



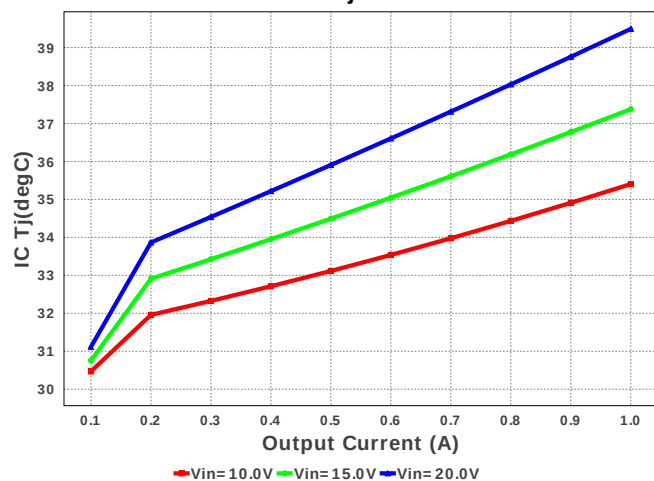
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Topology = Buck
Created = 7/19/16 7:22:21 AM
BOM Cost = \$2.67
BOM Count = 10
Total Pd = 0.58W

Electrical BOM

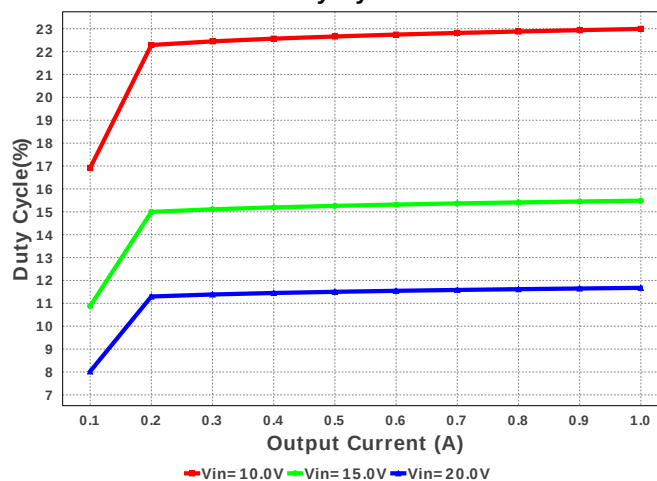
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H225KA88L Series= X7R	Cap= 2.2 uF ESR= 4.448 mOhm VDC= 50.0 V IRMS= 2.2252 A	1	\$0.05	 1206_190 11 mm ²
3.	Cout	Panasonic	6SVPE220MW Series= SVPE	Cap= 220.0 uF ESR= 15.0 mOhm VDC= 6.3 V IRMS= 3.15 A	1	\$0.20	 CAPSMT_62_E61 53 mm ²
4.	Css	MuRata	GRM155R71C822KA01D Series= X7R	Cap= 8.2 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
5.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	 SMA 37 mm ²
6.	L1	Bourns	SRU8043-6R8Y	L= 6.8 uH DCR= 22.4 mOhm	1	\$0.33	 SRU8043 100 mm ²
7.	Rfbb	Yageo America	RC0603FR-0712KL Series= ?	Res= 12.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm ²
8.	Rfbt	Vishay-Dale	CRCW040220K0FKED Series= CRCW..e3	Res= 20.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
9.	Rt	Vishay-Dale	CRCW040231K6FKED Series= CRCW..e3	Res= 31.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10. U1		Texas Instruments	LMR14050SDDAR	Switcher	1	\$1.95	 DDA0008E_N 57 mm ²

