LF100BI

1W, High Isolation Ultra-Miniature SMT DC/DC Converters

Key Features:

- 1W Output Power
- Ultra-Miniature SMT Case
- 3,000 VDC Isolation
- Short Circuit Protected
- Industry Standard Pin Out
- -40°C to +105°C Operation
- >3.5 MHour MTBF
- Available on Tape/Reel
- LOW COST!

CE

RoHS

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	5 VDC Input	4.5	5.0	5.5	VDC
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, For VIN Change of 1%	3.3 VOUT			±1.5	%
	All Other Outputs			±1.2	
Load Regulation, See Note 2	3.3 VDC Output		±15	±20	%
	5 VDC Output		±10	±15	
	9 VDC Output		±8	±10	
	12 VDC Output		±7	±10	
	15 VDC Output		±6	±10	
	24 VDC Output		±5	±10	
Ripple & Noise (20 MHz), See Note 3	24 VDC Output		50	100	mV P - P
	All Other Models		30	75	
Temperature Coefficient			±0.03		%/°C
Output Short Circuit	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	See Note 4	3,000			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 0.1V		20		pF
Switching Frequency			270		kHz

EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions, See Page 3	CISPR32/EN 55032		Class B
Radiated Emissions	CISPR32/EN 55032		Class B
ESD	EN 61000-4-2	B	±8 kV Air
			±4 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	%
Moisture Sensitivity Level	IPC/JEDEC J-STD-020D.1	Level 1			

Physical

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

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.5			MHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)				9.0	VDC
Peak Reflow Temperature	See Note 5			245	°C
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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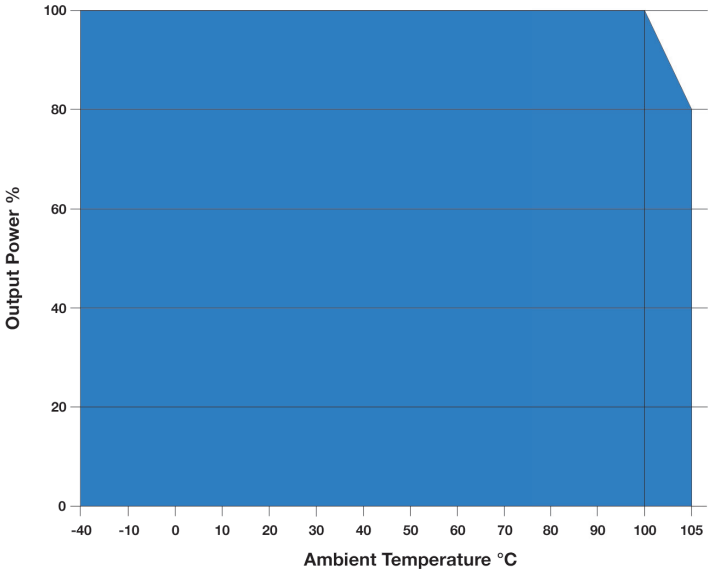
Model Selection Guide

Model Number	Input				Output			Efficiency (%) Full Load	Output Load Regulation		Output Capacitive Load (μF Max)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)		(%, Typ)	(%, Max)	
	Nominal	Range	Full-Load	No-Load							
LF105S-03BI	5.0	4.50 - 5.50	270	5	3.3	303	30	74	15	20	2,400
LF105S-05BI	5.0	4.50 - 5.50	270	5	5.0	200	20	82	10	15	2,400
LF105S-09BI	5.0	4.50 - 5.50	241	12	9.0	111	12	83	8	10	1,000
LF105S-12BI	5.0	4.50 - 5.50	241	12	12.0	84	9	83	7	10	560
LF105S-15BI	5.0	4.50 - 5.50	241	18	15.0	67	7	83	6	10	560
LF105S-24BI	5.0	4.50 - 5.50	241	18	24.0	42	4	85	5	10	220
LF105D-03BI	5.0	4.50 - 5.50	270	5	±3.3	±151	±15	74	15	20	1,200
LF105D-05BI	5.0	4.50 - 5.50	270	5	±5.0	±100	±10	82	10	15	1,200
LF105D-09BI	5.0	4.50 - 5.50	241	12	±9.0	±56	±6	83	8	10	470
LF105D-12BI	5.0	4.50 - 5.50	241	12	±12.0	±42	±5	83	7	10	220
LF105D-15BI	5.0	4.50 - 5.50	241	18	±15.0	±34	±4	83	6	10	220
LF105D-24BI	5.0	4.50 - 5.50	241	18	±24.0	±21	±2	85	5	10	100

