

LMS78_2.0 Series

Wide Input Non-Isolated & Regulated, Single Output

Switching Regulator

- ⊕ Efficiency up to 92%, no heatsink required
- ⊕ 2A large current output
- ⊕ Operating temperature: -40°C ~ +85°C
- ⊕ Short circuit protection, thermal shutdown
- ⊕ Low ripple and noise
- ⊕ Micro miniature SIP package, meet UL94-V0 requirement
- ⊕ Ultra low power loss
- ⊕ Industry standard pinout
- ⊕ Pin-out compatible with LM78xx Linear
- ⊕ MTBE >2000,000Hours

Upgraded LMS78_2.0 series switching regulators are ideal replacement for LM78xx linear regulators and LDOs. The efficiency of up to 92% means that very little energy is wasted as heat so there is no need for any heat sinks with their additional space and mounting costs. They are widely used in industrial control, instrumentation, and electric power applications.

Example:

LMS78_05-2.0

LM = Series; S = SIP Case; 05 = 5Vout; 2.0 = 2A



Output specifications

Item	Test conditions	Min	Typ	Max	Units
Output voltage accuracy	100% full load, input voltage range		±2	±3	%
Line regulation	Vin= min. to max. at full load		±0.5	±0.75	%
Load regulation	10% to 100% load		±0.5	±1.0	%
Ripple + Noise*	20MHz Bandwidth (refer to Test configurations, 1)		25	45	mVp-p
Short circuit input power			0.5	1.8	W
Short circuit protection	Continuous, automatic recovery				
Switching frequency	Full load, input voltage range	300	340	380	KHz
Quiescent current			5	10	mA
Thermal shutdown	Internal IC junction		150		°C
Output current limit			5000		mA
Temperature coefficient	-40 °C to +85 °C ambient			±0.03	%/°C
Max capacitance load				1000	µF

*Test ripple and noise by "parallel cable" method.

Common specifications

Cooling:	Free air convection	
Operating temperature range:	-40°C~+85°C (above 71°C power derating)	
Storage temperature range:	-55°C ~+125°C	
Lead temperature:	300°C MAX, 1.5mm from case for 10 sec	
Operating case temperature:	100°C MAX	
Storage humidity range:	< 95%	
Package material:	Plastic [UL94-V0]	
MTBF:	>2,000,000 hours (25°C, MIL-HDBK-217F)	
Package weight:	4.0g	
Conducted emissions (Refer to Figure 5)	EN55022	CLASS B
Radiated emissions	EN55022	CLASS B
ESD	EN61000-4-2 Level 3 6kV/8kV perf. Criteria B	

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, other models may be different, please contact our technical person for more details.
3. In this datasheet, all the test methods of indications are based on corporate standards.

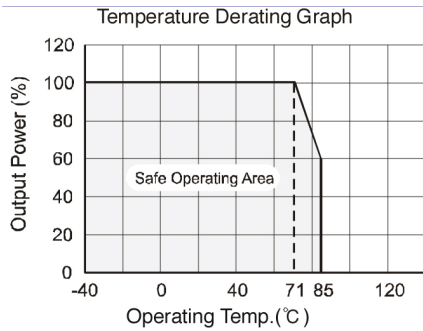
Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency [Vin. min]	Efficiency [Vin. max]
LMS78_1.5-2.0	4.75-18	1.5	2000	79	76
LMS78_1.8-2.0	4.75-18	1.8	2000	81	79
LMS78_2.5-2.0	4.75-18	2.5	2000	85	83
LMS78_03-2.0	4.75-18	3.3	2000	87	86
LMS78_05-2.0	7-18	5	2000	91	88
LMS78_6.5-2.0	8.5-18	6.5	2000	92	91

Add suffix "L" for 90° bend pins, for example: LMS78_05-2.0L.

