

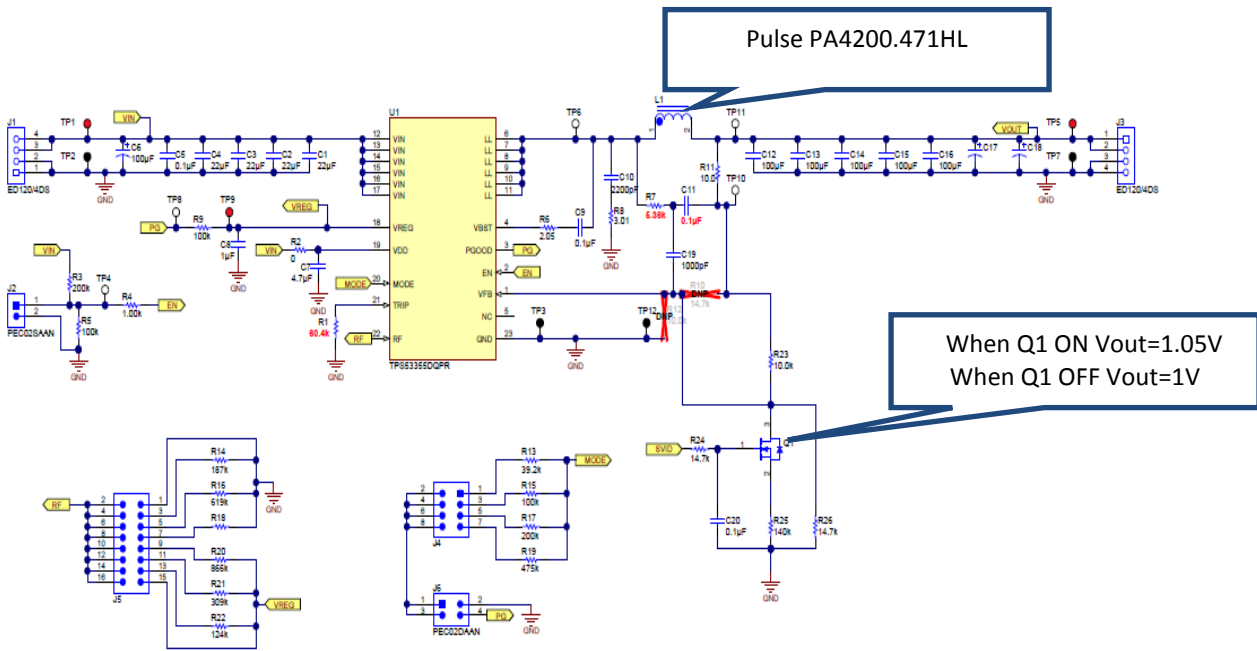
Description

The TPS53355 Inductor-On-Top Step-Down Buck Converter reference design enables reduction of X-Y area while enabling >86% efficiency with only 1.8W of power loss and 6mV of output voltage ripple with only 5x100uF ceramic output caps. This power reference design supports a 12V input and a 1V output at 12A and switches at 650 KHz.

