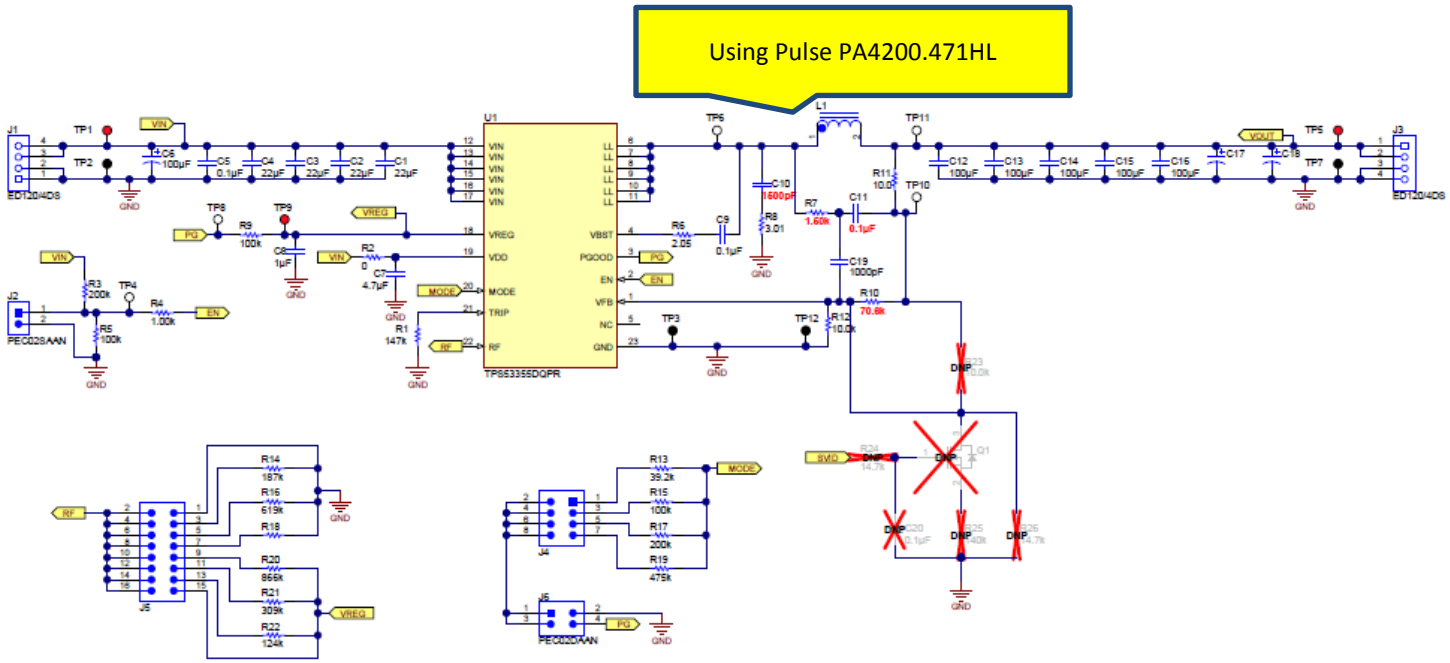
Description

The TPS53355 Inductor-On-Top Step-Down Buck Converter reference design enables reduction of X-Y area while enabling 94% efficiency at 5Voutput and 20A output current (100W output power) with only 6W of power loss and 14mV of output voltage ripple with only 4x100uF ceramic output caps. This power reference design supports a 12V input and 5V output at 20A and switches at 650 KHz.

TPS53355EVM Set up

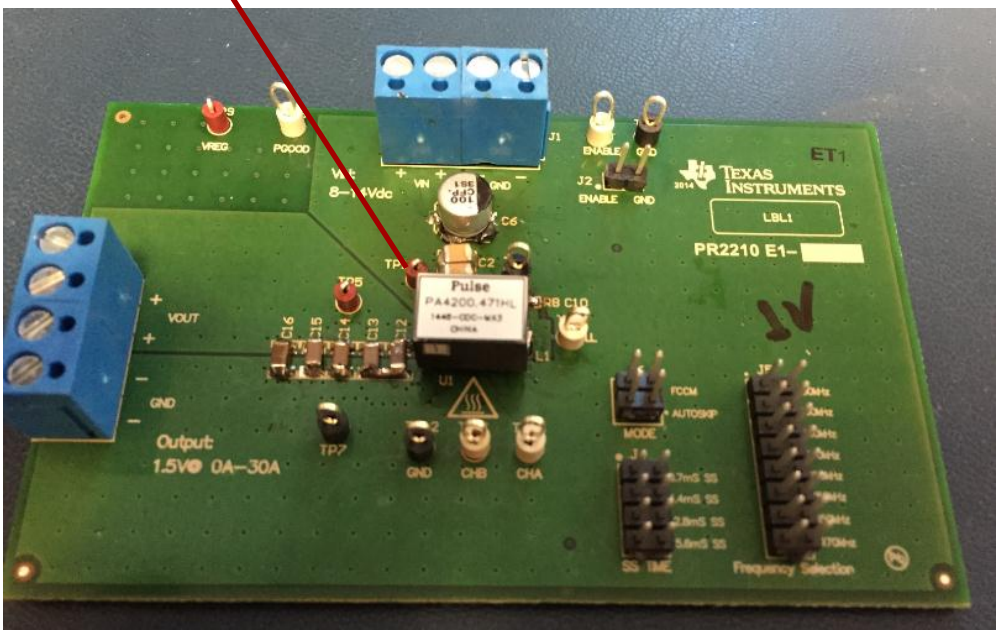
- **VIN**=12V
- **VOUT**=5V
- **IOUT**=E-Load Dynamic-5A to 10A at ~2.5A/us & Static=10A
- **COUT**=4x100uF_Ceramic, 6.3V
- **Inductor**=Coilcraft_1uH_35A_4.5mΩ (XAL1030-102MEB)
- **FREQ**=650kHz
- **Temperature**=25C

