

Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint

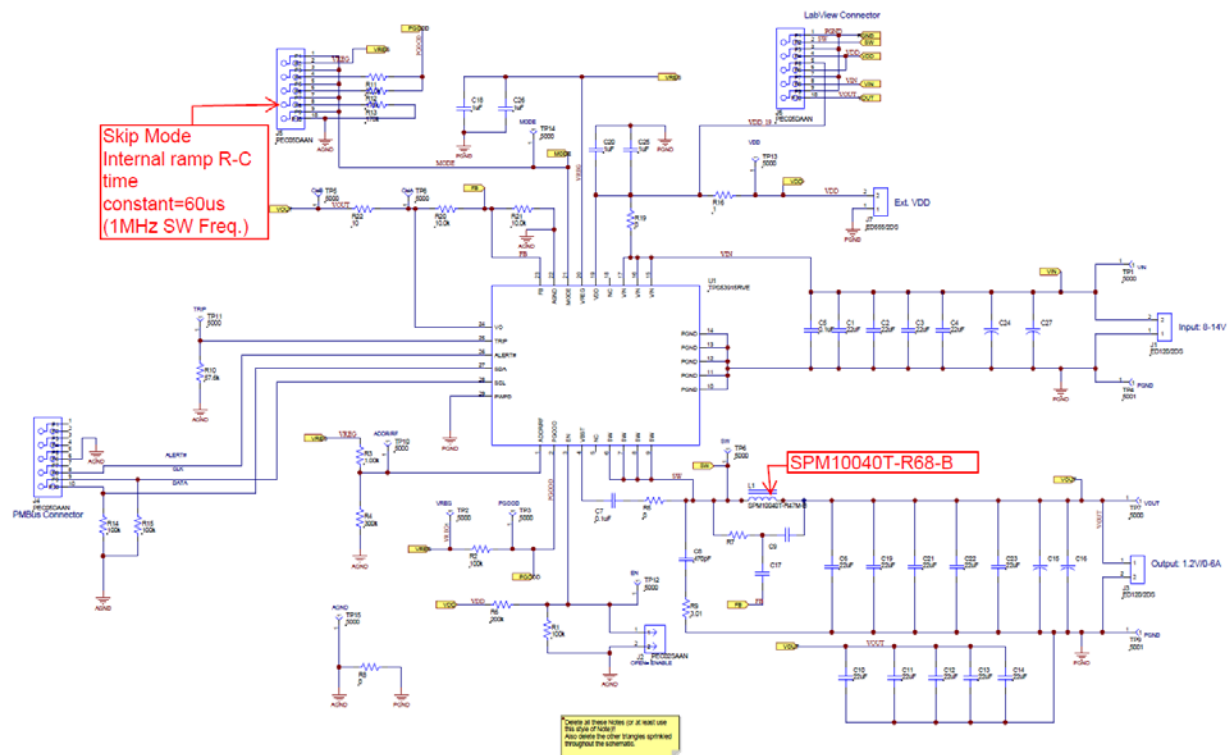
Description

The TPS53515 Inductor-On-Top Step-Down Buck Converter reference design enables reduction of X-Y area while enabling >87% efficiency with 2.6W of power loss @12A