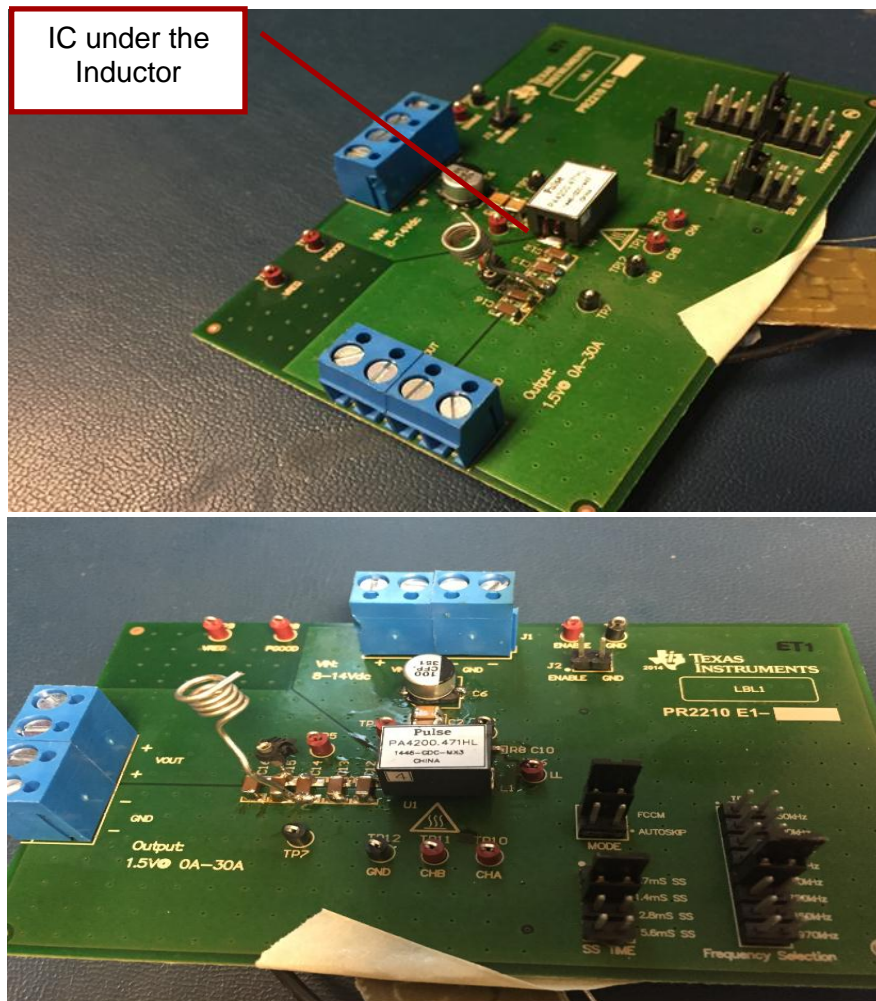
TPS53355EVM Set up

- **VIN**=12V
- **VOUT**=1V
- **IOUT**=E-Load Dynamic: 3A to 6A at ~2.5A/μs & Static=6A
- **IOUT_Max**=12A
- **COUT**=5x100μF_Ceramic, 6.3V
- **Inductor**=Pulse PA4200.471HL
- **FREQ**=650kHz
- **Temperature**=25°C
- **Min Bias Voltage** = 4.5 V