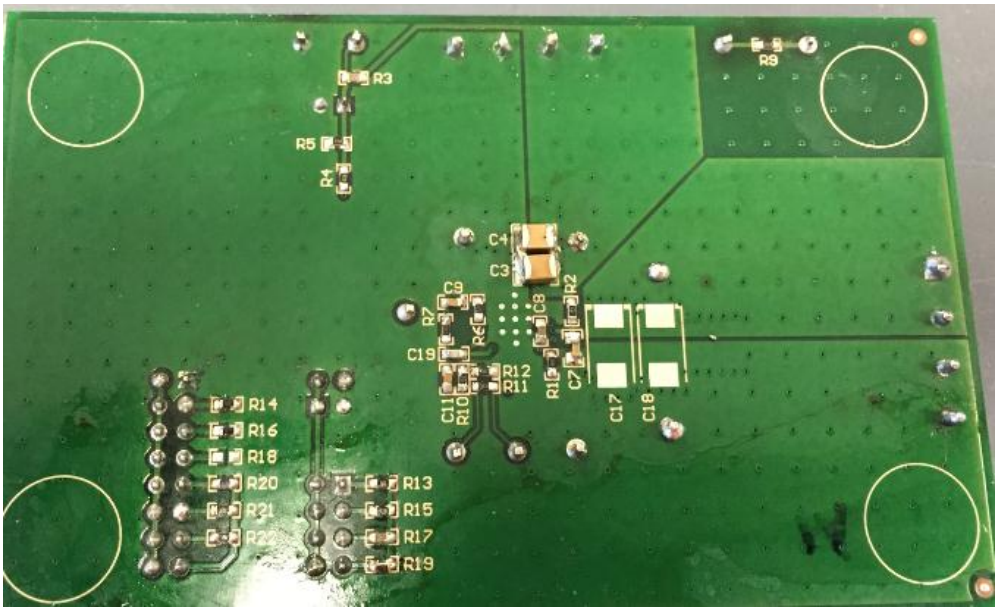
TPS53355 EVM Schematic



TPS53355 L-TOP Pictures

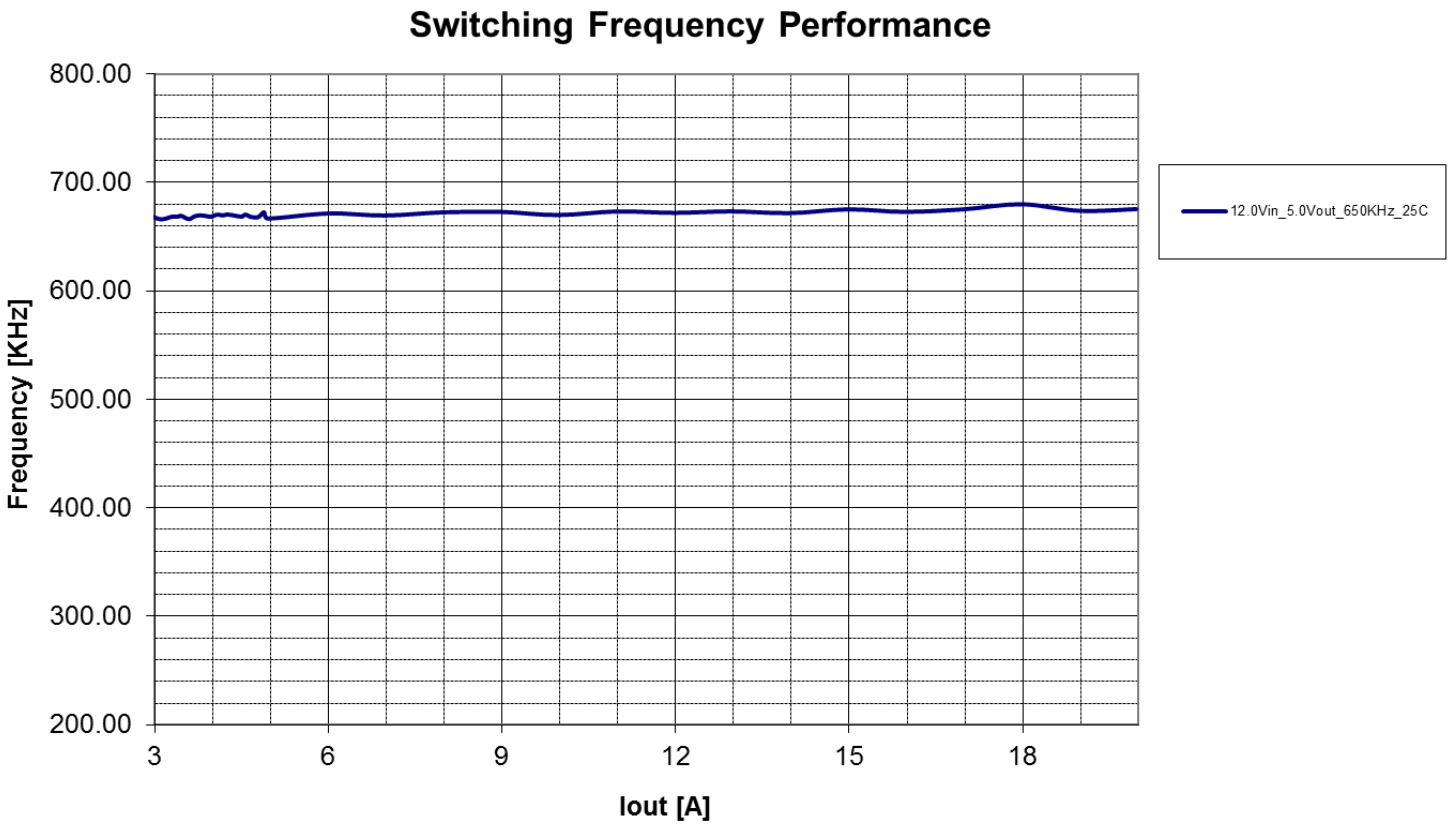
IC under the Inductor



