LMW78_1.0R series

Positive Output

Switching Regulator

- SIP3 package type
- Input voltage range up to 8:1
- Operating ambient temperature range: -40°C to +105°C
- MTBF: 8,215,000 hours
- No-load input current as low as 1.5 mA
- Up to 92% efficiency
- Short circuit protection (SCP)

The LMW78_1.0R series is designed for efficient and reliable power conversion in a compact SIP3 package. Featuring a wide input voltage range of up to 8:1, the series supports flexible system design and stable operation across an extended ambient temperature range from –40 °C to +105 °C.

With efficiency of up to 92%, an ultra-low no-load input current of just 1.5 mA, and integrated short-circuit protection (SCP), the LMW78_1.0R series delivers dependable performance while minimizing power losses. A high MTBF of 8,215,000 hours ensures long-term reliability, making the series well suited for demanding industrial and embedded applications.

Common specifications

Short circuit protection	Nominal input voltage Ambient temperature ≤ 85°C, continuous, self recovery Ambient temperature >85°C, short ≤ 3s
Switching frequency	Full load, nominal input voltage 3.3/5 VDC output 200kHz (typ.) 6.5/9 VDC output 250kHz (typ.) 12 VDC output 350kHz (typ.) 15 VDC output 400kHz (typ.) 24 VDC output 550kHz (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
Storage humidity	5 - 95%RH (non-condensing)
MTBF (MIL-HDBK-217F@25°C)	>8,215,000 Hours
Reverse polarity at input	Avoid/not protected
Input filter	Capacitance filter
Case material	Black flame-retardant and heat-resistant plastic (UL94V-0)
Package dimensions	11.50 x 9.00 x 17.50mm 19.00 x 11.50 x 9.00mm
Weight	3.8g (typ.)
Cooling method	Free air convection

Input specifications

Item	Operating condition	Min	Typ	Max	Units
No-load input current	Nominal input voltage		0.5	1.5	mA

Example:
LMW78_05-1.0R
LMW = Series; 05 = 5Vout; 1.0 = 1A; R = Revised

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Output voltage accuracy	10% - 100% load, input voltage range		±1.5	±3.0	%
Linear regulation Full load, input voltage range	3.3V/5V/6.5V output 9V/12V/15V output 24V output		±0.6 ±0.6 ±1.2	±3.0 ±3.0 ±3.0	%
Load regulation	Nominal input voltage, 10% - 100% load		±0.6	±3.0	%
Ripple & noise	20MHz bandwidth, nominal input voltage, full Load, use the parallel line test		75	120	mVp-p
Transient recovery time	Nominal input voltage, 25% load step change		150	250	µs
Transient response deviation	Nominal input voltage, 25% load step change		±100	±180	mV
Temperature drift coefficient	Operating temperature -40 to +105°C			±0.02	%/°C

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. The maximum capacitive load is tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, all indicators in this datasheet are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
5. All indicator testing methods in this datasheet are based on our company's standards;
6. For specific requirements please contact our technical team directly;
7. Product specifications are subject to change without prior notice.

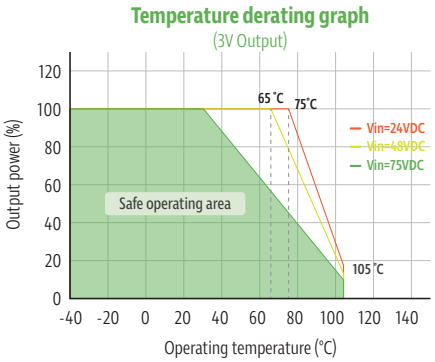
EMC specifications

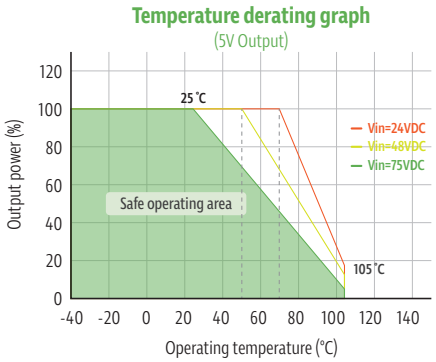
EMI	CE	CISPR32/EN55032	CLASS B (see Fig. 3/4-② for recommended circuit)	
EMI	RE	CISPR32/EN55032	CLASS B (see Fig. 3/4-② for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	Perf. criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	Perf. criteria A
EMS	EFT	IEC/EN61000-4-4	100kHz± 1kV (see Fig. 3/4-① for recommended circuit)	Perf. criteria B
EMS	Surge	IEC/EN61000-4-5	line to line ±1kV (see Fig. 3/4-① for recommended circuit)	Perf. criteria B
EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf. criteria A

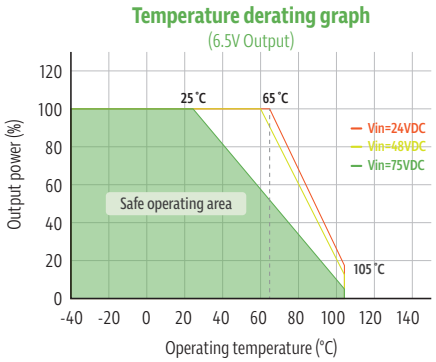
Product Selection Guide

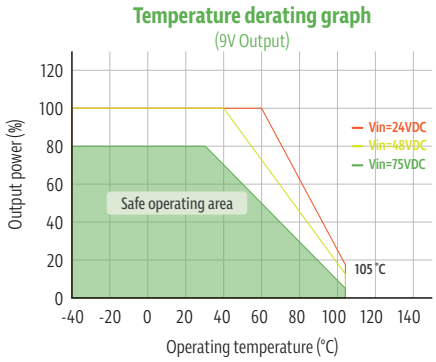
Approval	Part number	Input Voltage Nominal Range (VDC)	Output Voltage (VDC)	Output Current (mA) max.	Full Load Efficiency (%) min/typ. Vin = 24V	Full Load Efficiency (%) typ. Vin = 48V	Capacitive Load (µF) max.
	LMW78_03-1.0R	48 (9-75)	3.3	1000	76/80	76	2400
	LMW78_05-1.0R	48 (9-75)	5	1000	80/84	82.5	1580
	LMW78_06-1.0R	48 (9-75)	6.5	-500	82/86	85	1200
	LMW78_09-1.0R	48 (14-75)	9	1000	84/88	87.5	880
	LMW78_12-1.0R	48 (17-75)	12	1000	86.5/90.5	90.5	660
	LMW78_15-1.0R	48 (21-75)	15	1000	87/91	90	530
	LMW78_24-1.0R	48 (33-75)	24	700	--	92	330

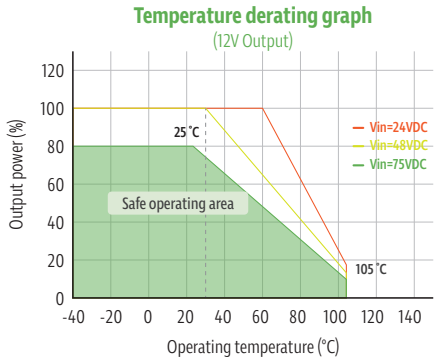
Product characteristic curve (fig.1)

