

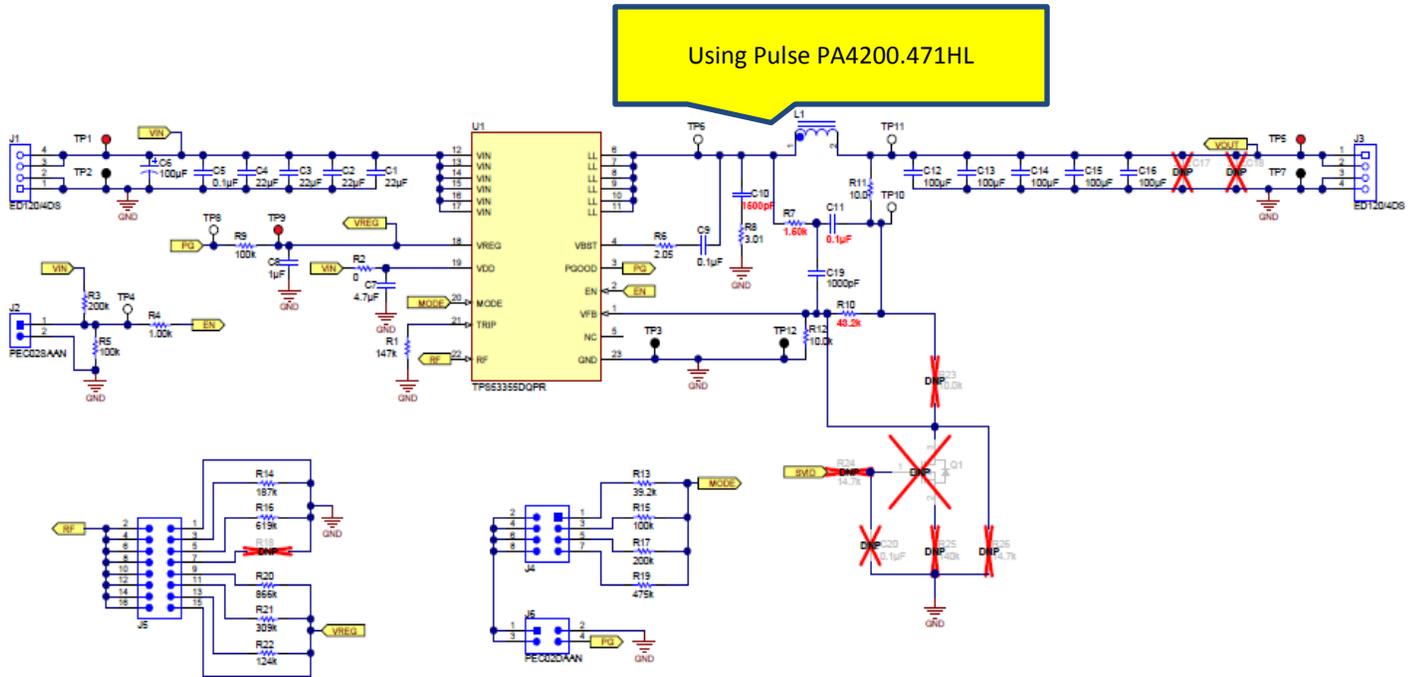
Description

The TPS53355 Inductor-On-Top Step-Down Buck Converter reference design enables reduction of X-Y area while enabling 92% efficiency at 3.3V output and 20A output current (66W Output Power) with only 5.6W of power loss and 11mV of output voltage ripple with only 4x100uF ceramic output caps. This power reference design supports a 12V input and 3.3V output at 20A and switches at 650 KHz.

