



EVL28600-TF-00A

Ultra-Low Quiescent Current, Synchronous Boost Converter Evaluation Board

DESCRIPTION

The EVL28600-TF-00A is an evaluation board designed to demonstrate the capabilities of the MP28600, an ultra-low quiescent current (I_Q), synchronous boost converter.

The MP28600 can start up from a low 0.7V input voltage (V_{IN}), and work down to a 0.1V V_{IN} after start-up. The MP28600 features constant-off-time (COT) control to achieve high efficiency under light-load conditions.

The MP28600 features boost mode and down mode for different V_{IN} conditions. In down mode, the output voltage (V_{OUT}) can still be regulated at a target value, even when V_{IN} exceeds V_{OUT} .

The MP28600 is available in a space-saving SOT563 (1.6mmx1.6mm) package.

It is recommended to read the MP28600 datasheet prior to making any changes to the EVL28600-TF-00A.

PERFORMANCE SUMMARY

Specifications are at $T_A = 25^\circ\text{C}$, unless otherwise noted.

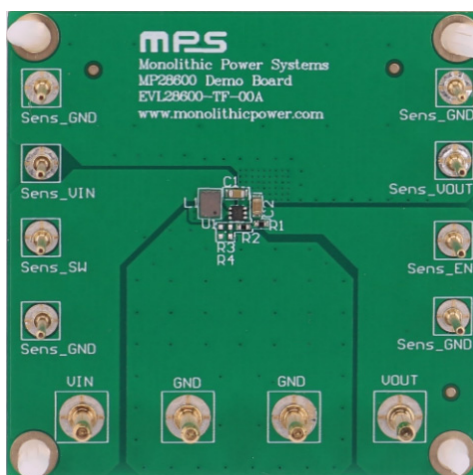
Parameters	Conditions	Value
Input voltage (V_{IN}) range		0.7V to 5.25V
Output voltage (V_{OUT})	$V_{IN} = 0.7\text{V to } 5.25\text{V}$, $I_{OUT} = 0\text{A to } 50\text{mA}$	5V
Maximum output current (I_{OUT})	$V_{IN} = 0.7\text{V to } 5.25\text{V}$	50mA to 650mA ⁽¹⁾
Typical load efficiency	$V_{IN} = 3.3\text{V}$, $V_{OUT} = 5\text{V}$, $I_{OUT} = 0.2\text{A}$	93.8%

Note:

1) The maximum I_{OUT} range is affected by V_{IN} . See the I_{OUT_MAX} vs. V_{IN} curve on page 5 for more details.

 Optimized Performance with MPS Inductor MPL-AT2512 Series

EVALUATION BOARD



LxWxH (5.1cmx5.1cmx0.6cm)

2 Layers (1oz and 1oz)

Board Number	MPS IC Number
EVL28600-TF-00A	MP28600GTF

QUICK START GUIDE

The EVL28600-TF-00A evaluation board is easy to set up and can be used to evaluate the performance of the MP28600. For proper measurement equipment set-up, refer to Figure 1 and follow the steps below:

1. Preset the power supply (V_{IN}) to be between 0.7V and 5.25V, then turn off the power supply.
2. Connect the power supply terminals to:
 - a. Positive (+): V_{IN}
 - b. Negative (-): GND
3. Connect the load terminals to:
 - a. Positive (+): V_{OUT}
 - b. Negative (-): GND
4. After making the connections, adjust the load to 0A, then turn on the power supply.
5. Check for the target output voltage (V_{OUT}) between the SENSE_ V_{OUT} and GND terminals.
6. Once the target V_{OUT} is established, adjust the load within the operating range, then measure the efficiency, output voltage ripple, and other relevant parameters.
7. After completing all tests, adjust the load to 0A, then turn off the input power supply.

