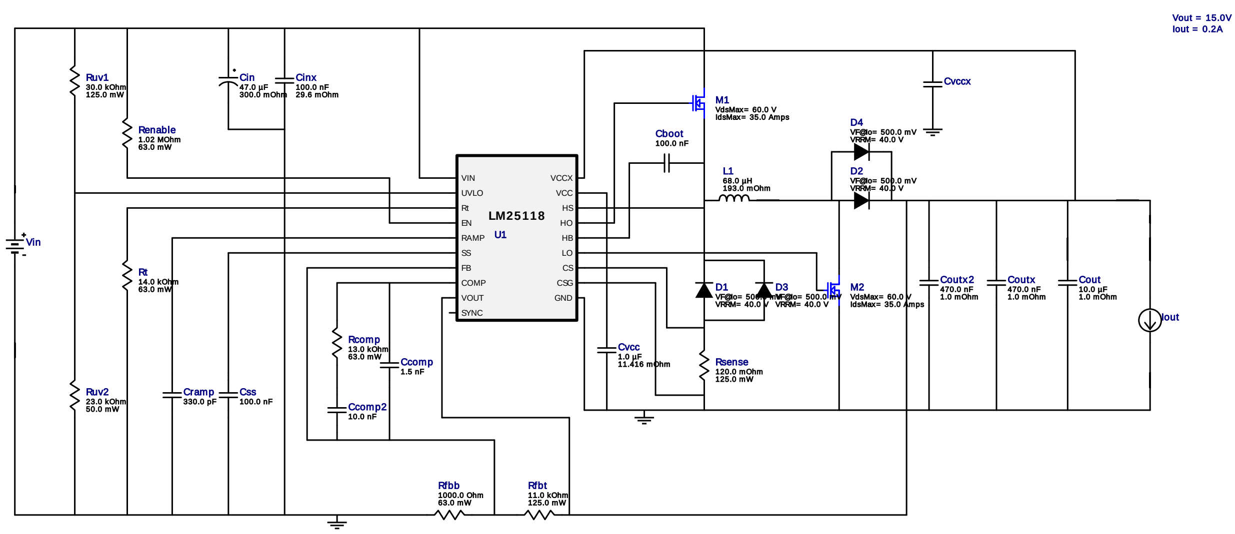
VinMin = 3.5V
VinMax = 29.0V
Vout = 15.0V
Iout = 0.2A

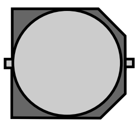
Device = LM25118MH/NOPB
Topology = Buck_Boost
Created = 2018-10-23 01:26:30.960
BOM Cost = NA
BOM Count = 27
Total Pd = 0.85W

WEBENCH ® Design Report

Design : 44 LM25118MH/NOPB
LM25118MH/NOPB 3.5V-29V to 15.00V @ 0.2A

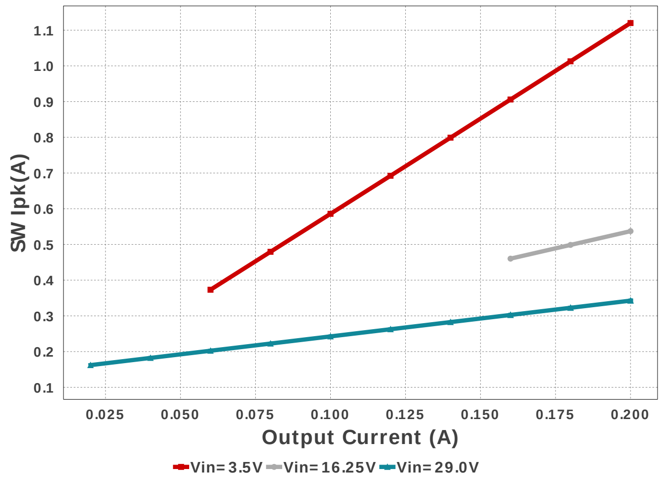


Electrical BOM

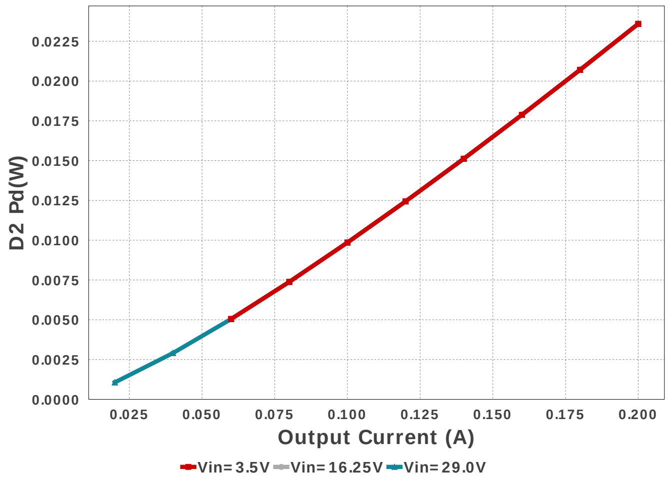
Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
Cboot	AVX	08053C104JAZ2A Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	$0.10	0805 7 mm²
Ccomp	MuRata	GCM1885C1H152JA16D Series= C0G/NP0	Cap= 1.5 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.02	0603 5 mm²
Ccomp2	TDK	CGA4C2C0G1H103J060AA Series= C0G/NP0	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.07	0805 7 mm²
Cin	Panasonic	EEE-FC1H470P Series= FC	Cap= 47.0 uF ESR= 300.0 mOhm VDC= 50.0 V IRMS= 500.0 mA	1	$0.23	 SM_RADIAL_G 172 mm²
Cinx	TDK	C1608X5R1H104K080AA Series= X5R	Cap= 100.0 nF ESR= 29.6 mOhm VDC= 50.0 V IRMS= 971.99 mA	1	$0.01	0603 5 mm²
Cout	MuRata	GRM32ER71H106KA12L Series= X7R	Cap= 10.0 uF ESR= 1.0 mOhm VDC= 50.0 V IRMS= 6.0 A	1	$0.33	1210_270 15 mm²
Coutx	MuRata	GRM188R61E474KA12D Series= X5R	Cap= 470.0 nF ESR= 1.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.04	0603 5 mm²
Coutx2	MuRata	GRM188R61E474KA12D Series= X5R	Cap= 470.0 nF ESR= 1.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.04	0603 5 mm²
Cramp	Taiyo Yuden	UMK105CG331JV-F Series= C0G/NP0	Cap= 330.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0402 3 mm²

Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
Css	AVX	08053C104JAZ2A Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	$0.10	0805 7 mm^2
Cvcc	TDK	C1005X5R1V105K050BC Series= X5R	Cap= 1.0 uF ESR= 11.416 mOhm VDC= 35.0 V IRMS= 1.483 A	1	$0.04	0402 3 mm^2
D1	Vishay-Semiconductor	SS14-E3/61T	VF@Io= 500.0 mV VRRM= 40.0 V	1	$0.09	SMA 37 mm^2
D2	Vishay-Semiconductor	SS14-E3/61T	VF@Io= 500.0 mV VRRM= 40.0 V	1	$0.09	SMA 37 mm^2
D3	Vishay-Semiconductor	SS14-E3/61T	VF@Io= 500.0 mV VRRM= 40.0 V	1	$0.09	SMA 37 mm^2
D4	Vishay-Semiconductor	SS14-E3/61T	VF@Io= 500.0 mV VRRM= 40.0 V	1	$0.09	SMA 37 mm^2
L1	Coilcraft	LPS8045B-683MRB	L= 68.0 µH DCR= 193.0 mOhm	1	$0.92	LPS8045B 102 mm^2
M1	Texas Instruments	CSD18543Q3A	VdsMax= 60.0 V IdsMax= 35.0 Amps	1	$0.27	DNH0008A 18 mm^2
M2	Texas Instruments	CSD18543Q3A	VdsMax= 60.0 V IdsMax= 35.0 Amps	1	$0.27	DNH0008A 18 mm^2
Rcomp	CUSTOM	CUSTOM Series= CRCW..e3	Res= 13.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	NA	0402 0 mm^2
Renable	Vishay-Dale	CRCW04021M02FKED Series= CRCW..e3	Res= 1.02 MOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rfbb	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rfbt	CUSTOM	CUSTOM Series= ?	Res= 11.0 kOhm Power= 125.0 mW Tolerance= 0.1%	1	NA	0805 0 mm^2
Rsense	Panasonic	ERJ-2BSFR12X Series= ERJ-2B	Res= 120.0 mOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.05	0402 3 mm^2
Rt	Vishay-Dale	CRCW040214K0FKED Series= CRCW..e3	Res= 14.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Ruv1	Susumu Co Ltd	RG2012P-303-B-T5 Series= RG2012	Res= 30.0 kOhm Power= 125.0 mW Tolerance= 0.1%	1	$0.07	0805 7 mm^2
Ruv2	CUSTOM	CUSTOM Series= ?	Res= 23.0 kOhm Power= 50.0 mW Tolerance= 1.0%	1	NA	0201 0 mm^2
U1	Texas Instruments	LM25118MH/NOPB	Switcher	1	$2.40	MXA20A 71 mm^2