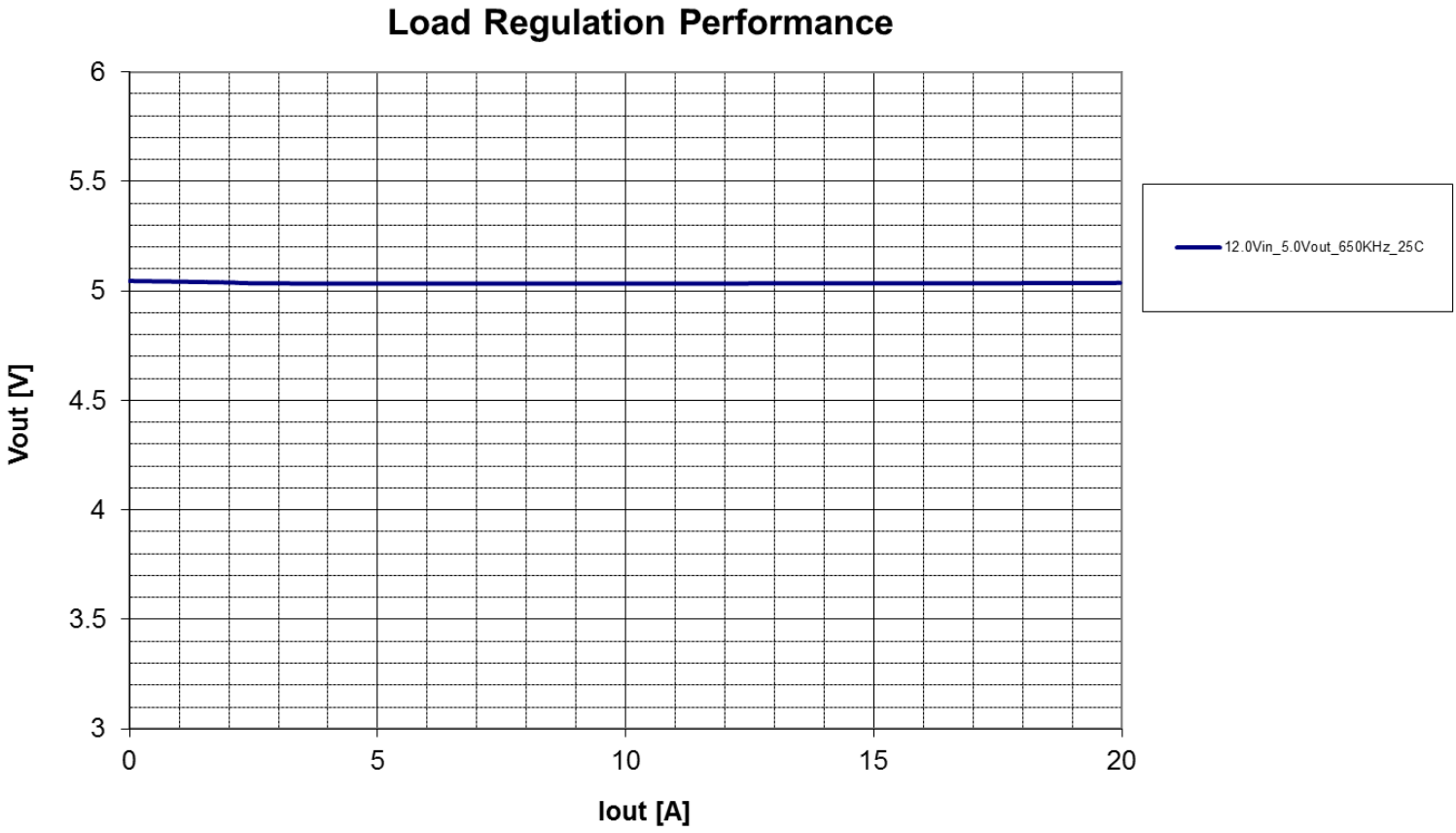


Efficiency Performance

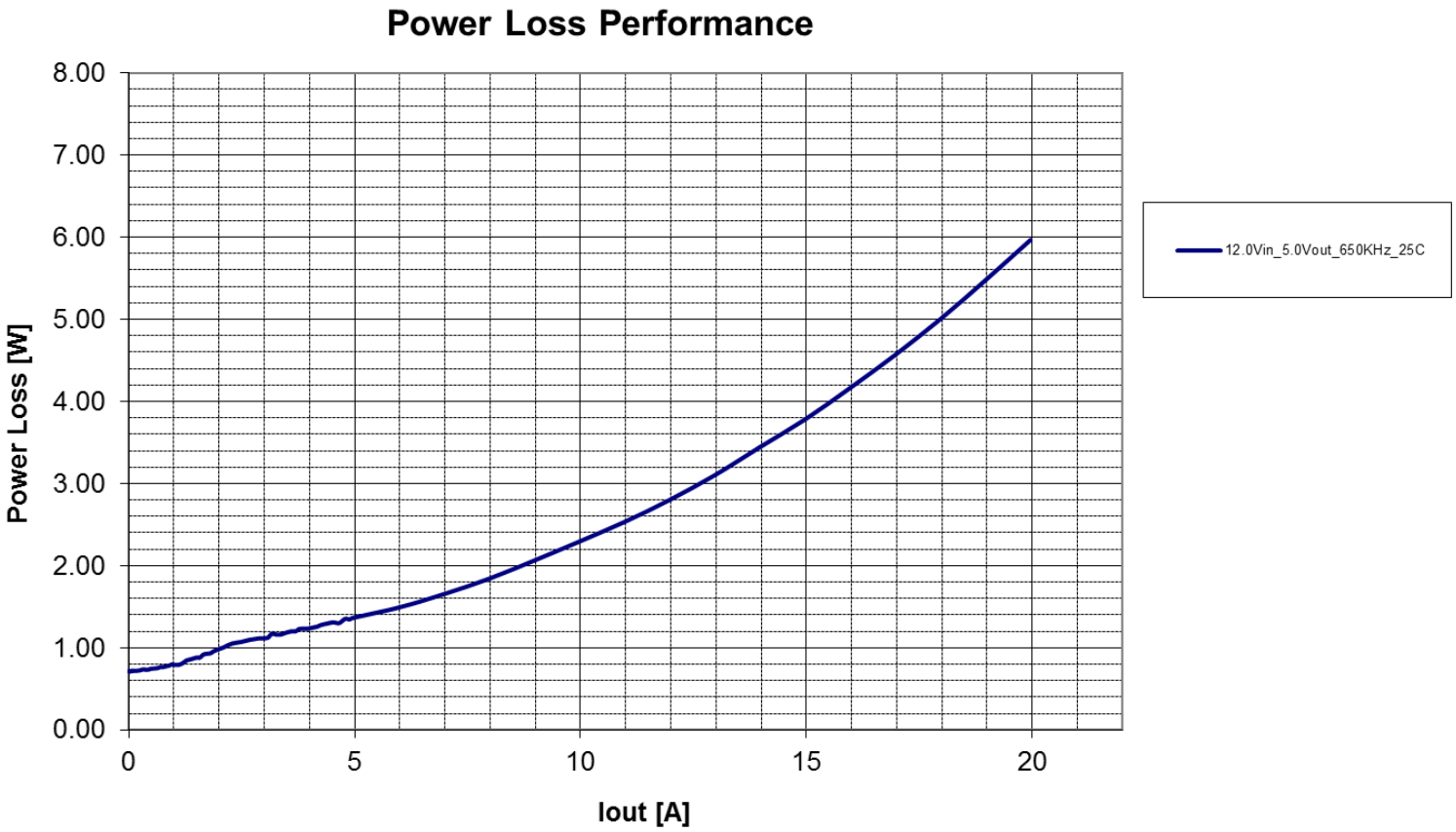
Frequency Performance



