



LMW78_1.0 series

Wide Input Non-Isolated & Regulated, Single Output

Switching Regulator

- ⊕ Input voltage range up to 8:1
- ⊕ High efficiency up to 92%
- ⊕ No-load input current as low as 0.5mA
- ⊕ Operating ambient temp. range: -40°C to 105°C
- ⊕ Output short-circuit protection
- ⊕ Meet MIL-STD-810F vibration test

The LMW78_1.0 series are high efficiency switching regulators. The converters feature high efficiency, low loss and short-circuit protection in a compact SIP package. These products are widely used in applications such as industrial control, instrumentation and electric power.



Common specifications					
Item	Test conditions	Min	Typ	Max	Units
Short circuit protection:	Continuous, auto-recovery (Nominal input voltage)				
Operating Temperature:	-40 ~ +105°C, See Temperature Derating Curve series				
Storage Temperature:	-55 ~ +125°C				
Pin Soldering Resistance Temperature:	+300°C, Soldering spot is 1.5mm away from case for 10 seconds				
Storage Humidity:	, Non-condensing	5		95%	RH
Switching Frequency*:	Full load, nominal input voltage				
	LMW78_03/05-1.0	200kHz			
	LMW78_06/09-1.0	250kHz			
	LMW78_12-1.0	350kHz			
	LMW78_15-1.0	400kHz			
	LMW78_24-1.0	550kHz			
MTBF:	8215 (MIL-HDBK-217F@25 °C)				k hrs
Case Material:	Black plastic; flame-retardant and heat-resistant (UL94V-0)				
Weight:	LMW78_1.0 series 6.2g (typ.)				
	LMW78_1.0 bent pins series 6.6g (typ.)				
Cooling:	Free air convection				
Dimensions	LMW78_1.0 series 12.10 × 8.60 × 17.5 mm				
	LMW78_1.0 bent pins series 20.35 × 12.10 × 8.60 mm				

Output specifications					
Item	Test conditions	Min	Typ	Max	Units
Output Voltage Accuracy	10%-100%, input voltage rang		±1.5	±2.5	%
Linear Regulation	Full load, input voltage range				
	LMW78_03/05/06-1.0		±0.6	±1.5	%
	LMW78_09/12/15-1.0		±0.6	±2.0	%
	LMW78_24-1.0		±1.2	±2.5	%
Load Regulation	Nominal input voltage, 10% -100% load		±0.6	±1.0	%
Ripple & Noise*	20MHz bandwidth, nominal input voltage, full load		75		mVp-p
Temperature Coefficient				±0.02	%/°C
Transient Response Deviation	Nominal input voltage, 25% load step change		±100	±180	mV
Transient Recovery Time	Nominal input voltage, 25% load step change		150	250	us

Note: * The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information;

Example:

LMW78_05-1.0

LM = Series; W = Wide input range; 05 = 5Vout; 1.0 = 1.0A output current

Note:

1. All specifications measured at TA = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
2. Only typical models listed. If you need other model, please confirm the power, input voltage and output voltage, and then phone us.

Note: *Meeting the vibration standard requires filling the bottom void of the product with silicone rubber..

Input specifications					
Item	Test conditions	Min	Typ	Max	Units
No-load Input Current	Nominal input voltage		0.5	1.5	mA
Reverse Polarity at Input		Avoid / Not protected			
Input Filter		Capacitance filter			

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 4-② for recommended circuit)			
Emissions	RE	CISPR32/EN55032 CLASS B (see Fig. 4-② for recommended circuit)			
Immunity	ESD	IEC/EN 61000-4-2 Contact ±4kV perf. Criteria B			
Immunity	RS	IEC/EN 61000-4-3 10V/m perf. Criteria B			
Immunity	EFT	IEC/EN 61000-4-4 100kHz ±1kV (see Fig. 4-③ for recommended circuit) perf. Criteria B			
Immunity	Surge	IEC/EN 61000-4-5 line to line ±1kV (see Fig. 4-④ for recommended circuit) perf. Criteria B			
Immunity	CS	IEC/EN 61000-4-6 3Vr.m.s perf. Criteria B			