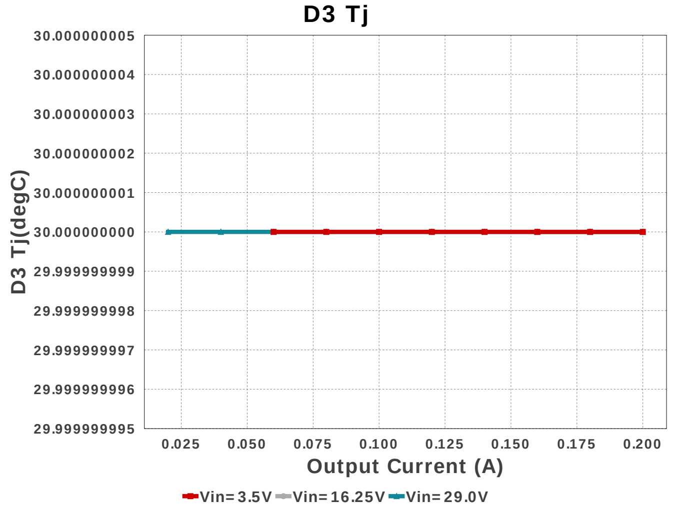
SW Ipk



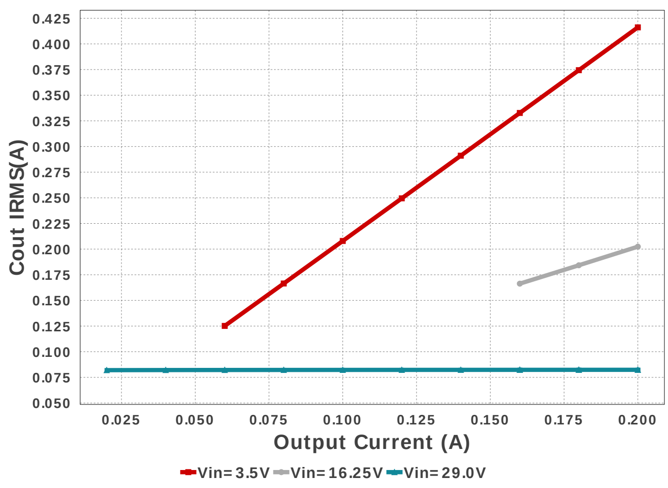
D2 Pd



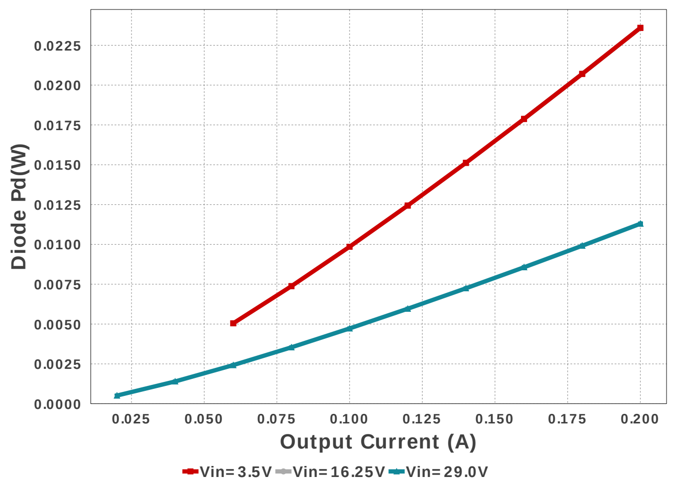
D3 Tj



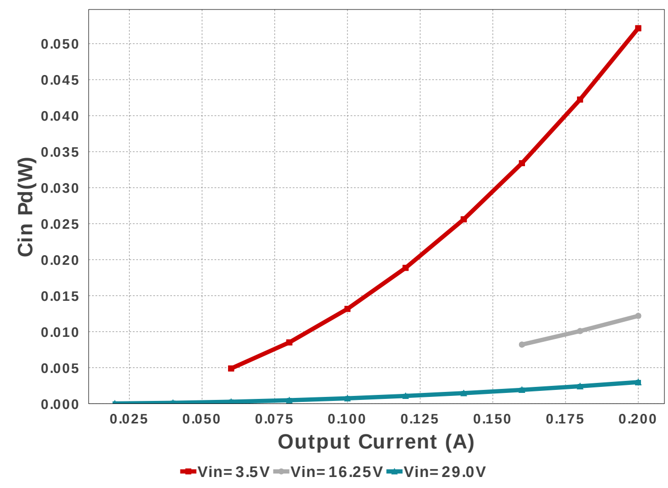
Cout IRMS



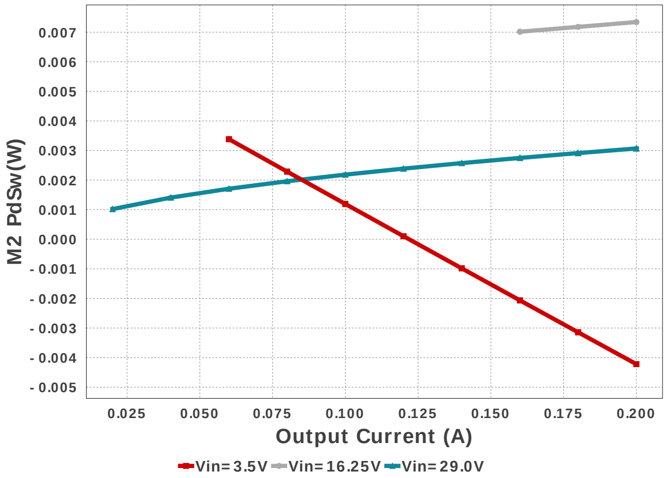
Diode Pd



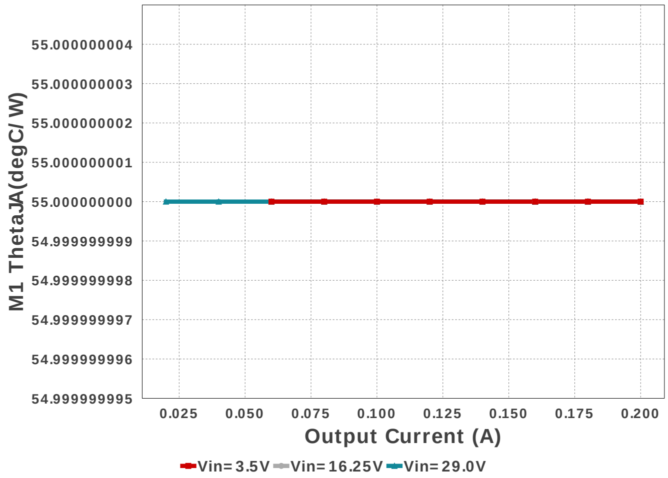
Cin Pd



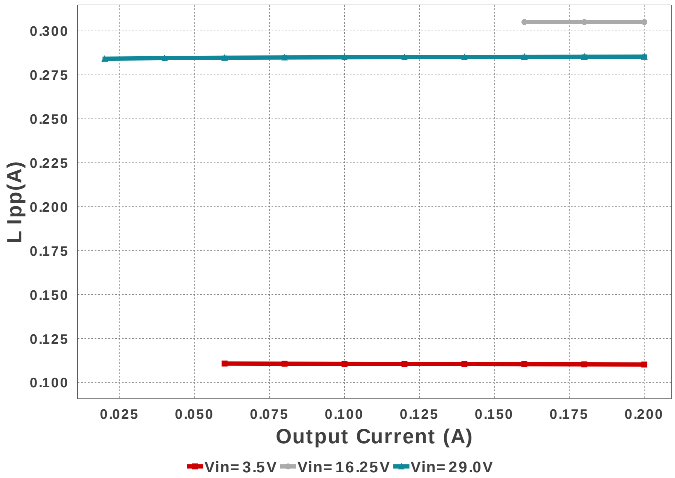
M2 PdSw



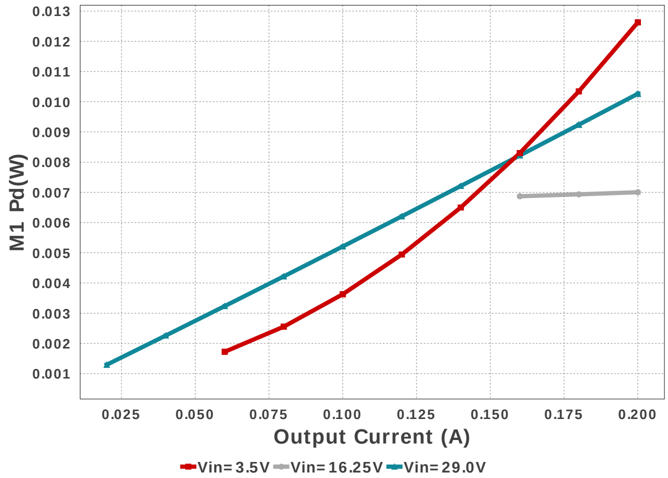
M1 ThetaJA



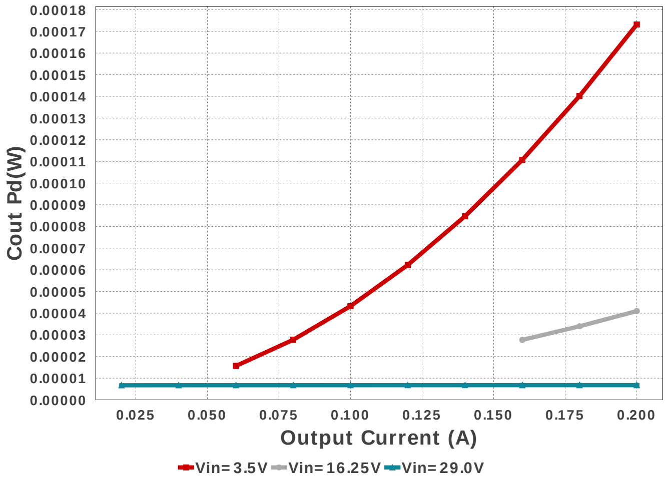