TPS53355EVM Set up

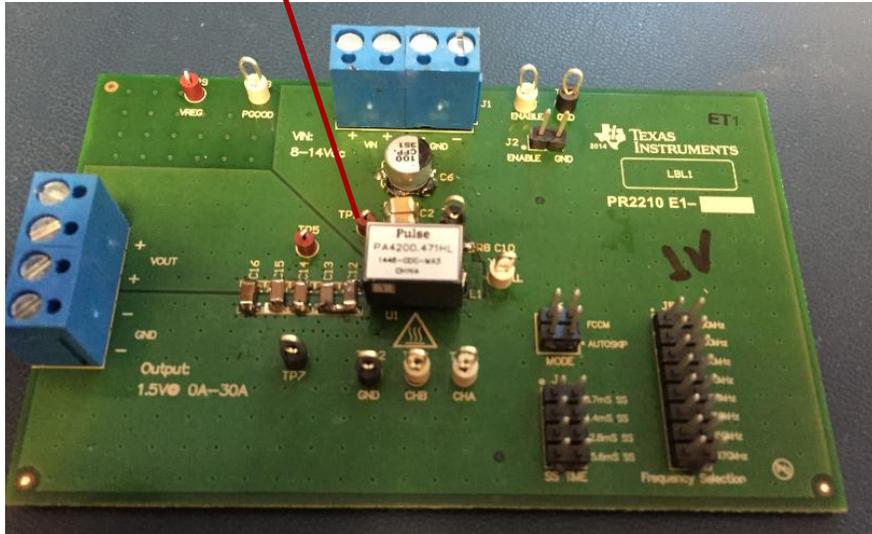
- **VIN=12V**
- **VOUT=3.3V**
- **IOUT=E-Load Dynamic-5A to 10A at ~2.5A/us & Static=10A**
- **COUT=4x100uF_Ceramic, 6.3V**
- **Inductor=Coilcraft_1uH_35A_4.5mΩ (XAL1030-102MEB)**
- **FREQ=650kHz**
- **Temperature=25C**