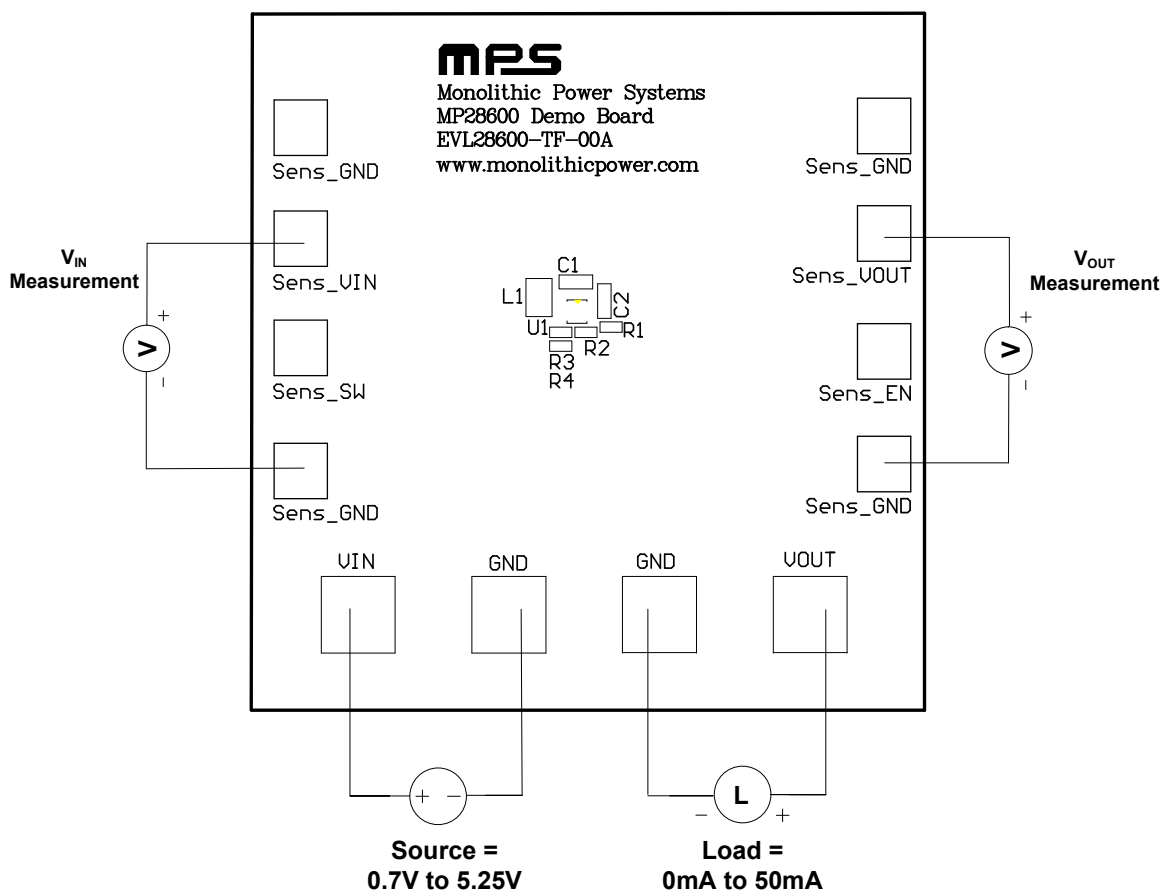


Figure 1: Proper Measurement Equipment Set-Up

EVALUATION BOARD SCHEMATIC

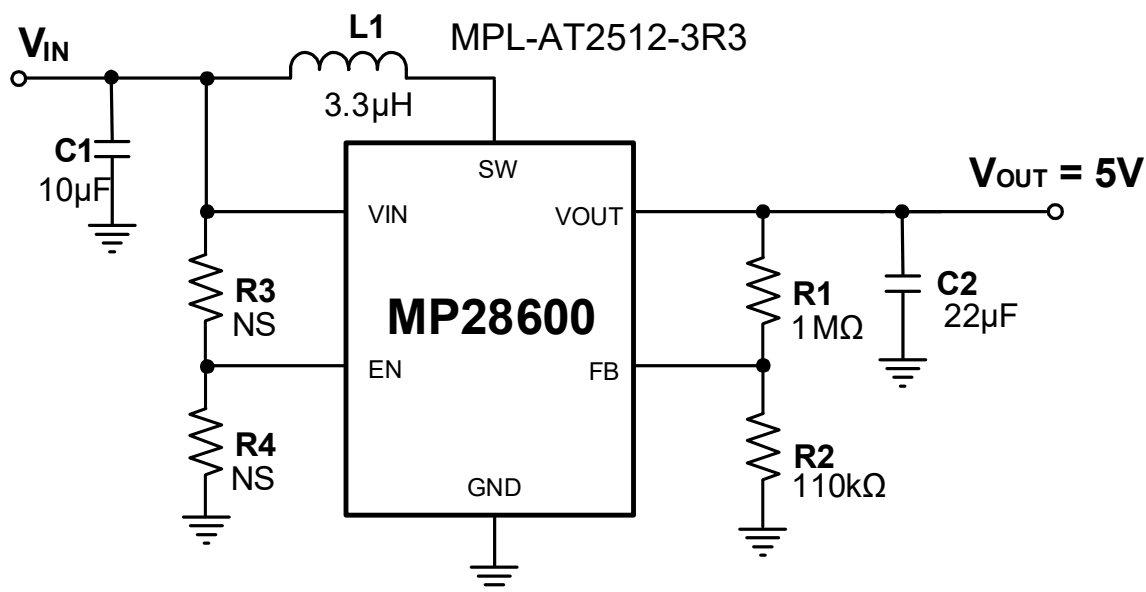


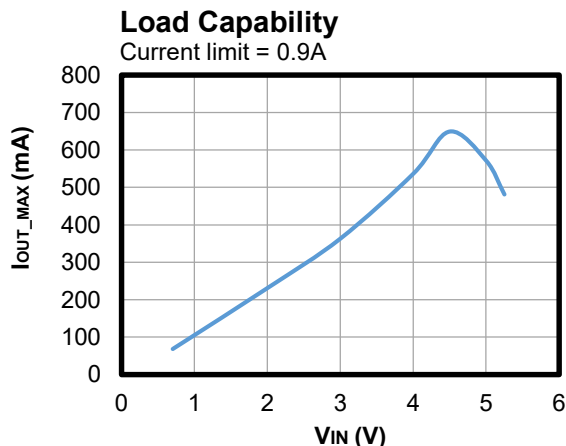
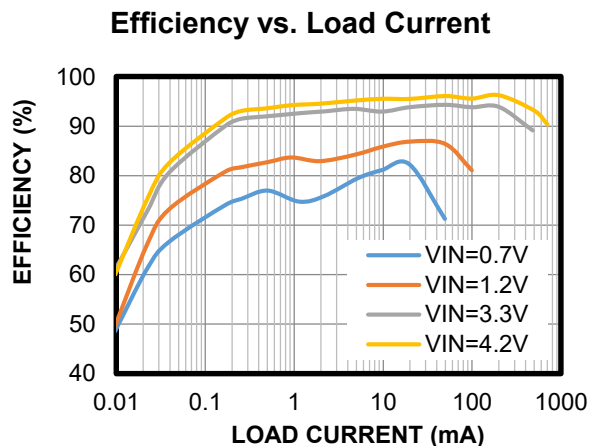
Figure 2: Evaluation Board Schematic

EVL28600-TF-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	L1	3.3μH	Inductor, R _{DC} = 121mΩ, I _{SAT} = 2.7A	SMD	MPS	MPL-AT2512-3R3
1	C1	10μF	Ceramic capacitor, 10V, X5R	0603	Murata	GRM188R61A106KE69D
1	C2	22μF	Ceramic capacitor, 10V, X5R	0603	Murata	GRM188R61A226ME15D
1	R1	1MΩ	Film resistor, 1%	0402	Yageo	RC0402FR-071ML