L Ipp



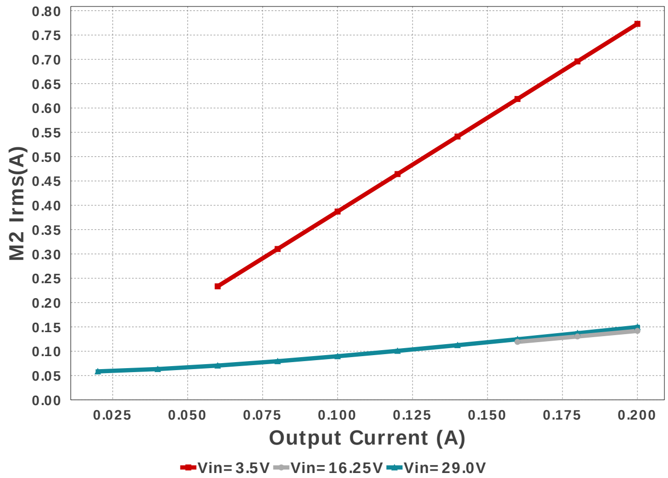
M1 Pd

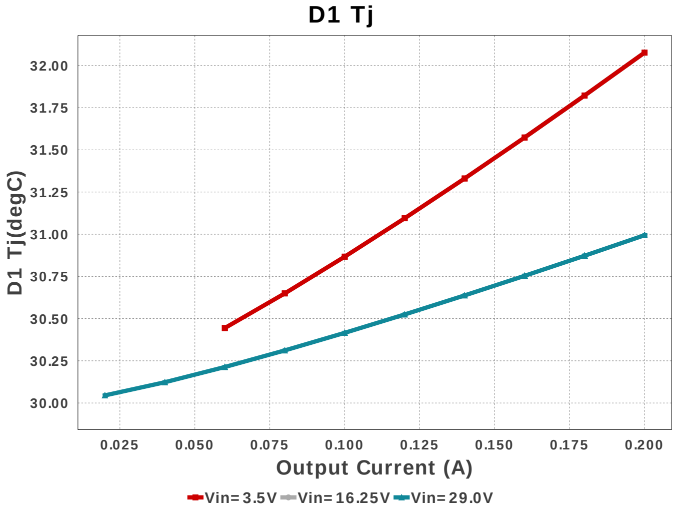


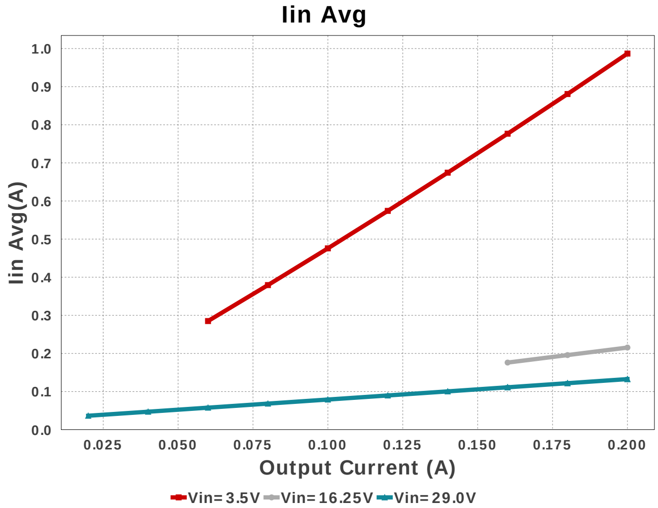
Cout Pd

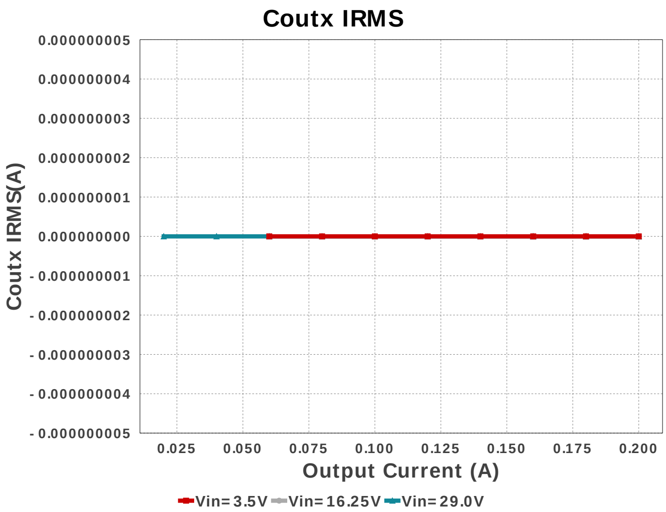


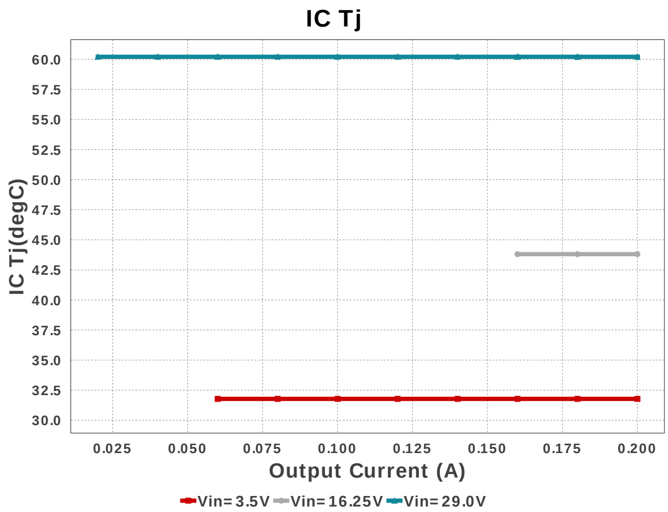
M2 Irms

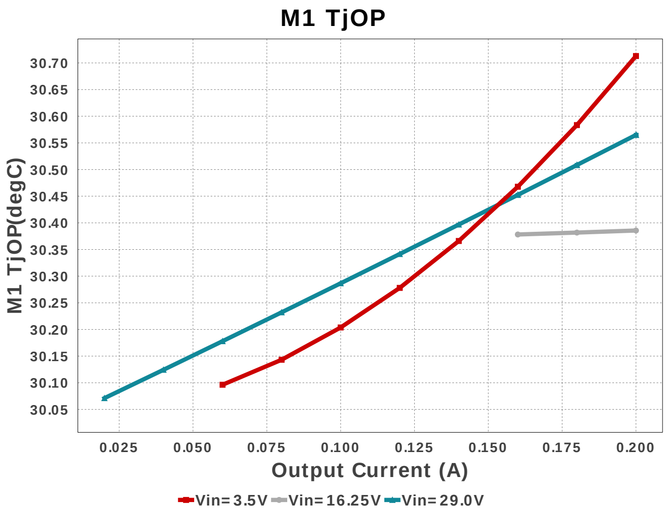


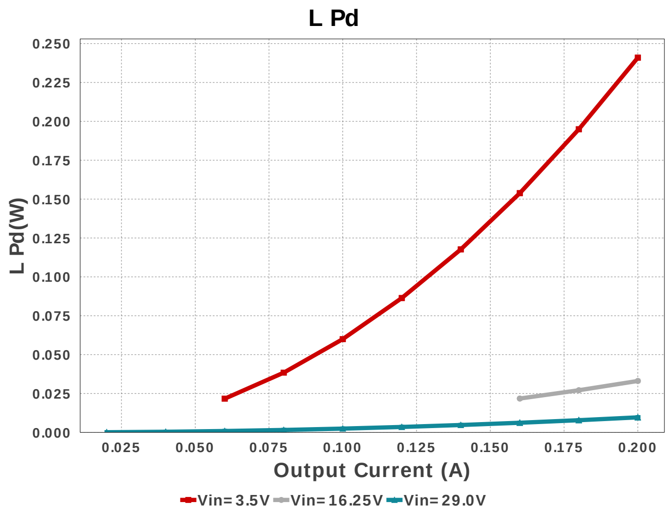

D1 Tj
D1 Tj(degC)
32.00
31.75
31.50
31.25
31.00
30.75
30.50
30.25
30.00
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

