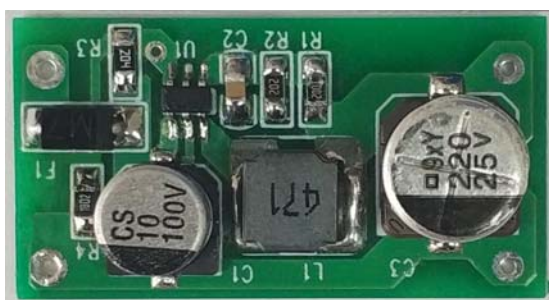


Subject
OB2106 Demo Board Manual

Board Model: AD12V0.2A2106.00

Doc. No.: OB_DOC_DBM_210600


Key features:

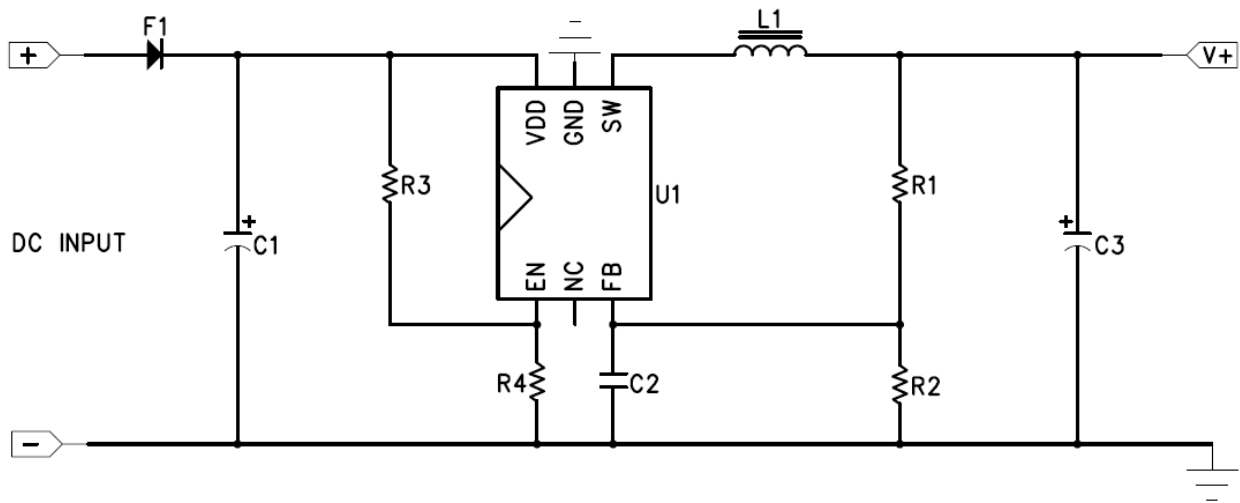
- Lowest possible component count
- Efficiency measured >75% at full load
- Good dynamic response
- Comprehensive protection including output short protection, OLP, etc.

