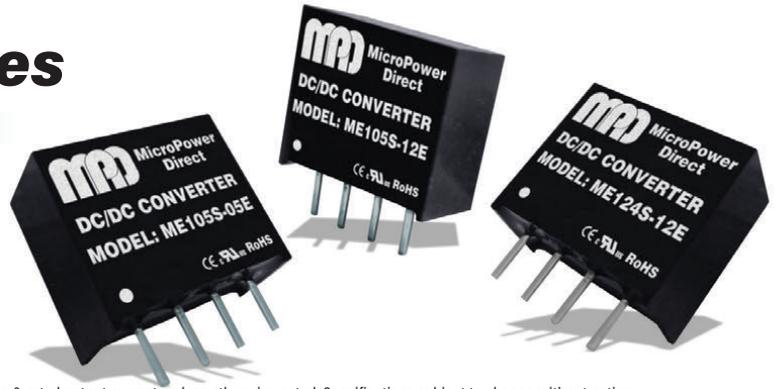


ME100E Series

Ultra-Miniature 1W Single Output SIP DC/DC Converters



Key Features:

- 1W Output Power
- Miniature SIP Case
- UL 62368 Approved
- 1,500 VDC Isolation
- Short Circuit Protected
- Meets EN 55032 Class B
- -40°C to +105°C Operation
- >3.5 MHour MTBF
- 24 Standard Models
- Standard Footprint
- **LOW COST!**

3.0 kV Isolation Models Available



MicroPower Direct

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F: (781) 344-8481

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Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Input Voltage Range	3.3 VDC Input	2.97	3.3	3.63	VDC	
	5 VDC Input	4.50	5.0	5.50		
	12 VDC Input	10.8	12.0	13.2		
	15 VDC Input	13.5	15.0	16.5		
	24 VDC Input	21.6	24.0	26.4		
Reflected Ripple Current			15		mA	
Input Filter	Capacitor					

Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Output Voltage Accuracy	See Tolerance Graphs (Page 2)					
Line Regulation, See Note 3	For V _{IN} Change of 1%				±1.2	%
Load Regulation, See Note 4	See Model Selection Guide					
Ripple & Noise (20 MHz), See Note 5	5 V _{IN}	24 V _{OUT}		50	100	mV P - P
		Other 5V _{IN} Models		30	75	
		All Other Models		60	150	
Temperature Coefficient			±0.02	±0.03	%/°C	
Output Short Circuit, See Note 6	Continuous (Autorecovery)					

General						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Isolation Voltage	See Note 7	1,500			VDC	
Isolation Resistance	500 VDC	1,000			MΩ	
Isolation Capacitance	100 kHz, 0.1V		20		pF	
Switching Frequency	5 V _{IN} Models		270		kHz	
	All Other Models		100			

EMI Characteristics						
Parameter	Standard	Criteria	Level			
Radiated Emissions, See Page 4	CISPR32/EN 55032		Class B			
Radiated Emissions	CISPR32/EN 55032		Class B			
ESD EN 61000-4-2 EN 61000-4-2	5 V _{IN} Models	EN 61000-4-2	B	±8 kV Air		
	All Other Models			±4 kV Contact		
				±8 kV Contact		

Environmental						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Operating Temperature Range	Ambient	-40	+25	+105	°C	
Storage Temperature Range		-55		+125	°C	
Cooling	Free Air Convection					
Humidity	RH, Non-condensing			95	%	

Physical						
Case Size	See Mechanical Drawing (Page 4)					
Case Material	Flame Retardant, Non-Conductive, Black Plastic (UL94-V0)					
Weight	See Mechanical Drawing (Page 4)					

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.5			MHours	
Safety Standards, See Note 1	UL/cUL 62368-1 recognition (UL certificate)					

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units	
Input Voltage Surge (1 Sec)	3.3 VDC Input			5.0	VDC	
	5 VDC Input			9.0		
	12 VDC Input			18.0		
	15 VDC Input			21.0		
	24 VDC Input			30.0		
Lead Temperature	1.5 mm From Case For 10 Sec			300	°C	

Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

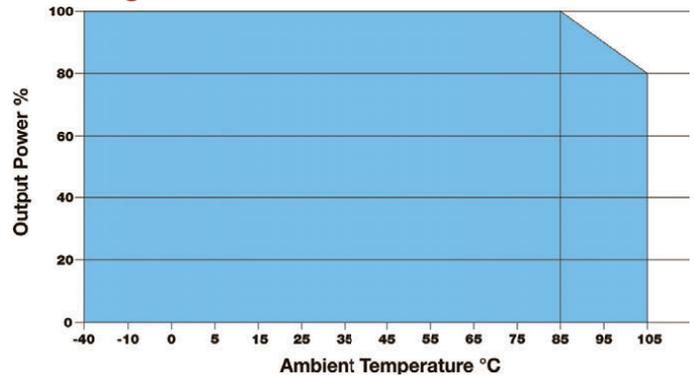
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	Model Number	Input				Output			Load Regulation (% Typ)	Efficiency (% Typ)	Capacitive Load (μF, Max)	Fuse Rating Slow-Blow (mA)
		Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA)					
		Nominal	Range	Full-Load	No-Load		Max.	Min.				
	ME103S-03E	3.3	2.97 - 3.63	404	30	3.3	303	30	±18	72	220	800
UL	ME103S-05E	3.3	2.97 - 3.63	404	30	5.0	200	20	±12	76	220	800
UL	ME103S-12E	3.3	2.97 - 3.63	404	30	12.0	84	9	±7	80	220	800
UL	ME105S-03E	5.0	4.5 - 5.5	270	5	3.3	303	30	±15	74	2,400	550
UL	ME105S-05E	5.0	4.5 - 5.5	270	5	5.0	200	20	±10	82	2,400	550
UL	ME105S-09E	5.0	4.5 - 5.5	241	12	9.0	111	12	±8	83	1,000	550
UL	ME105S-12E	5.0	4.5 - 5.5	241	12	12.0	84	9	±7	83	560	550
UL	ME105S-15E	5.0	4.5 - 5.5	241	18	15.0	67	7	±6	83	560	550
UL	ME105S-24E	5.0	4.5 - 5.5	241	18	24.0	42	4	±5	85	220	550
	ME112S-03E	12	10.8 - 13.2	115	15	3.3	303	30	±18	72	220	240
UL	ME112S-05E	12	10.8 - 13.2	115	15	5.0	200	20	±12	80	220	240
UL	ME112S-09E	12	10.8 - 13.2	115	15	9.0	111	12	±8	80	220	240
UL	ME112S-12E	12	10.8 - 13.2	115	15	12.0	84	9	±7	80	220	240
UL	ME112S-15E	12	10.8 - 13.2	115	15	15.0	67	7	±6	80	220	240
UL	ME112S-24E	12	10.8 - 13.2	115	15	24.0	42	4	±5	80	220	240
	ME115S-05E	15	13.5 - 16.5	83	10	5.0	200	20	±12	80	220	175
	ME115S-12E	15	13.5 - 16.5	83	10	12.0	84	9	±7	80	220	175
	ME115S-15E	15	13.5 - 16.5	83	10	15.0	67	7	±6	80	220	175
	ME124S-03E	24	21.6 - 26.4	57	17	3.3	303	30	±18	72	220	125
UL	ME124S-05E	24	21.6 - 26.4	57	17	5.0	200	20	±12	80	220	125
UL	ME124S-09E	24	21.6 - 26.4	57	17	9.0	111	12	±8	80	220	125
UL	ME124S-12E	24	21.6 - 26.4	57	17	12.0	84	9	±7	80	220	125
UL	ME124S-15E	24	21.6 - 26.4	57	17	15.0	67	7	±6	80	220	125
UL	ME124S-24E	24	21.6 - 26.4	57	17	24.0	42	4	±5	80	220	125

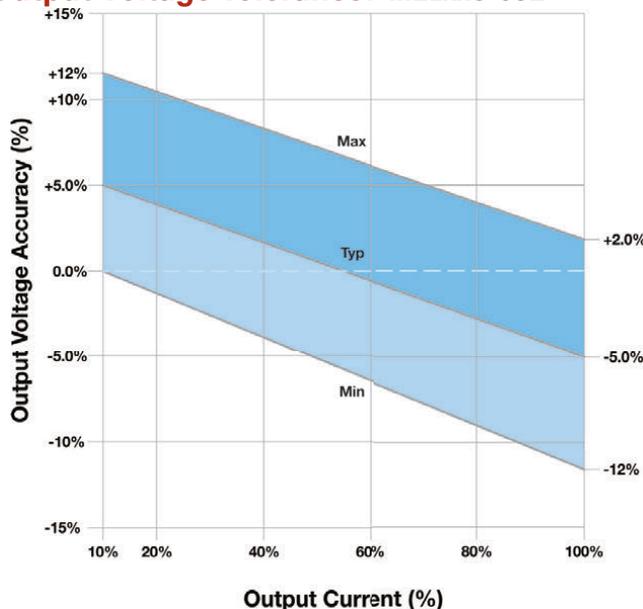
Notes:

- Units that are marked "UL" in the model selection table above are approved to EN 62368 (5 VIN models) or EN 60950 (3.3, 12, 15 & 24 VIN models).
- Output capacitive load is specified for each output.
- All 3.3 V_{OUT} models have a specified line regulation of 1.5 %/‰.
- Output load regulation is specified for a load change of 10% to 100%.
- When measuring output ripple, it is recommended that an external 1 μF ceramic capacitor & a 10 μF electrolytic capacitor be placed in parallel from the +V_{OUT} pin to the -V_{OUT} pin.
- The ME124S-xxE & ME103S-xxE models have momentary (1S) protection against short circuit faults.
- Isolation voltage is specified for a period of 60S with a leakage current lower than 1 mA. All 5 VIN models are also rated for 3 kV isolation for a period of 1S with a leakage current lower than 1 mA.
- Operation at no load will not damage these units, however, they may not meet all specifications.
- It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

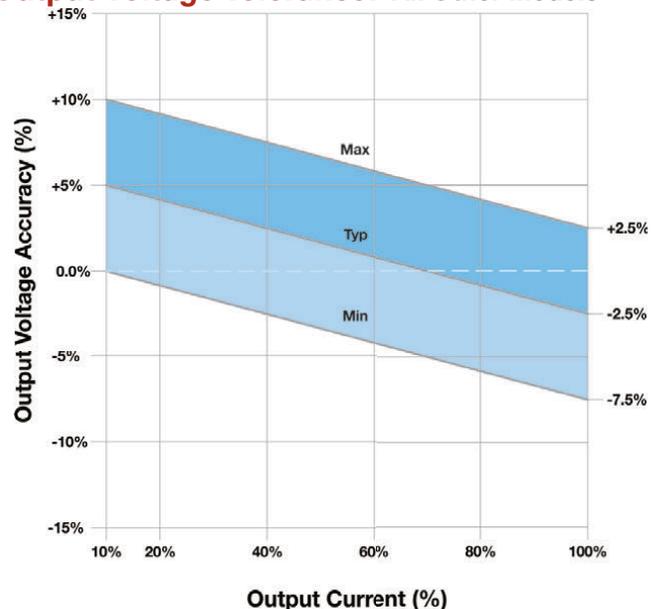
Derating Curve



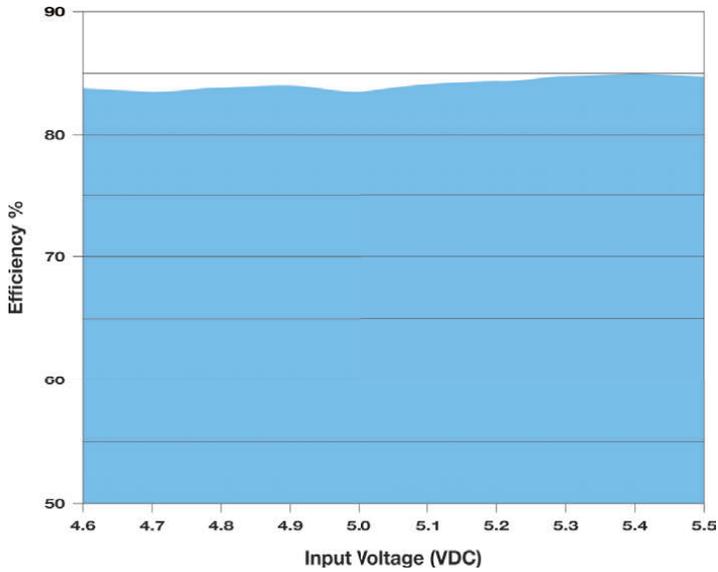
Output Voltage Tolerance: ME1xxS-03E



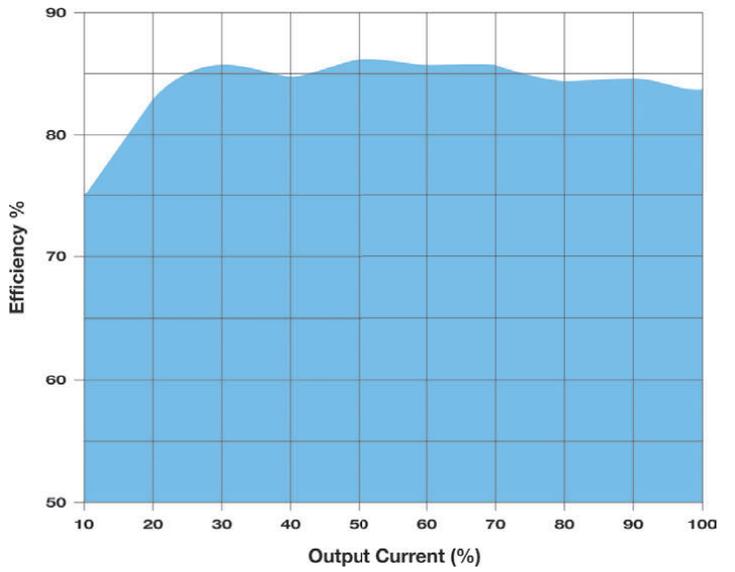
Output Voltage Tolerance: All Other Models