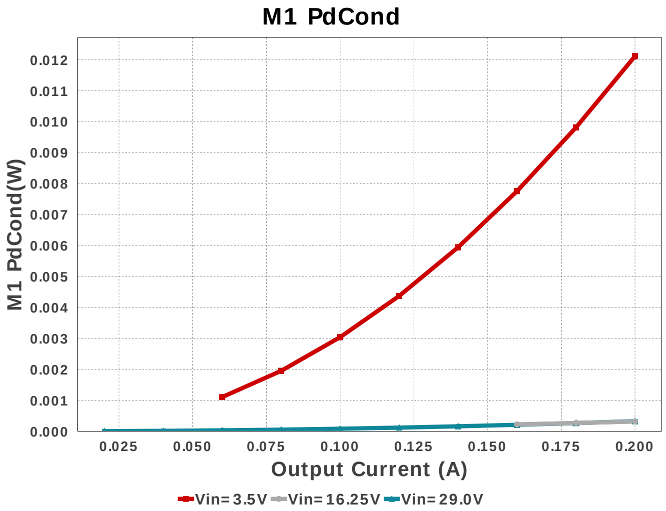

Iin Avg
Iin Avg(A)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

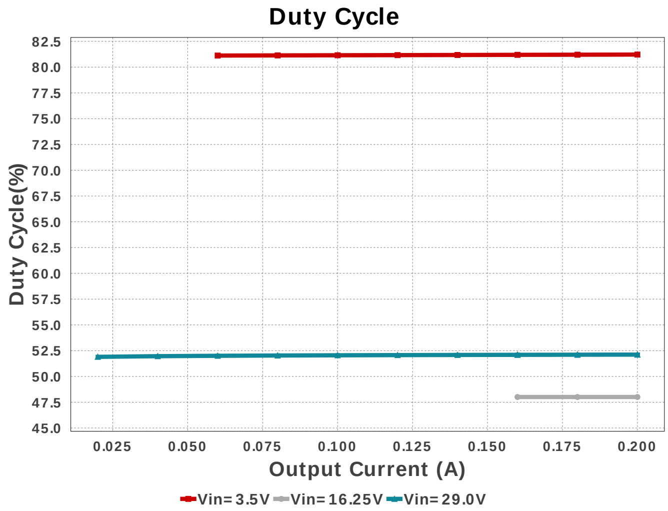

Coutx IRMS
Coutx IRMS(A)
0.000000005
0.000000004
0.000000003
0.000000002
0.000000001
0.000000000
-0.000000001
-0.000000002
-0.000000003
-0.000000004
-0.000000005
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

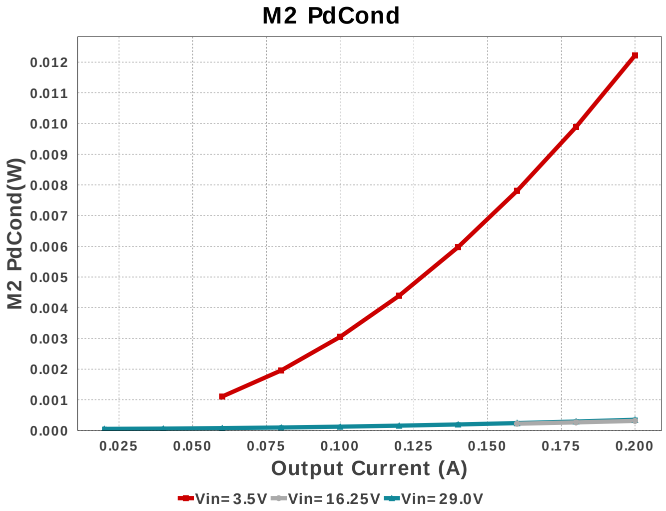

IC Tj
IC Tj(degC)
60.0
57.5
55.0
52.5
50.0
47.5
45.0
42.5
40.0
37.5
35.0
32.5
30.0
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

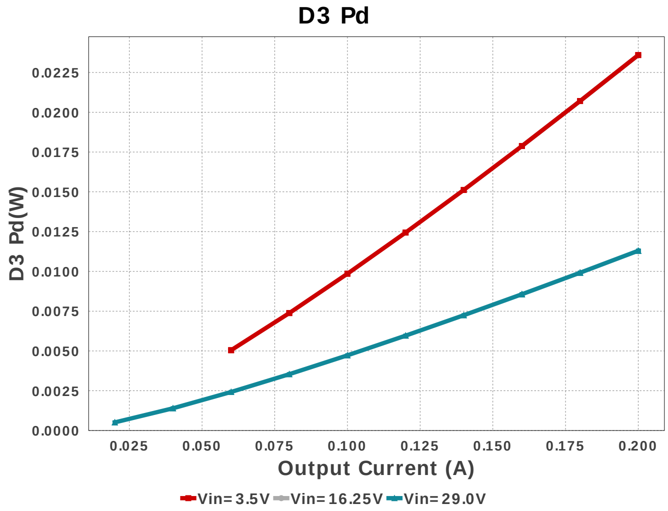

M1 TjOP
M1 TjOP(degC)
30.70
30.65
30.60
30.55
30.50
30.45
30.40
30.35
30.30
30.25
30.20
30.15
30.10
30.05
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

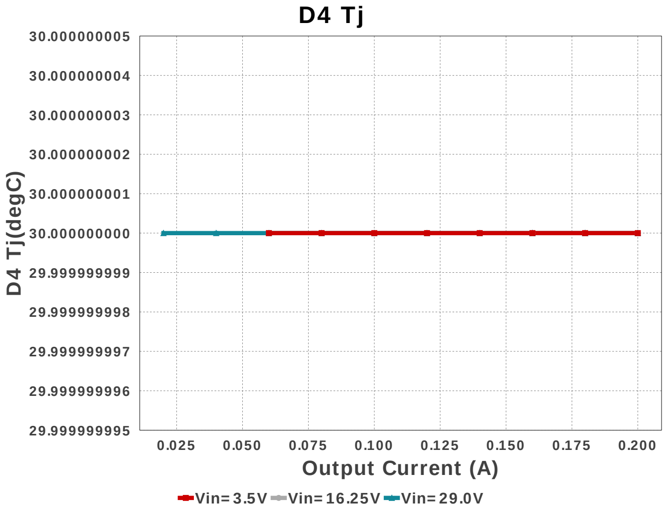

L Pd
L Pd(W)
0.250
0.225
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

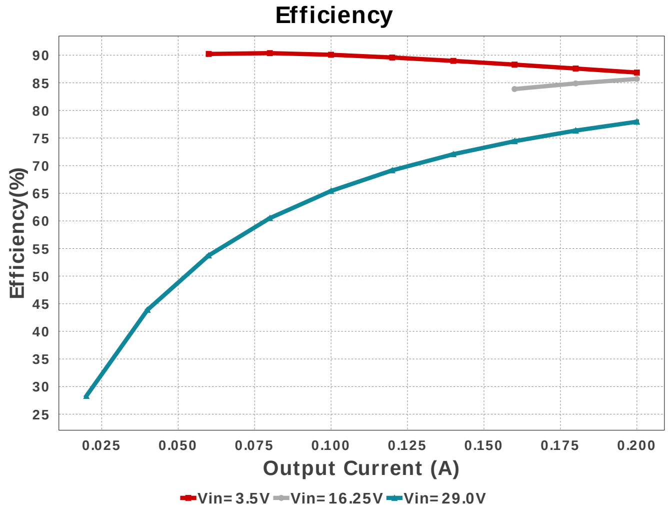

M1 PdCond
M1 PdCond(W)
0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

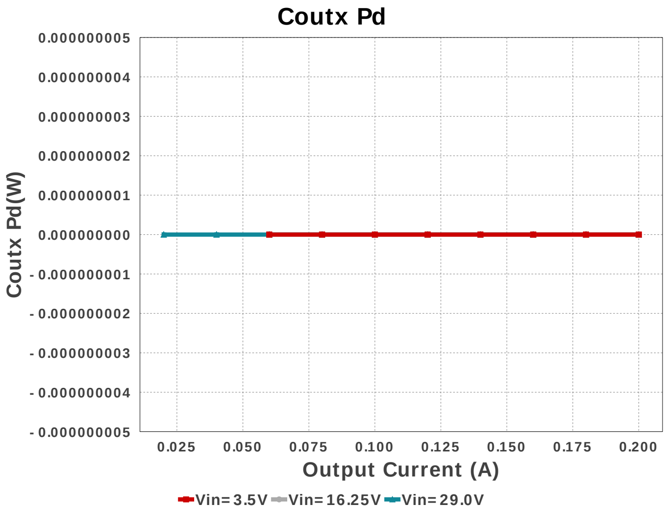

Duty Cycle
Duty Cycle(%)
82.5
80.0
77.5
75.0
72.5
70.0
67.5
65.0
62.5
60.0
57.5
55.0
52.5
50.0
47.5
45.0
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