Revision History

Revise Date	Version	Reason/Issue
2018/1/25	00	First issue

1. Board Information

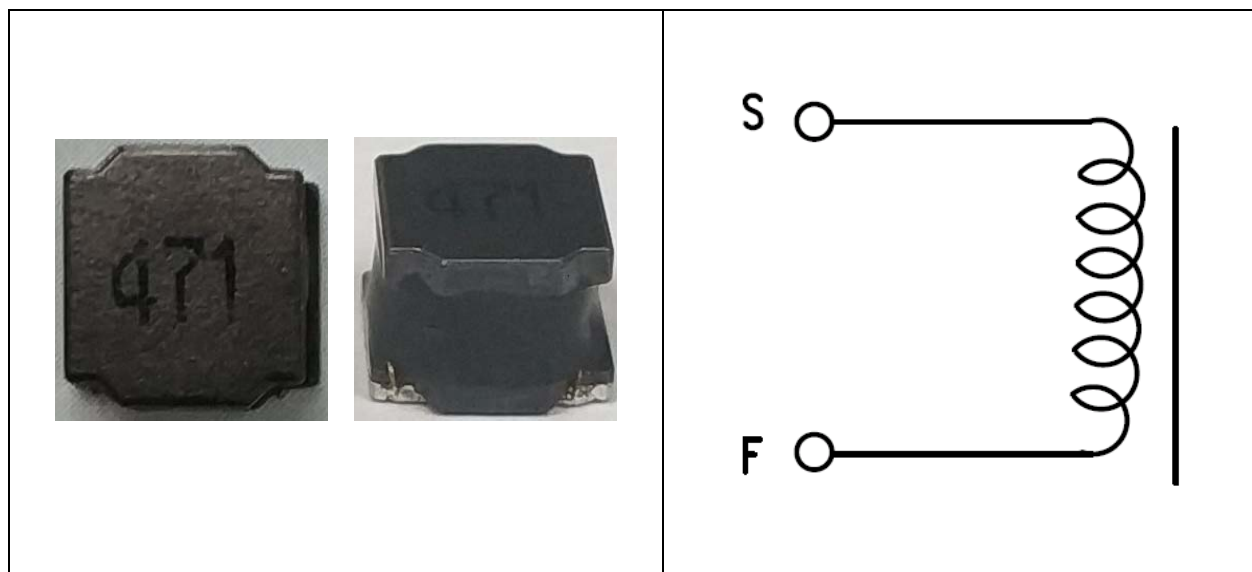
1.1. Board schematic



1.2. Component list

No.	Position	Description	Quantity
1	F1	Diode M7	1
2	C1	SMD E.C. 10uF /100V	1
3	C2	SMD C.C. 102P /50V /0805	1
4	C3	SMD E.C. 220uF /25V	1
5	R1	SMD RES 10K /1% /0805	1
6	R2	SMD RES 2K /1% /0805	1
7	R3	SMD RES 200K /5% /0805	1
8	R4	SMD RES 18K /5% /0805	1
9	U1	OB2106 SOT23-6	1
10	L1	Inductor 470uH	1
	Total		11

1.3. Inductor design



1、Core size: 6mm (L) X6mm (W) X4.5mm (H)

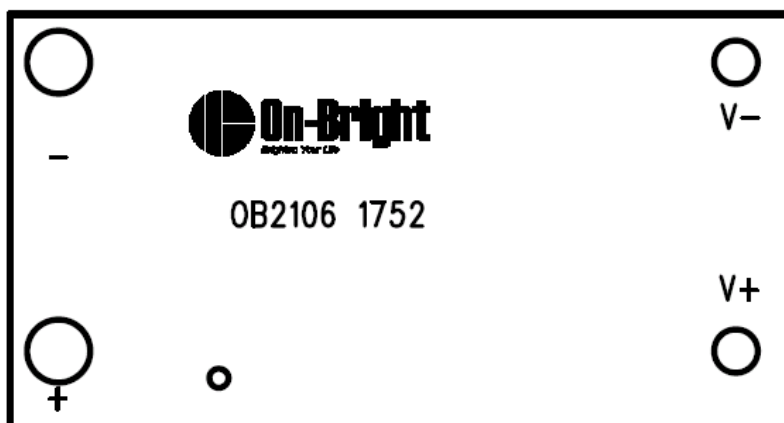
2、L= 470uH (at:10KHz, 1V)