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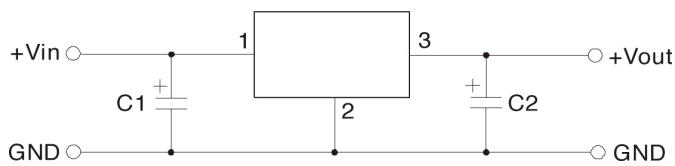
Typical characteristics



External capacitor table

Part Number	C1 (Ceramic Capacitor)	C2 (Ceramic Capacitor)
LMS78_1.5-2.0	10 μ F/25V	22 μ F/6.3V
LMS78_1.8-2.0	10 μ F/25V	22 μ F/6.3V
LMS78_2.5-2.0	10 μ F/25V	22 μ F/6.3V
LMS78_3.3-2.0	10 μ F/25V	22 μ F/6.3V
LMS78_05-2.0	10 μ F/25V	22 μ F/16V
LMS78_6.5-2.0	10 μ F/25V	22 μ F/16V

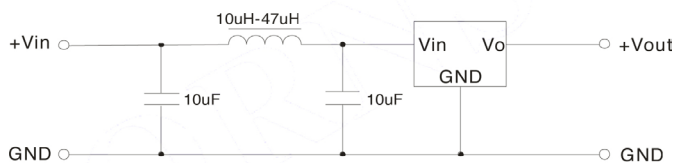
Typical application circuit



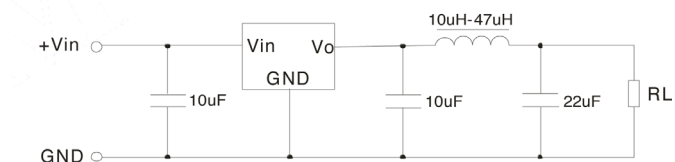
Note:

1. C1 and C2 are required and should be fitted close to the converter pins.
2. The capacitance of C1 and C2 sees external capacitor table, it can be increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
3. No parallel connection or plug and play.

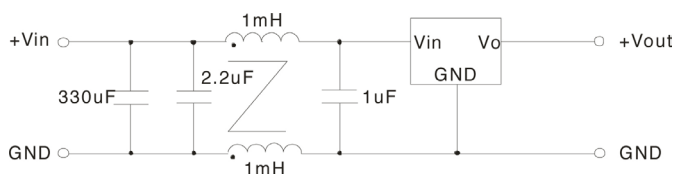
Input filter circuit connect



Output filter circuit connect

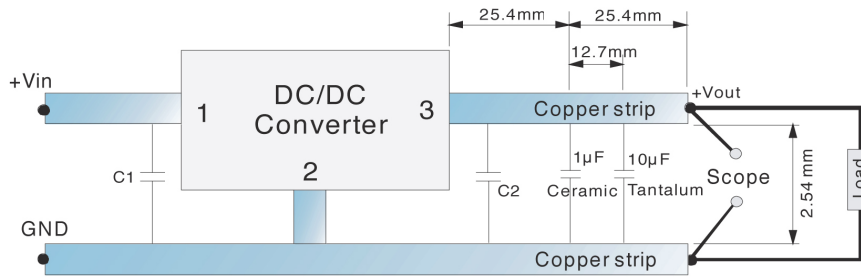


EMC recommended circuit

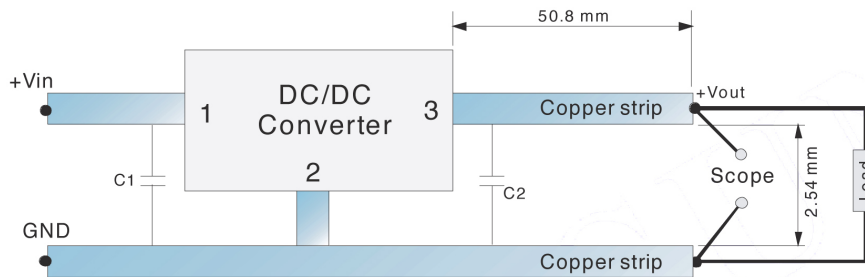


Test configurations (TA=25°C)

