

FEATURES

- UL60950 recognised
- Single isolated output
- 1kVDC isolation
- Efficiency up to 87%
- Wide temperature performance at full 1 watt load, -40°C to 85°C
- Power density 2.62W/cm³
- 3.3V, 5V & 12V inputs
- 3.3V, 5V, 12V & 15V outputs
- Custom solutions available
- PCB mounting
- Footprint reduction of over 26% from previous generations of 1W DC-DC's

DESCRIPTION

The MEU1 series is a new range of ultra miniature through hole 1W DC-DC converters, available in a ZIP style pinout. The MEU1 series offers 1W of available output power over the industrial temperature range of -40°C to 85°C. They are ideally suited for providing local supplies on control system boards.

With the added benefit of 1kVDC galvanic isolation to reduce switching noise and allows the device to be configured to provide an isolated negative rail in systems where only positive rails exist.

SELECTION GUIDE

Order Code	Nominal Input Voltage	Output Voltage	Output Current	Load Regulation (Typ.)	Load Regulation (Max.)	Ripple & Noise (Typ.)	Ripple & Noise (Max.)	Input Current at Rated Load	Efficiency (Min.)	Efficiency (Typ.)	Isolation Capacitance (Typ.)	MTTF ¹	Recommended Alternative
	V	V	mA	%	%	mVp-p	mVp-p	mA	%	%	pF	kHrs	
	Recommended												
	In Production												
MEU1S0303ZC	3.3	3.3	303	11	14	27	50	385	73	76	28	3084	
MEU1S0505ZC	5	5	200	7	9	19	45	244	78	81	34	3354	
MEU1S1212ZC	12	12	83	5	7	15	40	100	82	86	91	2438	
	To be discontinued												
MEU1S0305ZC	3.3	5	200	9	12	21	45	373	76	79	30	3125	MEE1S0305SC
MEU1S0512ZC	5	12	83	8	10	17	40	239	78	83	45	3317	MEE1S0512SC
MEU1S0515ZC	5	15	67	6	8	12	35	239	78	83	39	2600	NME0515SC
MEU1S1205ZC	12	5	200	5	7	21	45	100	79	83	43	3742	MEE1S1205SC
	Discontinued												
MEU1S0309ZC	3.3	9	111	10	13	16	40	376	75	79	34	3960	NTE0309MC
MEU1S0312ZC	3.3	12	83	9	12	15	40	369	77	81	40	3343	Contact Murata
MEU1S0315ZC	3.3	15	67	8	10	14	40	371	77	81	33	3140	Contact Murata
MEU1S0503ZC	5	3.3	303	9	12	26	50	249	74	77	29	2762	NTE0503MC
MEU1S0509ZC	5	9	111	9	12	17	40	245	77	81	47	2952	NTE0509MC
MEU1S1209ZC	12	9	111	6	9	17	40	100	80	84	71	2732	NTE1209MC
MEU1S1215ZC	12	15	67	4	6	15	40	100	84	87	91	2980	NTE1215MC

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	Continuous operation, 3.3V input types	2.97	3.3	3.63	V
	Continuous operation, 5V input types	4.5	5.0	5.5	
	Continuous operation, 12V input types	10.8	12.0	13.2	
Reflected ripple current	3.3V & 5V Input types		3	15	mA p-p
	12V Input types		5	15	

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	T _A = -40°C to 85°C			1.0	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High V _{IN} to low V _{IN}	0303	1.0	1.25	%/%
		All other types	1.0	1.2	

ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso = 1000VDC	10			GΩ

GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency			85		kHz

1. Calculated using MIL-HDBK-217F FN2 with nominal input voltage at full load.
All specifications typical at T_A = 25°C, nominal input voltage and rated output current unless otherwise specified.



