



LMS78_1.0R series

Negative/Positive Output

Switching Regulator

- ⊕ SIP3 package type
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ Support for negative output

- ⊕ Up to 96% efficiency
- ⊕ Short Circuit Protection (SCP), continuous, self recovery
- ⊕ MTBF: 2,000,000 hours

Introducing our new LMS78_1.0R series — a highly efficient, compact DC-DC converter line designed in a slim SIP3 package for easy integration into space-constrained designs. Operating reliably across a temperature range from -40°C to +85°C and delivering efficiency levels of up to 95%, this series ensures exceptional performance with minimal energy loss.

With an ultra-low no-load input current of just 0.1 mA, it is ideal for power-sensitive and standby-mode applications. Built-in short-circuit protection enhances system reliability, while an MTBF of 2,000,000 hours underscores the long-term durability of the design. The LMS78_1.0R series offers a powerful, modern alternative for high-efficiency, low-profile power regulation.



Common specifications

Short circuit protection	Nominal input voltage, continuous, self recovery
Switching frequency	500kHz (typ.)
Operating temperature	-40°C - +85°C (with derating)
Storage temperature	-55°C - +125°C
Soldering Profile	Wave soldering, 260°C (±5°C); time: 5 - 10s Manual welding, 360°C (±10°C); time: 3 - 5s
Relative humidity	5-95% RH (non-condensing)
MTBF (MIL-HDBK-217F@25°C)	2,000,000 hours
Reverse polarity input	Avoid
Input filter	Capacitance filter
Case material	Black flame-retardant and heat-resistant plastic (UL94V-0)
Package dimensions	17.50 × 11.50 × 9.00mm
Weight	4.1g (typ.)
Cooling method	Free air convection

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input current (no-load)	- Positive output, nominal 24VDC input voltage - Negative output		0.3 1.0	1.2 4.0	mA

Example:

LMS78_05-1.0R

LM = Series; S = SIP Case; 05 = 5Vout; 1.0 = 1.0A; R = Revised version

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy (full load, input voltage range)	LMS78_03-1.0R Others		±2 ±1.5	±4 ±3	%
Linear regulation	Full load, input voltage range		±0.2	±0.4	%
Load regulation (nominal input voltage)	10% to 100% load • Positive output • Negative output 0% to 10% load • Positive output • Negative output		±0.4 ±0.4 ±0.6 ±0.8	±0.6 ±0.8 ±4.0 ±4.0	%
Ripple & noise	20MHz bandwidth, nominal input voltage, 20% to 100% load, use the parallel line test		20	75	mVp-p
Ripple & noise	20MHz bandwidth, nominal input voltage, 0% to 20% load, use the parallel line test • 3.3/5 VDC output • Other models		60 --	100 2	mVp-p %Vo
Instantaneous recovery time	Nominal input, 25% load step		0.2	1	ms
Transient response deviation	Nominal input, 25% load step		±60	±200	mv
Temperature drift coefficient	Operating temperature -40 to +85°C			±0.03	%/°C

- Maximum capacitive loads are tested in the input voltage range and under full load conditions;
- Unless otherwise specified, the parameters in this datasheet were measured at 25°C, humidity 40%-75%, input nominal voltage and output pure resistance mode under full load;
- For specific needs please contact our technical team directly;
- All index test methods are based on our company's standards;

LMS78_1.0R series

Negative/Positive Output

EMC specifications				
EMI	CE	CISPR32/EN55032	CLASS B (see fig. 5-② for recommended circuit)	
EMI	RE	CISPR32/EN55032	CLASS B (see fig. 5-② for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	Perf. criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	Perf. criteria A
EMS	EFT	IEC/EN61000-4-4	±1kV (see fig. 5-③ for recommended circuit)	Perf. criteria B
EMS	Surge	IEC/EN61000-4-5	line to line ±1kV (see fig. 5-③ for recommended circuit)	Perf. criteria B
EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf. criteria A

Product Selection Guide

Approval	Part number	Input Voltage Nominal Range (VDC) ¹	Output Voltage (VDC)	Output Current (mA) max.	Full Load Efficiency (%)typ. max. vin	Capacitive Load (µF) max.
	LMS78_03-1.0R	24 (6-36)	3.3	1000	87	680
	LMS78_05-1.0R	24 (8-36) 12 (8-27)	5 -5	1000 -500	91 86	680 330
	LMS78_06-1.0R	24 (10-36)	6.5	1000	91	680
	LMS78_09-1.0R	24 (13-36)	9	1000	94	680
	LMS78_12-1.0R	24 (16-36) 12 (8-20)	12 -12	1000 -300	94 88	680 330
	LMS78_15-1.0R	24 (20-36) 12 (8-18)	15 -15	1000 -300	96 88	680 330

Notes:

- 1. For input voltage exceeding 30 VDC, an input electrolytic capacitor of 22uF/50V is required to prevent the module from being damaged by voltage spikes;
- 2. Refers to a bent-leg product.

