



LMW78_0.5R series

Wide Input Non-Isolated & Regulated, Single Output

Switching Regulator

- ⊕ High efficiency up to 93%
- ⊕ No-load input current as low as 1.5 mA
- ⊕ Operating ambient temp. range: -40°C to 85°C
- ⊕ Pin compatible with LM78XX
- ⊕ Output short-circuit protection
- ⊕ Input voltage range up to 10:1
- ⊕ International standard pin package



Common specifications					
Item	Test conditions	Min	Typ	Max	Units
Short circuit protection	Nominal input voltage. Continuous, self-recovery				
Operating Temperature	See Fig.1, Fig.2.	-40		+85	°C
Storage Temperature	See Fig.1, Fig.2.	-55		+125	°C
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds			+300	°C
Storage Humidity	Non-condensing	5		95	%RH
Switching Frequency*	Full load, nominal input voltage		300		kHz
MTBF	MIL-HDBK-217F@25	2000			kh
Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)				
Dimensions	LMW78_xx0.5R	11.50 x 9.00 x 17.50mm			
	LMW78_xx0.5RL	11.50 x 9.00 x 19.00mm			
Weight	3.8g Typ.				
Cooling Method	Free air convection				

Note: *Different output voltage with different switching frequency.

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

Example: LMW78_05-0.5RL

LM = Series; W = Ultra Wide input (10:1); 78 = Pin compatible three-terminal linear regulators; 05 = 5Vout; 0.5 = 0.5A; R = Revised series L = Bent pins (90° degrees)

The LMW78_0.5R series are high efficiency switching regulators and ideal substitutes for LM78xx series three-terminal linear regulators. The converters feature high efficiency, low loss, short circuit protection, and there is no need for a heat sink. These products are widely used in applications such as industrial control, instrumentation and electric power.

Output specifications						
Item	Test conditions	Min	Typ	Max	Units	
Output voltage accuracy	0%-100% load, input voltage range • 3.3V output • Others		±3.5 ±2	±4.5 ±3	% %	
Line regulation	Full load, input voltage range		±0.4	±0.8	%	
Load regulation	Nominal input voltage, 10% -100% load		±1.0	±2.0	%	
Ripple & Noise*	20MHz bandwidth, nominal input voltage, full load		40	80	mVp-p	
Temperature coefficient	Operating temp. -40°C to +85°C			±0.03	% / °C	
Transient Response Deviation	Nominal input voltage, 25% load step change • 3.3Vout • 5V/6.5Vout • 9V/12Vout • 15V/24Vout			5 4 3 2	%Vo %Vo %Vo %Vo	
Quiescent current	Vin=Nominal, Min.Load		1	5	mA	
Transient Recovery Time	Nominal input voltage, 25% load step change		0.2	1	ms	

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

Note:

- The maximum capacitive load offered were tested at nominal input voltage and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see „Features“ and „EMC“;
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

EMC specifications						
Item	Standard	Class	Test Method	Limit	Criteria	Notes
Emissions	CE	CISPR32/EN55032	CLASS B	(see Fig. 6-2 for recommended circuit)		
Emissions	RE	CISPR32/EN55032	CLASS B	(see Fig. 6-2 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	CS	IEC/EN61000-4-6	3Vr.m.s		perf.	Criteria B
Immunity	EFT	IEC/EN 61000-4-4	100kHz ±1KV	(see Fig. 6-3 for recommended circuit)	perf.	Criteria B
Immunity	Surge	IEC/EN 61000-4-5	line to line ±1KV	(see Fig. 6-3 for recommended circuit)	perf.	Criteria B

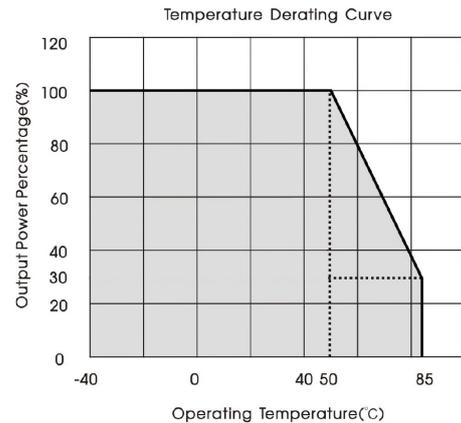
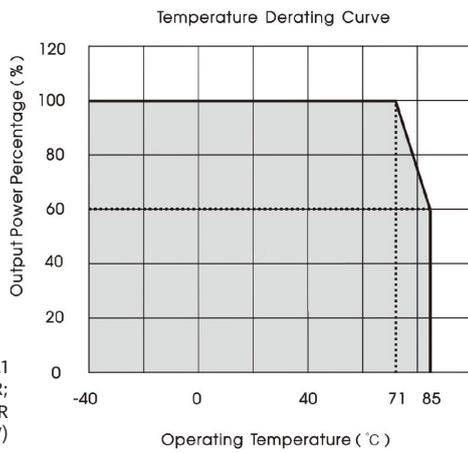
LMW78_0.5R series