Material	Turns	Inductance & Tolerance
Φ0.13 *1 2UEW	122	470uH ± 10%

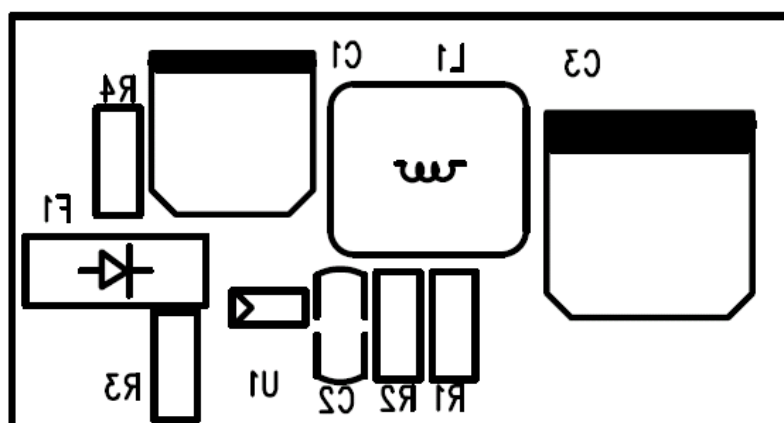
1.4.PCB Gerber File



Top

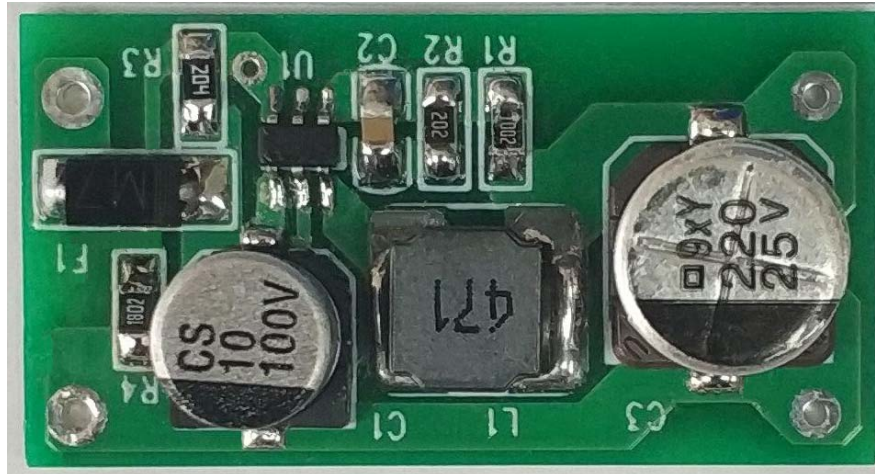


Bottom



Silkscreen Top

1.5. Snapshot



2. Converter Specification

2.1. Input Characteristics

- DC input voltage range 18Vdc - 75Vdc

2.2. Output Characteristics

- Output voltage V_{OUT} 12Vdc
- Output current I_{OUT} 200mA
- Output power 2.4W

2.3. Performance Function

- Efficiency >75%
- Ripple & Noise <150mV

2.4. Protection Function

- Short Circuit Protection Output shut down with auto-restart
- Over Load Protection Output shut down with auto-restart

3. Performance Evaluation

3.1. Efficiency

Input voltage	load 200mA	Spec	Remark
18Vdc	84.1	>75%	Pass
30Vdc	85.6		Pass
45Vdc	84.5		Pass
60Vdc	83.0		Pass
75Vdc	79.8		Pass

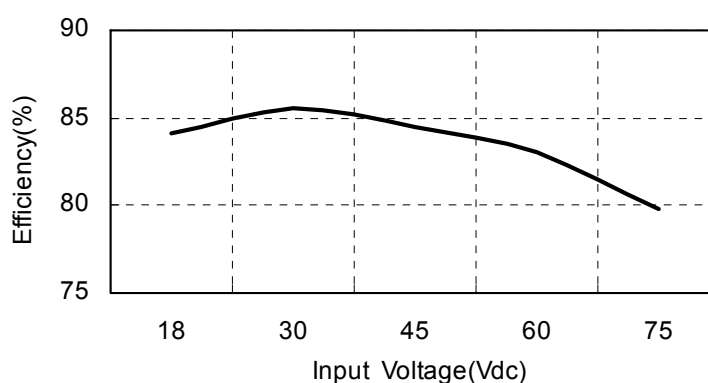


Figure 1. Efficiency @200mA load

3.2. Output Voltage

Input voltage	0mA	100mA	200mA	Spec	Remark
18Vdc	12.47	12.43	12.40	11~13V	Pass
30Vdc	12.47	12.43	12.41		Pass
45Vdc	12.45	12.43	12.40		Pass
60Vdc	12.44	12.42	12.39		Pass
75Vdc	12.43	12.41	12.38		Pass

3.3. Dynamic (Figure 2&3)

Input voltage	V _{OUT-MAX} (V)	V _{OUT-MIN} (V)	Spec	Remark
18Vdc	12.62	12.26	11~13V	Pass
30Vdc	12.59	12.26		Pass
45Vdc	12.58	12.26		Pass
60Vdc	12.56	12.26		Pass
75Vdc	12.54	12.26		Pass

Note: A dynamic loading with low load set at 0mA lasting for 5ms and high set at 200mA lasting for 5ms is added to output. The ramp is set at 0.25A/us at transient.