For full details go to
www.murata.com/en-global/products/power/rohs



TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output types	-40		85	°C
Storage		-50		125	
Case Temperature above ambient	MEU1S03			30	
	All other types			25	
Cooling	Free air convection				

ABSOLUTE MAXIMUM RATINGS

Lead temperature 1.5mm from case for 10 seconds	260°C
Wave Solder	Wave Solder profile not to exceed the profile recommended in IEC 61760-1 Section 6.1.3. Please refer to application notes for further information.
Input voltage V_{IN} , MEU1S03 types	5.5V
Input voltage V_{IN} , MEU1S05 types	7V
Input voltage V_{IN} , MEU1S12 types	15V

CHARACTERISATION TEST METHODS

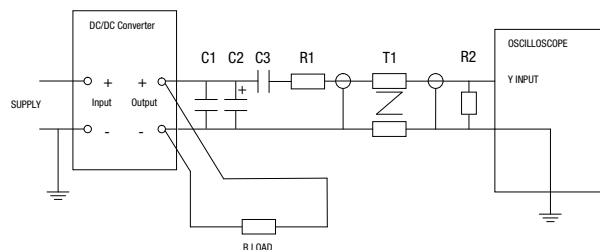
Ripple & Noise Characterisation Method

Ripple and noise measurements are performed with the following test configuration.

C1	1µF X7R multilayer ceramic capacitor, voltage rating to be a minimum of 3 times the output voltage of the DC-DC converter
C2	10µF tantalum capacitor, voltage rating to be a minimum of 1.5 times the output voltage of the DC-DC converter with an ESR of less than 100mΩ at 100 kHz
C3	100nF multilayer ceramic capacitor, general purpose
R1	450Ω resistor, carbon film, ±1% tolerance
R2	50Ω BNC termination
T1	3T of the coax cable through a ferrite toroid
RLOAD	Resistive load to the maximum power rating of the DC-DC converter. Connections should be made via twisted wires

Measured values are multiplied by 10 to obtain the specified values.

Differential Mode Noise Test Schematic



APPLICATION NOTES

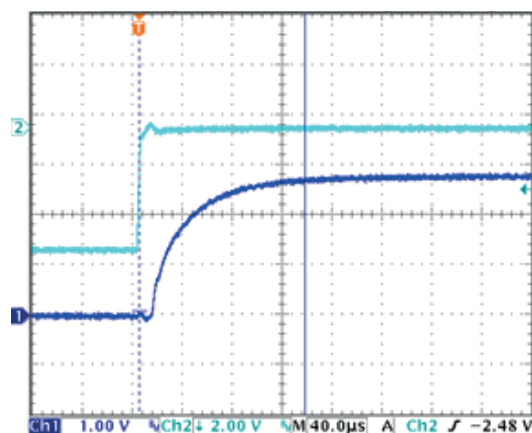
Minimum Load

The minimum load to meet datasheet specification is 10% of the full rated load across the specified input voltage range. Lower than 10% minimum loading will result in an increase in output voltage, which may rise to typically 1.25 times the specified output voltage if the output load falls to less than 5%.

Capacitive loading and start up

Typical start up times for this series, with a typical input voltage rise time of 2.2µs and output capacitance of 10µF, are shown in the table below. The product series will start into a capacitance of 47µF with an increased start time, however, the maximum recommended output capacitance is 10µF.

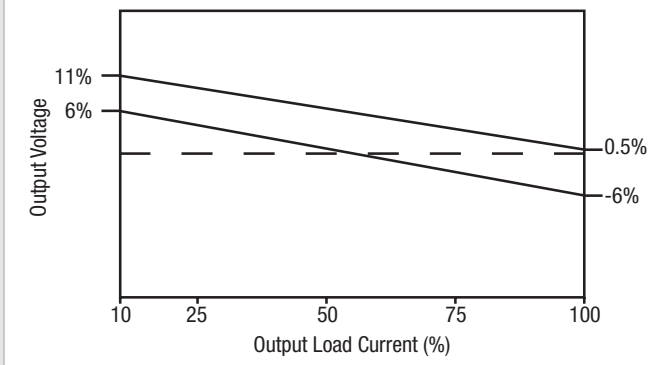
	Start-up time	
	µs	
MEU1S0303ZC	140	
MEU1S0305ZC	280	
MEU1S0309ZC	1050	
MEU1S0312ZC	1930	
MEU1S0315ZC	2790	
MEU1S0503ZC	110	
MEU1S0505ZC	200	
MEU1S0509ZC	490	
MEU1S0512ZC	880	
MEU1S0515ZC	1400	
MEU1S1205ZC	140	
MEU1S1209ZC	240	
MEU1S1212ZC	400	
MEU1S1215ZC	600	