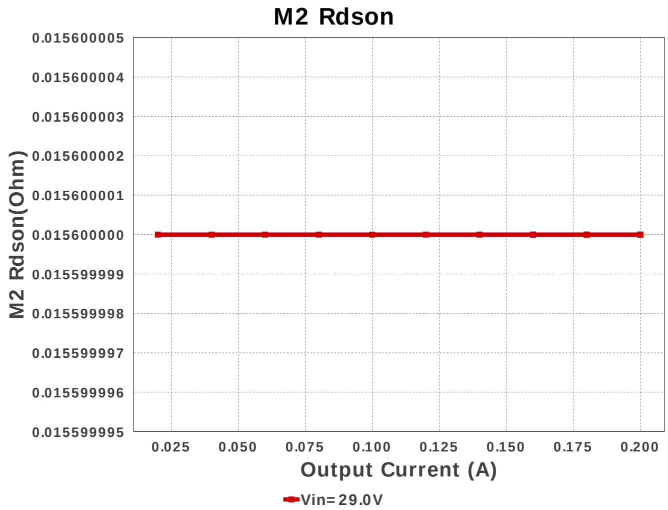

M2 PdCond
M2 PdCond(W)
0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

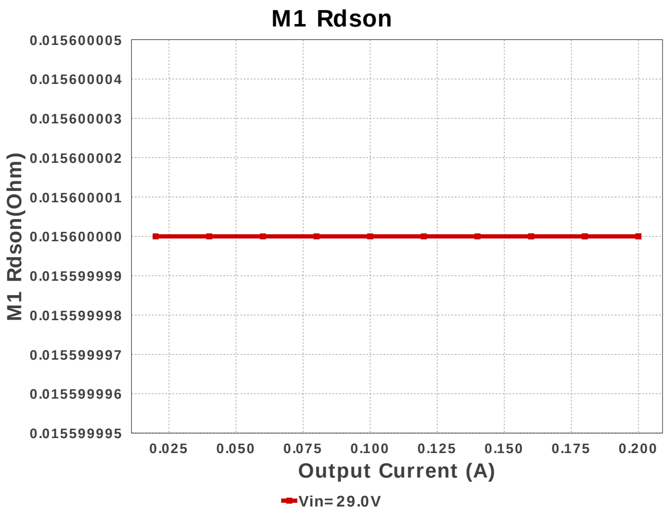

D3 Pd
D3 Pd(W)
0.0225
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

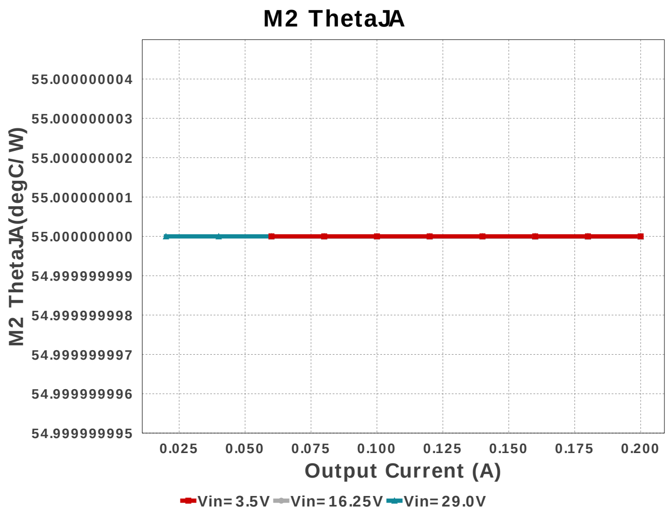

D4 Tj
D4 Tj(degC)
30.000000005
30.000000004
30.000000003
30.000000002
30.000000001
30.000000000
29.999999999
29.999999998
29.999999997
29.999999996
29.999999995
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

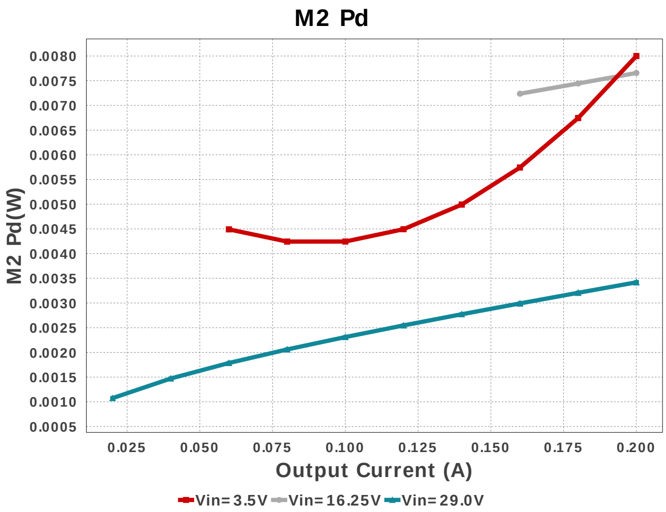

Efficiency
Efficiency(%)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Output Current (A)
Vin=3.5V
Vin=16.25V
Vin=29.0V