load and 12mV of output voltage ripple with only 10x22uF ceramic output caps. This power reference design supports a 12V input and a 1.2V output at 12A and switches at 1MHz.

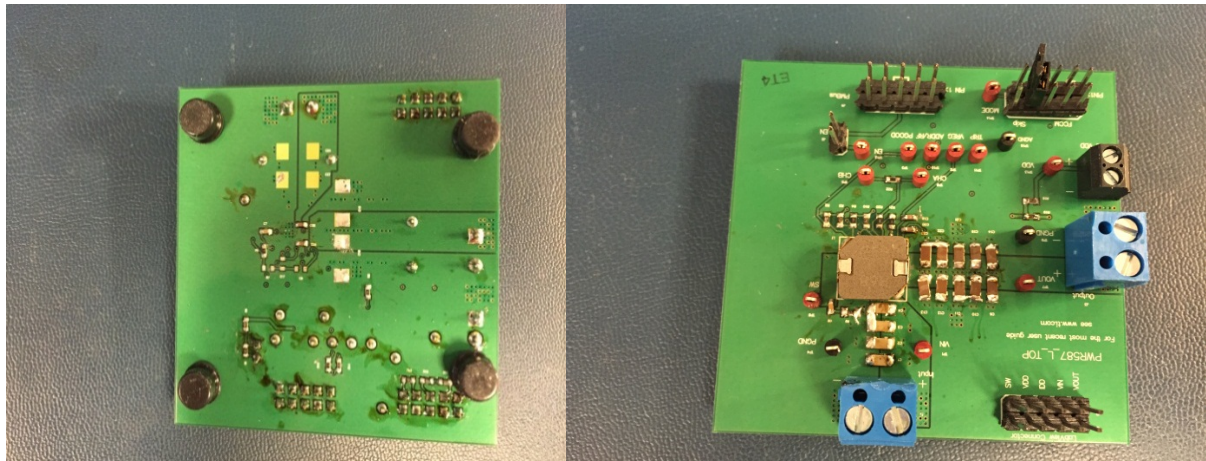
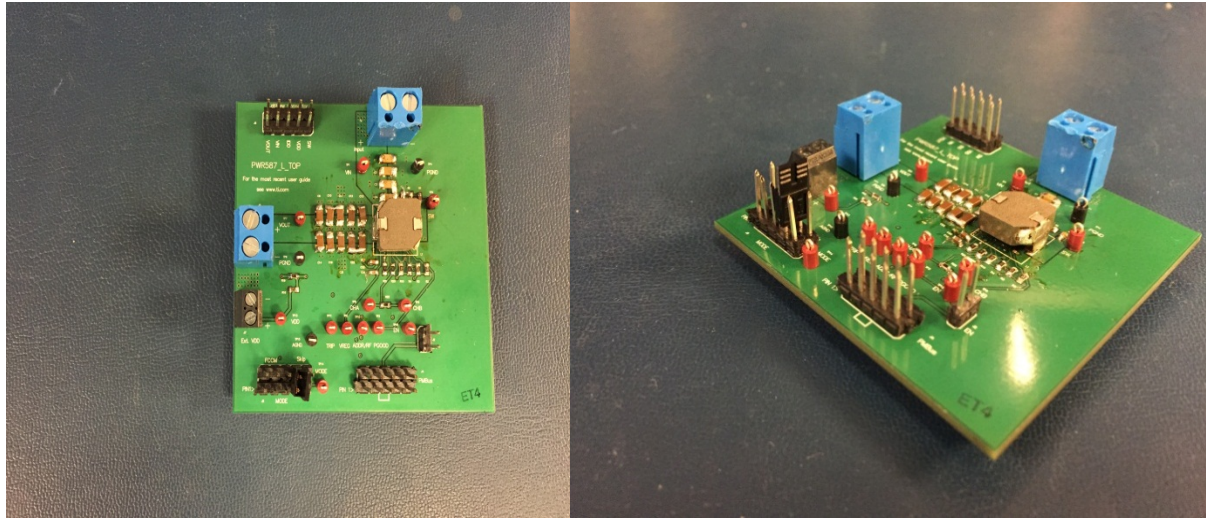
TPS53515EVM Set up