TPS53355 EVM Schematic



TPS53355 L-TOP Pictures

IC under the
Inductor



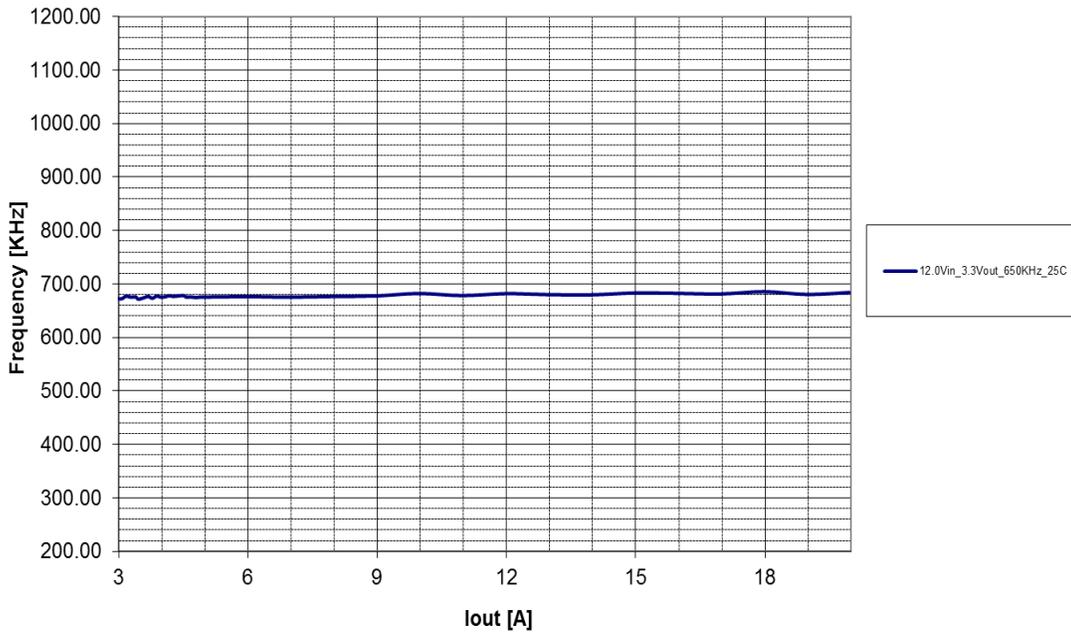
Efficiency Performance



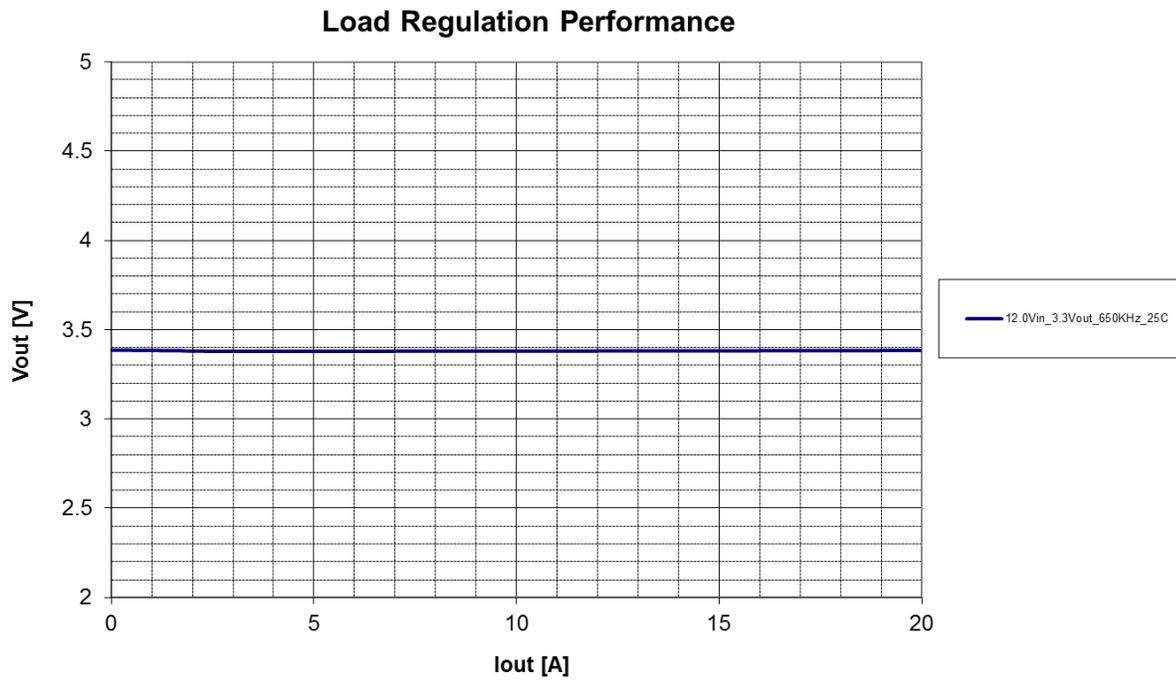
TIDA-00510 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint