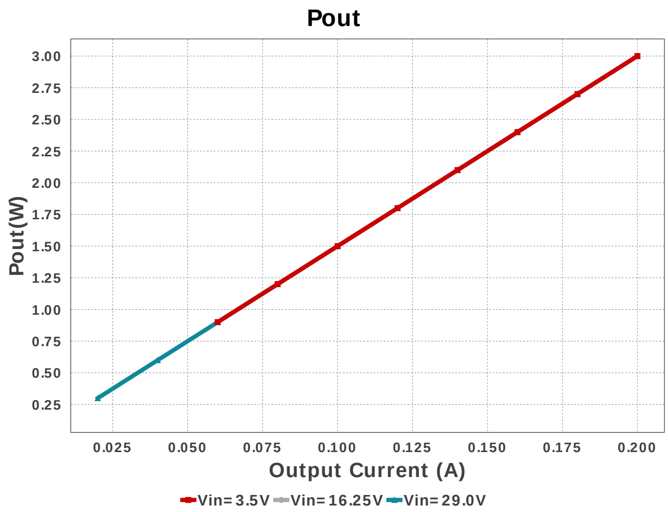

Coutx Pd
Coutx Pd(W)
Output Current (A)
Vin=3.5V Vin=16.25V Vin=29.0V


M2 Rdson
M2 Rdson(Ohm)
Output Current (A)
Vin=29.0V

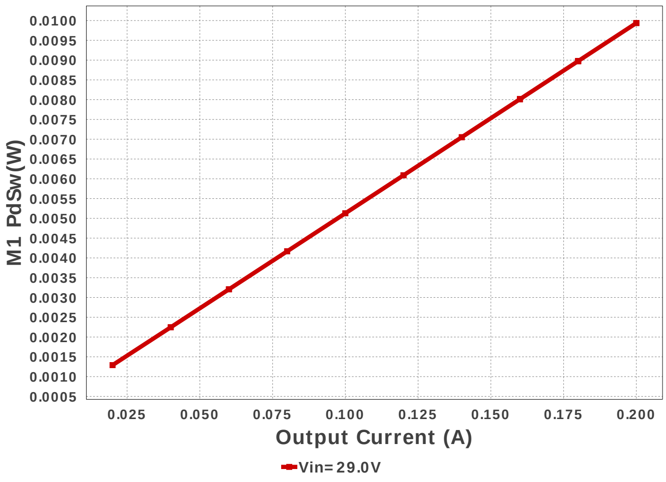

M1 Rdson
M1 Rdson(Ohm)
Output Current (A)
Vin=29.0V


M2 ThetaJA
M2 ThetaJA(degC/W)
Output Current (A)
Vin=3.5V Vin=16.25V Vin=29.0V

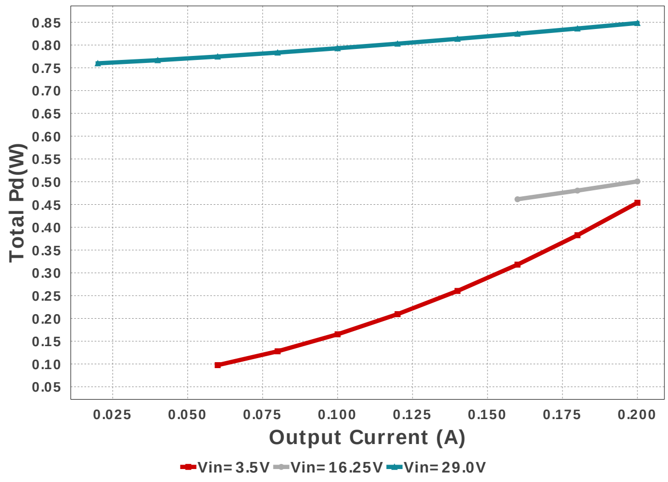

M2 Pd
M2 Pd(W)
Output Current (A)
Vin=3.5V Vin=16.25V Vin=29.0V


Pout
Pout(W)
Output Current (A)
Vin=3.5V Vin=16.25V Vin=29.0V

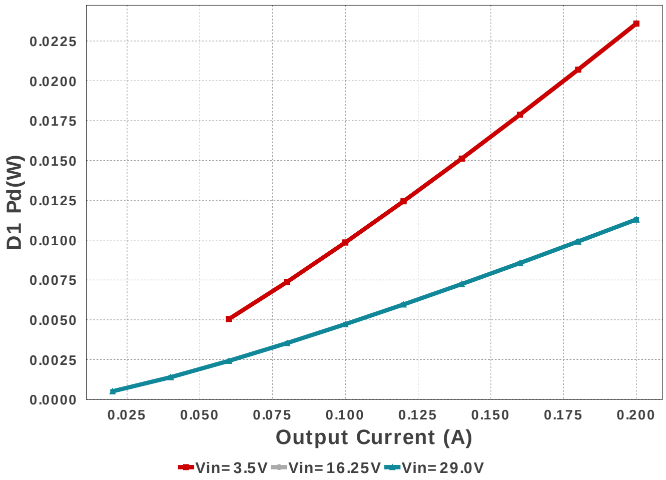
M1 PdSw



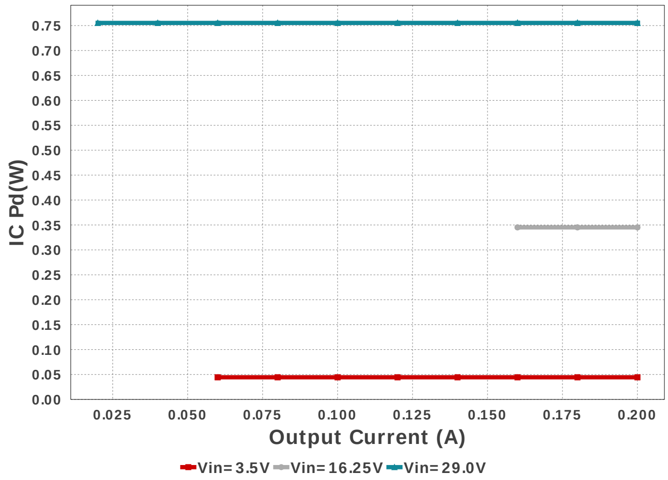
Total Pd



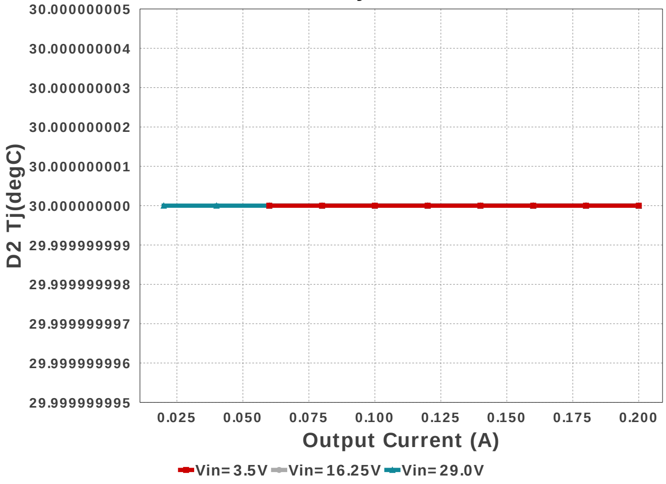
D1 Pd



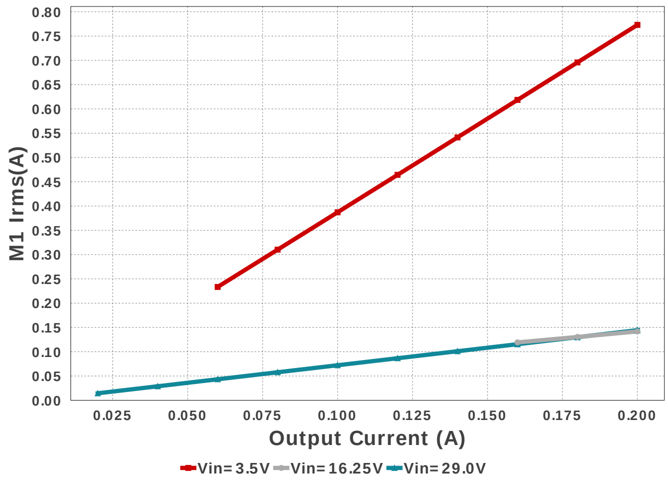
IC Pd

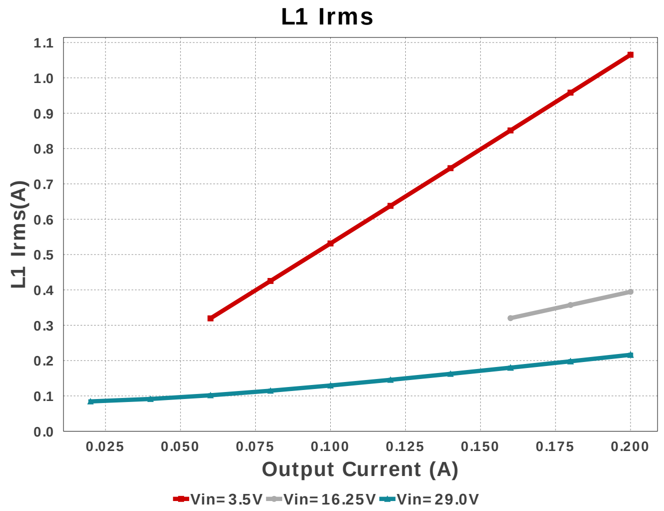


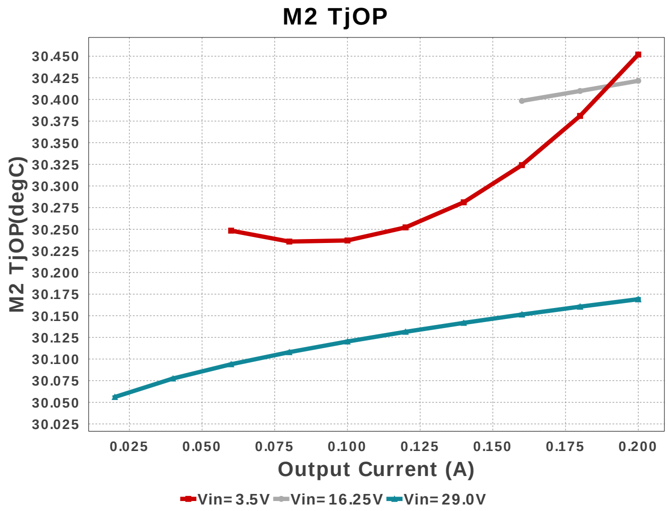
D2 Tj

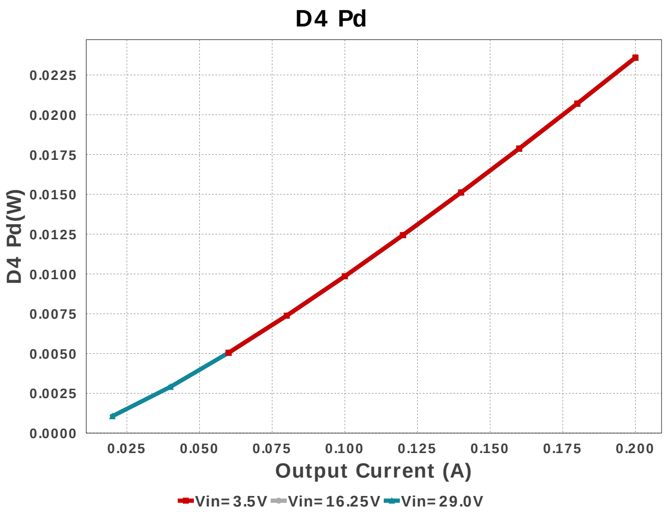


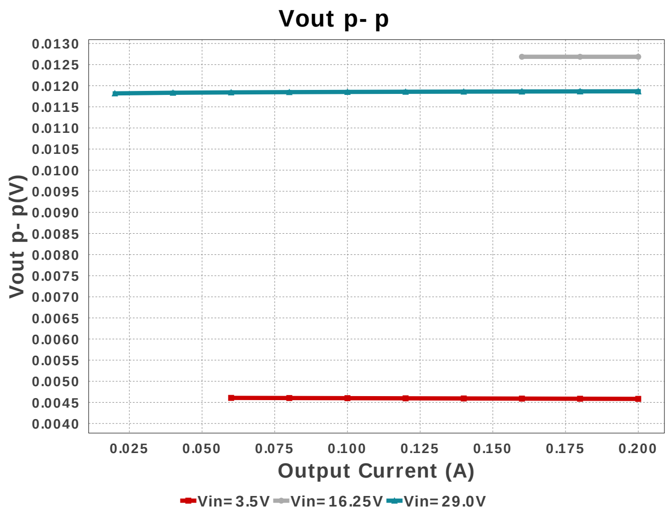
M1 Irms

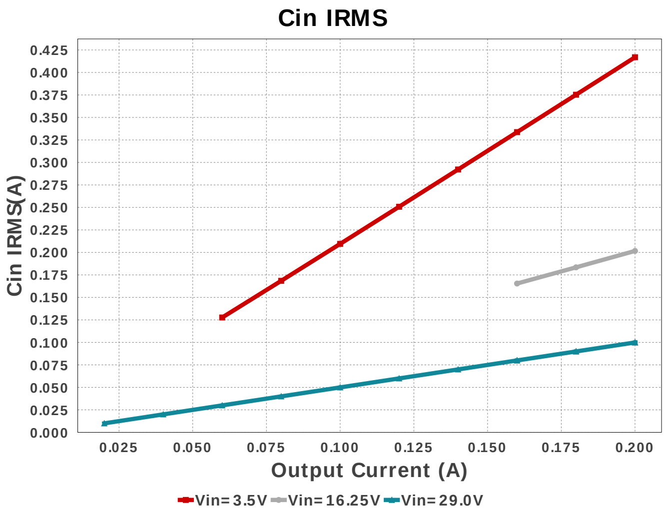


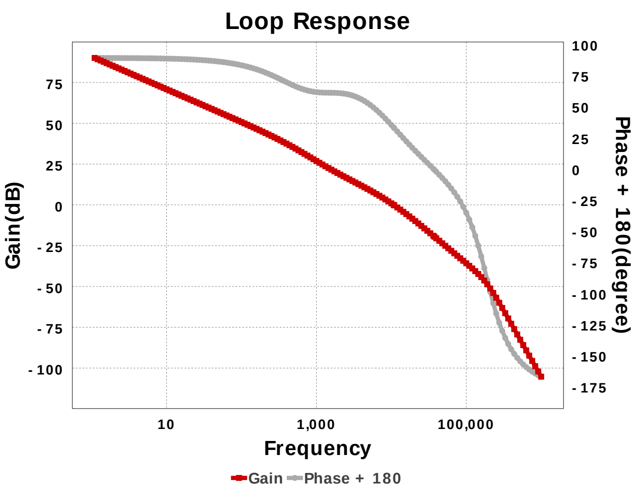












Operating Values

#	Name	Value	Category	Description
1.	BOM Count	27		Total Design BOM count
2.	Total BOM	NA		Total BOM Cost
3.	Cin IRMS	99.91 mA	Capacitor	Input capacitor RMS ripple current
4.	Cin IRMS	99.91 mA	Capacitor	Input capacitor RMS ripple current
5.	Cin Pd	2.995 mW	Capacitor	Input capacitor power dissipation
6.	Cin Pd	2.995 mW	Capacitor	Input capacitor power dissipation
7.	Cout IRMS	82.375 mA	Capacitor	Output capacitor RMS ripple current
8.	Cout IRMS	82.375 mA	Capacitor	Output capacitor RMS ripple current
9.	Cout Pd	6.786 µW	Capacitor	Output capacitor power dissipation
10.	Cout Pd	6.786 µW	Capacitor	Output capacitor power dissipation
11.	Coutx IRMS	0.0 A	Capacitor	Output capacitor_x RMS ripple current

#	Name	Value	Category	Description
12.	Coutx IRMS	0.0 A	Capacitor	Output capacitor_x RMS ripple current
13.	Coutx Pd	0.0 W	Capacitor	Output capacitor_x power loss
14.	Coutx Pd	0.0 W	Capacitor	Output capacitor_x power loss
15.	D1 Pd	11.297 mW	Diode	Diode power dissipation
16.	D1 Pd	11.297 mW	Diode	Diode power dissipation
17.	D1 Tj	30.994 degC	Diode	D1 junction temperature
18.	D1 Tj	30.994 degC	Diode	D1 junction temperature
19.	D1 Tj	30.994 degC	Diode	D1 junction temperature
20.	D1 Tj	30.994 degC	Diode	D1 junction temperature
21.	D2 Pd	23.593 mW	Diode	Diode2 power dissipation
22.	D2 Pd	23.593 mW	Diode	Diode2 power dissipation
23.	D3 Pd	11.297 mW	Diode	Diode3 power dissipation
24.	D3 Pd	11.297 mW	Diode	Diode3 power dissipation
25.	D4 Pd	23.593 mW	Diode	Diode4 power dissipation
26.	D4 Pd	23.593 mW	Diode	Diode4 power dissipation
27.	Diode Pd	11.297 mW	Diode	Diode power dissipation
28.	Diode Pd	11.297 mW	Diode	Diode power dissipation
29.	IC Pd	755.31 mW	IC	IC power dissipation
30.	IC Pd	755.31 mW	IC	IC power dissipation
31.	IC Tj	60.212 degC	IC	IC junction temperature
32.	IC Tj	60.212 degC	IC	IC junction temperature
33.	IC Tolerance	18.0 mV	IC	IC Feedback Tolerance
34.	IC Tolerance	18.0 mV	IC	IC Feedback Tolerance
35.	ICThetaJA	40.0 degC/W	IC	IC junction-to-ambient thermal resistance