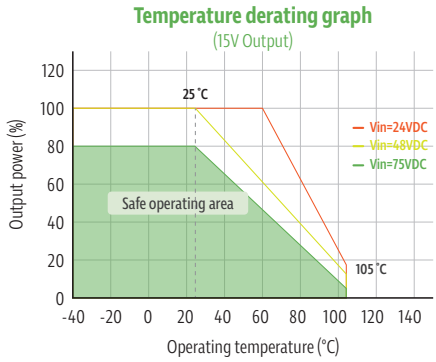


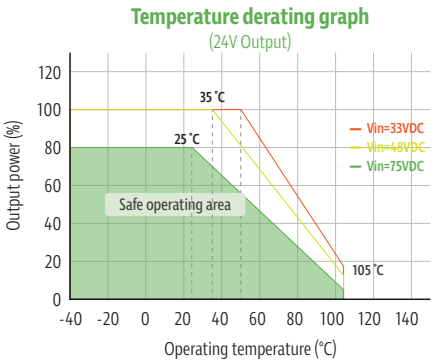




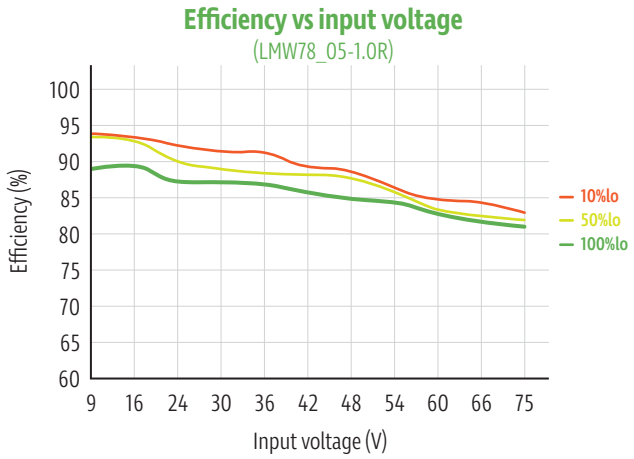


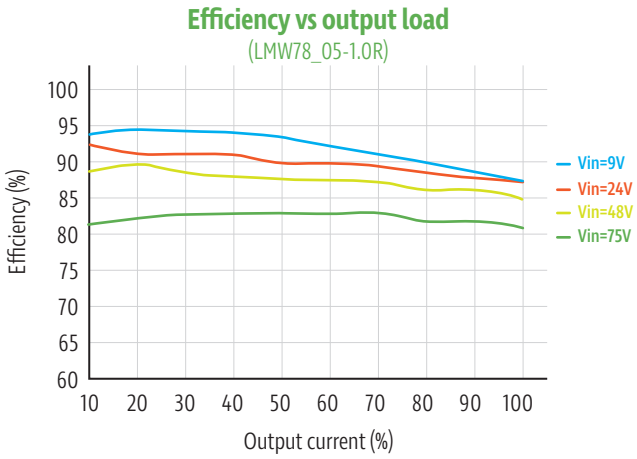






Product characteristic curve





Design and application circuit reference

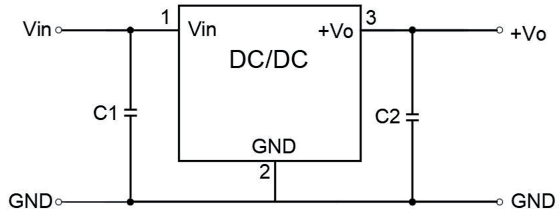


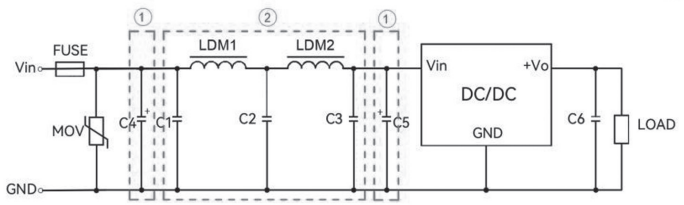
Fig.2

Recommended Capacitive Load Value Table (Table 1)

Product Model	C1	C2
3.3	10uF/100V	22uF/10V
5	10uF/100V	22uF/10V
6,5	10uF/100V	22uF/10V
9	10uF/100V	22uF/16V
12	10uF/100V	22uF/25V
15	10uF/100V	22uF/25V
24	10uF/100V	10uF/50V

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.

EMC recommended circuit

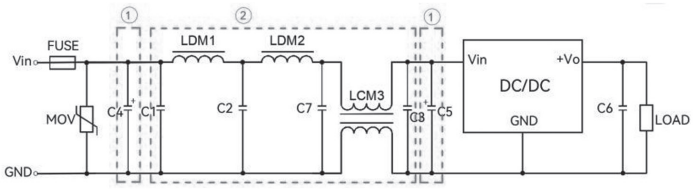


EMC Recommended Parameter Table

Part No.	3.3/5/6.5/9/12/15
FUSE	Select according to the actual input current of the customer
MOV	NC
C4/C5	680µF/100V
C1/C2/C3	4.7µF/100V
C6	10µF/50V
LDM1	10µH
LDM2	22µH

Note: We use part ① in fig. 3 for immunity tests and part ② for emissions test.
Selecting based on needs.

EMC recommended circuit

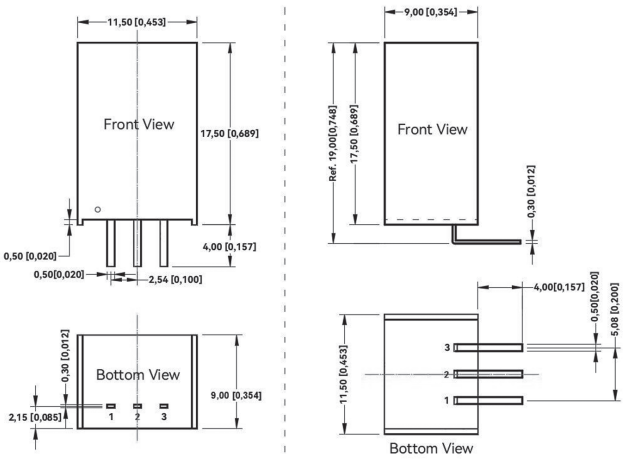


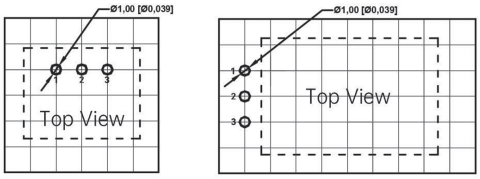
EMC Recommended Parameter Table

Part No.	24
FUSE	Select according to the actual input current of the customer
MOV	NC
C4/C5	680µF/100V
C1/C2/C3/C7	4.7µF/100V
C6	10µF/50V
LDM1	10µH
LDM2	22µH
LCM3	1.3mH

Note: We use part ① in fig. 4 for immunity tests and part ② for emissions test.
Selecting based on needs.

Mechanical dimensions and installation





The grid distance is 2.54mm x2.54mm

Pin Definition Table

Pin	Function
1	Vin
2	GND
3	+Vo

Note:
Unit: mm [inch]
Pin section tolerances: ±0.10 [±0.004]
General tolerances: ±0.50 [±0.020]