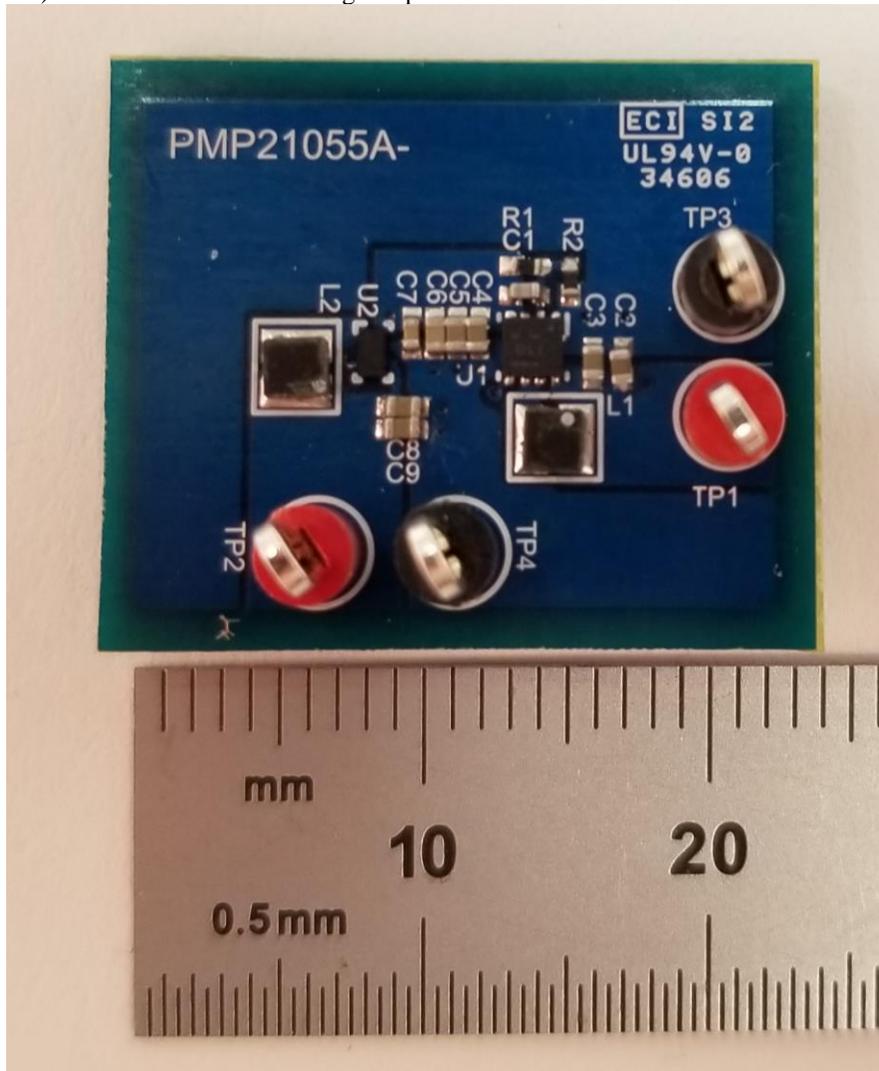




## 1 Board Photo

The image below shows PMP21055. This is a 0.8V-4.2V input boost+buck design producing 330mW (3.3V@100mA). The solution size excluding test points measures 10mm x6mm.