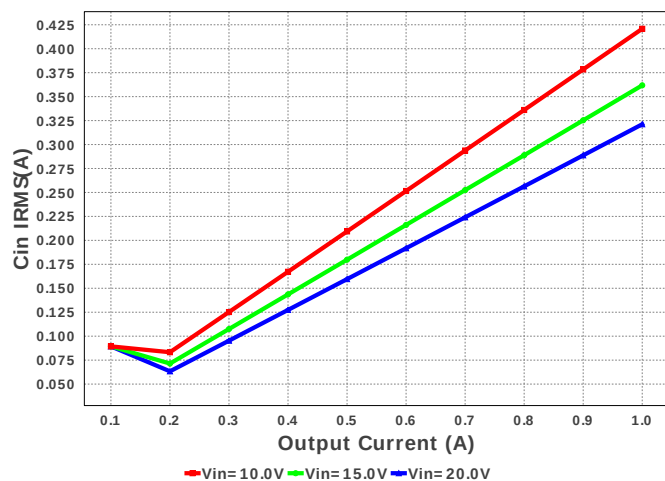
IC Tj



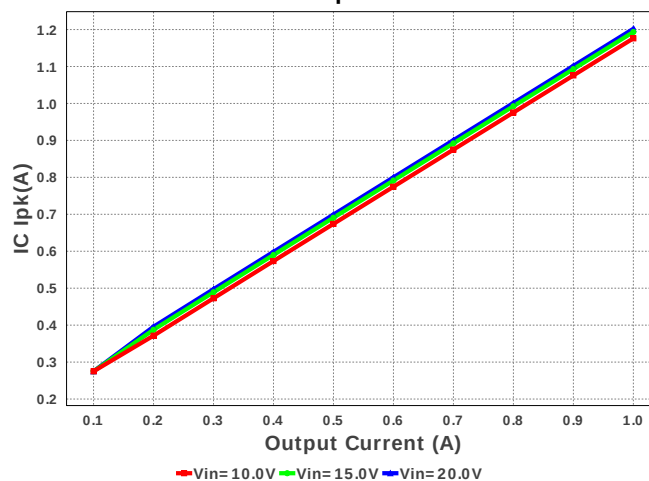
Duty Cycle

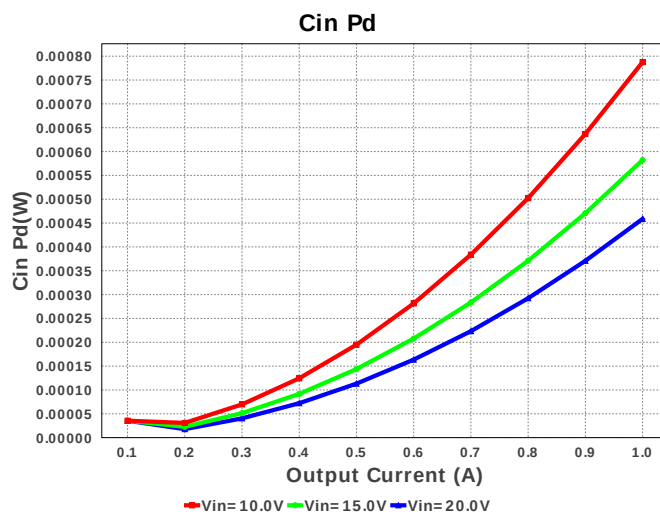