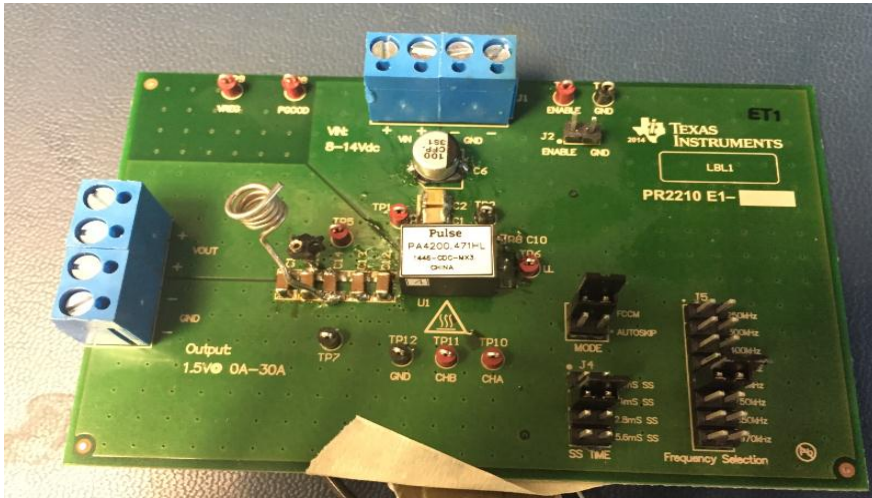
TPS53355 EVM Schematic



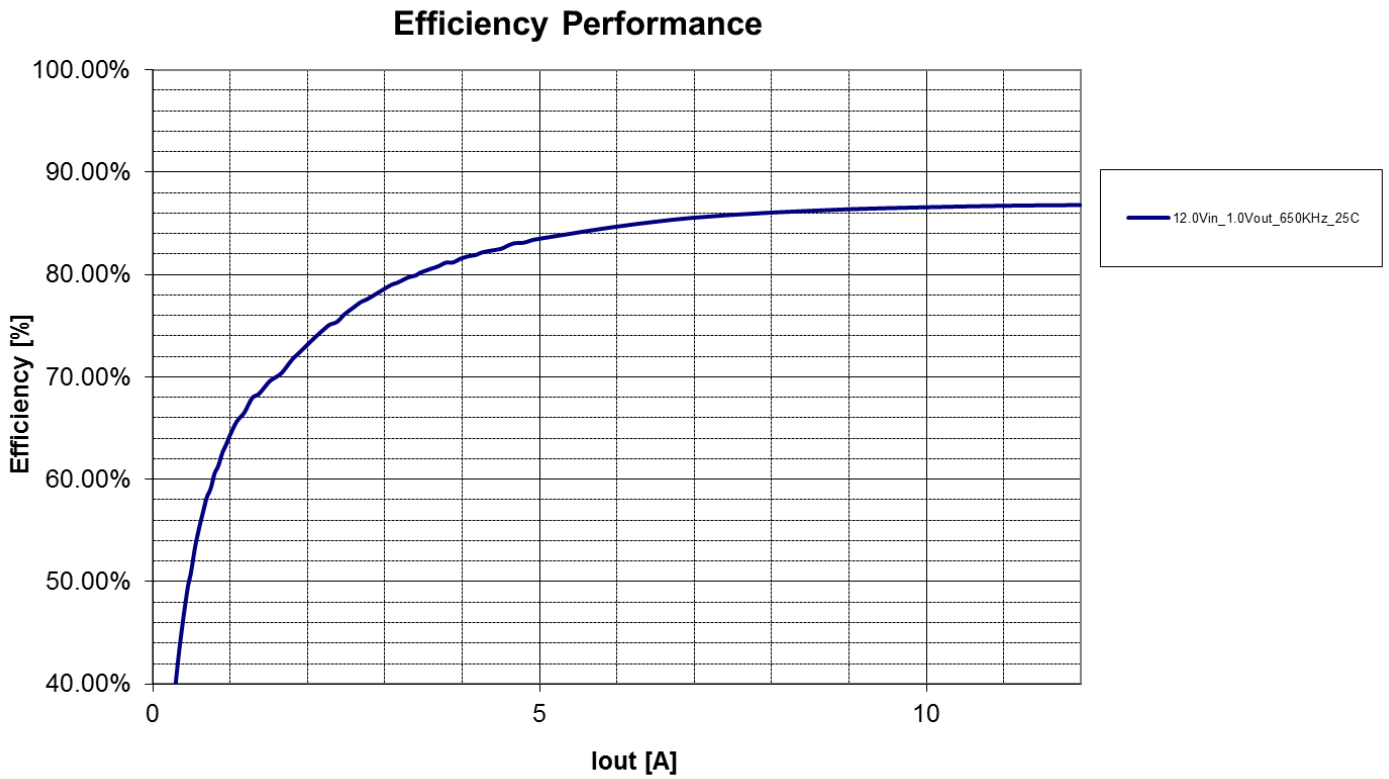
TPS53355 L-TOP Pictures