Product characteristic curve

Temperature derating graph

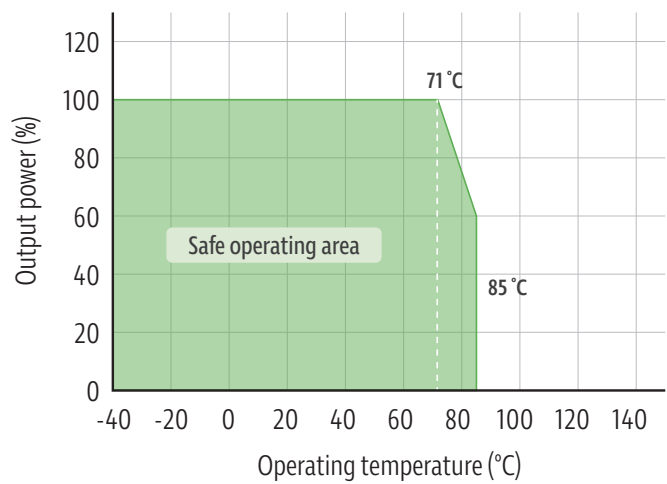
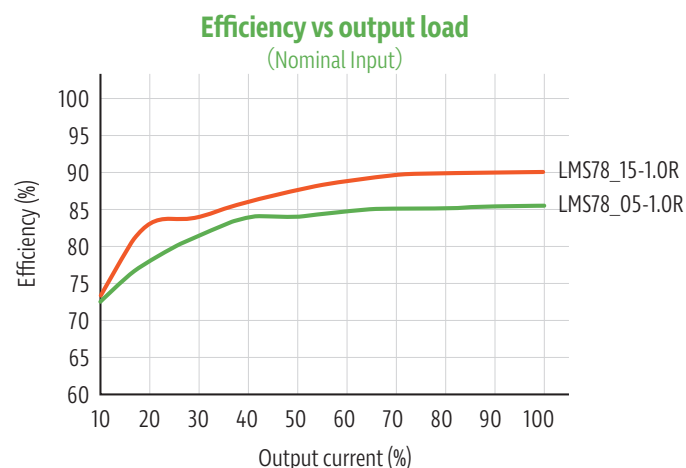
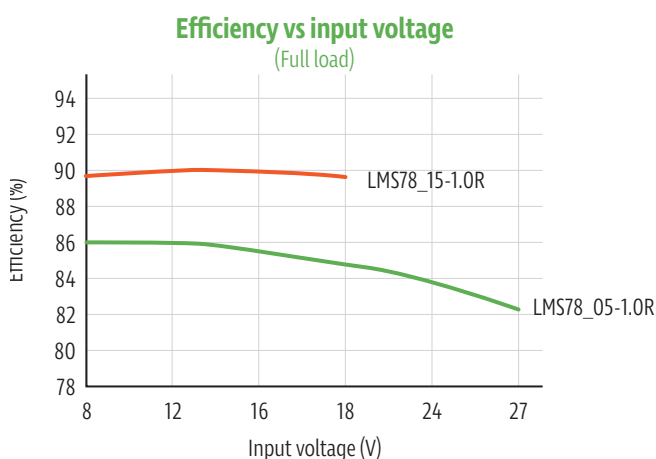
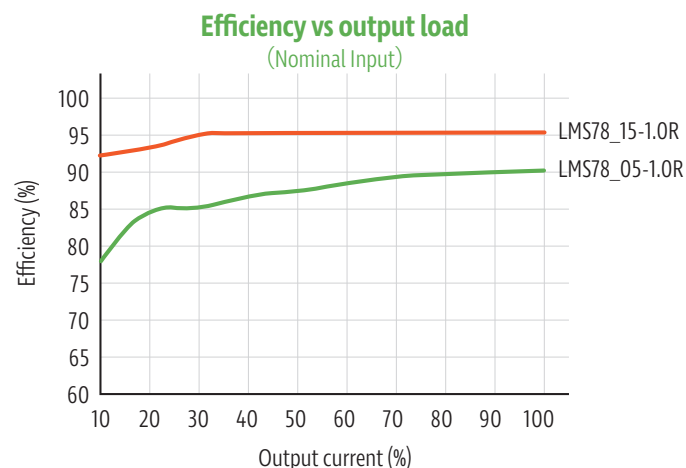
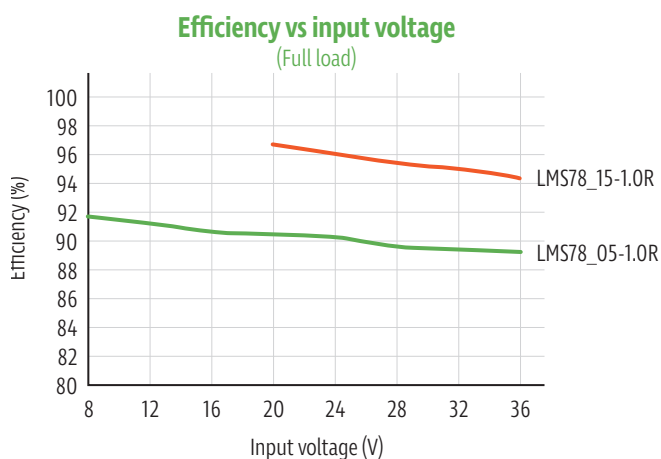
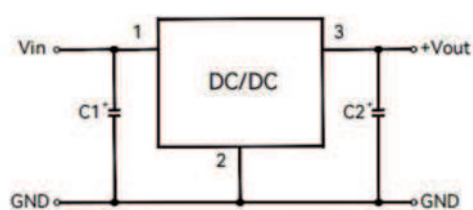