3.4. Over Current Protection & Recovery

Input voltage	OCP (mA)	Recovery (mA)	Spec	Remark
18Vdc	230	228	≥200mA	Pass
30Vdc	228	225		Pass
45Vdc	227	222		Pass
60Vdc	226	221		Pass
75Vdc	228	223		Pass

3.5. Ripple & Noise (Figure 4-7)

Input voltage	No load (mV)	Full load (mV)	Spec	Remark
18Vdc	103	110	<150mV	Pass
30Vdc	87	80		Pass
45Vdc	78	75		Pass
60Vdc	75	72		Pass
75Vdc	71	61		Pass

3.6. Waveforms

Figure 2: 18Vdc, 0-200mA load

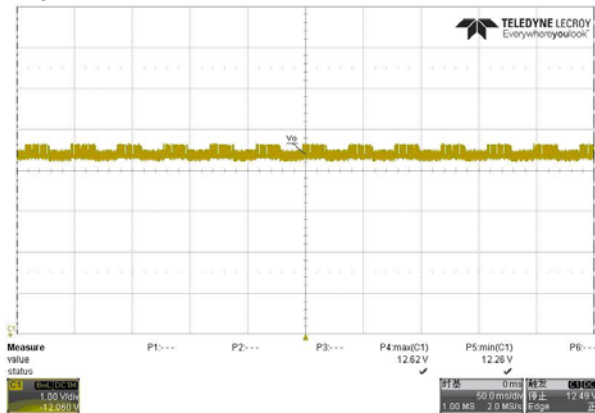


Figure 3: 75Vdc, 0-200mA load

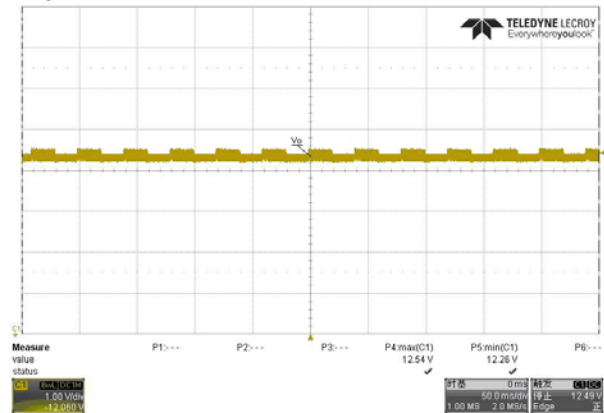