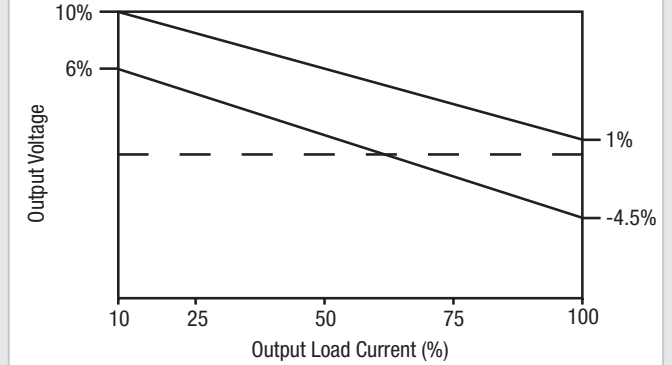
TOLERANCE ENVELOPES

The voltage tolerance envelopes show typical load regulation characteristics for this product series. The tolerance envelope is the maximum output voltage variation due to changes in output loading and set point accuracy.

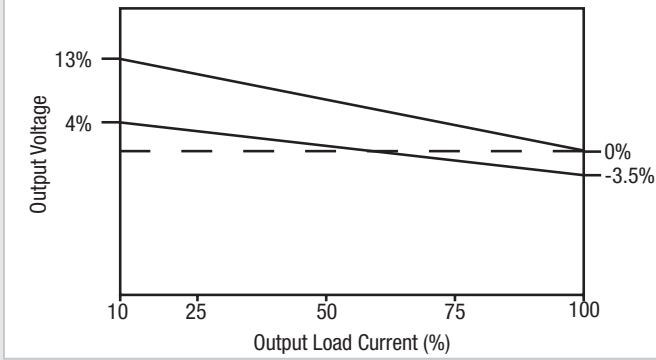
