	