Figure 1

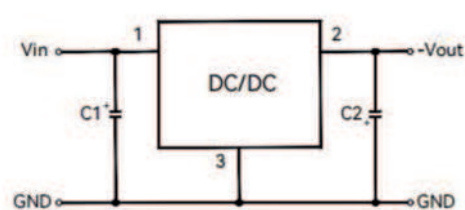
Product characteristic curve



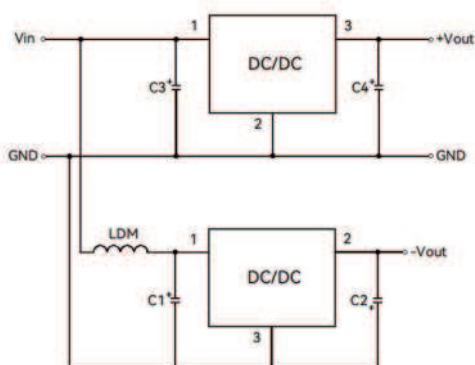
Design and application circuit reference



Positive Output Application Circuit Figure 2



Negative Output Application Circuit Figure 3



Positive And Negative Output Application Circuit Figure 4

Recommended component parameters

Product Model	C1/C3	C2/C4
3.3	10uF/50V	22uF/10V
5		22uF/10V
6.5		22uF/10V
9		22uF/16V
12		22uF/25V
15		22uF/25V

EMC recommended circuit

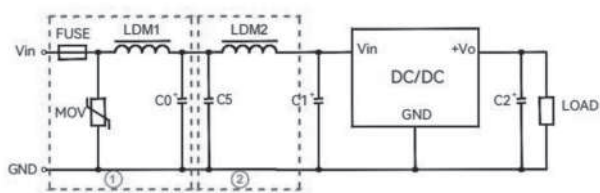


Figure 5

Notes: For EMC tests we use part ① in Fig.5 for immunity and part ② for emissions test. selecting based on needs.

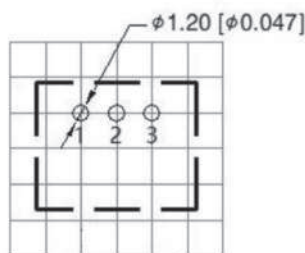
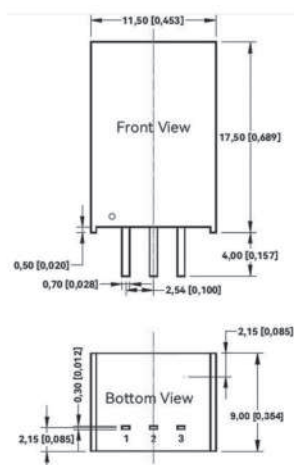
Notes:

1. The required C1 and C2 (C3 and C4) capacitors must be connected as close as possible to the terminals of the module;
2. Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values;
3. For certain applications, increased values for C2 and C4 and/or tantalum or low ESR electrolytic capacitors may also be used instead;
4. When using configurations as shown in Fig.4, we recommended to add an inductor (LDM) with a value of up to 10μH which helps reducing mutual interference;
5. Converter cannot be used for hot swap and with output in parallel.

EMI Recommended component parameters

Part No.	Vin: 24V
FUSE	Selected fuse value according to ac-tual
MOV	S20K30
LDM1	82μH
C0	680uF/50V
C1/C2	Refer to table 1
C5	4.7uF/50V
LDM2	12μH

Mechanical dimensions



The grid distance is 2.54mm x2.54mm

Note:

Unit: mm [inch]

Pin section tolerances: ±0.10 [±0.004]

General tolerances: ±0.50 [±0.020]

Pin Definition Table

Pin	Positive output	Negative output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND