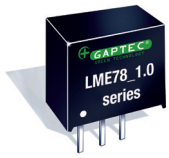
LME78_1.0 series

Wide Input Non-Isolated & Regulated, Single Positive/Negative Output



Switching Regulator

- High efficiency up to 96%
- Operating temperature range: -40°C ~ +85°C
- Short circuit protection (SCP)
- No-load input current as low as 0.3mA
- 3PIN SIP package
- Non isolated, no need for heatsink
- UL94V-0 package material
- Meets IEC62368, UL62368, EN62368 test standards

Introducing our high-performance LME78_1.0 series: with an impressive efficiency of up to 96%, this converter is designed for optimal performance. It operates within a wide temperature range of -40°C to +85°C and includes short circuit protection (SCP) for enhanced safety. The no-load input current is as low as 0.3mA, making it highly efficient even at low loads.

Housed in a 3PIN SIP package, this non-isolated converter requires no heatsink. The package material is UL94V-0 rated for superior flame resistance. Additionally, it meets IEC62368, UL62368, and EN62368 test standards, ensuring compliance with international safety regulations.

Common specifications

Short circuit protection:	Hiccup, automatic recovery
No-load input current:	2mA TYP, 5mA MAX
Temperature rise at full load:	25°C MAX, 15°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C (see temperature derating curve)
Storage temperature range:	-55°C ~+125°C
Pin welding resistance temperature:	260°C MAX, 1.5mm from case for 10 sec
Operating case temperature:	100°C
Storage humidity range:	< 95%RH
Package material:	Plastic [UL94-V0]
MTBF (MIL-HDBK-217F @25°C):	2000 K hours
Weight:	1.9g

Input specifications

Item	Test conditions	Min	Typ	Max	Units
No-load input current	• positive output • negative output		0.3 1	1 4	mA mA
Reverse polarity input	Forbidden				
Input Filter	Capacitor Filter				

* Test ripple and noise by “parallel cable” method.

Example:
LME78_05-1.0
LME78 = Series; 05 = 5Vout; 1.0 = 1.0A

Note:

1. The max. capacitive load should be tested within the input voltage range and under full load conditions;
2. Without any special statement, all indexes are only specific to positive output application;
3. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta = 25°C, humidity <75% when inputting nominal voltage and outputting rated load;
4. All index testing methods in this datasheet are based on our Company’s corporate standards;
5. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact with our technician for specific information;
6. Specifications subject to change without prior notice.

Output specifications

Item	Test conditions	Min	Typ	Max	Units
Voltage accuracy	Full load, input voltage range • LME78_03-1.0 • Others		 ±2 ±1.5	 ±4 ±3	 % %
Line regulation	Full load, input voltage range		±0.2	±0.4	%
Load regulation	10% to 100% load • positive output • negative output		 ±0.4 ±0.4	 ±0.6 ±0.8	 % %
Ripple + Noise*	20MHz bandwidth, nominal input, 20% -100% load		25	75	mVp-p
Switching frequency			520		KHz
Temperature Drift Coefficient				±0.03	%/°C
Transient response deviation	Nominal input, 25%-50%-25%, 50%-75%-50% load step change		±60	±200	mV
Transient recovery time	Nominal input, 25%-50%-25%, 50%-75%-50% load step change			1	ms

* Test ripple and noise by “parallel cable” method.
With the load lower than 20%, the maximum ripple and noise of 3.3V/5V output products will be 100mVp-p, 9V/12V/15V output products will be 2%Vo.

EMC specifications

EMI	CE	CISPR32/EN55032	CLASS B ◯ (see EMC rec. circuit 2)
EMI	RE	CISPR32/EN55032	CLASS B ◯ (see EMC rec. circuit 2)
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV perf. Criteria A
EMS	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±1KV ◯ perf. Criteria A (see EMC rec. circuit 1)
EMS	Surge	IEC/EN61000-4-5	line to line ±1KV ◯ perf. Criteria A (see EMC rec. circuit 1)
EMS	CS	IEC/EN61000-4-6	3Vr.m.s perf. Criteria A

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LME78_1.0 series

Wide Input Non-Isolated & Regulated, Single Positive/Negative Output

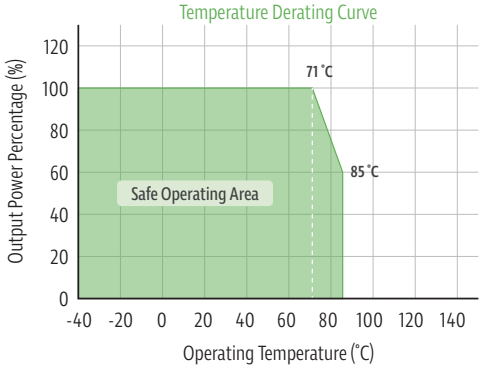
Part Number	Input Voltage [VDC] Nominal (Range)	Output Voltage [VDC]	Output Current [mA]	Capacitive load [µF, max.]	Efficiency [%, min/max Vin]
LME78_03-1.0	24 (6-36)	3.3	1000	680	90/80
LME78_05-1.0	24 (8-36) 12 (8-27)	5 -5	1000 -500	680 330	93/95 85/81
LME78_09-1.0	24 (13-36)	9	1000	680	94/89
LME78_12-1.0	24 (16-36) 12 (8-20)	12 -12	1000 -300	680 330	95/92 88/87
LME78_15-1.0	24 (20-36) 12 (8-18)	15 -15	1000 -300	680 330	96/93 87/88

Note: For input voltage higher than 30 VDC, a 22µF/50V input capacitor is required.

Typical characteristics

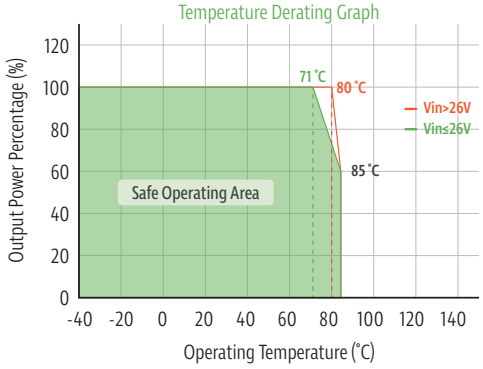
Negative Output

Temperature Derating Curve



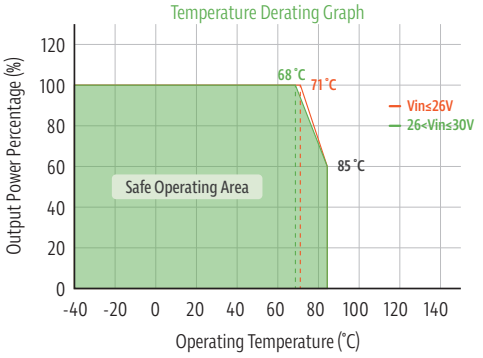
3.3V/5V Output

Temperature Derating Graph



9V/12V/15V Output

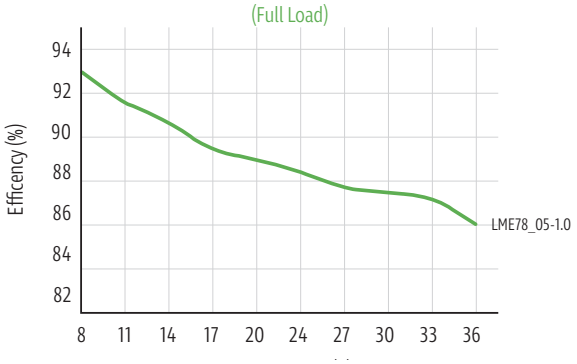
Temperature Derating Graph



Efficiency

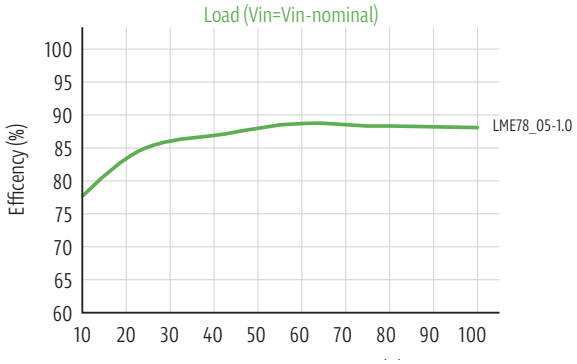
Positive Output Efficiency Vs Input Voltage

(Full Load)



Positive Output Efficiency Vs Output

Load (Vin=Vin-nominal)



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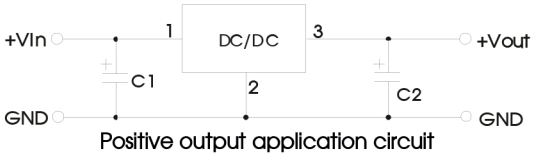
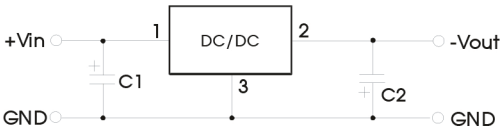
Typical application circuit