VOUT Load Regulation Performance

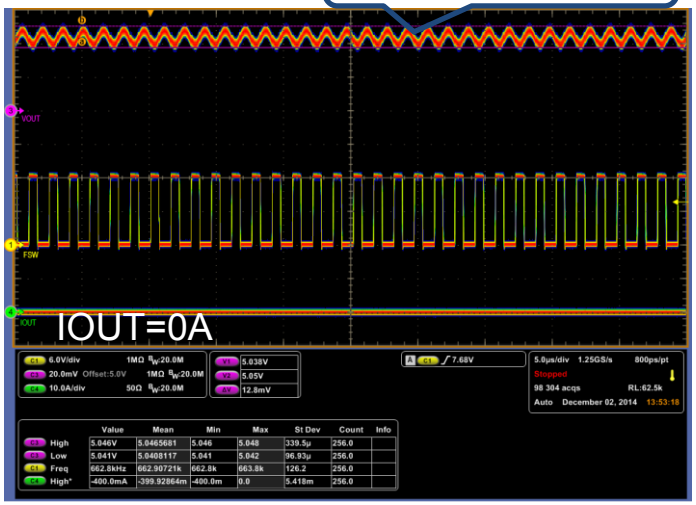


Power Loss Performance

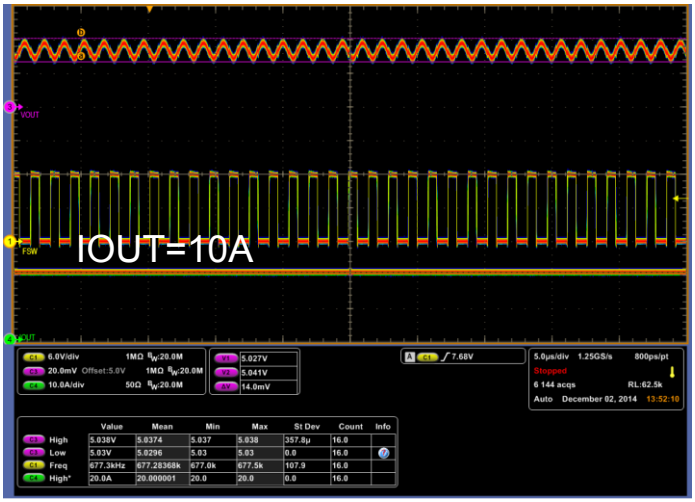