- **VIN**=12V
- **VOUT**=1.2V
- **IOUT**=E-Load Dynamic: 5A to 10A at ~2.5A/ μ s & Static=5A
- **IOUT_Max**=12A
- **COUT**=10x22 μ F_Ceramic, 6.3V
- **Inductor**=SPM10040T-R68-B
- **FREQ**=1MHz
- **Temperature**=25°C

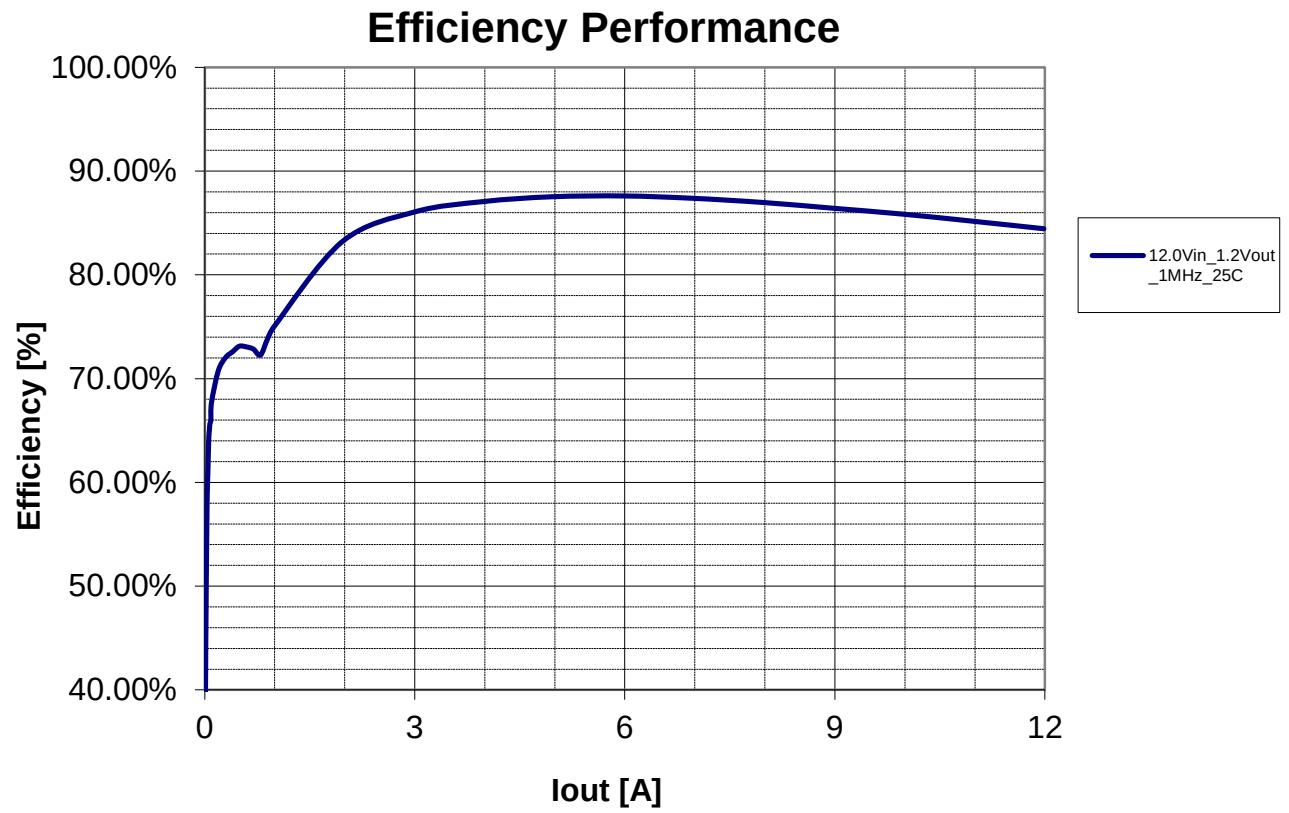
TPS53515 EVM Schematic



TPS53515 L-TOP Pictures

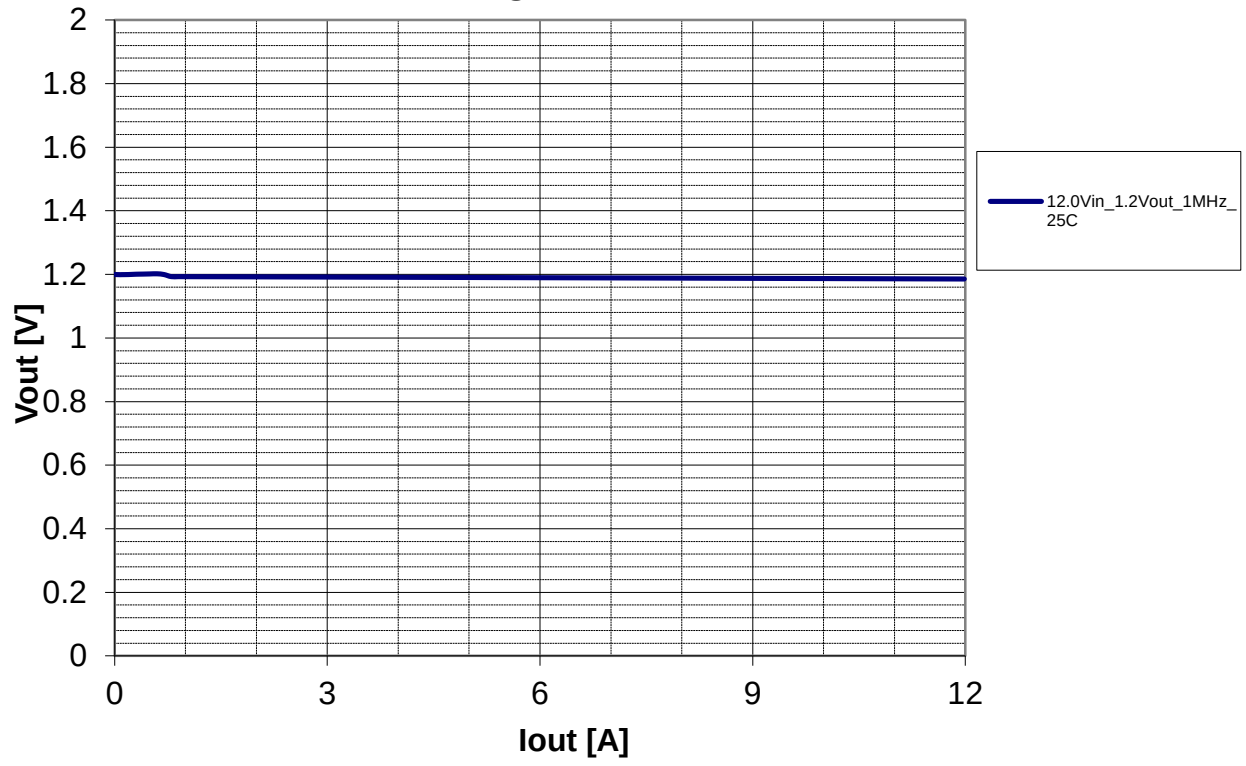