Figure 4: 18Vdc, no- load

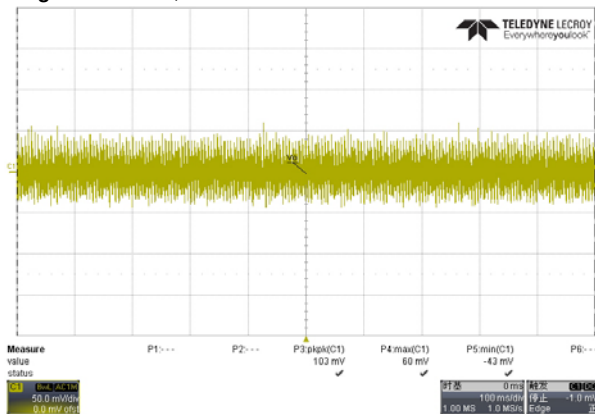


Figure 5: 18Vdc, full load

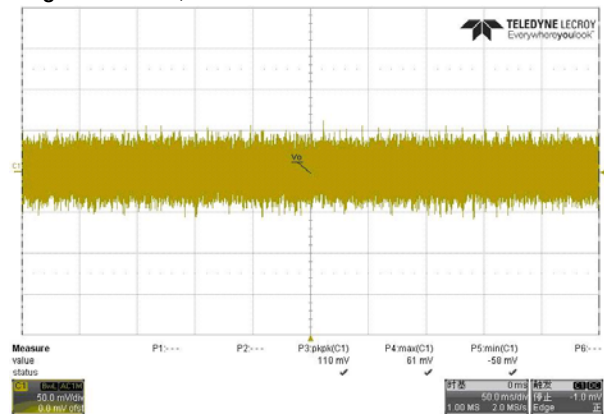


Figure 6: 75Vdc, no- load

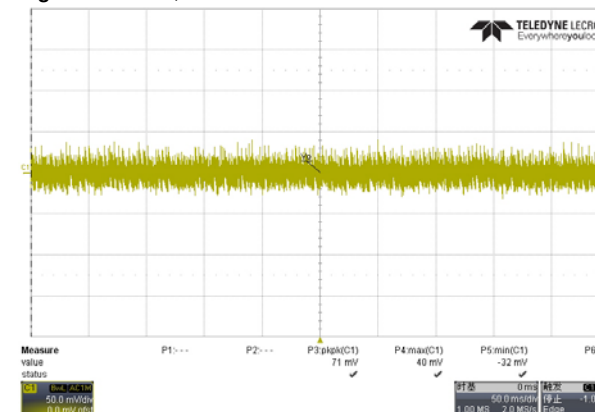


Figure 7: 75Vdc, full load

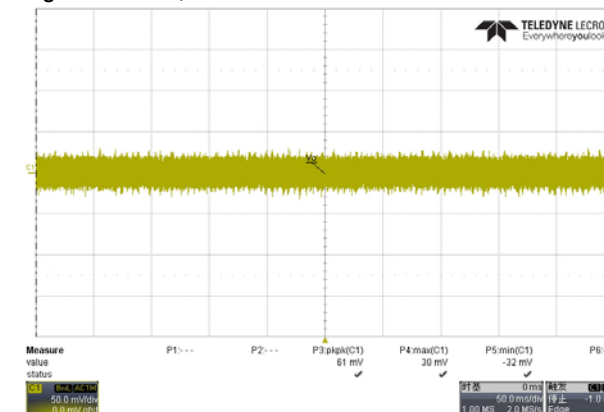
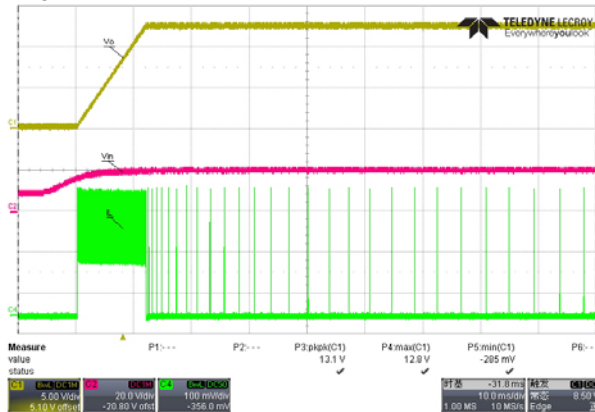
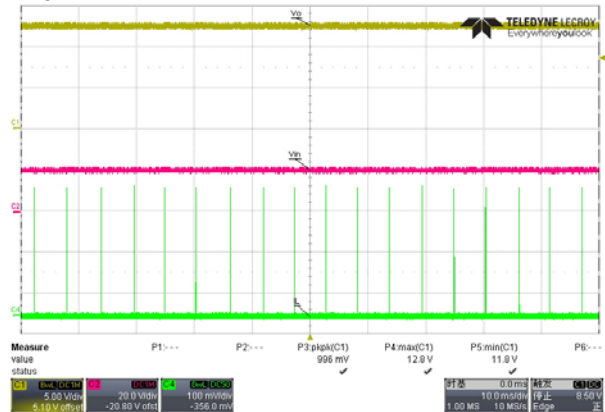


Figure 8: 18Vdc, start at no-load



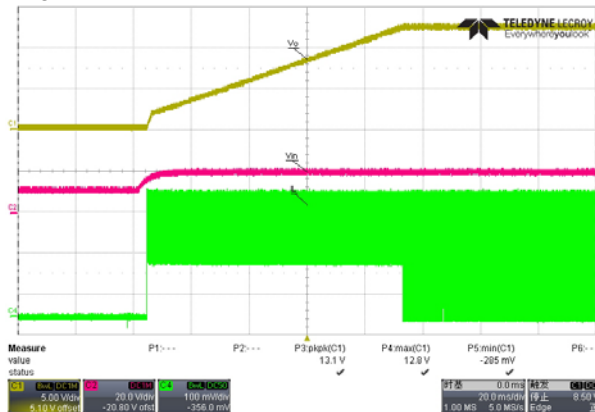
CH1: V_{out} CH2: V_{in} CH4: $I_{Inductor}$
 18V 直流输入, 空载启动波形