1	R2	110kΩ	Film resistor, 1%	0402	Yageo	RC0402FR-07110KL
0	R3, R4	NS				
1	U1	MP28600	1A, 5.25V, synchronous boost converter	SOT563	MPS	MP28600GTF

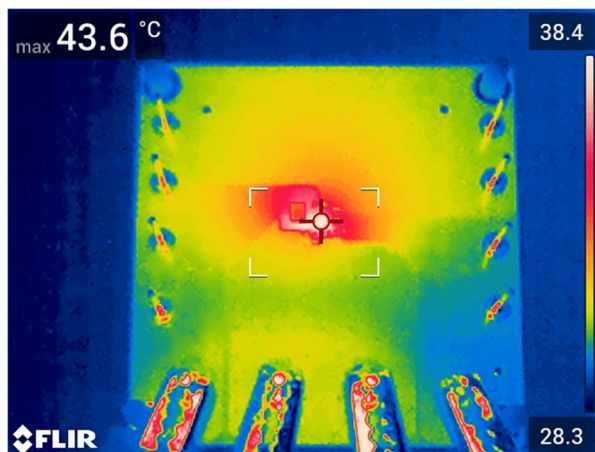
EVB TEST RESULTS

Performance curves and waveforms are tested on the evaluation board, $V_{IN} = 3.3V$, $V_{OUT} = 5V$, $L = 3.3\mu H$, $T_A = 25^\circ C$, unless otherwise noted.



Thermal Performance

$V_{IN} = 3.3V$, $I_{OUT} = 0.4A$, $T_A = 29^\circ C$, no forced airflow

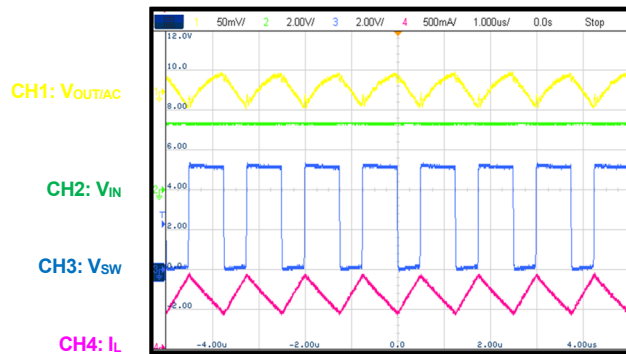


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board, $V_{IN} = 3.3V$, $V_{OUT} = 5V$, $L = 3.3\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