TPS53515 Efficiency Performance

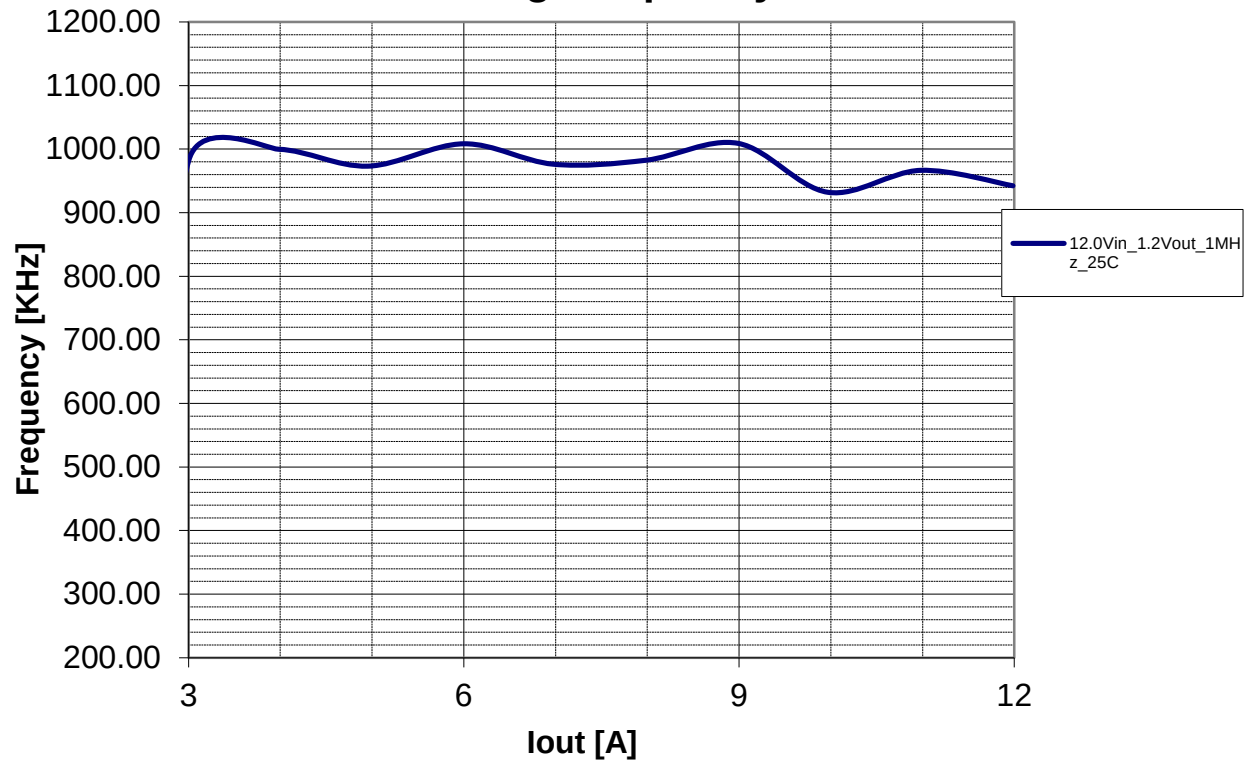




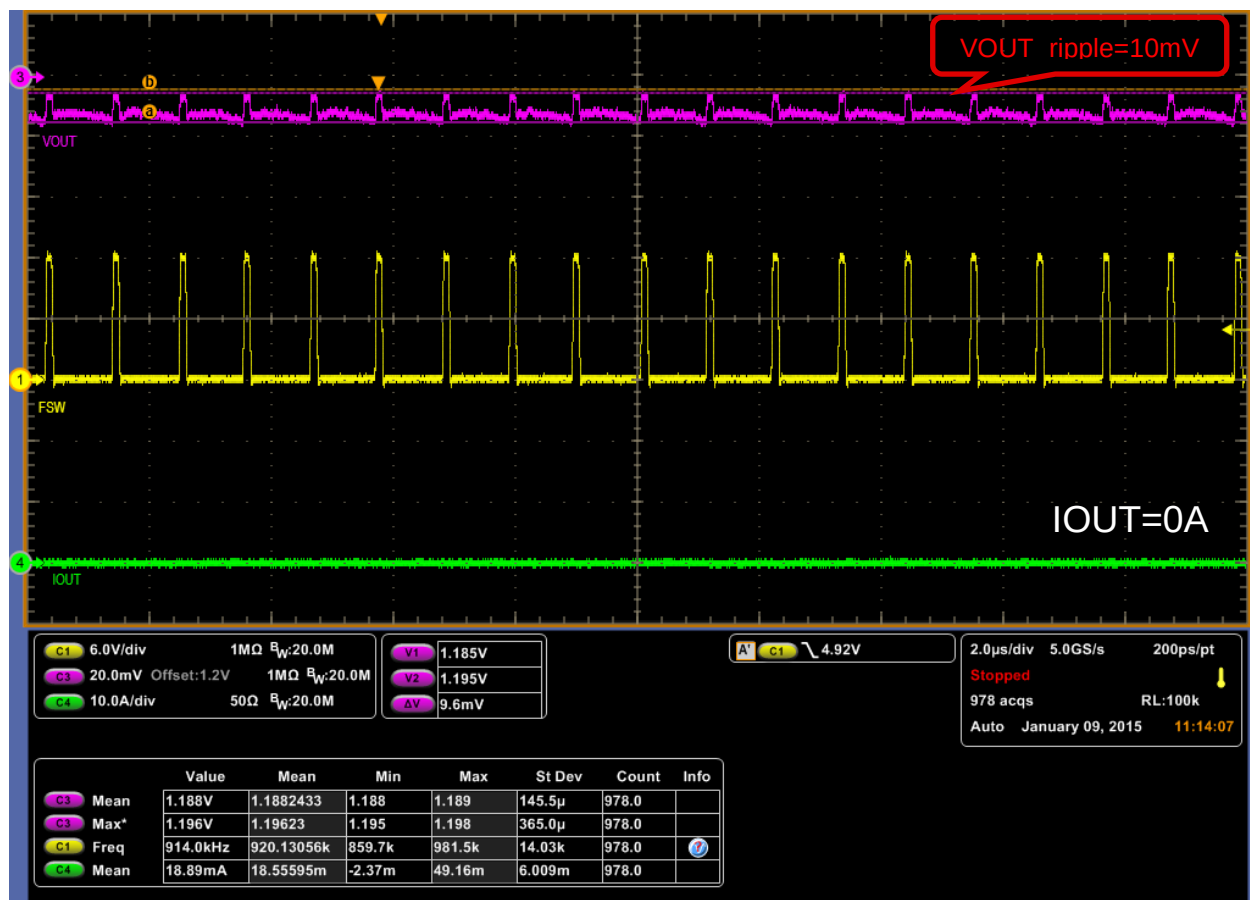
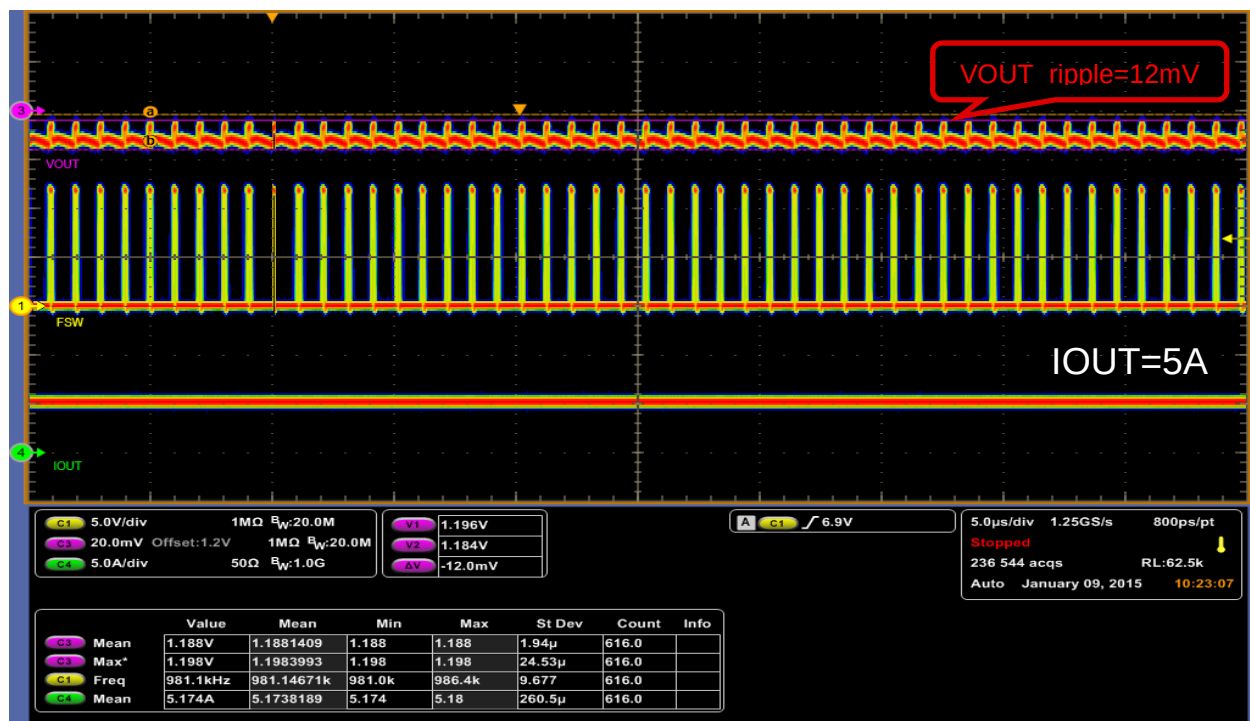
Load Regulation Performance