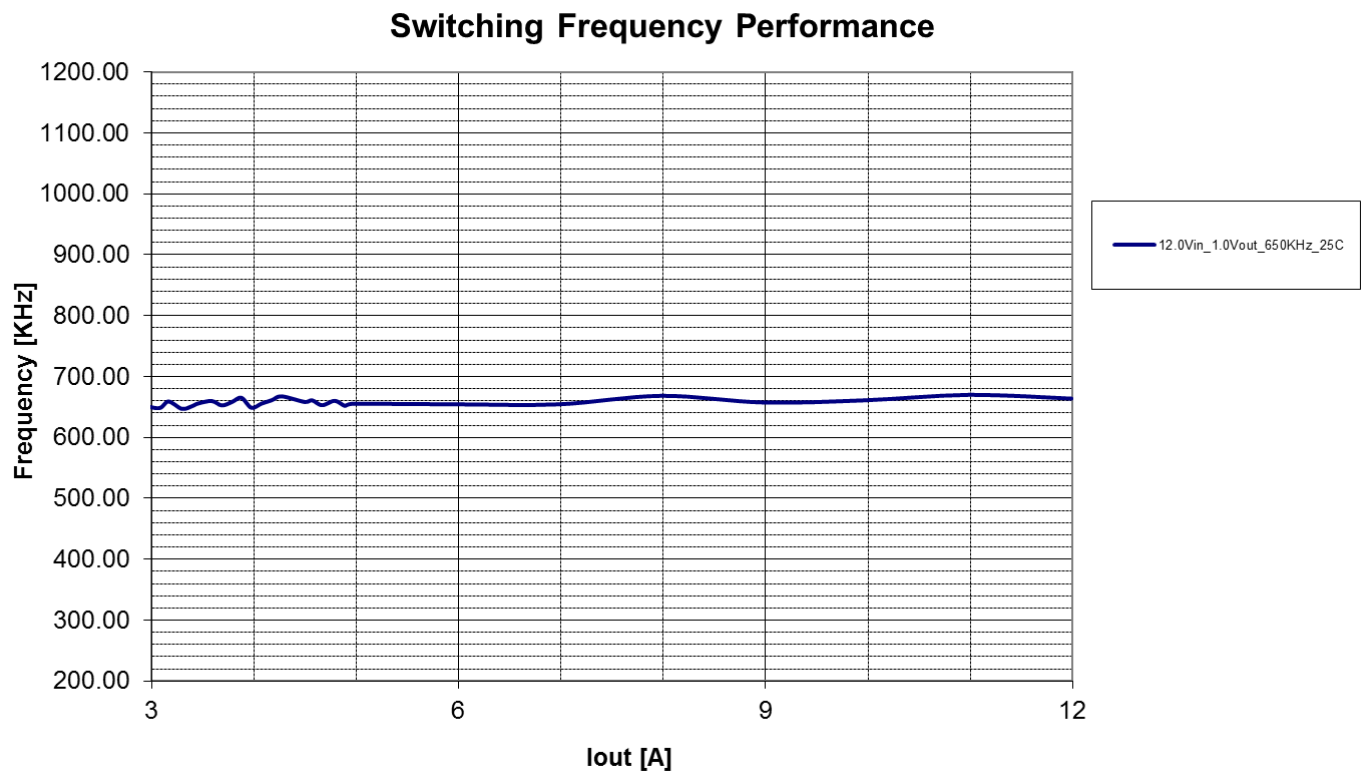
TIDA-00471 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint



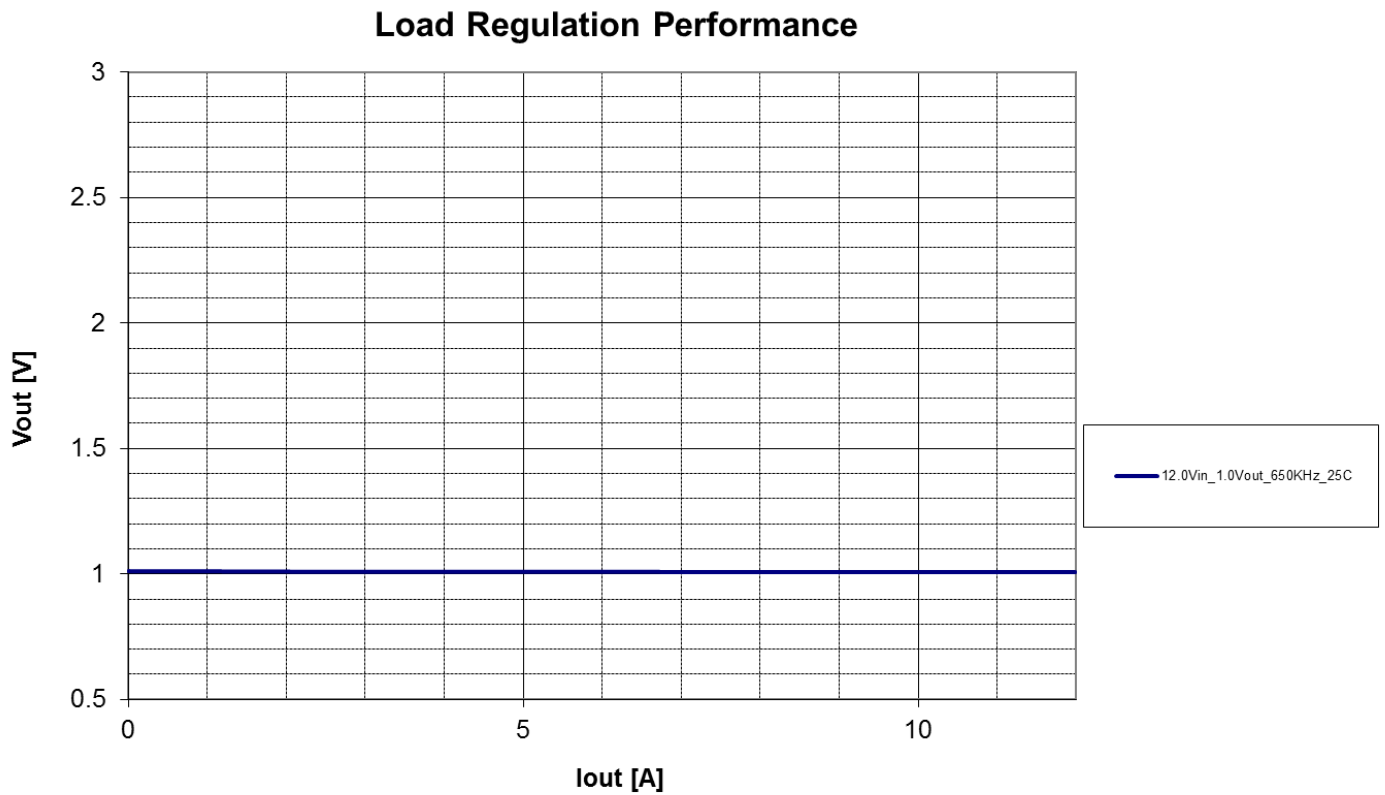
Efficiency Performance



Frequency Performance



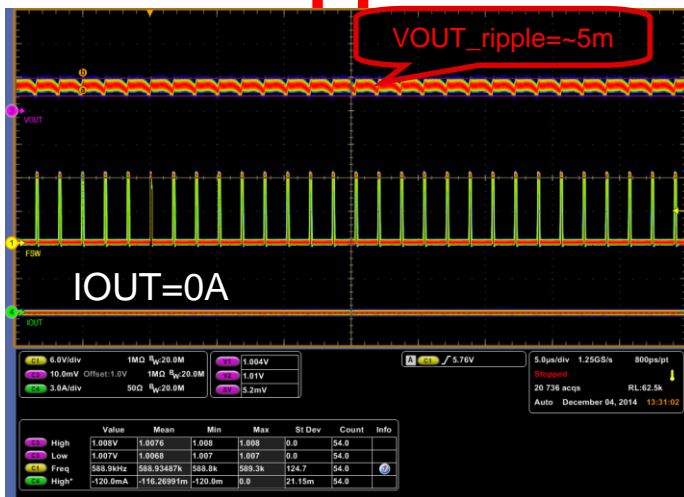
VOUT Load Regulation Performance



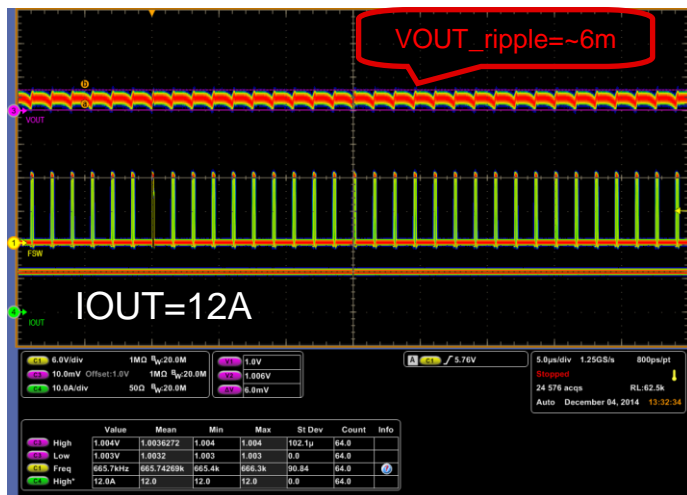