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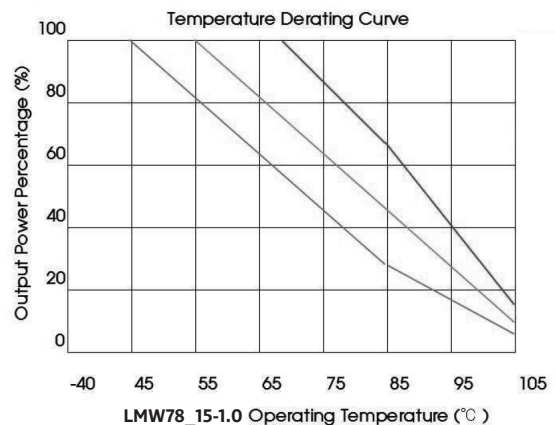
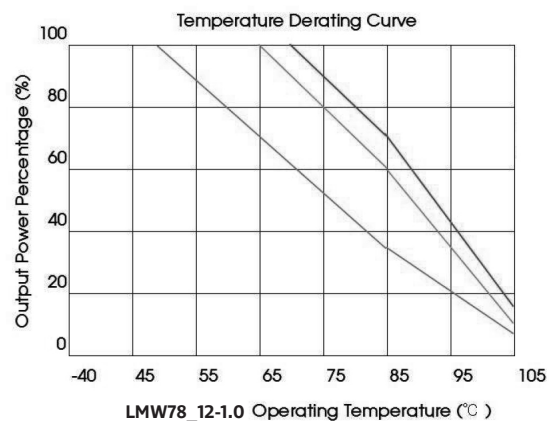
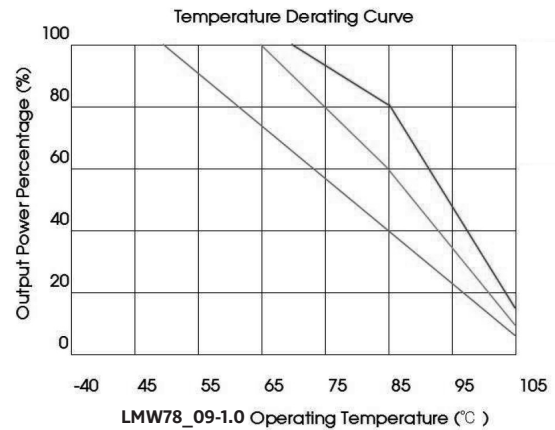
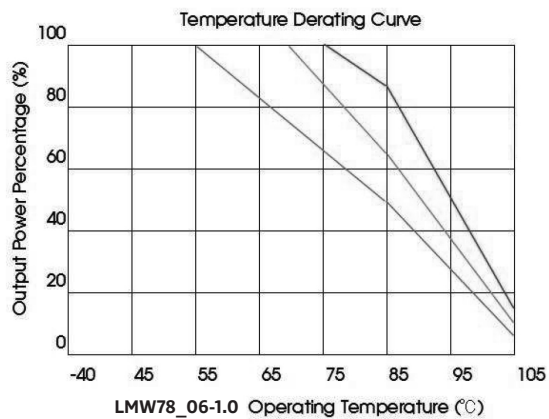
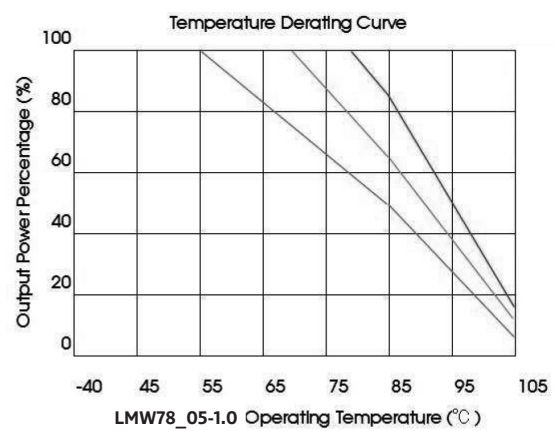
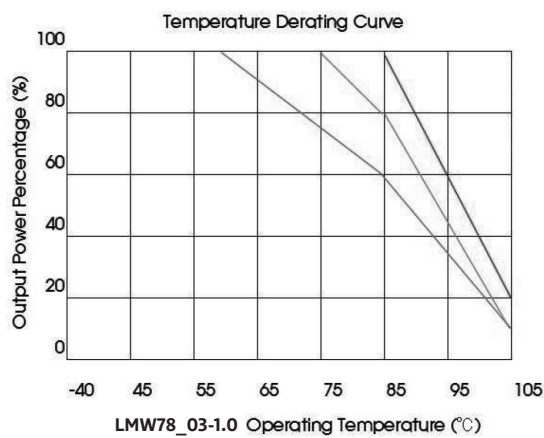
Wide Input Non-Isolated & Regulated, Single Output