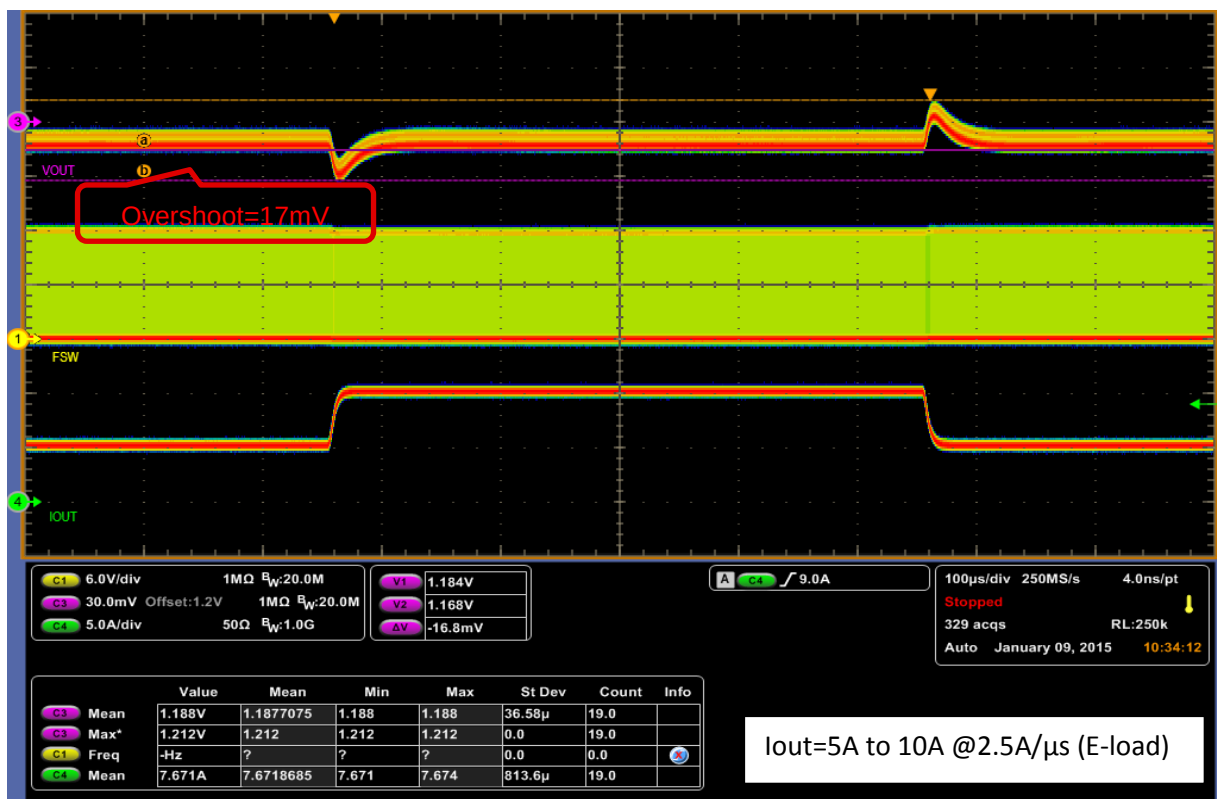
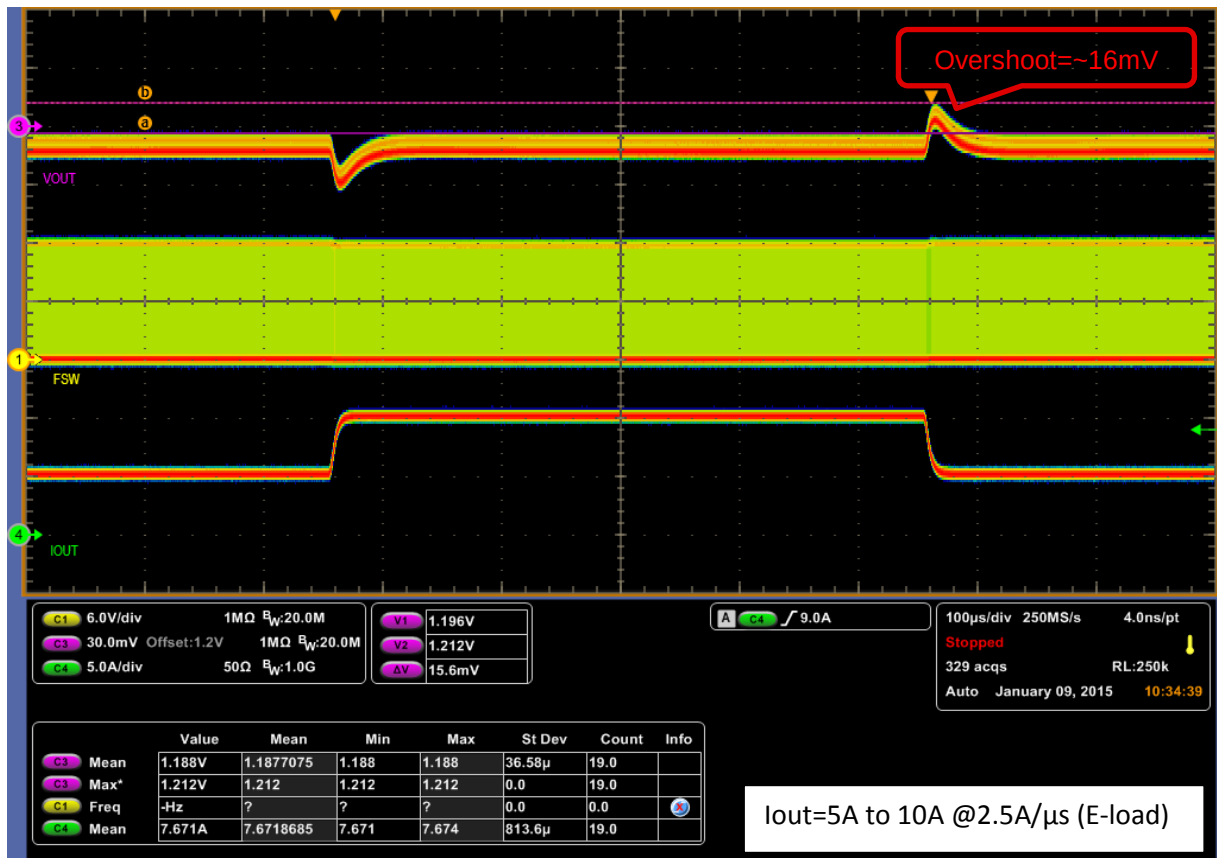
Switching Frequency Performance