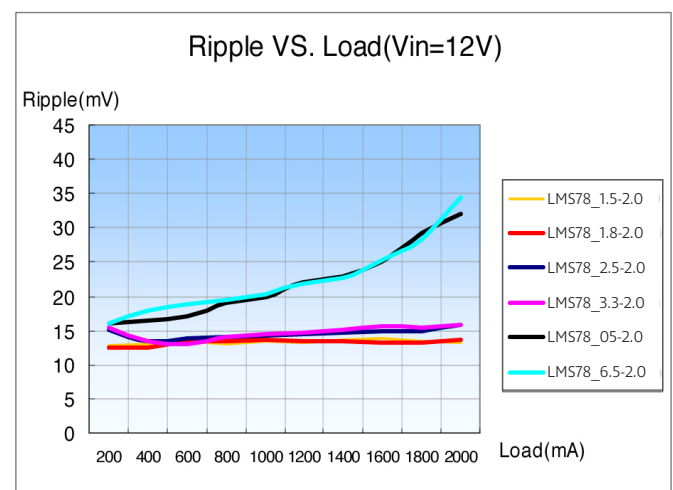
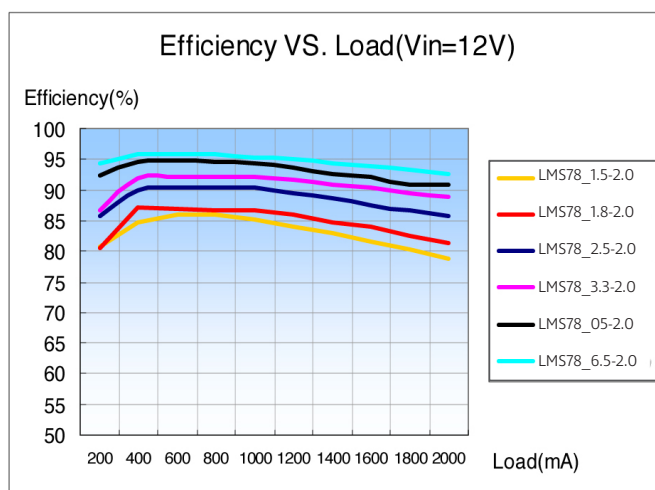
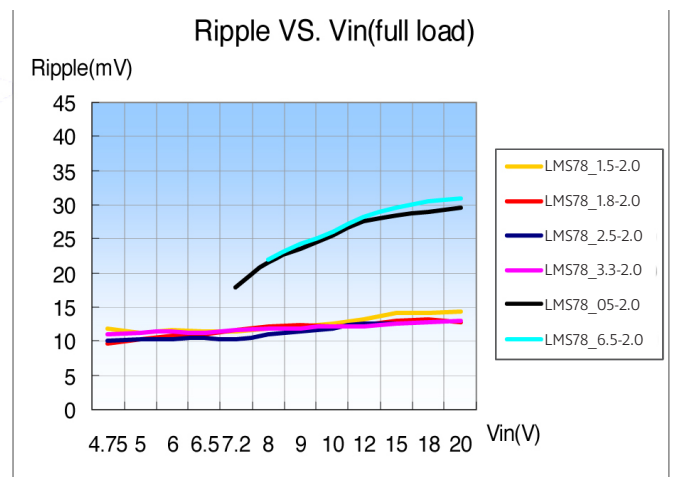
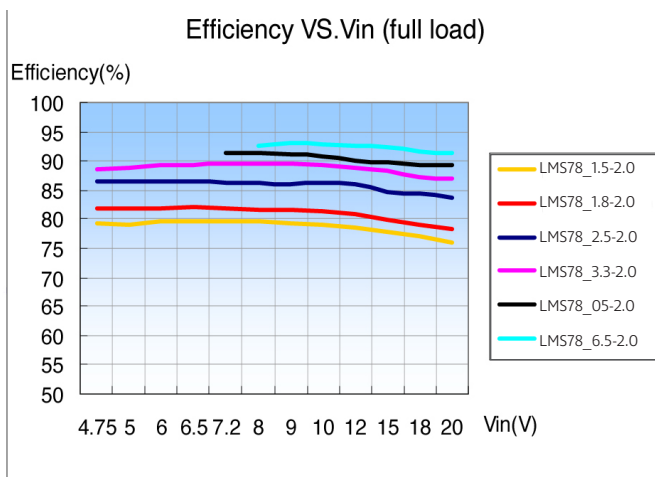
1 Efficiency and output voltage ripple test