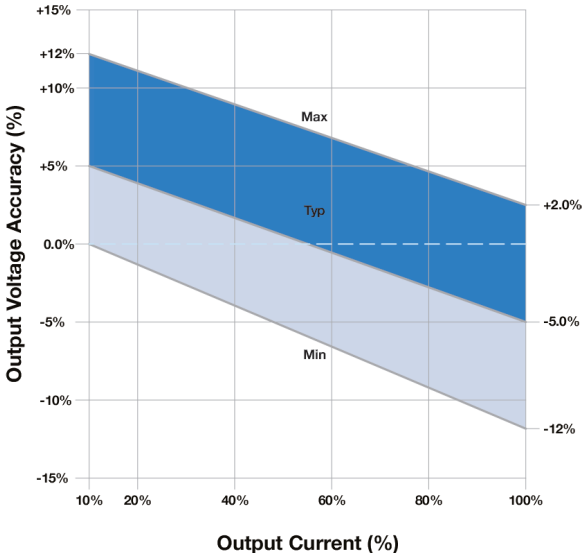
Notes:

1. Output capacitive load is specified for each output.
2. Output load regulation is specified for a load change of 10% to 100%.
3. 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 +VOUT pin to the -VOUT pin.
4. Isolation voltage is specified for a period 60S with a leakage current lower than 1 mA.
5. The recommended reflow settings are a peak temperature of 245 °C for a maximum period (TPK) of 10S and a time above liquidous (TL) of ≤60 seconds at 217 °C. For more information, please contact the factory.
6. Operation at no load will not damage these units, however, they may not meet all specifications.
7. It is recommended that a fuse be used on the input of a power supply for protection. Contact the factory for more information.

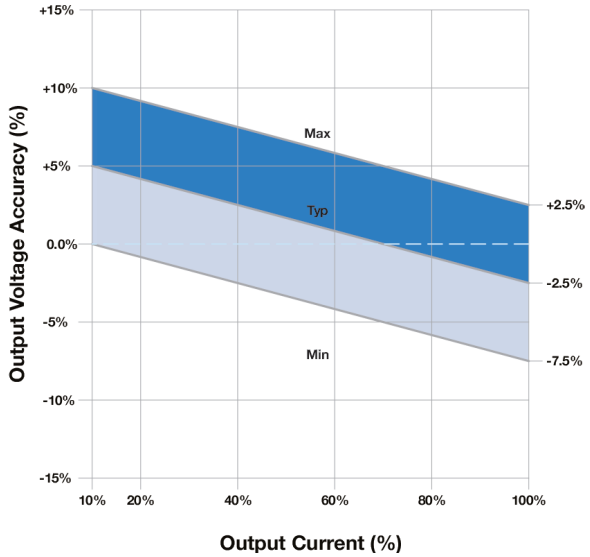
Temperature Derating Curve



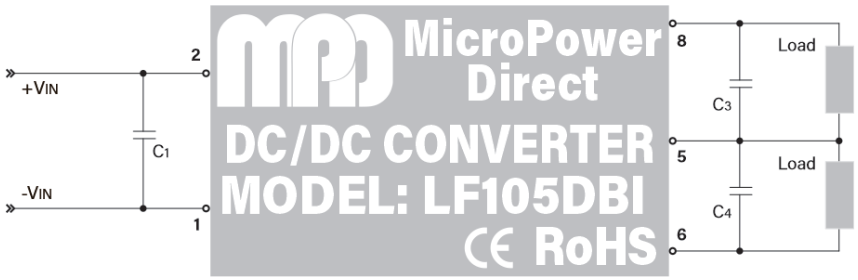
Output Voltage Tolerance: 3.3 VDC Output