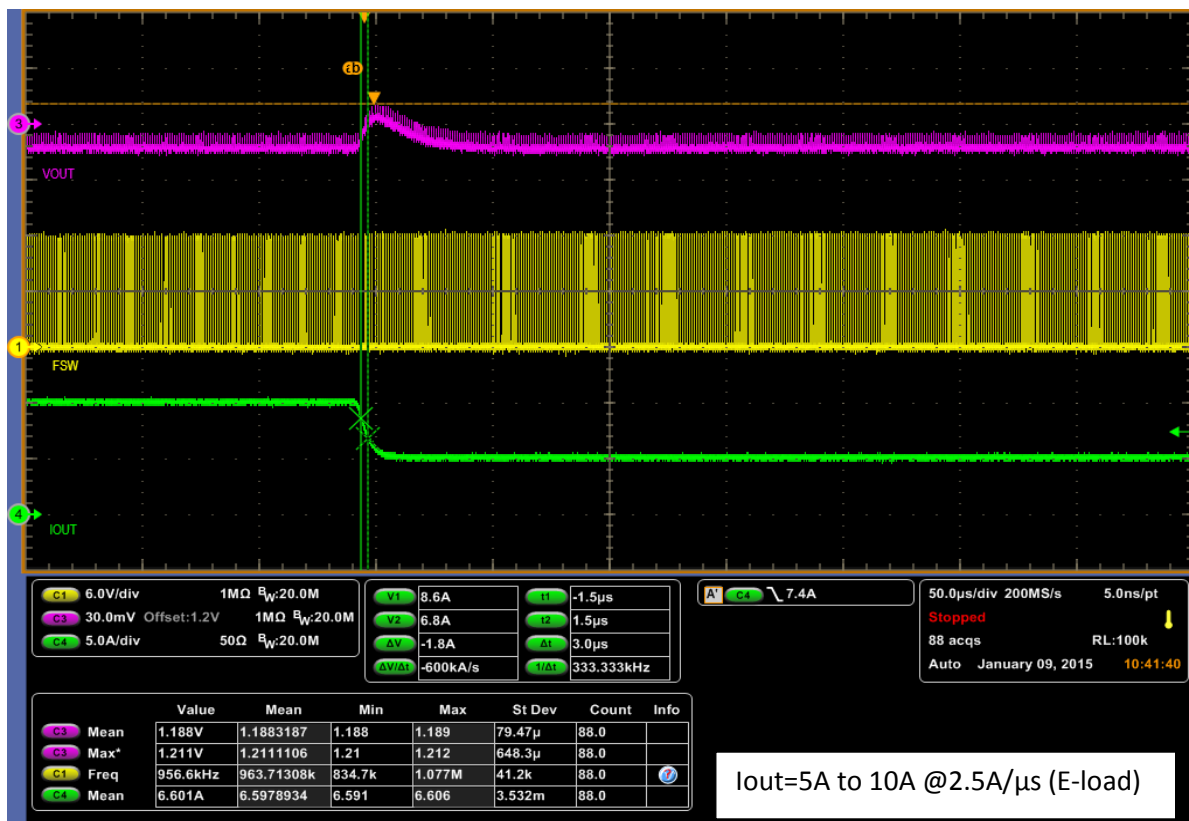
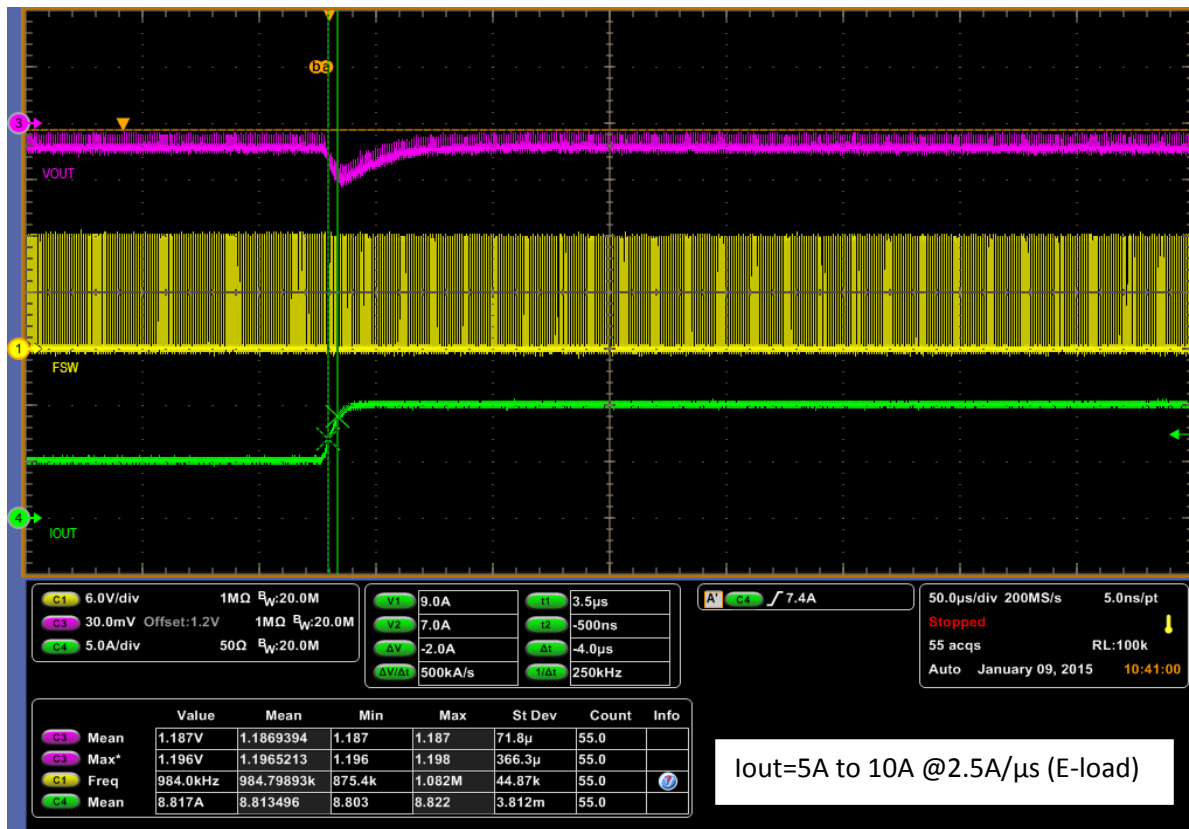
Vout Ripple Test