Figure 9: 18Vdc, no-load



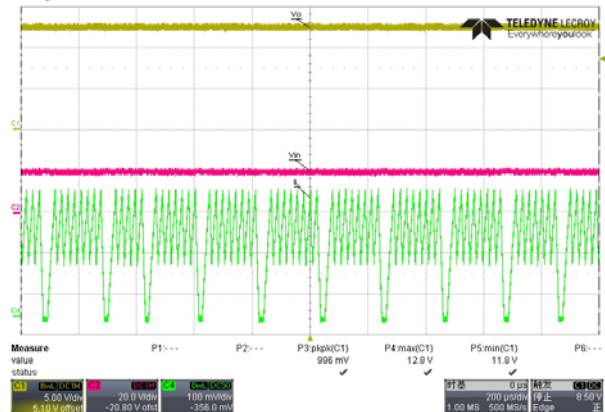
CH1: V_{out} CH2: V_{in} CH4: $I_{Inductor}$
 18V 直流输入, 空载正常工作波形

Figure 10: 18Vdc, start at full load



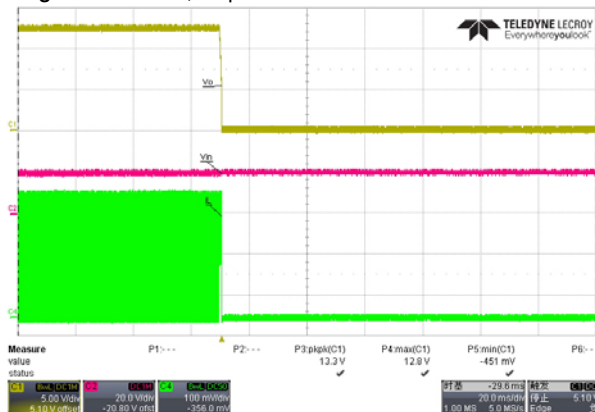
CH1: V_{out} CH2: V_{in} CH4: $I_{Inductor}$
 18V 直流输入, 满载启动波形

Figure 11: 18Vdc, full load



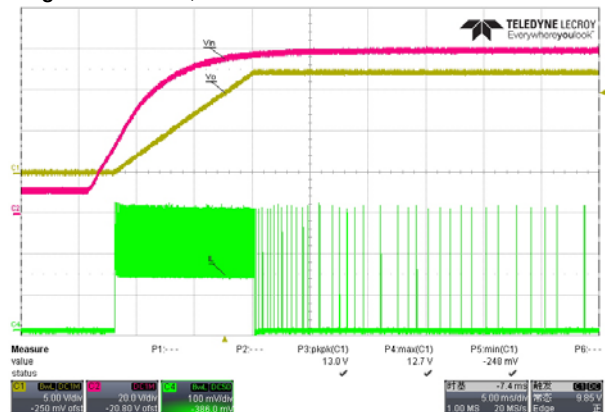
CH1: V_{out} CH2: V_{in} CH4: $I_{Inductor}$
 18V 直流输入, 满载正常工作波形

Figure 12: 18Vdc, output short to GND



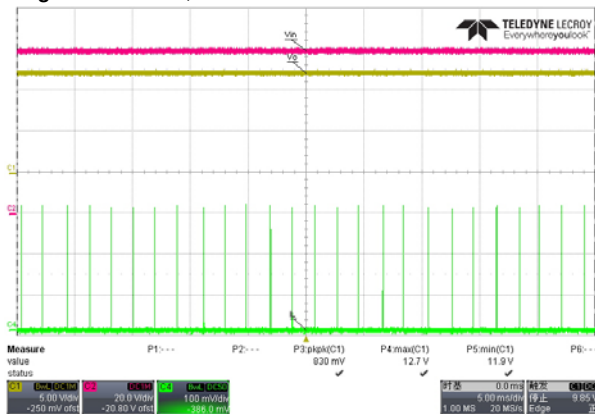
CH1: V_{out} CH2: V_{in} CH4: $I_{Inductor}$
 18V 直流输入, 输出短路