Output Voltage Tolerance: All Other Outputs



Simple Connection

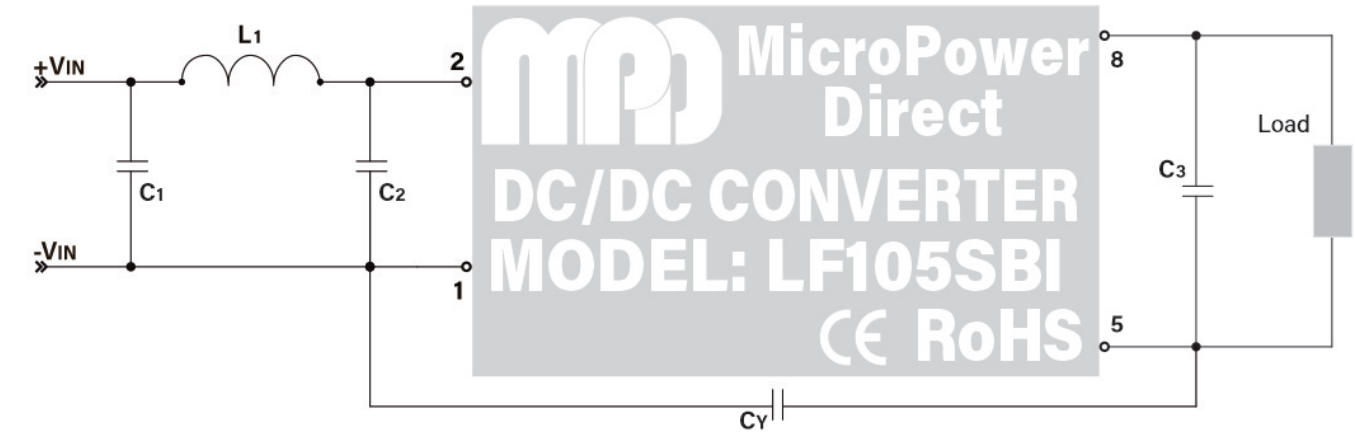


VIN	C1
5 VDC	4.7 µF/16V

VOUT	C3/ C4
3.3 VDC	10 µF/10V
5 VDC	10 µF/10V
9 VDC	4.7 µF/16V
12 VDC	2.2 µF/25V
15 VDC	1 µF/25V
24 VDC	0.47 µF/50V

The diagram above illustrates a simple connection of the **LF105DBI**. For applications that do not require the circuit to meet EMi/EMC specifications, the capacitors C1 ,C3 and C4 will reduce input/output ripple and improve the converter stability over time and temperature. The recommended component values are given in the table above.

Typical Connection



The diagram above shows a typical connection of the **LF105SBI** 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:

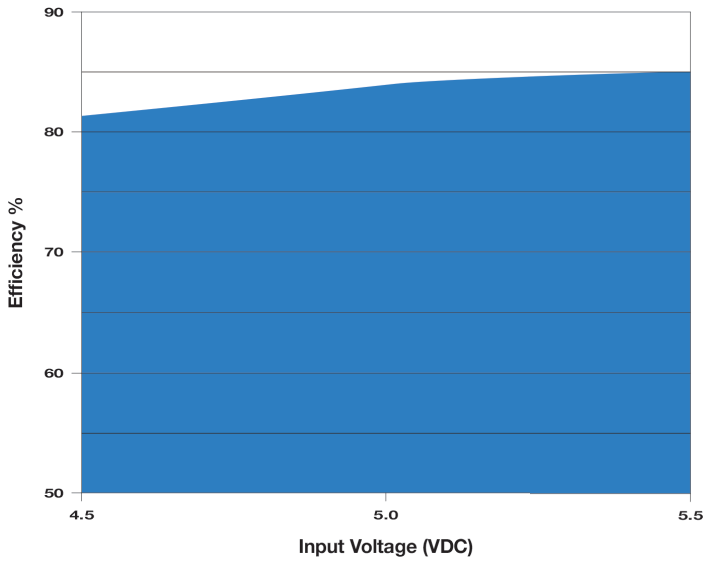
1. The output filtering capacitor (C3) is a high frequency, low resistance electrolytic capacitor. Care must be taken in choosing this capacitor not to exceed the capacitive load specification for the unit. Voltage derating of all capacitors should be 80% or above.

2. Suggested component values are:

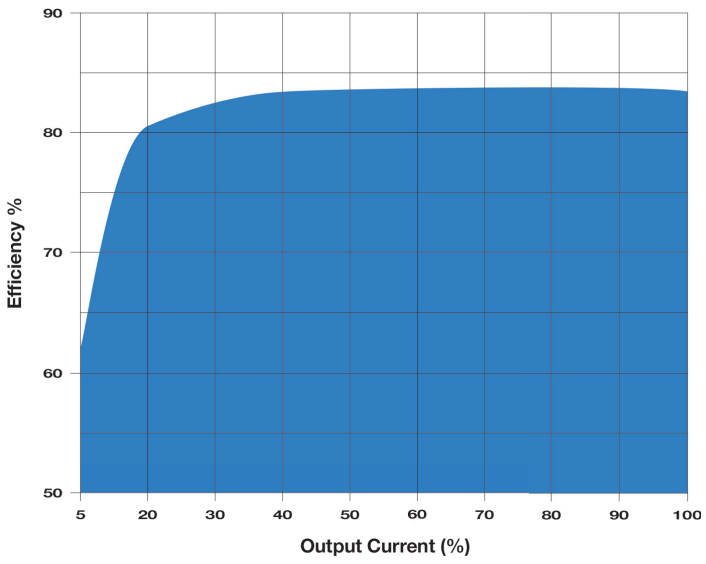
C1	4.7µF/25V
C2	4.7µF/25V
L1	6.8 µH
C3	See Chart Above
CY	1 nF/4 kVDC

