

# LMZ10501 SIMPLE SWITCHER® Nano Module Demo Board

National Semiconductor  
Application Note 2167  
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LMZ10501 SIMPLE SWITCHER® Nano Module Demo Board

## Introduction

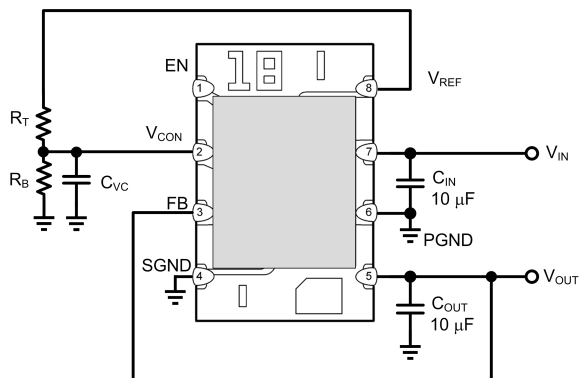
The LMZ10501 and LMZ10500 SIMPLE SWITCHER® nano modules are easy-to-use DC-DC solutions optimized for space-constrained applications. The LMZ10501 is capable of driving up to 1A load with excellent power conversion efficiency, output voltage accuracy, line and load regulation. The LMZ10500 is a 650mA version module, pin-to-pin compatible with the LMZ10501.

The LMZ10501 Demo Board is configured for 1.8V output voltage from 2.7V to 5.5V input. The resistor voltage divider  $R_T$  and  $R_B$  set the output voltage. The external capacitor  $C_{VC}$  bypasses the  $V_{CON}$  pin. The bottom of the board has a 3-pin header for  $V_{IN}$ , GND, and  $V_{OUT}$  connections. See the datasheet for component selection and device details.

## Board Specifications

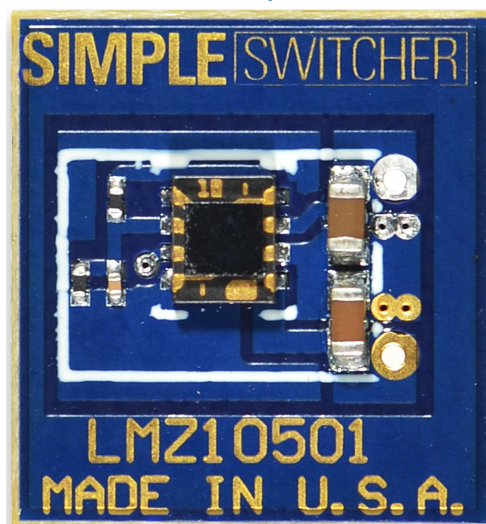
- $V_{IN}$  = 2.7V to 5.5V
- $V_{OUT}$  = 1.8V
- 1A max load (LMZ10501)
- 650mA max load (LMZ10500)
- 2MHz switching frequency
- 2 layer PCB with 1oz copper
- 11 x 13 mm PCB size
- 5 x 7 mm solution size

Schematic



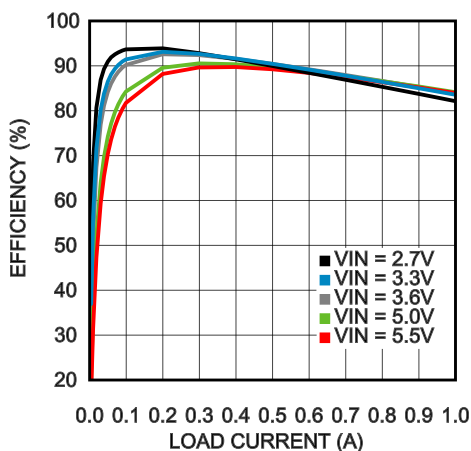
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Board Top View



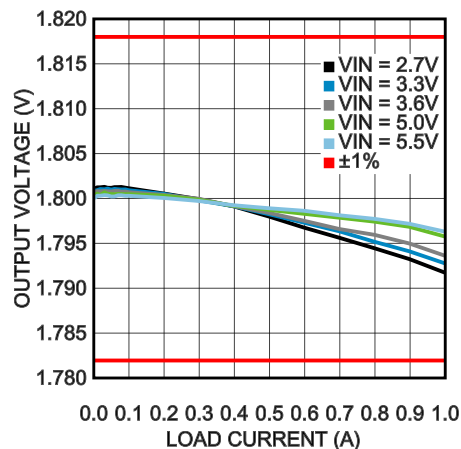
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Efficiency  $V_{OUT} = 1.8V$