Product Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. [%]		Max Capacitive Load
				Vin=24V	Vin=48V	
LMW78_03-1.0	48 (9-75)	3.3	1000	80	76	2400
LMW78_05-1.0	48 (9-75)	5	1000	84	82.5	1580
LMW78_06-1.0	48 (9-75)	6.5	1000	86	85	1200
LMW78_09-1.0	48 (14-75)	9	1000	88	87.5	880
LMW78_12-0.7	48 (17-75)	12	1000	90.5	90.5	660
LMW78_15-1.0	48 (21-75)	15	1000	91	90	530
LMW78_24-1.0	48 (33-75)	24	700	/	92	330

Note: * For input voltage exceeding 60 VDC, an input capacitor of 100uF/100V is required.

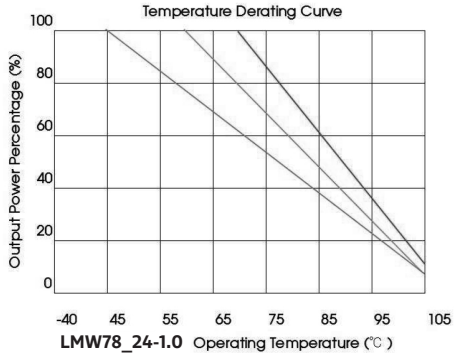
Typical characteristics



All curves in the graph represent: 24VDC, 48VDC and 75VDC (right to left)

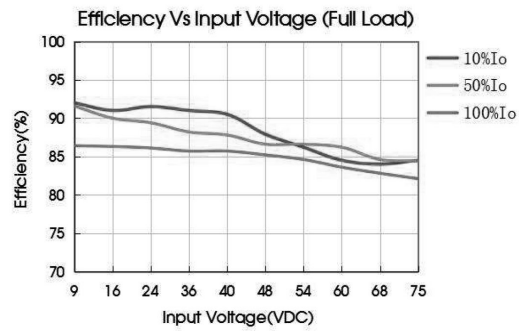
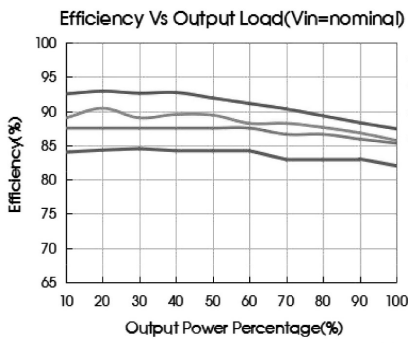
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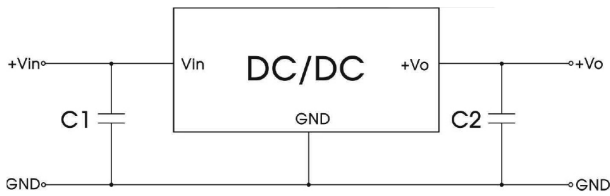


All curves in the graph represent: 33VDC, 48VDC and 75VDC (right to left)

Efficiency



Typical application

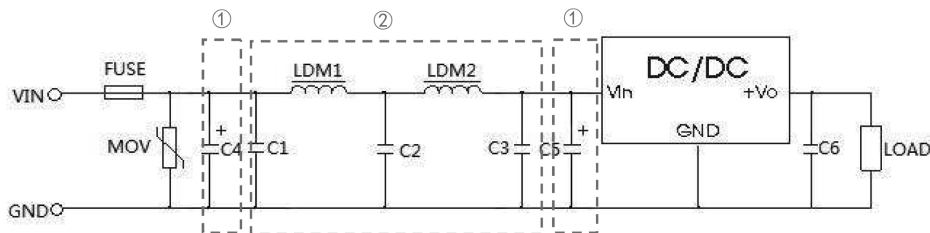


Notes:

1. The required C1 and C2 capacitors must be connected as close as possible to the terminals of the module;
2. Refer to Table 1 for C1 and C2 capacitor values. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
3. Converter cannot be used for hot swap and with output in parallel.