36.	ICThetaJA	40.0 degC/W	IC	IC junction-to-ambient thermal resistance
37.	Iin Avg	132.699 mA	IC	Average input current
38.	Iin Avg	132.7 mA	IC	Average input current
39.	L Ipp	285.354 mA	Inductor	Peak-to-peak inductor ripple current
40.	L Ipp	285.354 mA	Inductor	Peak-to-peak inductor ripple current
41.	L Pd	9.65 mW	Inductor	Inductor power dissipation
42.	L Pd	9.65 mW	Inductor	Inductor power dissipation
43.	L1 Irms	216.3 mA	Inductor	Inductor ripple current
44.	L1 Irms	216.3 mA	Inductor	Inductor ripple current
45.	M1 Irms	144.385 mA	Mosfet	MOSFET RMS ripple current
46.	M1 Irms	144.385 mA	Mosfet	MOSFET RMS ripple current
47.	M1 Pd	10.263 mW	Mosfet	MOSFET power dissipation
48.	M1 Pd	10.263 mW	Mosfet	MOSFET power dissipation
49.	M1 PdCond	326.01 µW	Mosfet	M1 MOSFET conduction losses
50.	M1 PdCond	326.01 µW	Mosfet	M1 MOSFET conduction losses
51.	M1 PdSw	9.937 mW	Mosfet	M1 MOSFET switching losses
52.	M1 PdSw	9.937 mW	Mosfet	M1 MOSFET switching losses
53.	M1 Rdson	15.6 mOhm	Mosfet	Drain-Source On-resistance
54.	M1 Rdson	15.6 mOhm	Mosfet	Drain-Source On-resistance
55.	M1 ThetaJA	55.0 degC/W	Mosfet	MOSFET junction-to-ambient thermal resistance
56.	M1 ThetaJA	55.0 degC/W	Mosfet	MOSFET junction-to-ambient thermal resistance
57.	M1 TjOP	30.565 degC	Mosfet	MOSFET junction temperature
58.	M1 TjOP	30.565 degC	Mosfet	MOSFET junction temperature
59.	M2 Irms	149.673 mA	Mosfet	MOSFET RMS ripple current
60.	M2 Irms	149.673 mA	Mosfet	MOSFET RMS ripple current
61.	M2 Pd	16.637 mW	Mosfet	MOSFET power dissipation
62.	M2 Pd	16.637 mW	Mosfet	MOSFET power dissipation
63.	M2 PdCond	352.37 µW	Mosfet	M2 MOSFET conduction losses
64.	M2 PdCond	352.37 µW	Mosfet	M2 MOSFET conduction losses
65.	M2 PdSw	16.285 mW	Mosfet	M2 MOSFET switching losses
66.	M2 PdSw	16.285 mW	Mosfet	M2 MOSFET switching losses
67.	M2 Rdson	15.6 mOhm	Mosfet	Drain-Source On-resistance
68.	M2 Rdson	15.6 mOhm	Mosfet	Drain-Source On-resistance
69.	M2 ThetaJA	55.0 degC/W	Mosfet	MOSFET junction-to-ambient thermal resistance
70.	M2 ThetaJA	55.0 degC/W	Mosfet	MOSFET junction-to-ambient thermal resistance
71.	M2 TjOP	31.729 degC	Mosfet	MOSFET junction temperature
72.	M2 TjOP	31.729 degC	Mosfet	MOSFET junction temperature
73.	Cin Pd	2.995 mW	Power	Input capacitor power dissipation
74.	Cin Pd	2.995 mW	Power	Input capacitor power dissipation
75.	Cout Pd	6.786 µW	Power	Output capacitor power dissipation
76.	Cout Pd	6.786 µW	Power	Output capacitor power dissipation
77.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
78.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
79.	D1 Pd	11.297 mW	Power	Diode power dissipation
80.	D1 Pd	11.297 mW	Power	Diode power dissipation
81.	D2 Pd	23.593 mW	Power	Diode2 power dissipation
82.	D2 Pd	23.593 mW	Power	Diode2 power dissipation
83.	D3 Pd	11.297 mW	Power	Diode3 power dissipation
84.	D3 Pd	11.297 mW	Power	Diode3 power dissipation
85.	D4 Pd	23.593 mW	Power	Diode4 power dissipation
86.	D4 Pd	23.593 mW	Power	Diode4 power dissipation
87.	Diode Pd	11.297 mW	Power	Diode power dissipation