## 2 System Standby Power

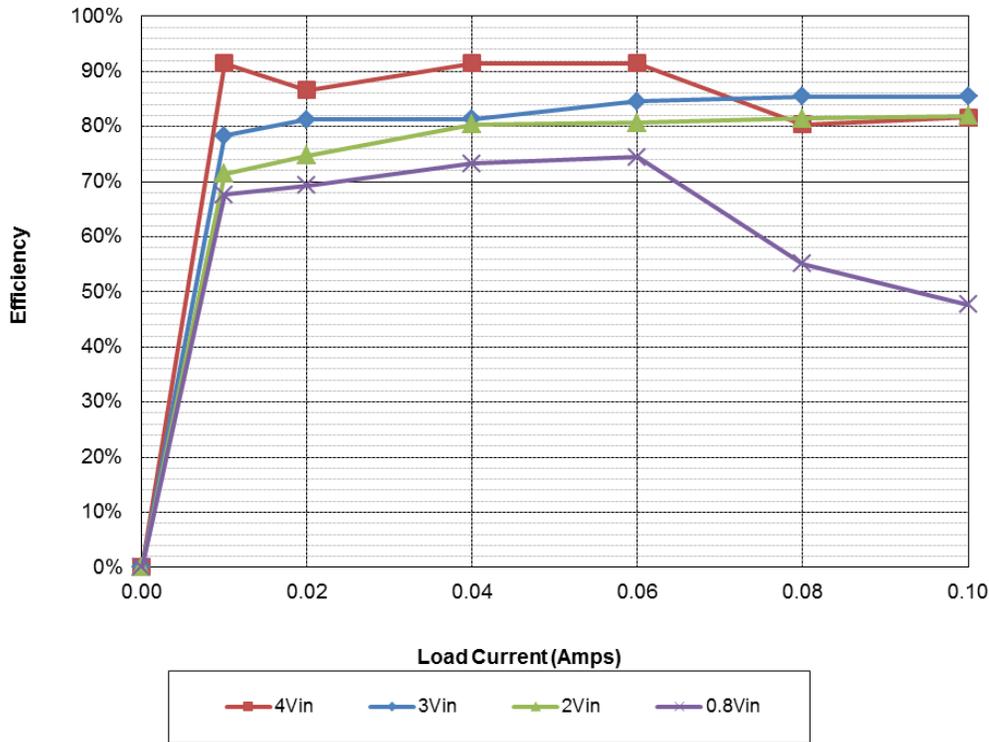
Vin	Standby current
4.0V	119 $\mu$ A



### 3 Efficiency

The following efficiency data was taken from TP1 and TP3 for input to TP2 and TP4 for output.

#### 3.1 Plot



lout	Vout	Vin	lin	Pin	Pout	Losses	Efficiency
0.000	3.305	4.0	0.00012	0.0005	0.00	0.00	0.0%
0.010	3.301	4.0	0.0090	0.0361	0.03	0.00	91.5%
0.020	3.299	4.0	0.019	0.0762	0.07	0.01	86.6%
0.040	3.297	4.0	0.036	0.1442	0.13	0.01	91.4%
0.060	3.296	4.0	0.054	0.2162	0.20	0.02	91.5%
0.080	3.296	4.0	0.082	0.3279	0.26	0.06	80.4%
0.100	3.296	4.0	0.101	0.4036	0.33	0.07	81.7%

lout	Vout	Vin	lin	Pin	Pout	Losses	Efficiency
0.000	3.305	3.0		0.0000	0.00	0.00	0.0%
0.010	3.301	3.0	0.0140	0.0421	0.03	0.01	78.3%
0.020	3.299	3.0	0.027	0.0812	0.07	0.02	81.2%
0.040	3.297	3.0	0.054	0.1622	0.13	0.03	81.3%
0.060	3.296	3.0	0.078	0.2339	0.20	0.04	84.5%
0.080	3.296	3.0	0.103	0.3085	0.26	0.04	85.5%
0.100	3.296	3.0	0.129	0.3858	0.33	0.06	85.4%