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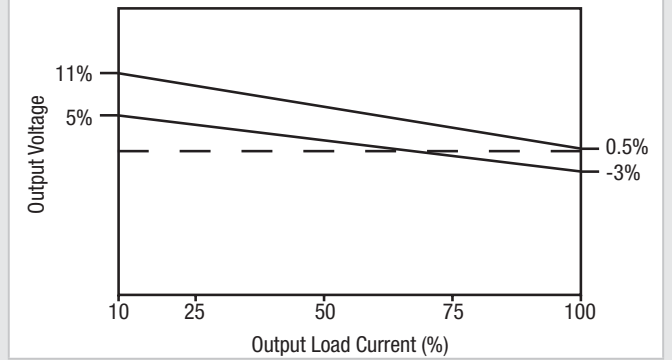
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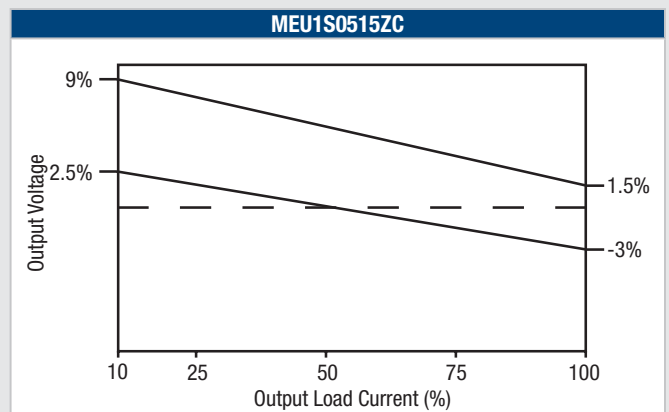
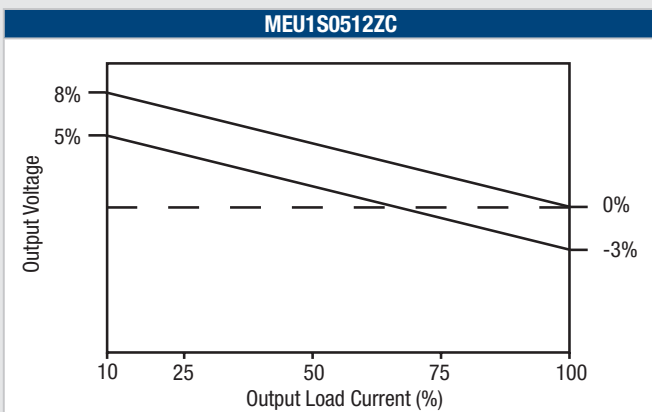
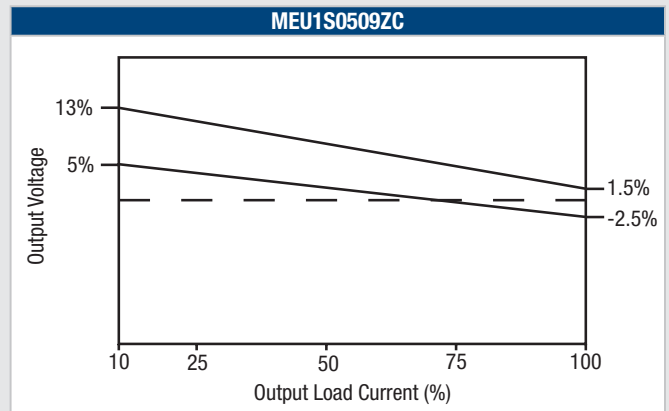
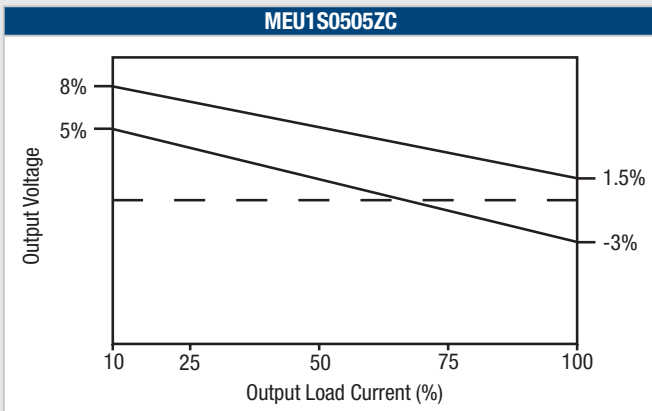
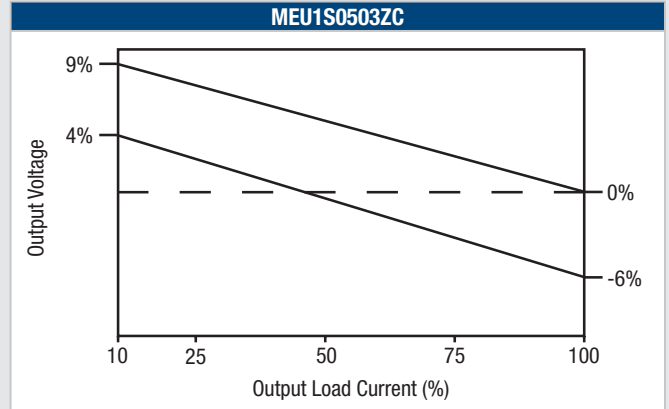
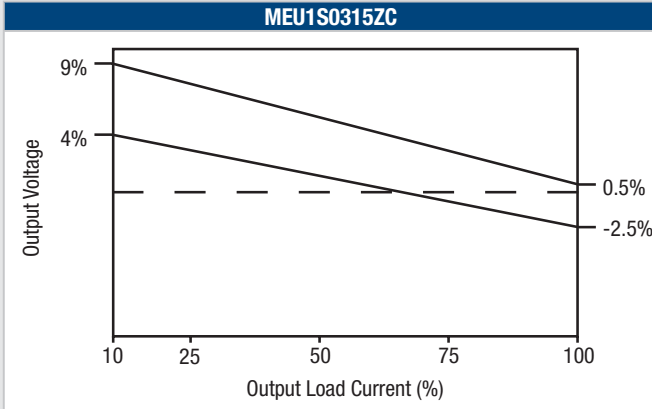
MEU1S0309ZC