2 Start-up and load transient response test



Characteristics curve

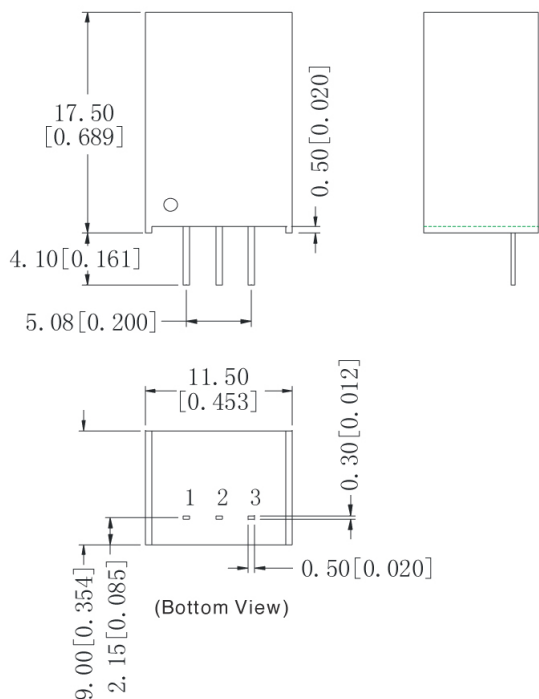


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Mechanical dimensions

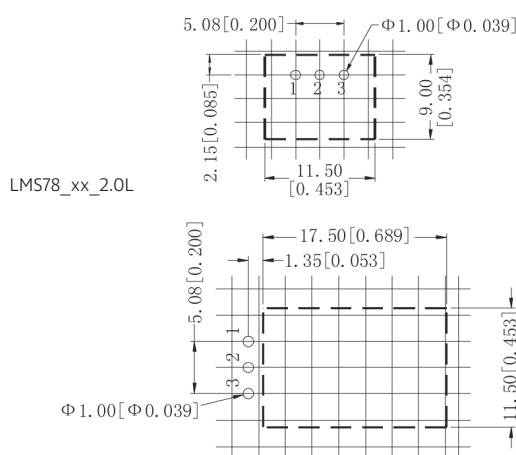
LMS78_xx_2.0



Note:
 Unit: mm[inch]
 Pin selection tolerances: ±0.10mm [±0.004inch]
 General tolerances: ±0.25mm [±0.010inch]

Recommended footprint

LMS78_xx_2.0

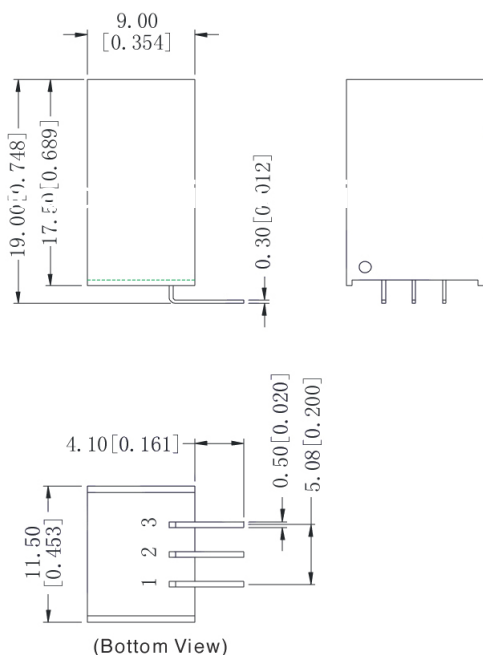


Note:
 grid: 2.54*2.54mm.

FOOTPRINT DETAILS	
Pin	Function
1	+Vin
2	GND
3	+Vout

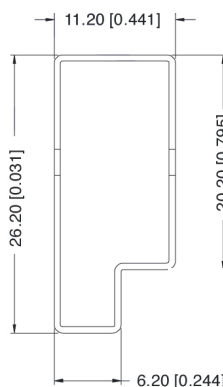
Tube outline dimensions

LMS78_xx_2.0L

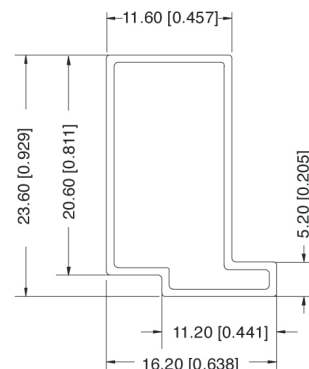


Note:
 Unit: mm[inch]
 Pin selection tolerances: ±0.10mm [±0.004inch]
 General tolerances: ±0.25mm [±0.010inch]

LMS78_xx_2.0



LMS78_xx_2.0L



Note:
 Unit: mm[inch]
 General tolerances: ±0.50mm [±0.020inch]

L=530mm [20.866inch] Devices per tube quantity: 44pcs
 L=220mm [8.661inch] Devices per tube quantity: 17pcs