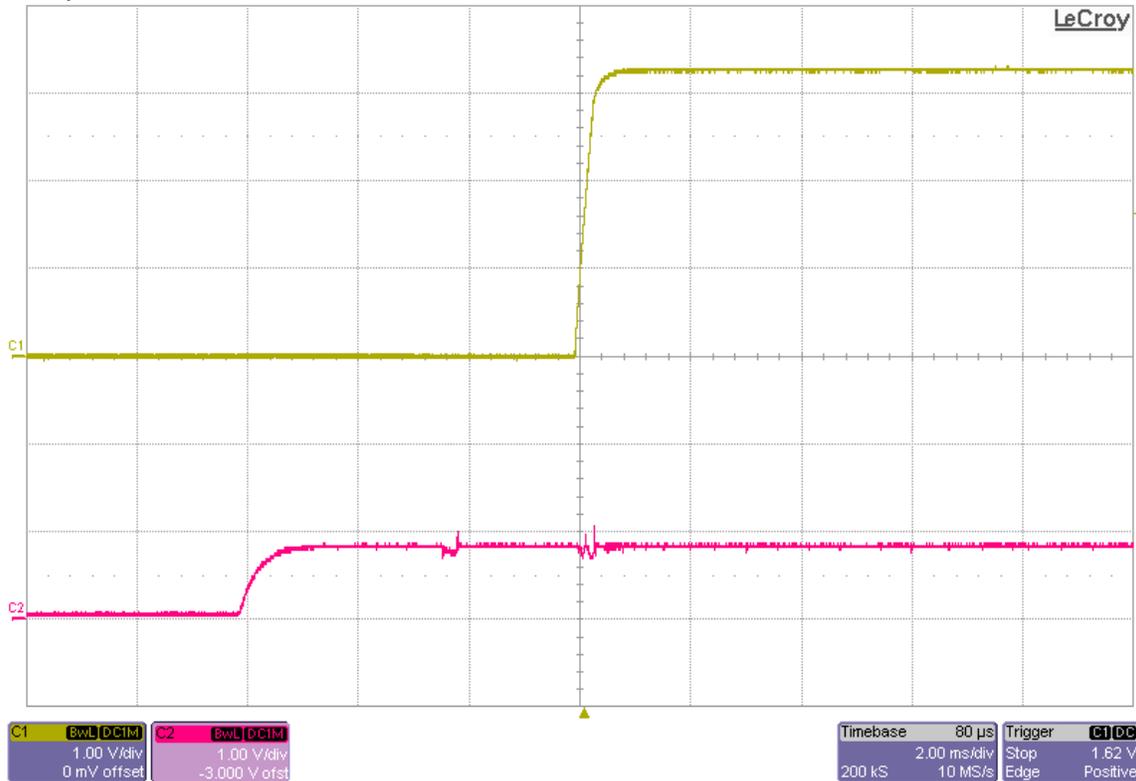


Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	3.305	2.0		0.0000	0.00	0.00	0.0%
0.010	3.301	2.0	0.0230	0.0462	0.03	0.01	71.4%
0.020	3.299	2.0	0.044	0.0883	0.07	0.02	74.8%
0.040	3.297	2.0	0.082	0.1640	0.13	0.03	80.4%
0.060	3.296	2.0	0.123	0.2451	0.20	0.05	80.7%
0.080	3.296	2.0	0.163	0.3239	0.26	0.06	81.4%
0.100	3.297	2.0	0.203	0.4021	0.33	0.07	82.0%

Iout	Vout	Vin	Iin	Pin	Pout	Losses	Efficiency
0.000	3.306	0.8		0.0000	0.00	0.00	0.0%
0.010	3.301	0.8	0.0610	0.0488	0.03	0.02	67.6%
0.020	3.300	0.8	0.119	0.0952	0.07	0.03	69.3%
0.040	3.297	0.8	0.225	0.1800	0.13	0.05	73.3%
0.060	3.297	0.8	0.332	0.2656	0.20	0.07	74.5%
0.080	3.297	0.8	0.598	0.4784	0.26	0.21	55.1%
0.100	3.299	0.8	0.863	0.6913	0.33	0.36	47.7%

### 4 Startup

The image below shows startup for the 0.8V case. Channel 2 is the Input and Channel 1 is the output of the total system.