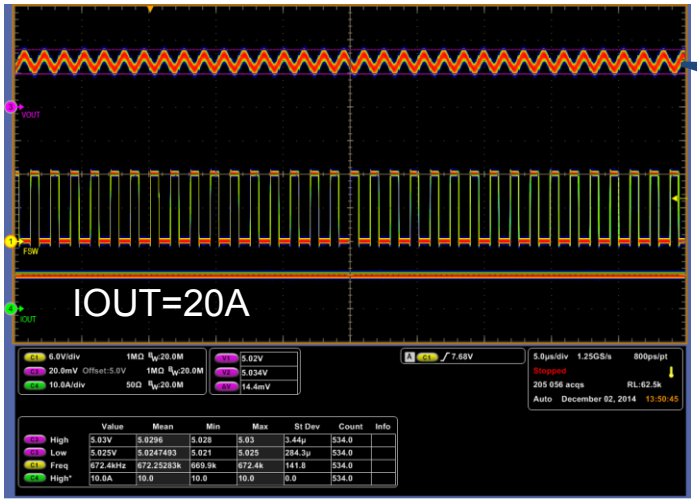
VOUT Ripple Test

VOUT_ripple=~12.8mV



VOUT_ripple=~14mV

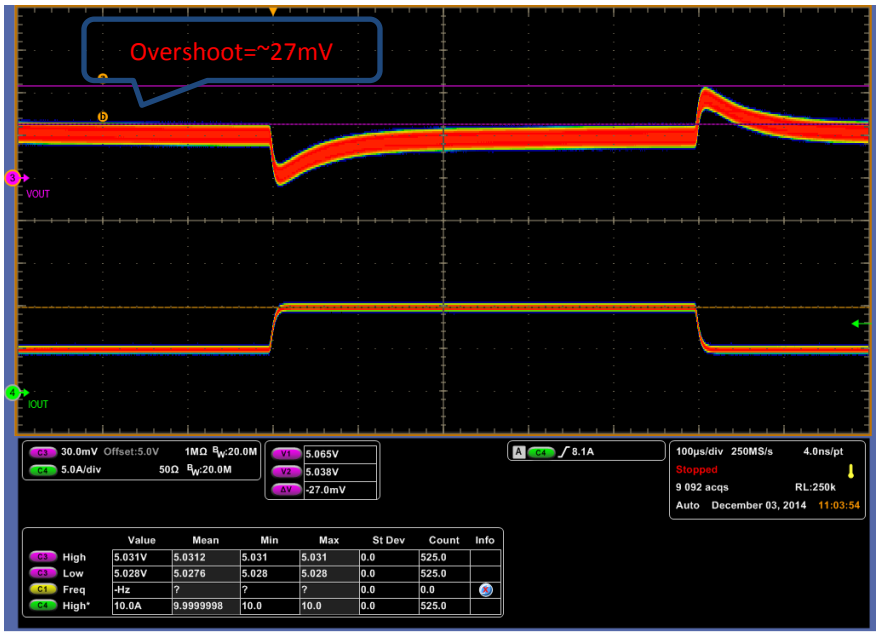