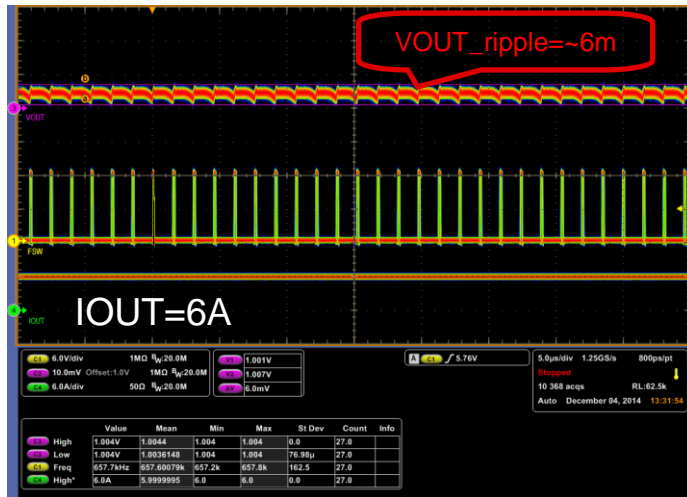
Power Loss Performance



VOUT Ripple Test



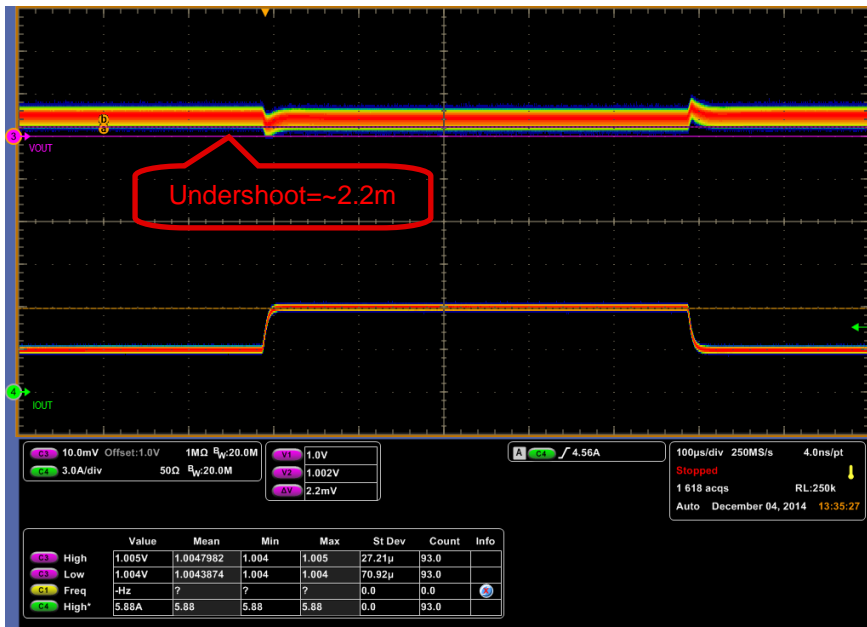
TIDA-00471 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint



Under/Overshoot Measurements

IOU=3A to 6A @ 2.5A/μs (E-Load)

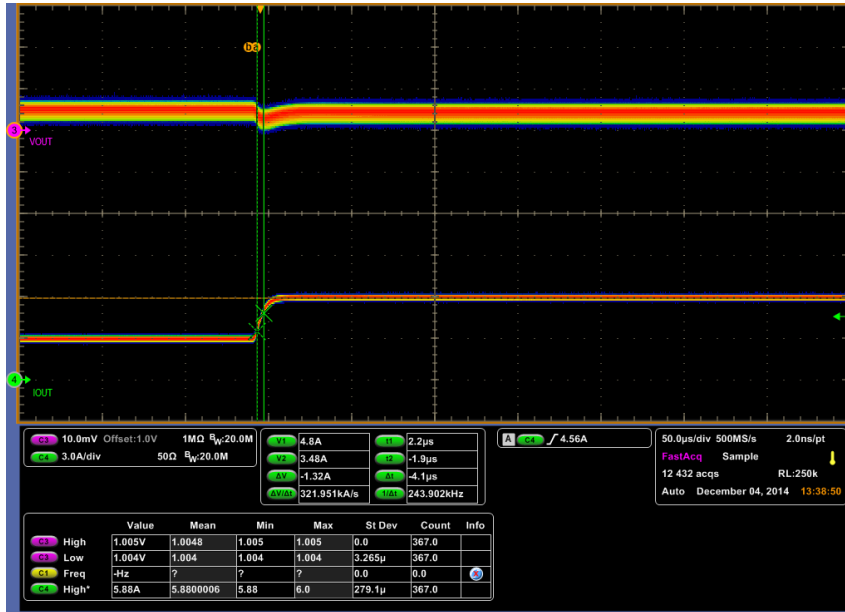
TIDA-00471 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint



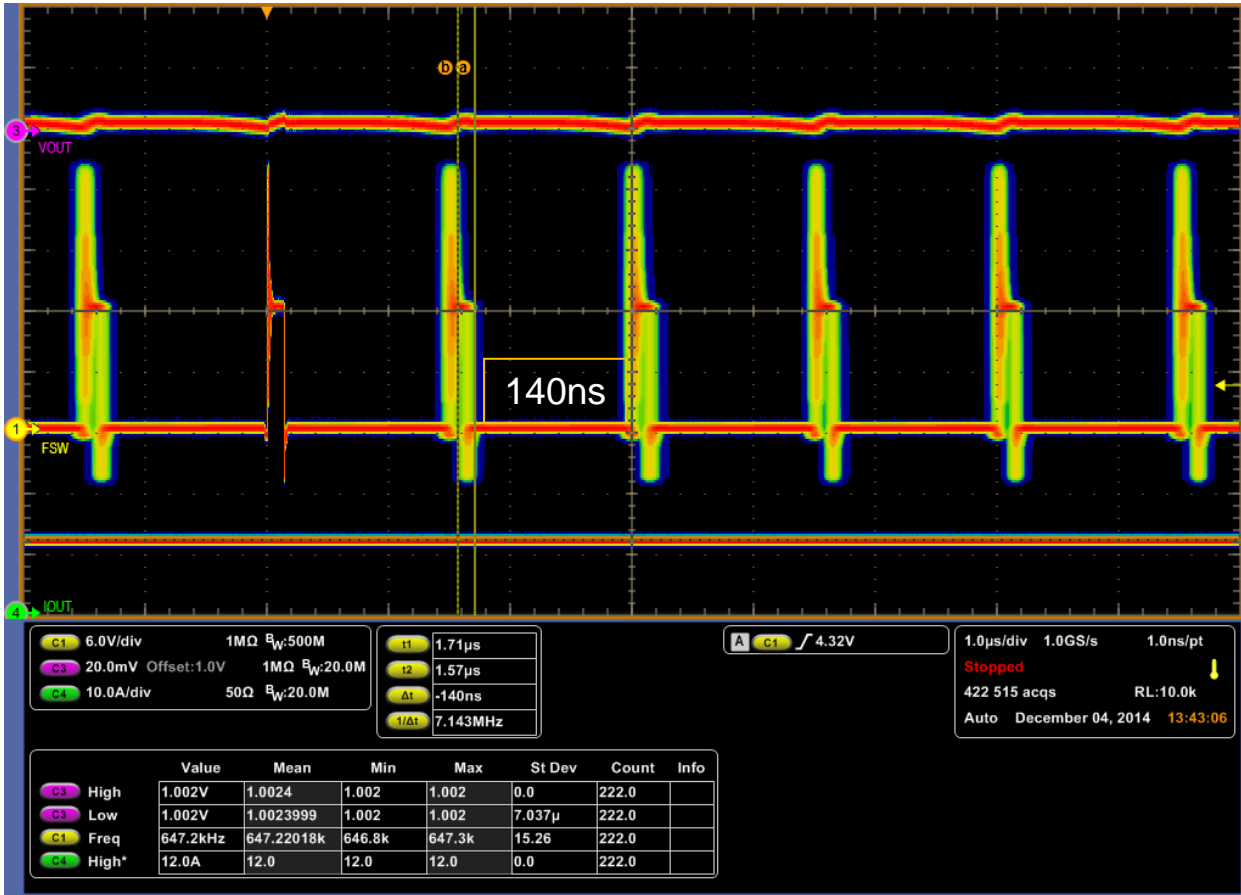
Transient Performance

I_{OUT}=3A to 6A@2.5A/µs(E-Load)

TIDA-00471 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint



Jitter Performance



IC Case Temperature

Vin=12V, Vout=1.05V, Amb=25°C, Wait 10min

Load (A)	Case Temp (°C)
0	27.9
3	30.4
6	31.9
9	34

TIDA-00471 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint

12	38.3		

Temperature



Image and Object Parameters

Camera Model FLIR T300

Text Comments

Due to the location of the IC, the measurement is just an estimate and it may not be accurate

Image Date 12/4/2014 10:54:45 PM

Image Name IR_0332.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.8 ft

Description

Vin=12V, Vout=1.05V, Iout=0A

TIDA-00471 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint

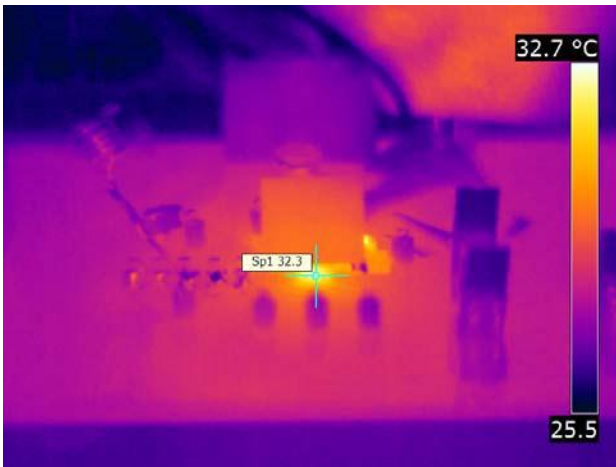


Image and Object Parameters

Camera Model FLIR T300

Text Comments

Due to the location of the IC, the measurement is just an estimate and it may not be accurate

Image Date 12/4/2014 11:19:47 PM

Image Name IR_0333.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.8 ft

Description

Vin=12V, Vout=1.05V, Iout=6A



Image and Object Parameters

Camera Model FLIR T300

Image Date 12/4/2014 11:42:50 PM

Image Name IR_0334.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.8 ft

Text Comments

Due to the location of the IC, the measurement is just an estimate and it may not be accurate

Description

Vin=12V, Vout=1.05V, Iout=12A

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