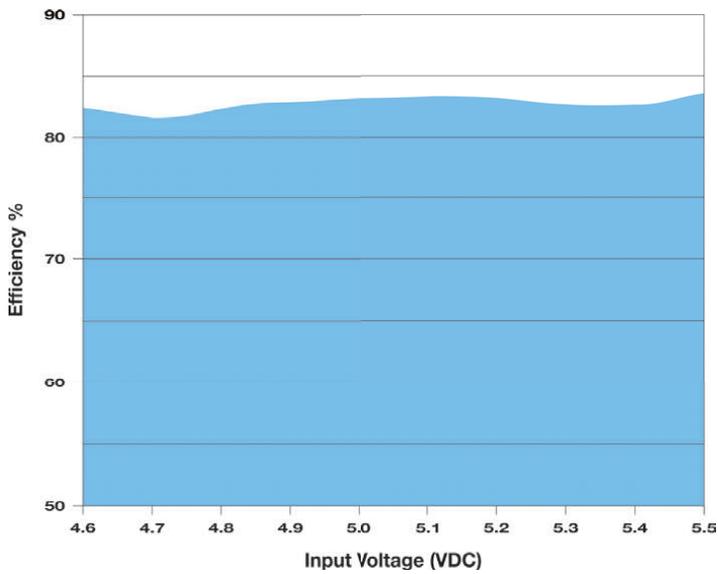
Efficiency vs Input: ME105S-05E



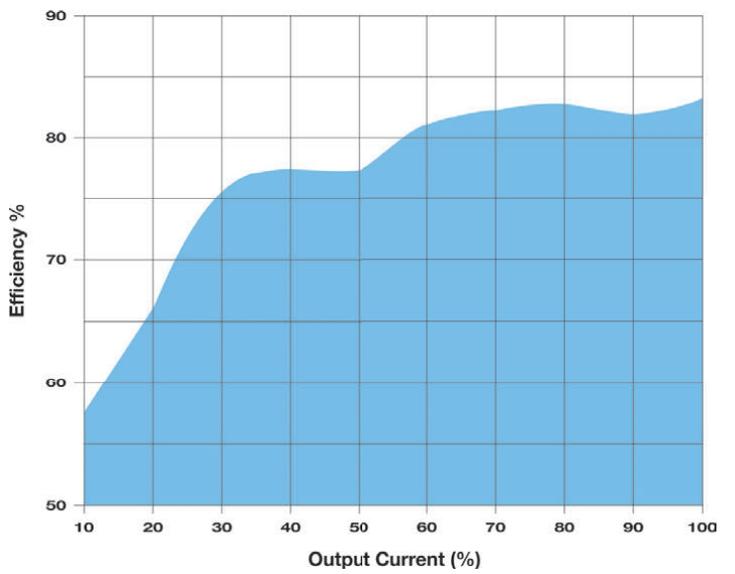
Efficiency vs Output Load: ME105S-05E



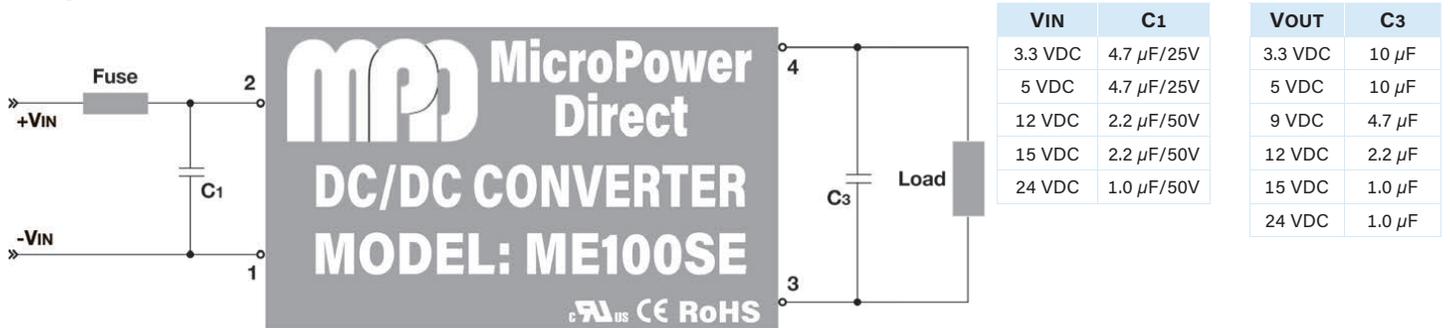
Efficiency vs Input: ME105S-15E



Efficiency vs Output Load: ME105S-15E

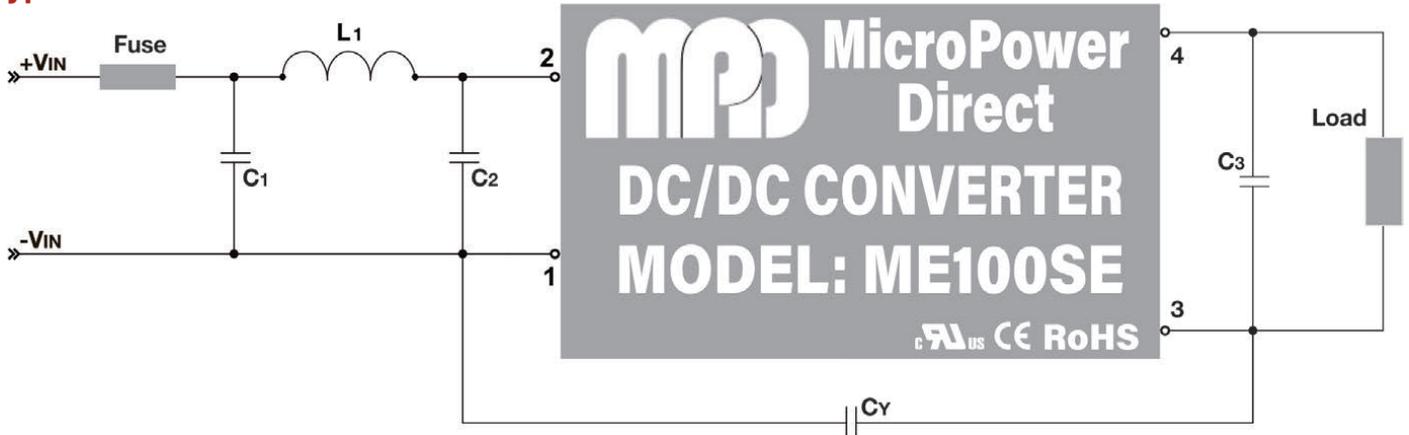


Simple Connection



The diagram above illustrates a simple connection of the ME100SE. For applications that do not require the circuit to meet EMI/EMC specifications, the capacitors C1 and C3 will reduce input/output ripple and improve the converter stability over time and temperature. The recommended component values are given in the table at right.