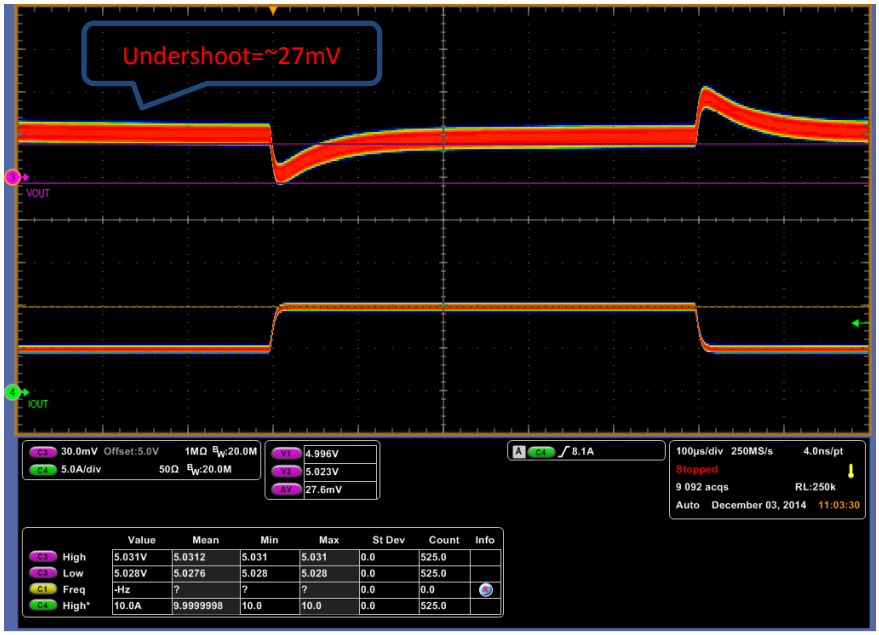


VOUT_ripple=~14mV

Under/Overshoot Measurements

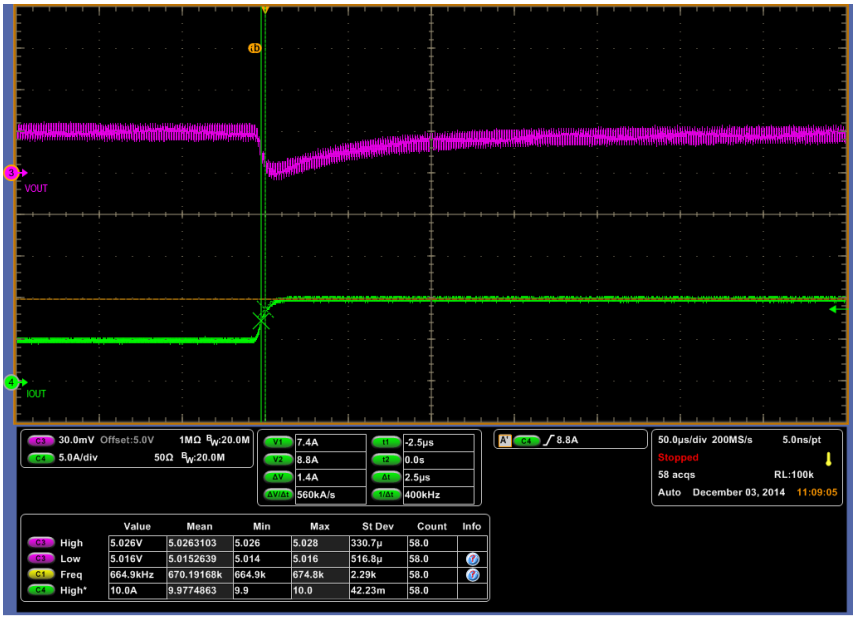
IOUT=5A to [10A@2.5A/us]