Figure 13: 75Vdc, start at no-load



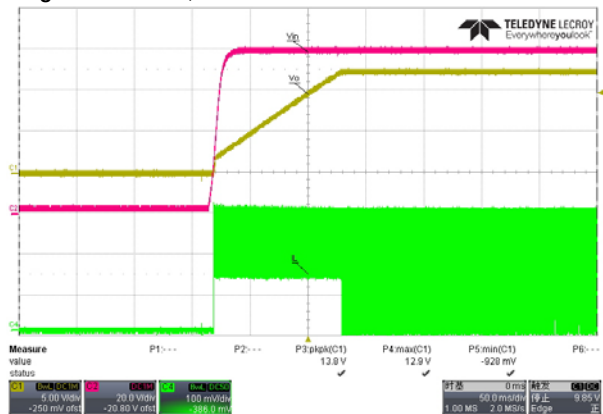
CH1: V_{out} CH2: V_{in} CH4: $I_{Inductor}$
 75V 直流输入, 空载启动波形

Figure 14: 75Vdc, no-load



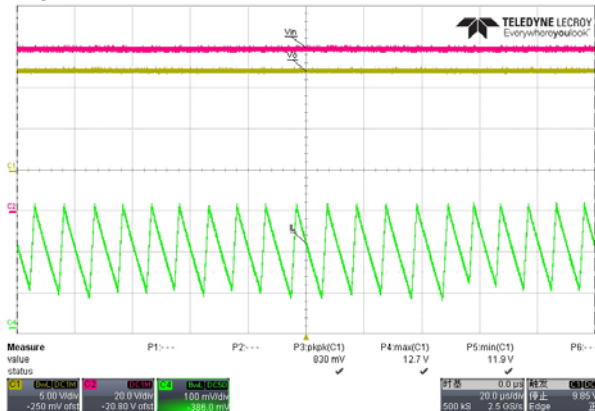
CH1: V_{out} CH2: V_{in} CH4: $I_{inductor}$
 75V 直流输入, 空载正常工作波形

Figure 15: 75Vdc, start at full load



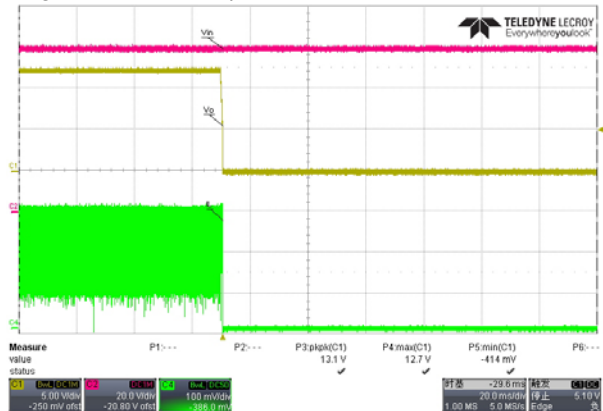
CH1: V_{out} CH2: V_{in} CH4: $I_{inductor}$
 75V 直流输入, 满载启动波形

Figure 16: 75Vdc, full load



CH1: V_{out} CH2: V_{in} CH4: $I_{inductor}$
 75V 直流输入, 满载正常工作波形

Figure 17: 75Vdc, output short to GND



CH1: V_{out} CH2: V_{in} CH4: $I_{inductor}$
 75V 直流输入, 输出短路

3.7. Thermal Test

Figure 18: 18Vdc input, 200mA load

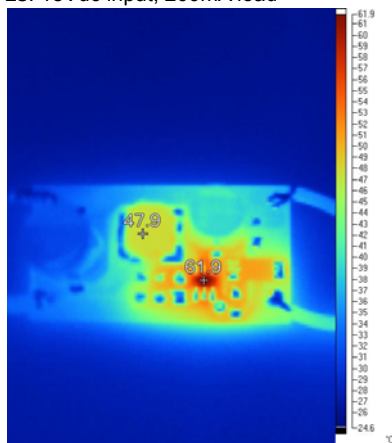
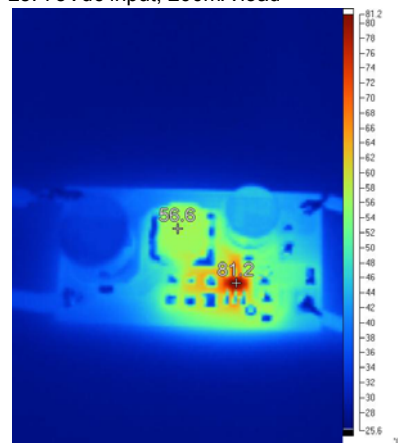


Figure 19: 75Vdc input, 200mA load



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