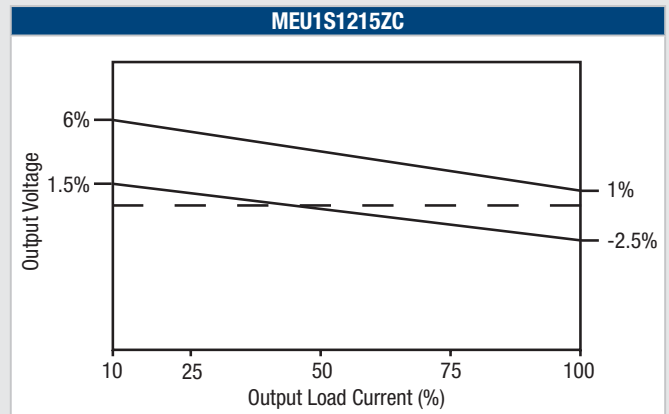
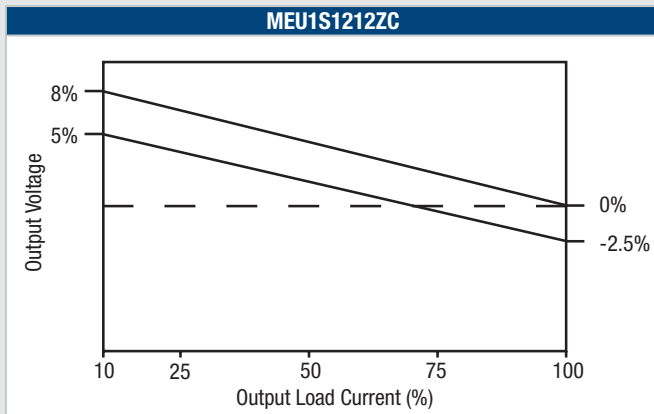
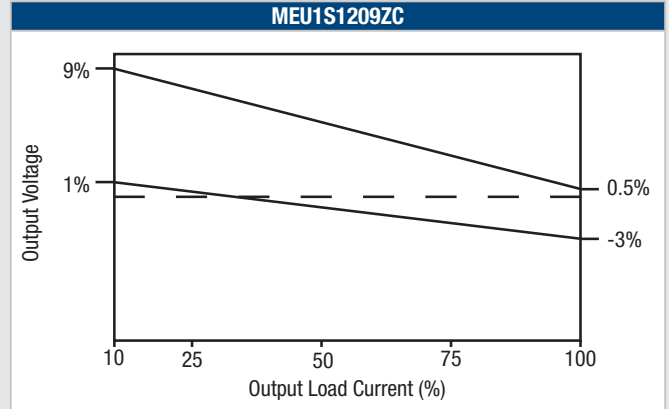
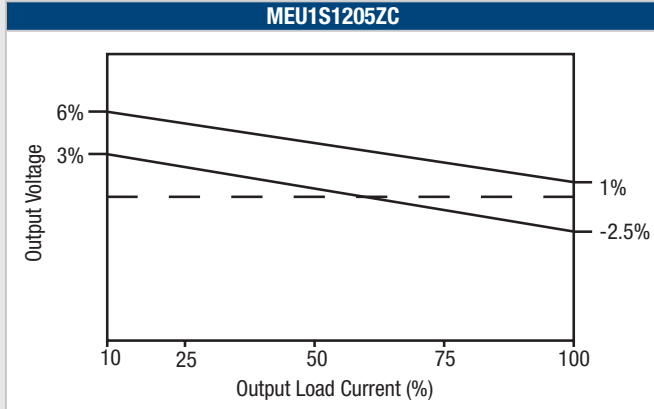
MEU1S0312ZC



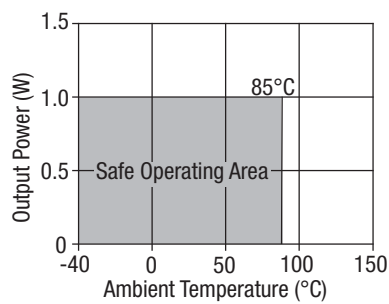
TOLERANCE ENVELOPES (Continued)



TOLERANCE ENVELOPES (Continued)