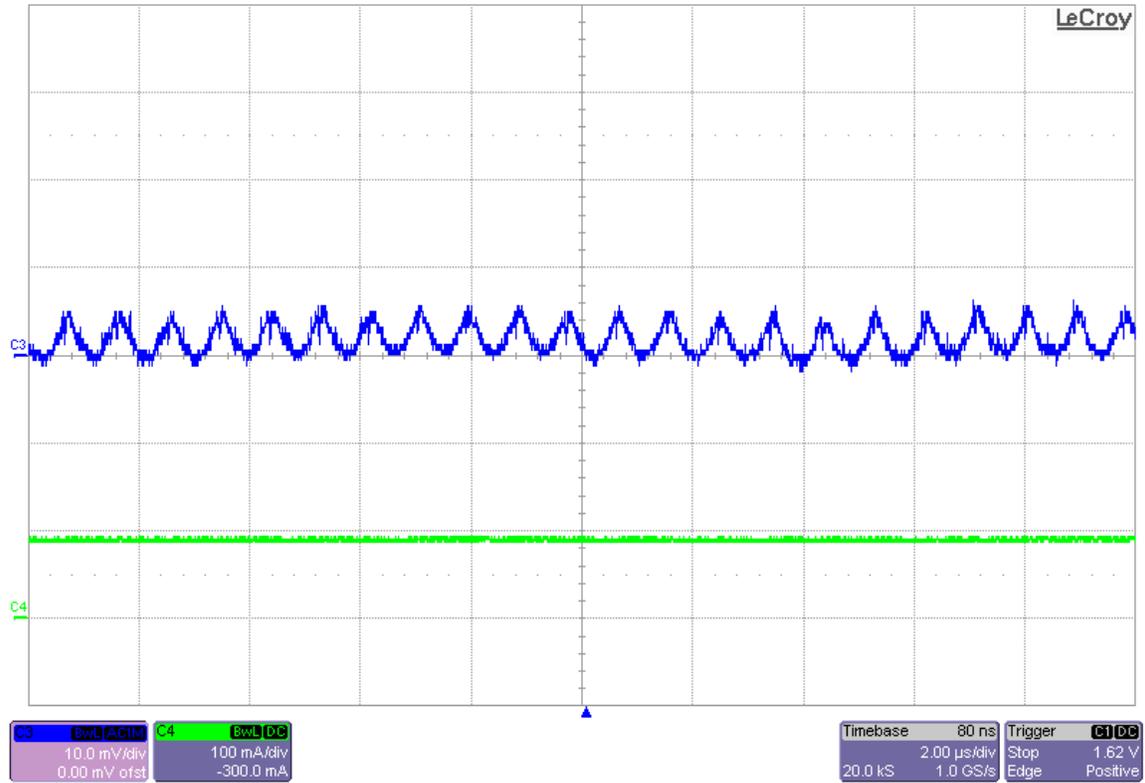




## 5 Output Ripple Voltage

The following image shows the output ripple at full load.