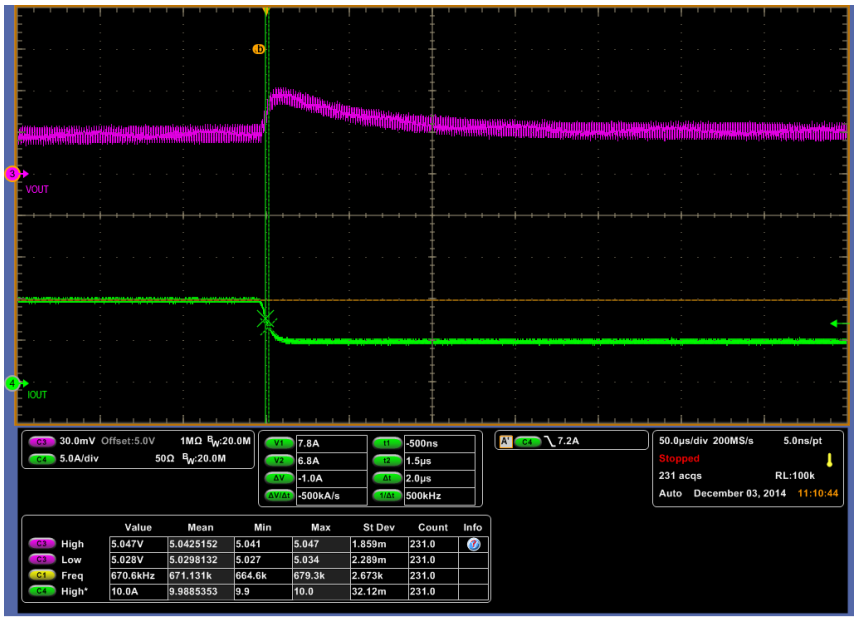




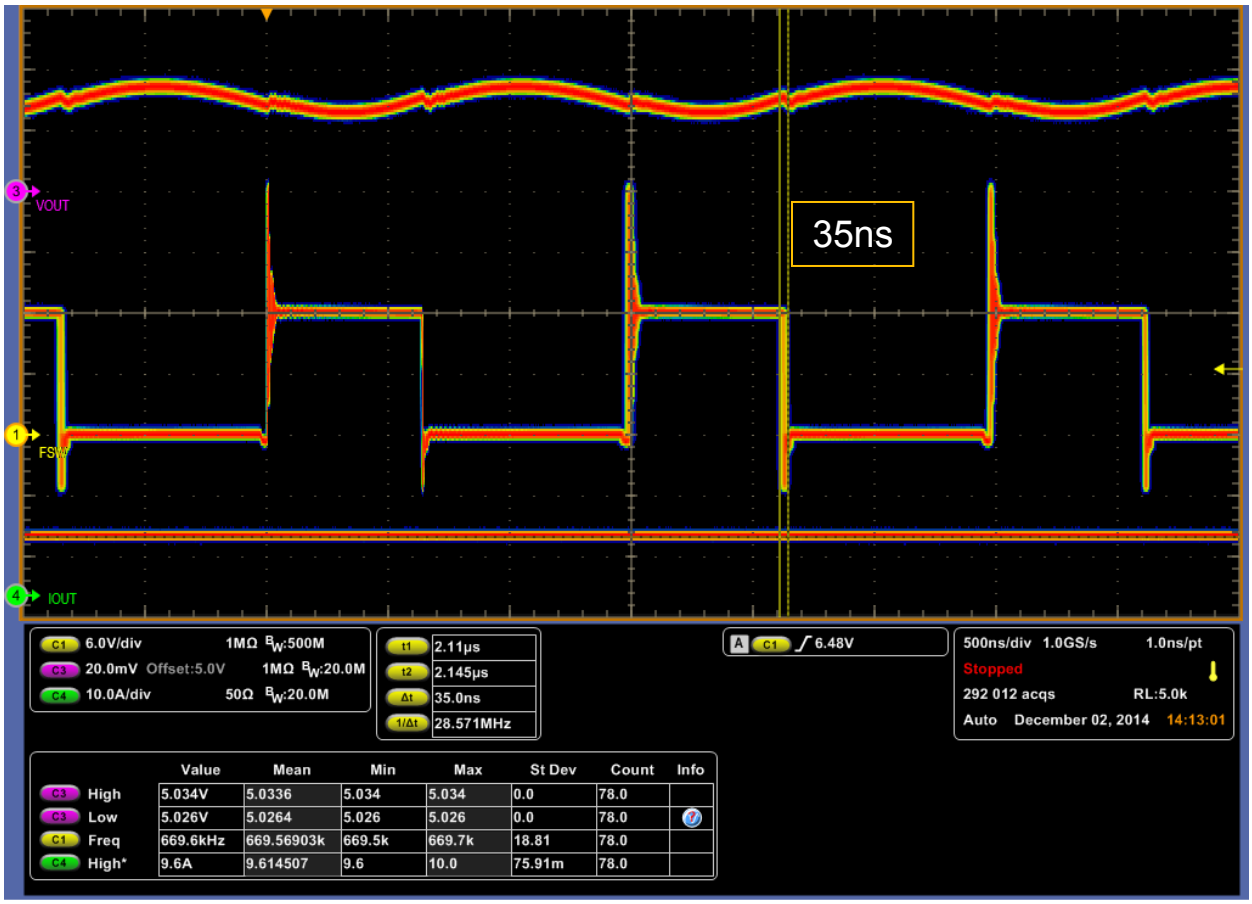
Transient Performance

IOUT=5A [to10A@2.5A/us]