Part No.	C1	C2
LMW78_03-1.0	10µF/100V	22µF/10V
LMW78_05-1.0	10µF/100V	22µF/10V
LMW78_06-1.0	10µF/100V	22µF/10V
LMW78_09-1.0	10µF/100V	22µF/10V
LMW78_12-0.7	10µF/100V	22µF/10V
LMW78_15-1.0	10µF/100V	22µF/25V
LMW78_24-1.0	10µF/100V	10µF/50V

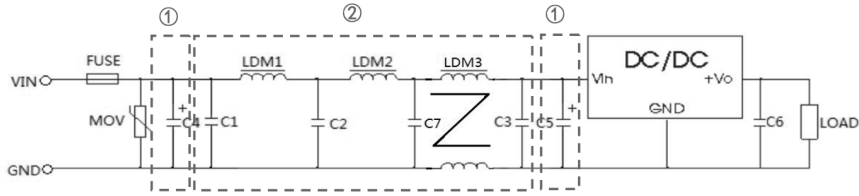
EMC compliance circuit



Part No.	C4/C5	C1/C2/C3	C3	C6	LDM1	LDM2
LMW78_03/05/06/09/12/15-1.0	680µF/100V	4.7µF/100V	225K/100V	10µF/50V	10µH	22µH

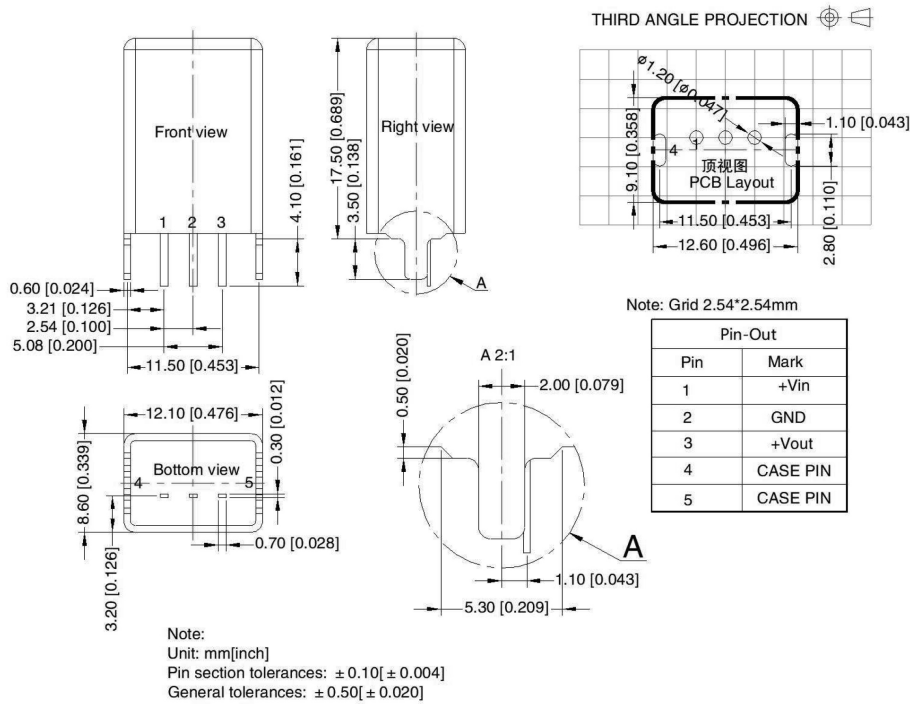
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Part No.	C4/C5	C1/C2/C3/C7	C6	LDM1	LDM2	LDM3
LMW78_24-1.0	680uF/100V	4.7uF/100V	10uF/50V	10uH	22uH	1.3mH

Mechanical dimensions



Mechanical dimensions (Bent pins)