### 5.1 Output Ripple (3Vin, 100mA Load)

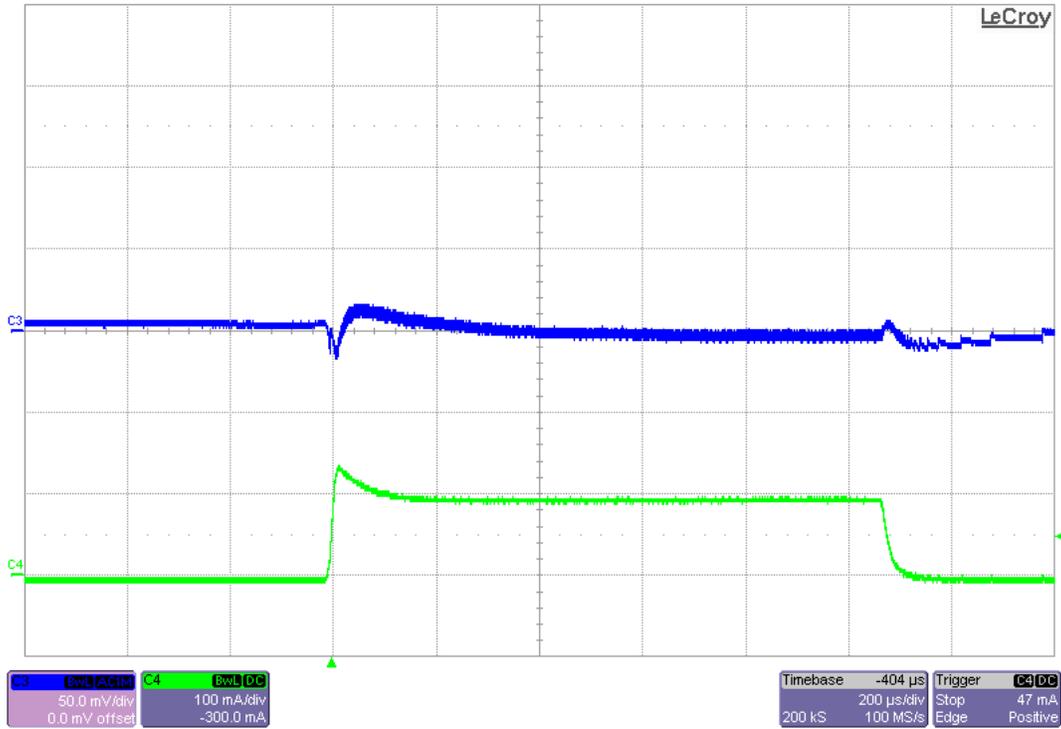




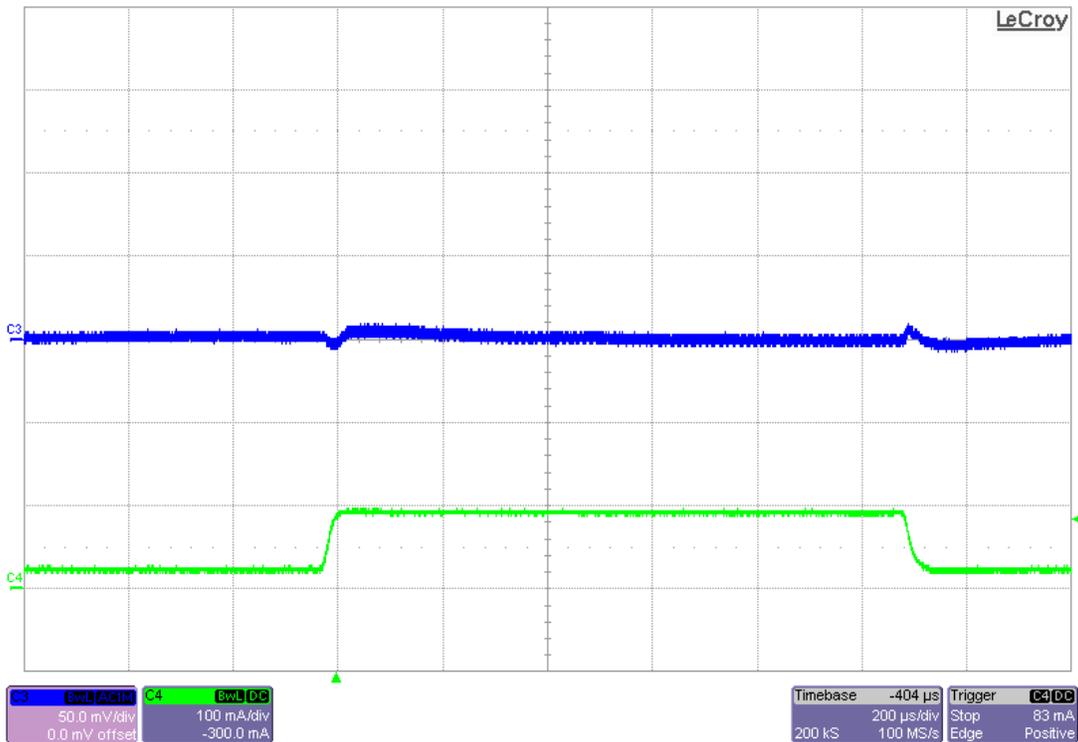
## 6 Load Transients

The following waveforms were taken with  $V_{in} = 3V$ .