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

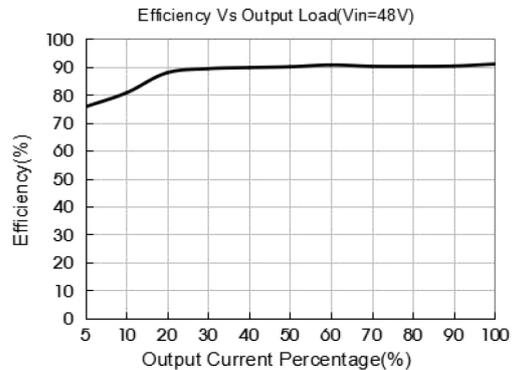
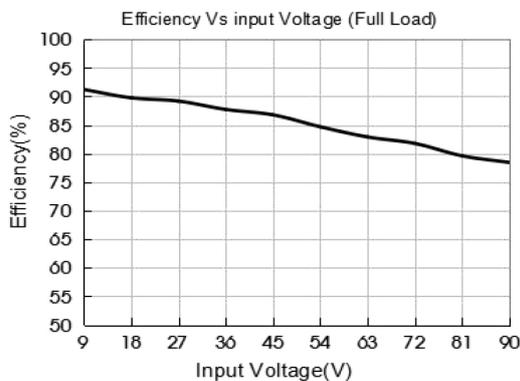
Part Number	Input Voltage Range [Nominal, VDC]	Output Voltage [VDC]	Output Current [mA, Max]	Full Load Efficiency [Vin. max/min, %]	Capacitive Load [μ F, max.]
LMW78_03-0.5R	48 (9-90)	3.3	500	82/69	100
LMW78_05-0.5R	48 (9-90)	5.0	500	87/75	100
LMW78_6.5-0.5R	48 (9-90)	6.5	500	91/78	100
LMW78_09-0.5R	48 (14-90)	9.0	500	91/80	100
LMW78_12-0.5R	48 (18-90)	12.0	500	91/83	100
LMW78_15-0.5R	48 (20-90)	15.0	500	93/84	100
LMW78_24-0.3R	48 (36-90)	24.0	300	93/85	100

Note: 1. For input voltage exceeding 80 VDC, an input capacitor of 22 μ F/100V is required.
2. Add suffix "L" for 90° bend pins, for example: LMW78_05-0.5R**L**.

Typical characteristics



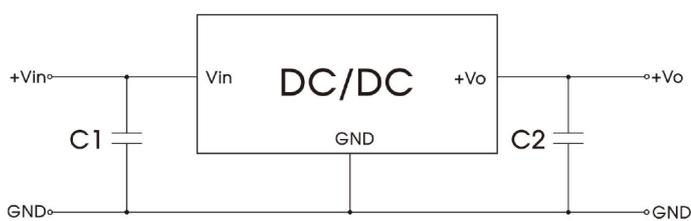
Efficiency



LMW78_05-0.5R

figure 4

Typical application



Part No.	C1 (ceramic capacitor)	C2 (ceramic capacitor)
LMW78_03-0.5R	10 μ F/100V	22 μ F/10V
LMW78_05-0.5R		22 μ F/10V
LMW78_6.5-0.5R		22 μ F/10V
LMW78_09-0.5R		22 μ F/10V
LMW78_12-0.5R		22 μ F/25V
LMW78_15-0.5R		22 μ F/25V
LMW78_24-0.3R		10 μ F/50V

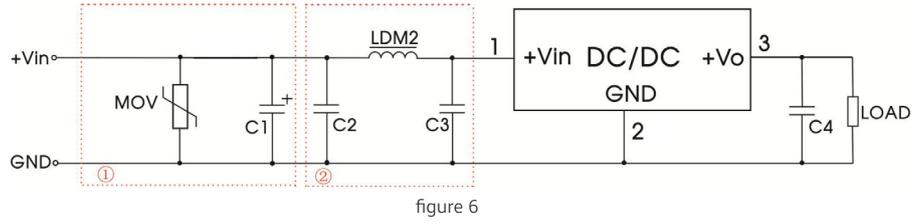
Notes:

- The required C1 and C2 capacitors must be connected as close as possible to the terminals of the module;
- 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;
- Converter cannot be used for hot swap and with output in parallel.

LMW78_0.5R series

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

EMC recommended circuit



Part No.	MOV	C1	C2	LDM2	C3	C4
LMW78_xx0.5R	S20K30	680 μ F/100V	4.7 μ F/100V	120 μ H	4.7 μ F/100V	10 μ F/50V

Mechanical dimensions