3. The capacitor CY is suggested for use with the 12V, 15V and 24V output models.

Efficiency Vs Input Voltage: LF105S-05BI



Efficiency Vs Output Load: LF105S-05BI



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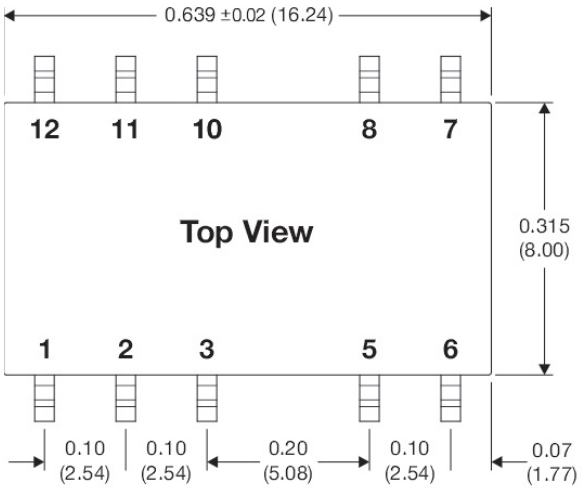
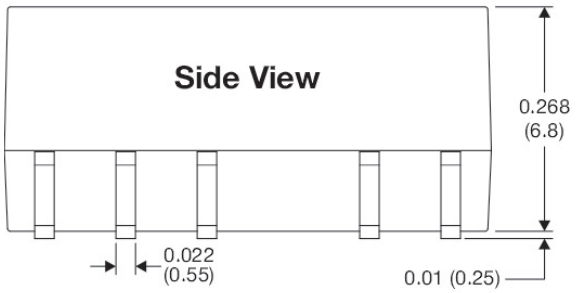
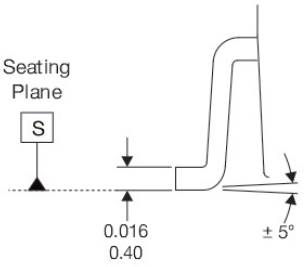
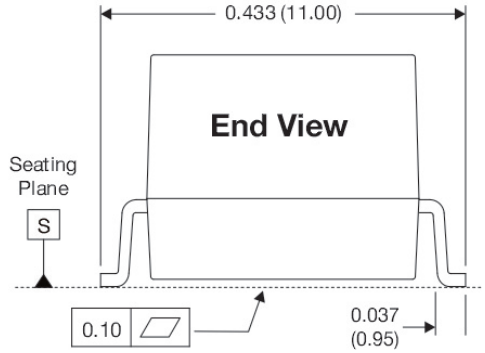
Mechanical Dimensions

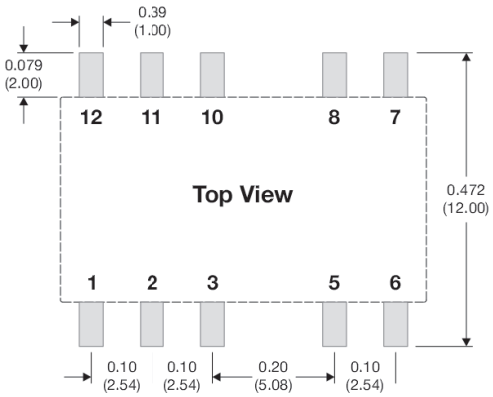








Board Layout



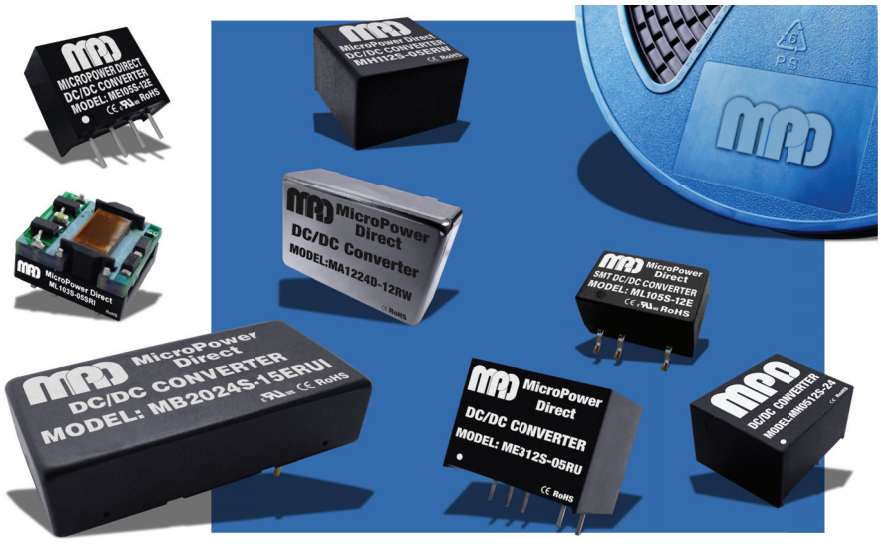
Pin Connections

Pin	Single	Dual
1	-VIN	-VIN
2	+VIN	+VIN
3	NC	NC
5	-VOUT	Com
6	NC	-VOUT
7	NC	NC
8	+VOUT	+VOUT
10	NC	NC
11	NC	NC
12	NC	NC

NC = No Connection

Notes:

- All dimensions are typical in inches (mm)
- Terminal Tolerance: x.xxx = ±0.004 (±0.10)
- All Other Tolerances x.xxx = ±0.020 (±0.50)
- Weight (Typ) = 0.056 Oz (1.6g)



MPD offers a very wide range of DC/DC converters in the compact MiniDIP package. Ranging from 1W to 15W, these units offer

- Compact "MiniDip Packaging
- 1W to 15W Output Power
- Wide 2:1 or 4:1 Inputs
- UL 62368 Recognition (Most Models)
- Single & Dual Outputs
- Wide Temperature Operation
- Tight Regulation
- Low Cost

Call today, or go to our website to find the right, miniature DC/DC power module for your application.

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Packaging Specifications
Reel Dimensions

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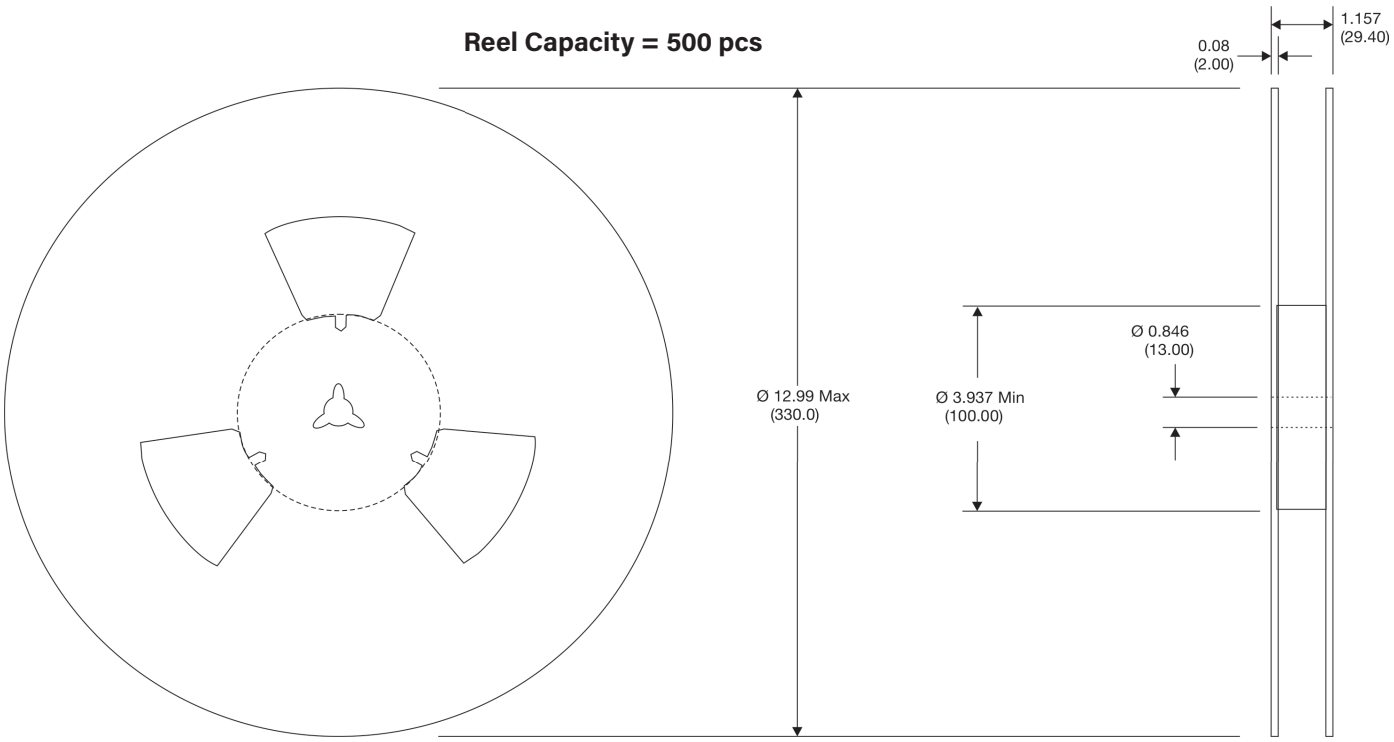
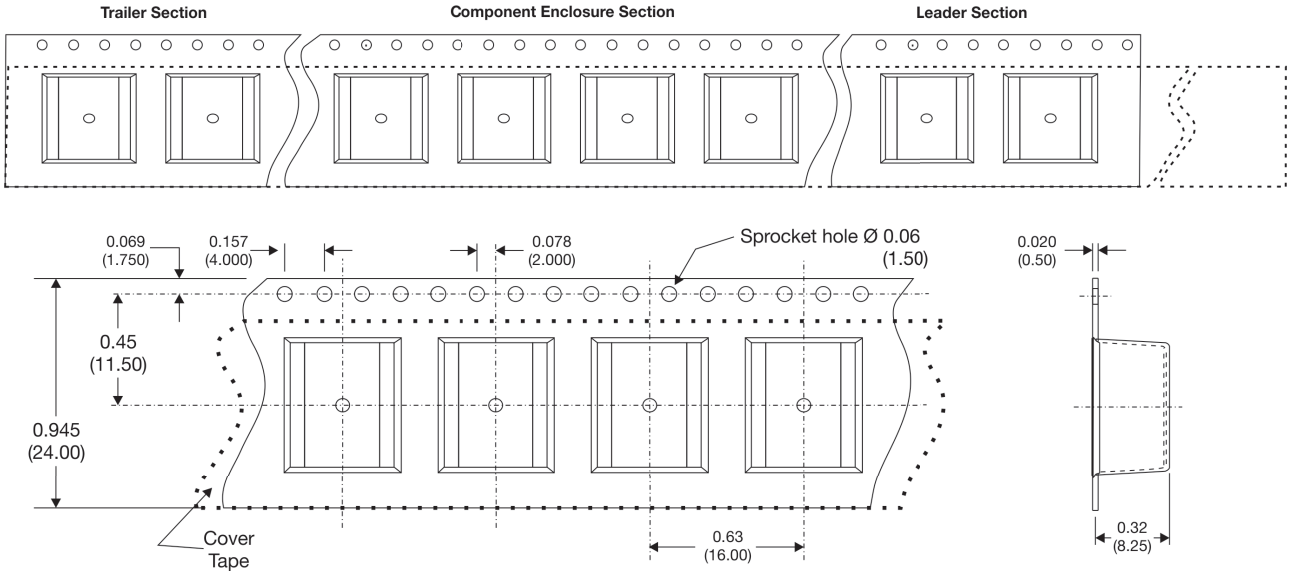
Reel Capacity = 500 pcs

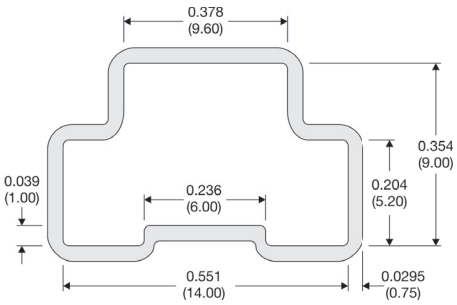


Tape Dimensions

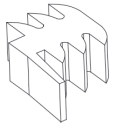


Tube Dimensions

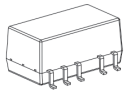
Tube Capacity = 32 pcs



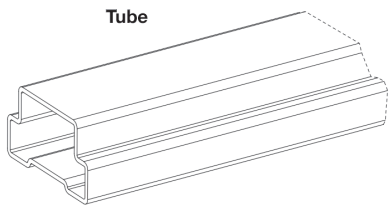
10 mm Rubber Plug



ML100BI



Tube



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