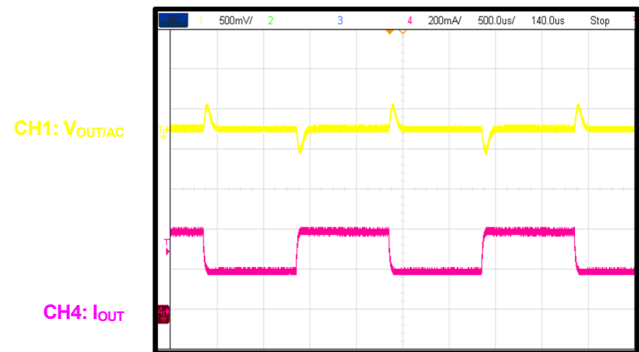
Steady State

$I_{OUT} = 0.4A$



Load Transient Response

$I_{OUT} = 0.2A$ to $0.4A$, slew rate = $800mA/\mu s$ (e-load)



PCB LAYOUT

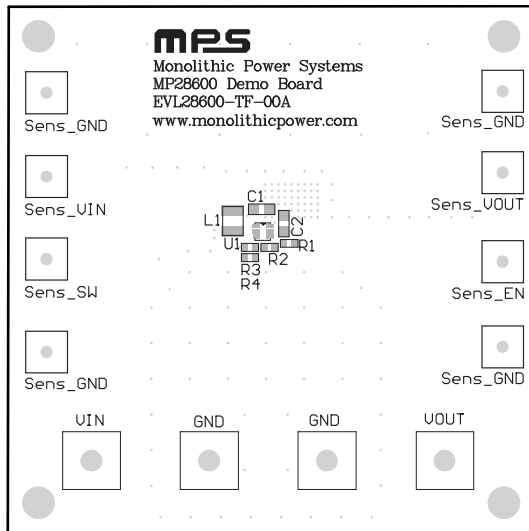


Figure 3: Top Silk

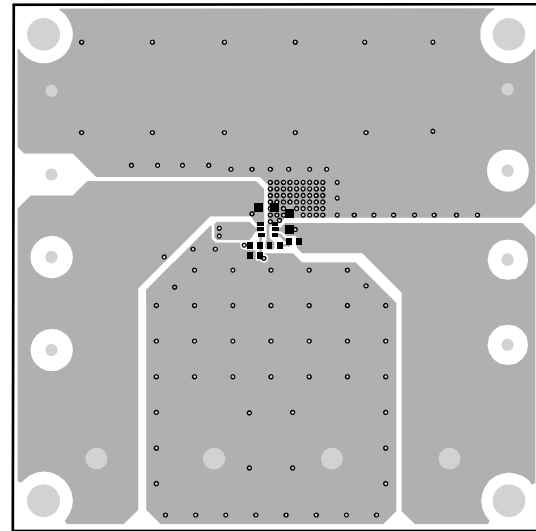


Figure 4: Top Layer

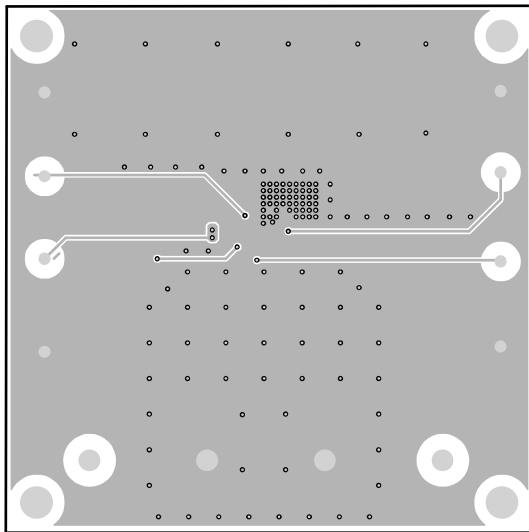


Figure 5: Bottom Layer

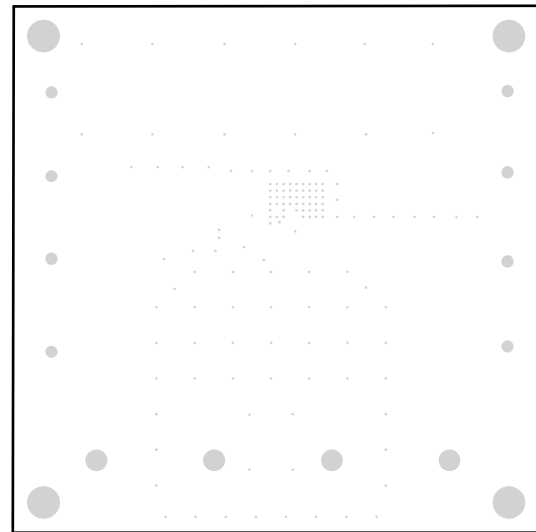


Figure 6: Bottom Silk



REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	7/14/2023	Initial Release	-

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