### 6.1 3.3Vout, 0-100mA Load Step



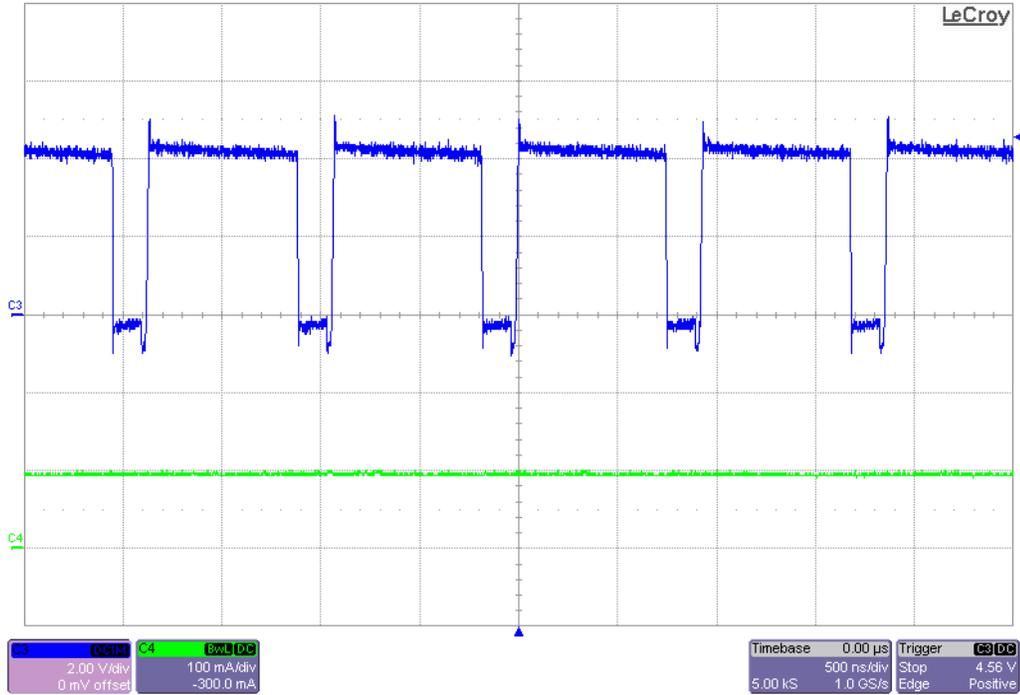
### 6.2 3.3Vout, 30mA-100mA Load step



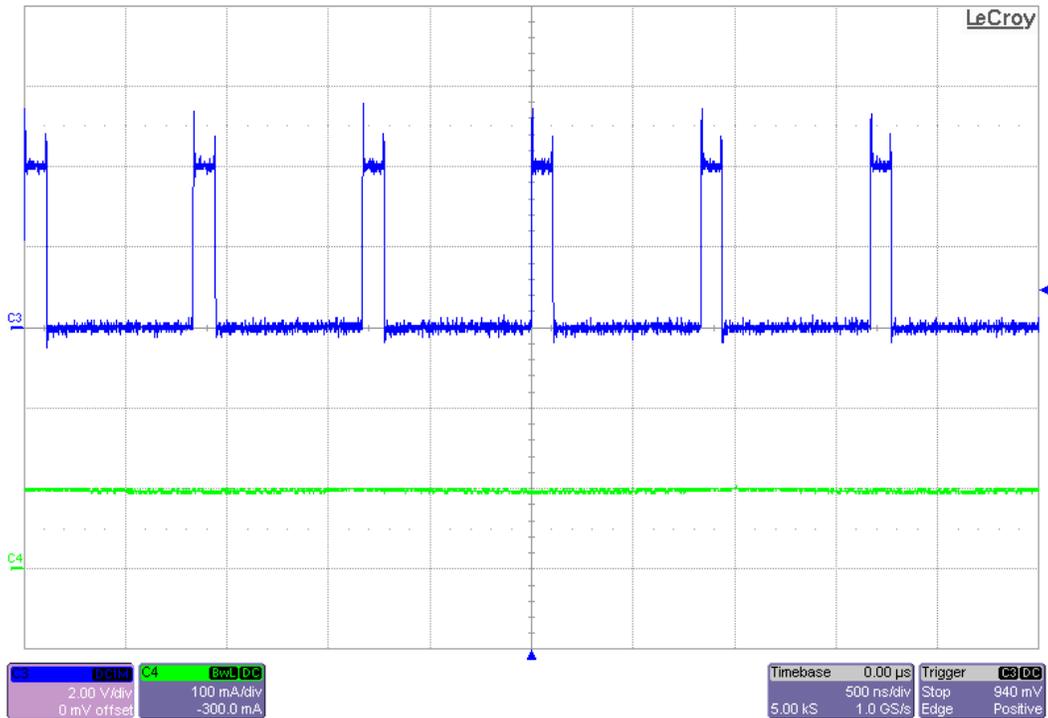


## 7 Switch Node Waveforms

### 7.1 Buck SW node at 4.2Vin, 100mA load



### 7.2 Boost SW node at 0.8Vin, 100mA load

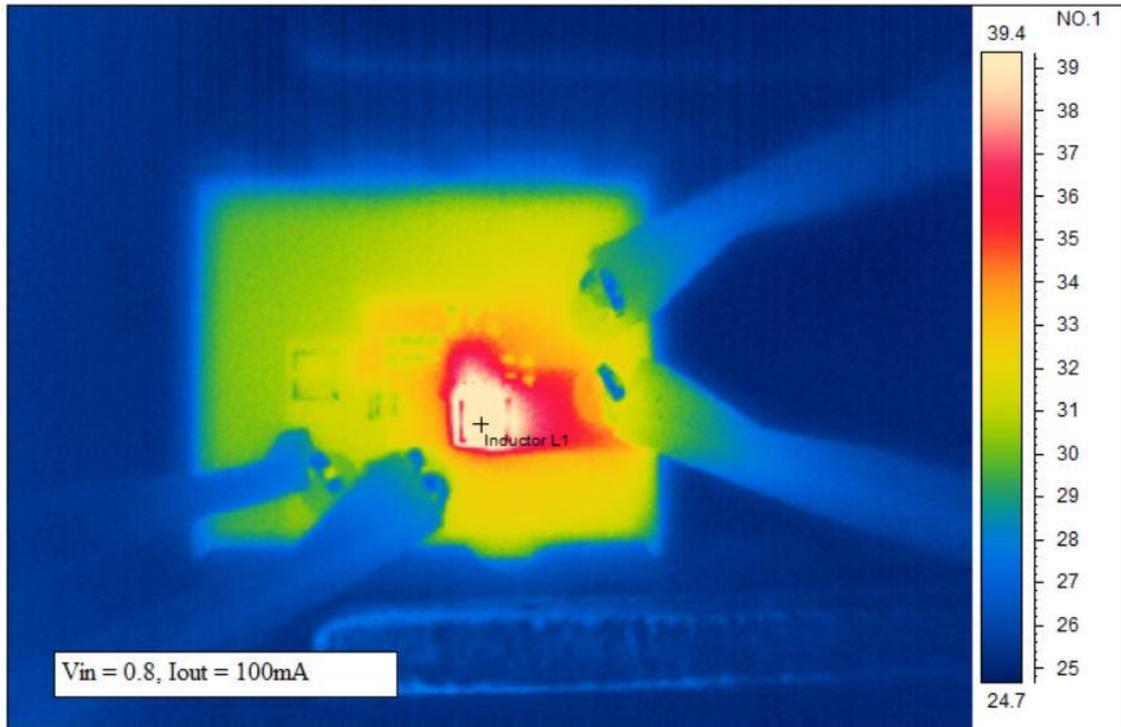




## 8 Thermal Images

These thermal images were taken after a 15 minute soak when fully loaded to 100mA.

### 8.1 0.8Vin



Spot analysis	Value	NO.1
Inductor L1 Temperature	48.1°C	

## IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (<https://www.ti.com/legal/termsofsale.html>) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2021, Texas Instruments Incorporated