Jitter Performance



IC Case Temperature

Vin=12V, Vout=5V, Amb=25◦C, Wait 10min					Vin=12V, Vout=3.3V, Amb=25◦C, Wait 10min				
Load (A)	Case Temp (◦C)				Load (A)	Case Temp (◦C)			
0	28.9				0	28.5			
5	33.1				5	32.7			
10	38.5				10	37.9			
15	46.7				15	45.8			
20	58.7				20	57.2			

Temperature

FLIR

Inspection Report

Report Date	12/3/2014

Company	Texas Instruments	**Customer**	
Address	1000 CentreGreen Way, Suite 100, Cary, NC 27513	**Site Address**	
Thermographer	A.S.	**Contact Person**	

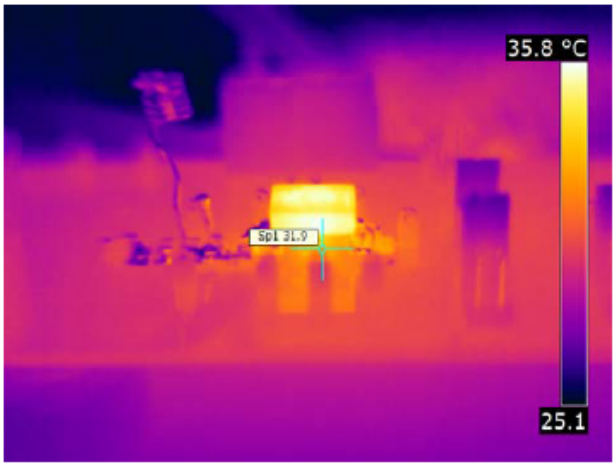


Image and Object Parameters		Text Comments
Camera Model	FLIR T300	**Due to location of the IC, the measurement data is just an estimate and may not be acurate**
Image Date	12/3/2014 4:42:33 PM	
Image Name	IR_0329.jpg	
Emissivity	0.98	
Reflected apparent temperature	25.0 °C	
Object Distance	0.8 ft	

Description
Vin=12V, Vout=5V, Iout=0A

Inspection Report

Report Date	12/3/2014

Company	Texas Instruments	**Customer**	
Address	1000 CentreGreen Way, Suite 100, Cary, NC 27513	**Site Address**	
Thermographer	A.S.	**Contact Person**	

Image and Object Parameters		Text Comments
Camera Model	FLIR T300	**Due to location of the IC, the measurement data is just an estimate and may not be acurate**
Image Date	12/3/2014 4:54:21 PM	
Image Name	IR_0330.jpg	
Emissivity	0.98	
Reflected apparent temperature	25.0 °C	
Object Distance	0.8 ft	

Description
Vin=12V, Vout=5V, Iout=10A

Inspection Report

Report Date	12/3/2014

Company	Texas Instruments	**Customer**	
Address	1000 CentreGreen Way, Suite 100, Cary, NC 27513	**Site Address**	
Thermographer	A.S.	**Contact Person**	

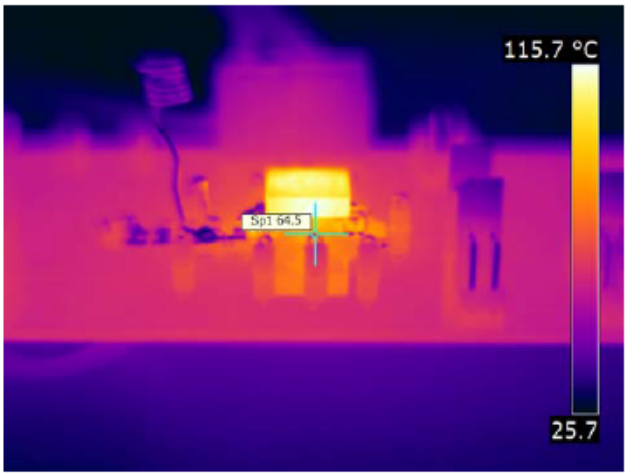


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Image Name	IR_0331.jpg	
Emissivity	0.98	
Reflected apparent temperature	25.0 °C	
Object Distance	0.8 ft	

Description
Vin=12V, Vout=5V, Iout=20A

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