#	Name	Value	Category	Description
88.	Diode Pd	11.297 mW	Power	Diode power dissipation
89.	IC Pd	755.31 mW	Power	IC power dissipation
90.	IC Pd	755.31 mW	Power	IC power dissipation
91.	L Pd	9.65 mW	Power	Inductor power dissipation
92.	L Pd	9.65 mW	Power	Inductor power dissipation
93.	M1 Pd	10.263 mW	Power	MOSFET power dissipation
94.	M1 Pd	10.263 mW	Power	MOSFET power dissipation
95.	M1 PdCond	326.01 µW	Power	M1 MOSFET conduction losses
96.	M1 PdCond	326.01 µW	Power	M1 MOSFET conduction losses
97.	M1 PdSw	9.937 mW	Power	M1 MOSFET switching losses
98.	M1 PdSw	9.937 mW	Power	M1 MOSFET switching losses
99.	M2 Pd	16.637 mW	Power	MOSFET power dissipation
100.	M2 Pd	16.637 mW	Power	MOSFET power dissipation
101.	M2 PdCond	352.37 µW	Power	M2 MOSFET conduction losses
102.	M2 PdCond	352.37 µW	Power	M2 MOSFET conduction losses
103.	M2 PdSw	16.285 mW	Power	M2 MOSFET switching losses
104.	M2 PdSw	16.285 mW	Power	M2 MOSFET switching losses
105.	Total Pd	848.281 mW	Power	Total Power Dissipation
106.	Cross Freq	10.736 kHz	System Information	Bode plot crossover frequency
107.	D2 Tj	30.0 degC	System Information	D2 junction temperature
108.	D2 Tj	30.0 degC	System Information	D2 junction temperature
109.	D3 Tj	30.0 degC	System Information	D3 junction temperature
110.	D3 Tj	30.0 degC	System Information	D3 junction temperature
111.	D4 Tj	30.0 degC	System Information	D4 junction temperature
112.	D4 Tj	30.0 degC	System Information	D4 junction temperature
113.	Duty Cycle	52.118 %	System Information	Duty cycle
114.	Duty Cycle	52.118 %	System Information	Duty cycle
115.	Efficiency	77.957 %	System Information	Steady state efficiency
116.	Efficiency	77.957 %	System Information	Steady state efficiency
117.	FootPrint	622.0 mm^2	System Information	Total Foot Print Area of BOM components
118.	Frequency	376.028 kHz	System Information	Switching frequency
119.	Frequency	376.028 kHz	System Information	Switching frequency
120.	Gain Marg	-23.284 dB	System Information	Bode Plot Gain Margin
121.	Iout	200.0 mA	System Information	Iout operating point
122.	Iout	200.0 mA	System Information	Iout operating point
123.	Low Freq Gain	91.834 dB	System Information	Gain at 1Hz
124.	Mode	CCM	System Information	Conduction Mode
125.	Mode	CCM	System Information	Conduction Mode
126.	Operating Topology	Buck	System Information	The current operating topology of the device
127.	Operating Topology	Buck	System Information	The current operating topology of the device
128.	Phase Marg	34.952 deg	System Information	Bode Plot Phase Margin
129.	Pout	3.0 W	System Information	Total output power
130.	Pout	3.0 W	System Information	Total output power
131.	SW Ipk	342.677 mA	System Information	Peak switch current
132.	SW Ipk	342.677 mA	System Information	Peak switch current
133.	Vin	29.0 V	System Information	Vin operating point
134.	Vin	29.0 V	System Information	Vin operating point

#	Name	Value	Category	Description
135.	Vout	15.0 V	System Information	Operational Output Voltage
136.	Vout	15.0 V	System Information	Operational Output Voltage
137.	Vout Actual	14.76 V	System Information	Vout Actual calculated based on selected voltage divider resistors
138.	Vout Tolerance	2.497 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
139.	Vout p-p	11.868 mV	System Information	Peak-to-peak output ripple voltage
140.	Vout p-p	11.868 mV	System Information	Peak-to-peak output ripple voltage

Design Inputs

Name	Value	Description
Iout	200.0 m	Maximum Output Current
SoftStart	2.5 ms	Soft Start Time (ms)
VinMax	29.0	Maximum input voltage
VinMin	3.5	Minimum input voltage
Vout	15.0	Output Voltage
base_pn	LM25118	Base Product Number
source	DC	Input Source Type
Ta	30.0	Ambient temperature
UserFsw	399.501 k	Customer Selected Frequency

WEBENCH® Assembly

Component Testing

Some published data on components in datasheets such as Capacitor ESR and Inductor DC resistance is based on conservative values that will guarantee that the components always exceed the specification. For design purposes it is usually better to work with typical values. Since this data is not always available it is a good practice to measure the Capacitance and ESR values of Cin and Cout, and the inductance and DC resistance of L1 before assembly of the board. Any large discrepancies in values should be electrically simulated in WEBENCH to check for instabilities and thermally simulated in WebTHERM to make sure critical temperatures are not exceeded.

Soldering Component to Board

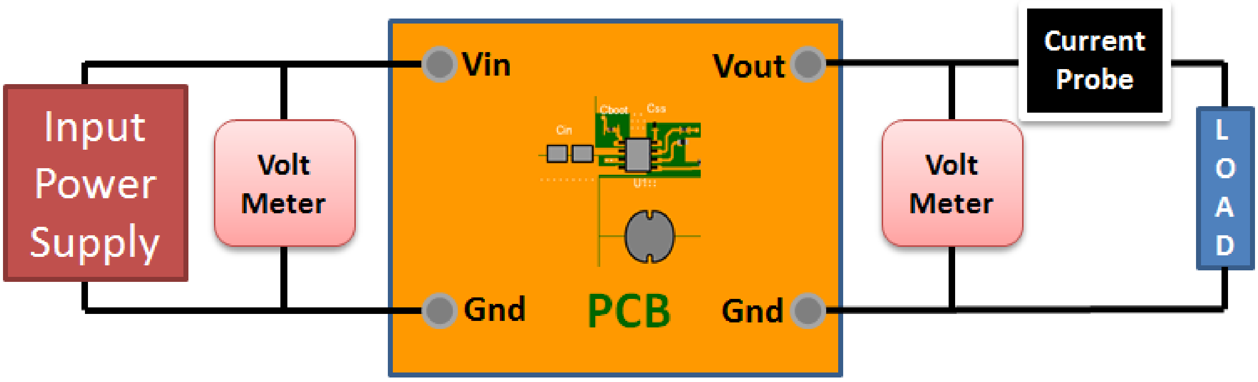
If board assembly is done in house it is best to tack down one terminal of a component on the board then solder the other terminal. For surface mount parts with large tabs, such as the DPAK, the tab on the back of the package should be pre-tinned with solder, then tacked into place by one of the pins. To solder the tab town to the board place the iron down on the board while resting against the tab, heating both surfaces simultaneously. Apply light pressure to the top of the plastic case until the solder flows around the part and the part is flush with the PCB. If the solder is not flowing around the board you may need a higher wattage iron (generally 25W to 30W is enough).

Initial Startup of Circuit

It is best to initially power up the board by setting the input supply voltage to the lowest operating input voltage 3.5V and set the input supply's current limit to zero. With the input supply off connect up the input supply to Vin and GND. Connect a digital volt meter and a load if needed to set the minimum Iout of the design from Vout and GND. Turn on the input supply and slowly turn up the current limit on the input supply. If the voltage starts to rise on the input supply continue increasing the input supply current limit while watching the output voltage. If the current increases on the input supply, but the voltage remains near zero, then there may be a short or a component misplaced on the board. Power down the board and visually inspect for solder bridges and recheck the diode and capacitor polarities. Once the power supply circuit is operational then more extensive testing may include full load testing, transient load and line tests to compare with simulation results.

Load Testing

The setup is the same as the initial startup, except that an additional digital voltmeter is connected between Vin and GND, a load is connected between Vout and GND and a current meter is connected in series between Vout and the load. The load must be able to handle at least rated output power + 50% (7.5 watts for this design). Ideally the load is supplied in the form of a variable load test unit. It can also be done in the form of suitably large power resistors. When using an oscilloscope to measure waveforms on the prototype board, the ground leads of the oscilloscope probes should be as short as possible and the area of the loop formed by the ground lead should be kept to a minimum. This will help reduce ground lead inductance and eliminate EMI noise that is not actually present in the circuit.



Design Assistance

1. The LM25118 is a wide range buck-boost controller which is operable in an ultra wide input range of 3 to 75V. A buck-boost regulator can maintain regulation for input voltages either higher or lower than the output voltage. The challenge is that buck-boost power converters are not as efficient as buck regulators. The LM5118 has been designed as a dual mode controller whereby the power converter acts as a buck regulator while the input voltage is above the output. As the input voltage approaches the output voltage, a gradual transition to the buck-boost mode occurs. This gradual transition between modes eliminates disturbances at the output during transitions.

2. Master key : 7FD28BC771716426[v1]

3. **LM25118** Product Folder : http://www.ti.com/product/LM25118 : contains the data sheet and other resources.

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