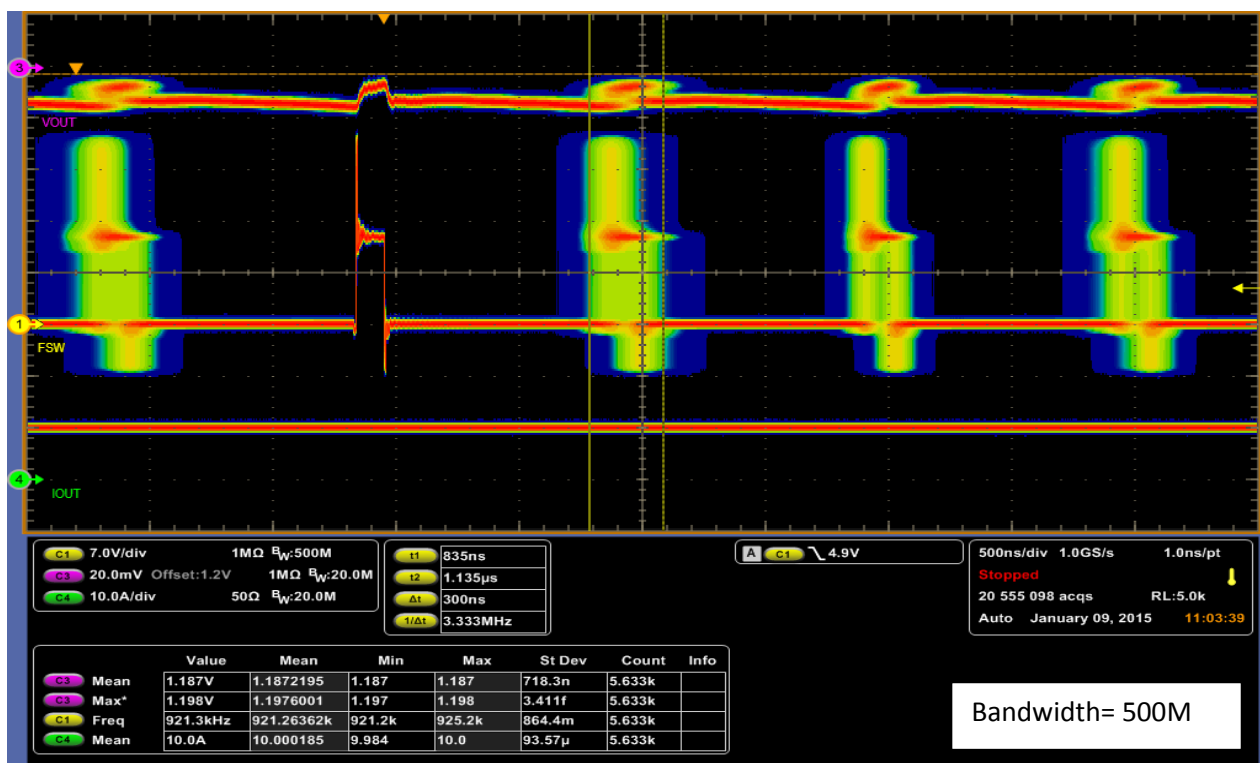
Under/Overshoot Measurements



Transient Performance



Jitter Performance



IC Case and Inductor Temperature

Vin=12V, Vout=1.2V, Fsw=1MHz, Ambient=25°C, Waiting time for each load= 10min.

Load (A)	Case Temp (°C)	Inductor(°C)
0	27.2	27
3	32.6	30
6	36.6	32.2
9	42.5	36
12	50	41.3



Inspection Report

Report Date 2/25/2015

Company Texas Instruments Inc.

Address

Thermographer Benyam Gebru

Customer

Site Address

Contact Person

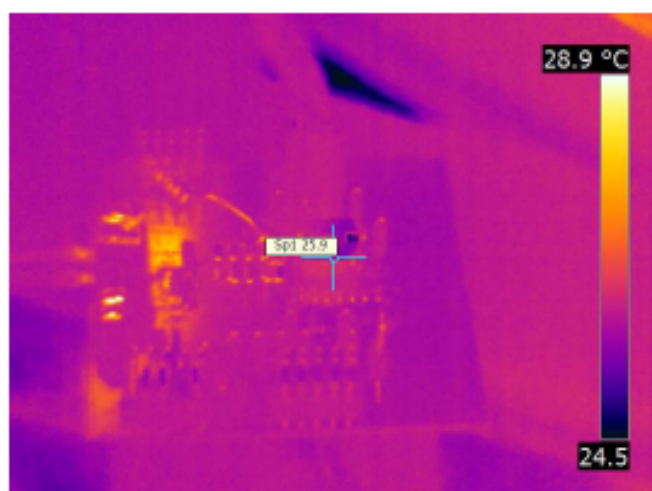


Image and Object Parameters

Camera Model FLIR T300

Text Comments

Due to the location of the IC, the measurement may not be accurate

Image Date 2/25/2015 10:46:53 PM

Image Name IR_0385.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.2 m

Description

12Vin_1.2Vout_1MHz_0Aload



Inspection Report

Report Date 2/25/2015

Company Texas Instruments Inc.

Customer

Address

Site Address

Thermographer Benyam Gebru

Contact Person



Image and Object Parameters

Camera Model FLIR T300

Text Comments

Due to the location of the IC, the measurement may not be accurate

Image Date 2/25/2015 11:03:35 PM

Image Name IR_0386.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.2 m

Description

12Vin_1.2Vout_1MHz_6Aload



Inspection Report

Report Date 2/25/2015

Company Texas Instruments Inc.

Customer

Address

Site Address

Thermographer Benyam Gebru

Contact Person

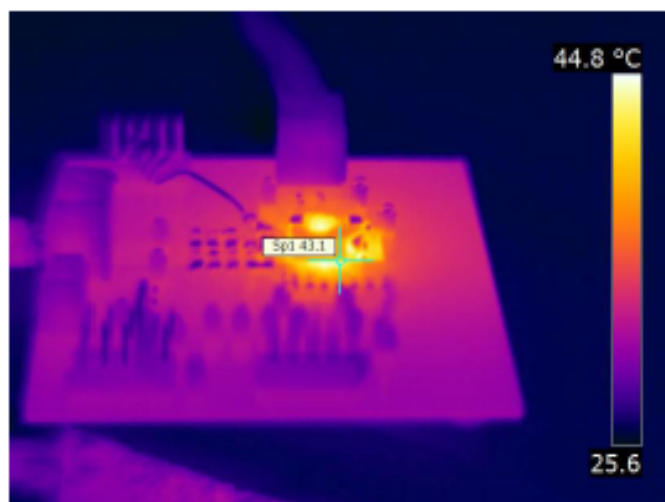


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Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.2 m

Description

12Vin_1.2Vout_1MHz_12Aload

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