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Line and Load Regulation



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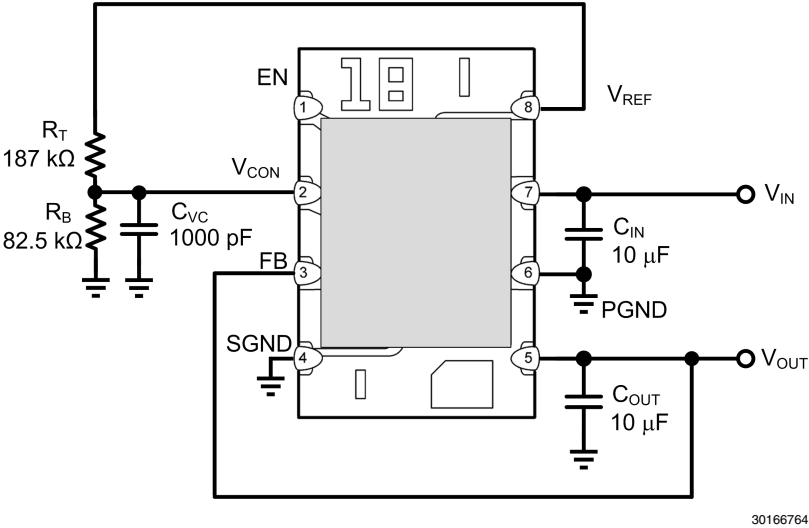
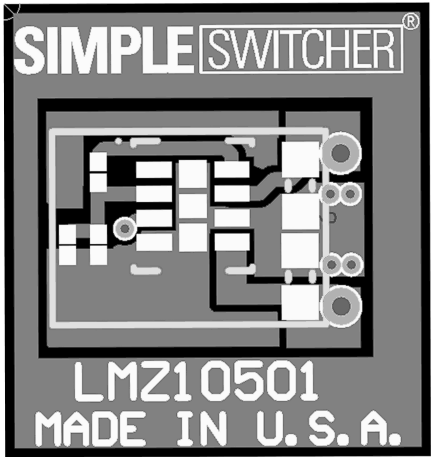


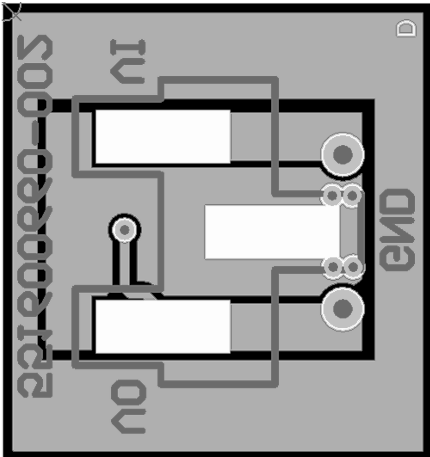
FIGURE 1. Demo Board Schematic

TABLE 1. LMZ10501 Demo Board Bill of Materials,  $V_{IN} = 2.7V$  to  $5.5V$ ,  $V_{OUT} = 1.8V$ ,  $I_{OUT(MAX)} = 1000mA$

Designator	Description	Case Size	Manufacturer	Manufacturer P/N	Quantity
U1	SIMPLE SWITCHER® Nano Module	SE08A	National Semiconductor	LMZ10501SE	1
$C_{IN}, C_{OUT}$	10 $\mu F$ , X5R, 10V	0603	TDK	C1608X5R1A106M	2
$C_{VC}$	1000 pF	0201	TDK	C0603X7R1C102K	1
$R_B$	82.5 k $\Omega$	0201	Panasonic	ERJ-1GEF8252C	1
$R_T$	187 k $\Omega$	0201	Panasonic	ERJ-1GEF1873C	1
J1	3-Pin male header	2.54mm (0.1") pitch	Samtec, Inc	TSM-103-01-L-SV	1



Demo Board Top Layer



Demo Board Bottom Layer  
Terminal Markings: VI =  $V_{IN}$ , VO =  $V_{OUT}$

## Notes

## Notes

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Interface	<a href="http://www.national.com/interface">www.national.com/interface</a>	Eval Boards	<a href="http://www.national.com/evalboards">www.national.com/evalboards</a>
LVDS	<a href="http://www.national.com/lvds">www.national.com/lvds</a>	Packaging	<a href="http://www.national.com/packaging">www.national.com/packaging</a>
Power Management	<a href="http://www.national.com/power">www.national.com/power</a>	Green Compliance	<a href="http://www.national.com/quality/green">www.national.com/quality/green</a>
Switching Regulators	<a href="http://www.national.com/switchers">www.national.com/switchers</a>	Distributors	<a href="http://www.national.com/contacts">www.national.com/contacts</a>
LDOs	<a href="http://www.national.com/ldo">www.national.com/ldo</a>	Quality and Reliability	<a href="http://www.national.com/quality">www.national.com/quality</a>
LED Lighting	<a href="http://www.national.com/led">www.national.com/led</a>	Feedback/Support	<a href="http://www.national.com/feedback">www.national.com/feedback</a>
Voltage References	<a href="http://www.national.com/vref">www.national.com/vref</a>	Design Made Easy	<a href="http://www.national.com/easy">www.national.com/easy</a>
PowerWise® Solutions	<a href="http://www.national.com/powerwise">www.national.com/powerwise</a>	Applications & Markets	<a href="http://www.national.com/solutions">www.national.com/solutions</a>
Serial Digital Interface (SDI)	<a href="http://www.national.com/sdi">www.national.com/sdi</a>	Mil/Aero	<a href="http://www.national.com/milaero">www.national.com/milaero</a>
Temperature Sensors	<a href="http://www.national.com/tempsensors">www.national.com/tempsensors</a>	SolarMagic™	<a href="http://www.national.com/solarmagic">www.national.com/solarmagic</a>
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