Frequency Performance

Switching Frequency Performance

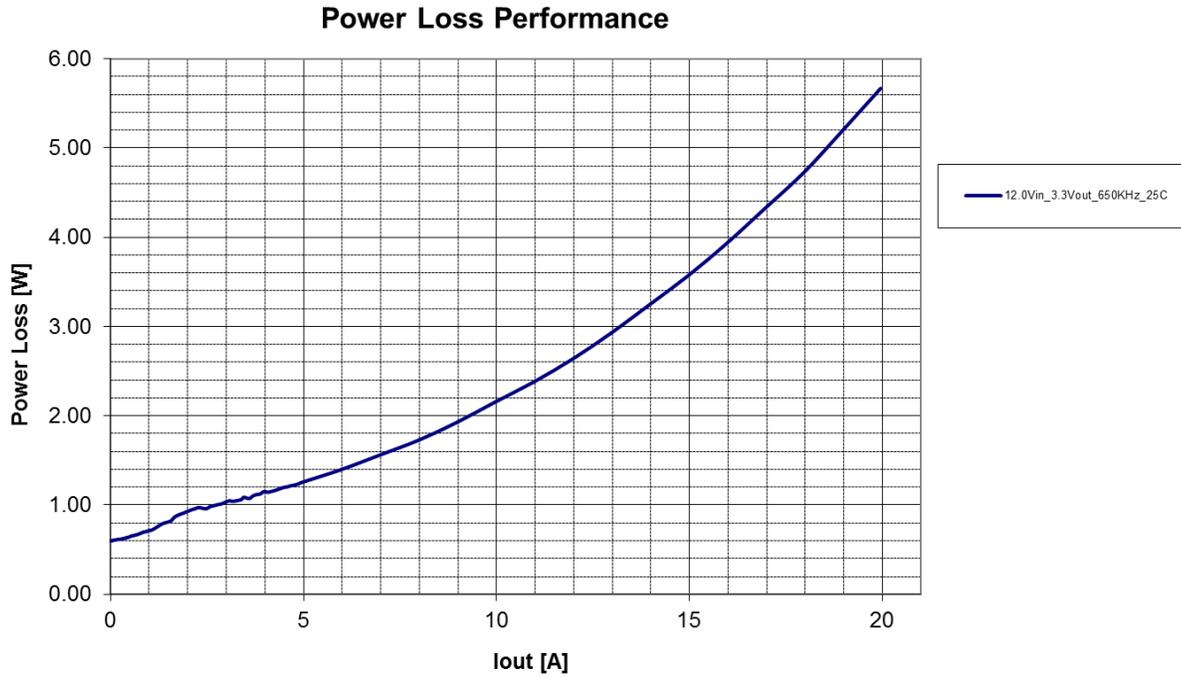


VOUT Load Regulation Performance



TIDA-00510 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint

Power Loss Performance



VOUT Ripple Test

VOUT_ripple= \sim 10mV



VOUT_ripple= \sim 10mV



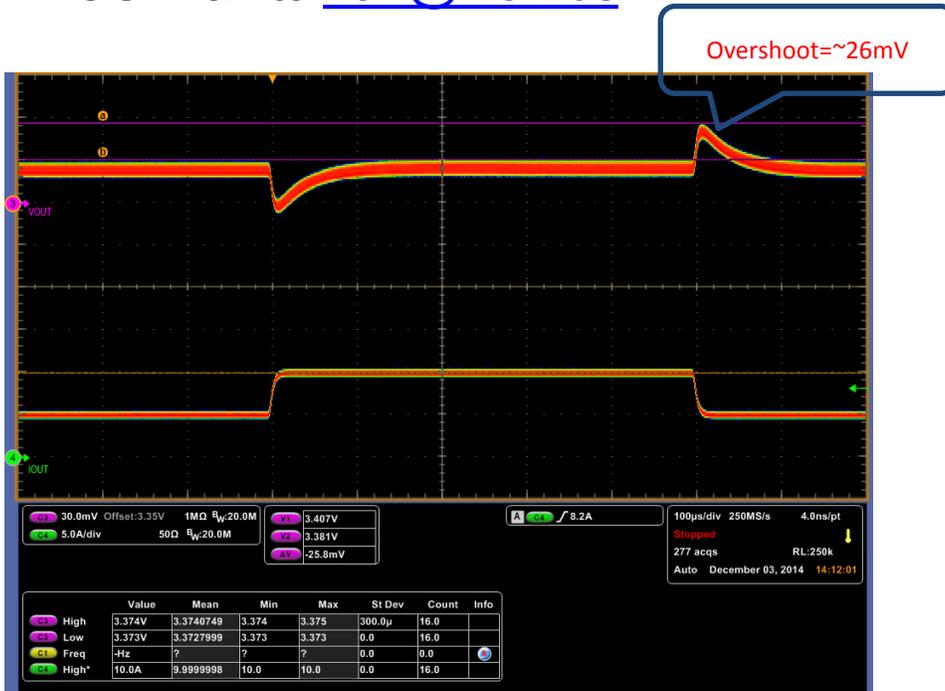
VOUT_ripple= \sim 11mV



TIDA-00510 Synchronous DC/DC Converter with Inductor on top of IC for Small Footprint

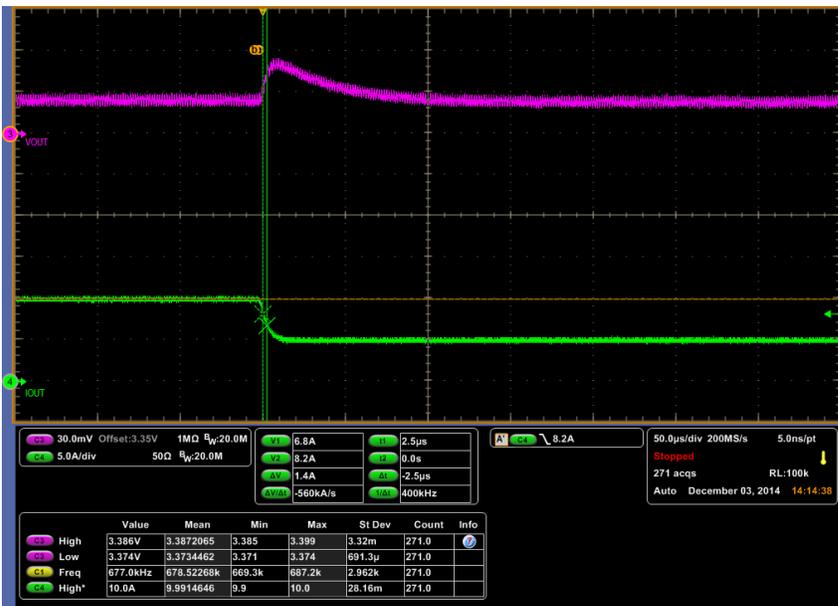
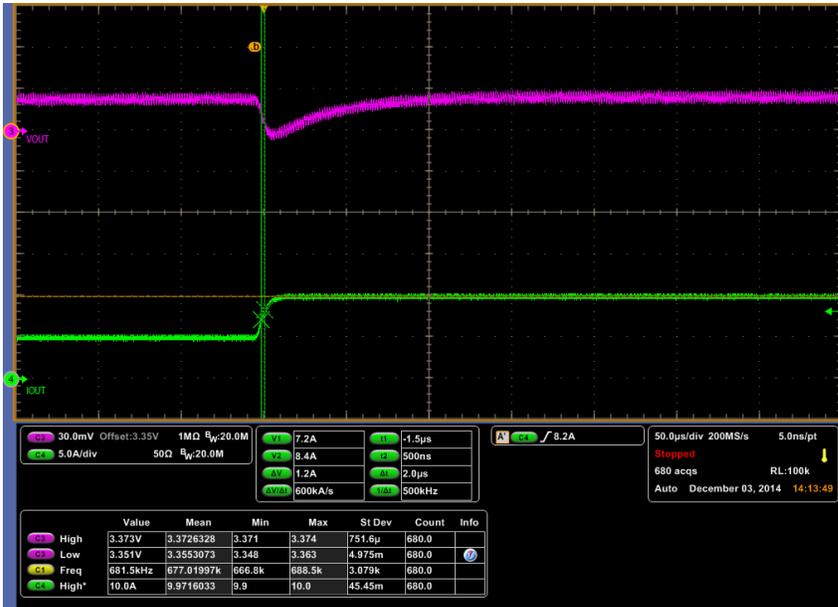
Under/Overshoot Measurements

IO_{UT}=5A to 10A@2.5A/us



Transient Performance

IO_{UT}=5A to 10A@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



Inspection Report

Report Date 12/3/2014

Company Texas Instruments
Address 1000 CentreGreen Way,
 Suite 100, Cary, NC
 27513

Customer
Site Address

Thermographer A.S.

Contact Person

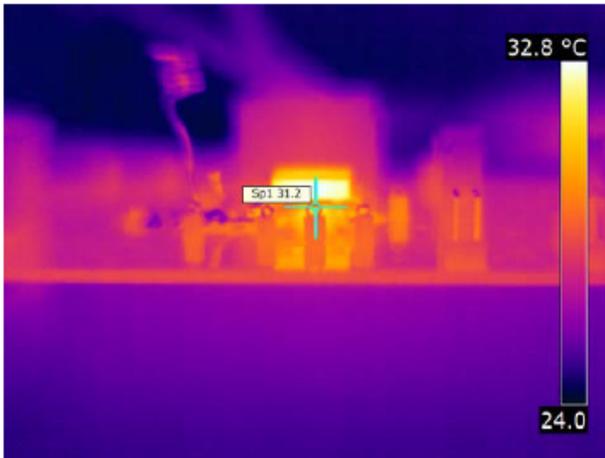


Image and Object Parameters

Camera Model FLIR T300

Text Comments

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

Image Date 12/3/2014 4:00:51 PM

Image Name IR_0326.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.8 ft

Description

Vin=12V, Vout=3.3V, Iout=0A



Inspection Report

Report Date 12/3/2014

Company Texas Instruments
Address 1000 CentreGreen Way,
 Suite 100, Cary, NC
 27513

Customer
Site Address

Thermographer A.S.

Contact Person



Image and Object Parameters

Camera Model FLIR T300

Text Comments

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

Image Date 12/3/2014 4:13:32 PM

Image Name IR_0327.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.8 ft

Description

Vin=12V, Vout=3.3V, Iout=10A



Inspection Report

Report Date 12/3/2014

Company Texas Instruments
Address 1000 CentreGreen Way,
 Suite 100, Cary, NC
 27513

Customer
Site Address

Thermographer A.S.

Contact Person



Image and Object Parameters

Camera Model FLIR T300

Text Comments

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

Image Date 12/3/2014 4:24:44 PM

Image Name IR_0328.jpg

Emissivity 0.98

Reflected apparent temperature 25.0 °C

Object Distance 0.8 ft

Description

Vin=12V, Vout=3.3V, Iout=20A

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