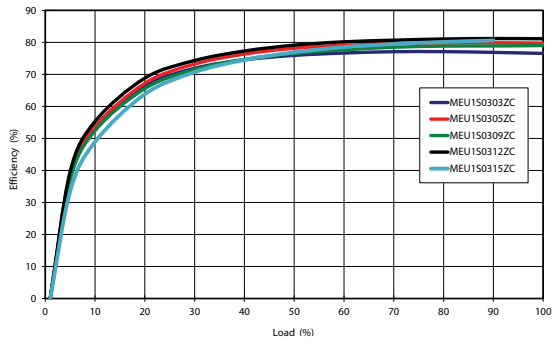


TEMPERATURE DERATING GRAPH

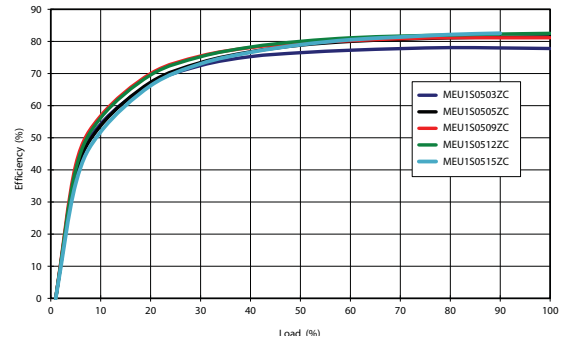


EFFICIENCY VS LOAD

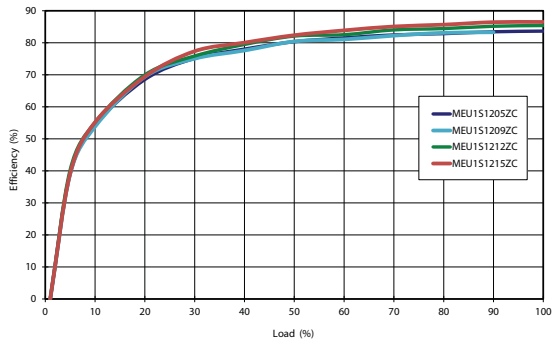
3.3V Input



5V Input

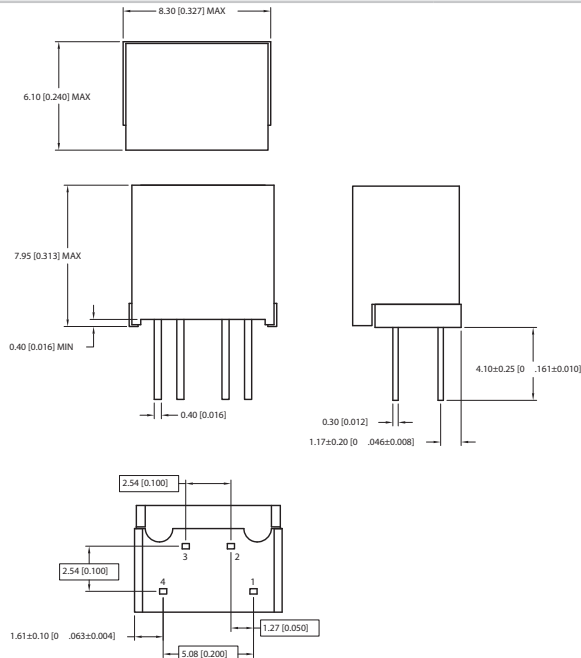


12V Input



PACKAGE SPECIFICATIONS

Mechanical Dimensions



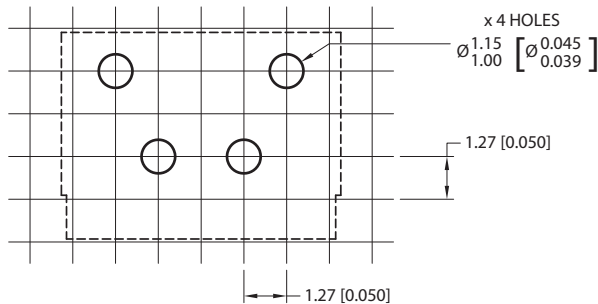
All dimensions in mm ±0.25mm (inches ±0.01). All pins on a 2.54 (0.1) pitch and within ± 0.25 (0.01) of true position.

Weight: 0.77g

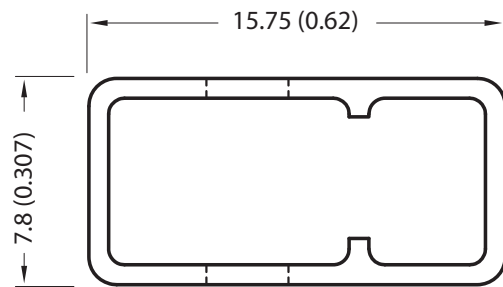
Pin connection - 4 PIN ZIP

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

Recommended Footprint Details



Tube Outline Dimensions



Unless otherwise stated all dimensions in mm (inches) ±0.5mm.
 Tube length (4 Pin) : 520mm ±2mm (20.47).

Tube Quantity : 60

DISCLAIMER

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- Traffic signal equipment
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- Data Processing equipment

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