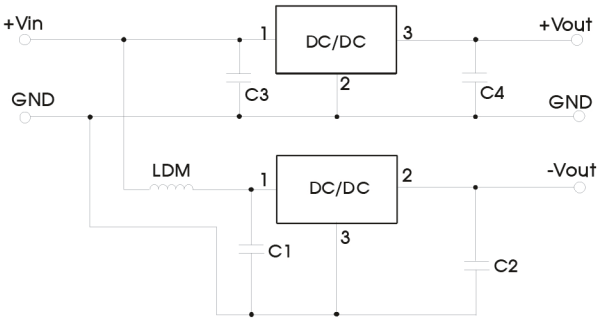


Positive output application circuit



Negative output application circuit

Typical application circuit



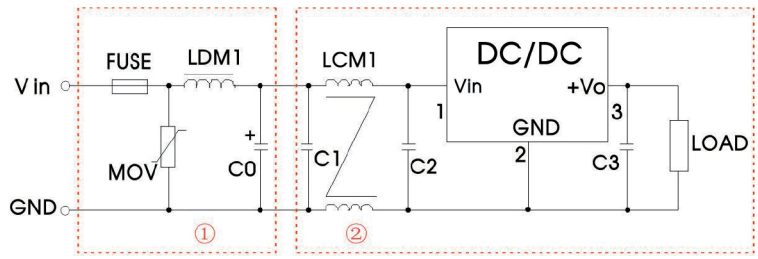
Sheet 1

Part No.	C1/C3 (ceramic capacitor)	C2/C4 (ceramic capacitor)
	10μF/50V	22μF/10V
		22μF/10V
		22μF/16V
		22μF/25V
		22μF/25V

Note:
1. C1 and C2 (C3 and C4) are required and should be connected close to the pin terminal of the module.
2. The capacitance of C1 and C2 (C3 and C4) refer to Sheet 1.
3. To reduce the output ripple furtherly, C2 and C4 can be increased properly if required, tantalum capacitor and aluminum electrolytic capacitor of low ESR may also suffice.
4. When the products used as the circuit like figure 3, an inductor named as LDM up to 10μH is recommended in the circuit to reduce the mutual interference.
5. Cannot be used in parallel to enlarge the power for output and hot swap.

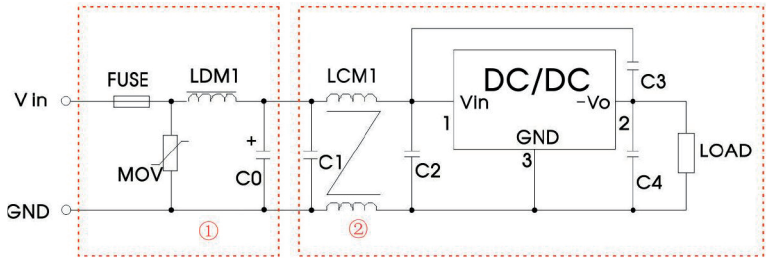
EMC solution recommended circuit

positive output



FUSE	According to the customer actual input current choice
MOV	20D470K
LDM1	82μH
C0	680μF /50V
LCM1	4.7mH
C1/C2	4.7μF /50V
C3	Refer to the Cout in Sheet 1

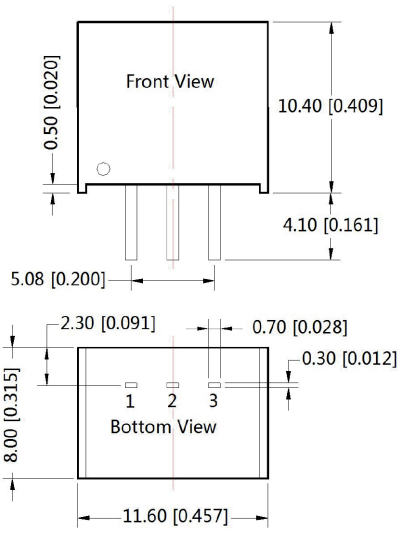
negative output

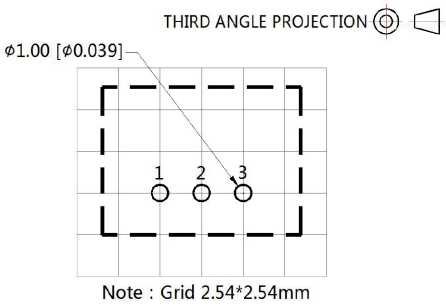


FUSE	According to the customer actual input current choice
MOV	20D470K
LDM1	82μH
C0	680μF /50V
LCM1	4.7mH
C1/C3/C4	4.7μF /50V
C2	10μF /50V

Note:
Part ① in the Fig. 4 is for EMS test, part ② is for EMI filtering; parts ① and ② can be added based on actual requirement.

Mechanical dimensions





Pin-Out		
Pin	Positive Output	Nagetive Output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND

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