Typical Connection



The diagram above illustrates a typical connection of the **ME100SE** for an application that requires compliance to EMI/EMC standards EN 55032 and EN 61000-4 (as specified on page 1). Some notes on these components are:

1. An external fuse is recommended to protect the unit in the event a fault occurs on the input line. A recommended value is given in model selection table on page 2.
2. In many applications, the capacitor C2 may not be needed.
3. The output filtering capacitor (C3) is a high frequency, low resistance electrolytic capacitor. Care must be taken in choosing This capacitor not to exceed the

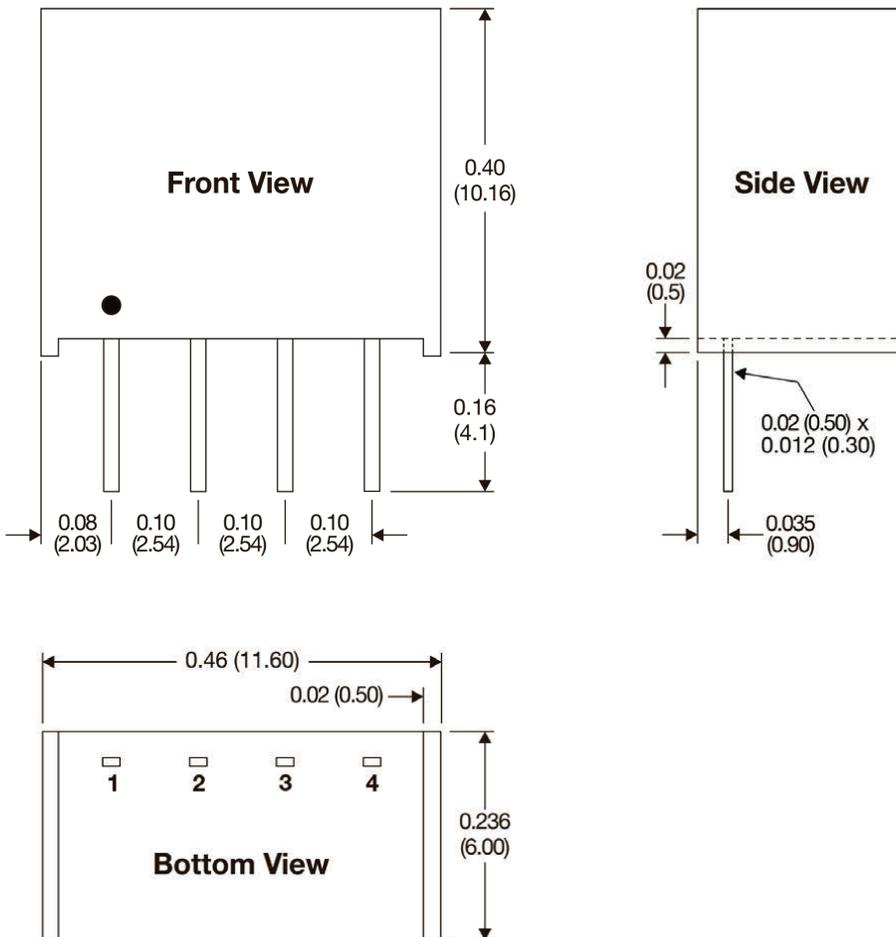
capacitive load specification for the unit. Voltage derating of capacitors should be 80% or above.

4. Suggested component values are:

Component	VIN: 3.3V, 5V, 12V	VIN: 15V, 24V
C1	4.7µF/25V	4.7µF/50V
C2	4.7µF/25V	4.7µF/50V
L1	6.8 µH	6.8 µH
C3	See C3/C4 in Table Above	
CY	---	1 nF/4 kV

5. In many applications, simply adding input/output capacitors will enhance the input surge protection & and reduce output ripple sufficiently. In this case, capacitors C1 and C3 could be connected as shown in the simple connection above, without the other filter components. Recommended capacitor values are given in the table at left.

Mechanical Dimensions



Pin Connections

Pin	Description
1	-VIN
2	+VIN
3	-VOUT
4	+VOUT

Notes:

- All dimensions are typical in inches (mm)
- Pin 1 is marked by a "dot" or indentation on the unit
- General Tolerance = ±0.01 (±0.25)
- Pin Tolerance = ±0.004 (±0.10)
- Recommended pin hole size (on the application PC Board) is Ø 0.039 (Ø 1.00)
- Weight (Typ) = 0.043 Oz (1.3g)