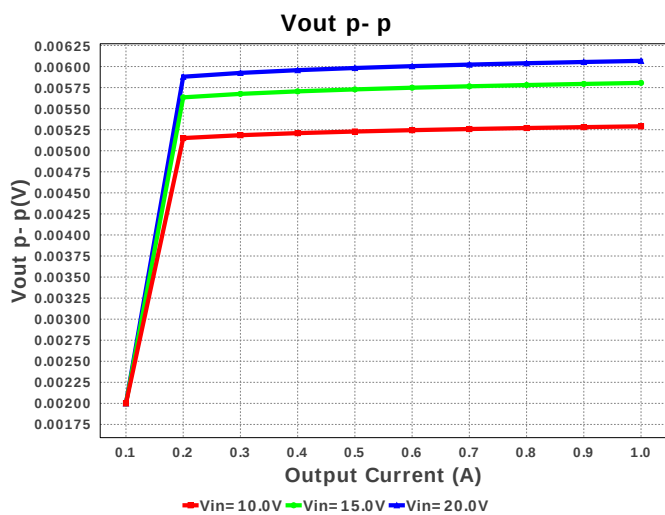
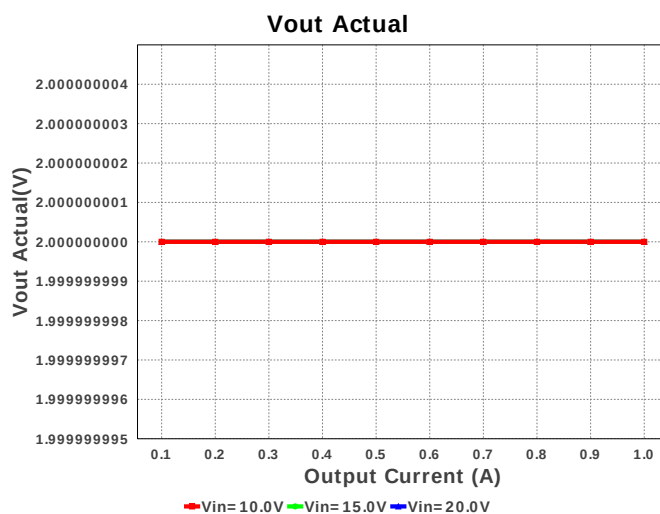
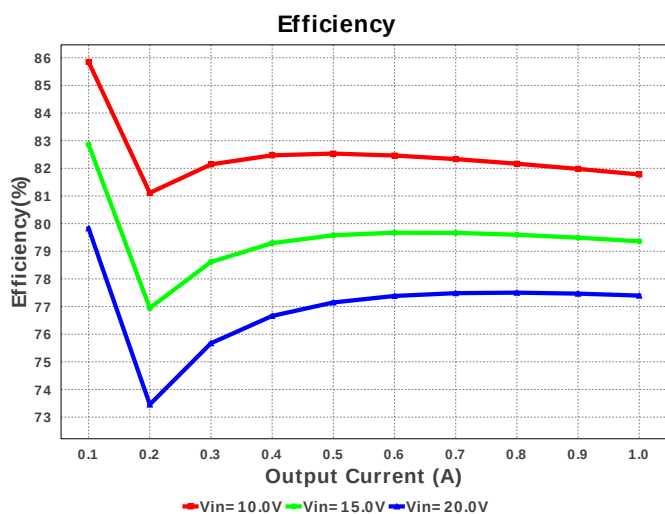
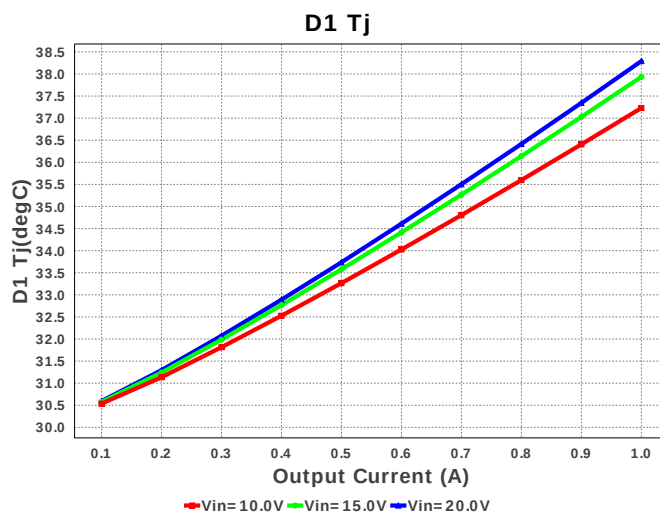
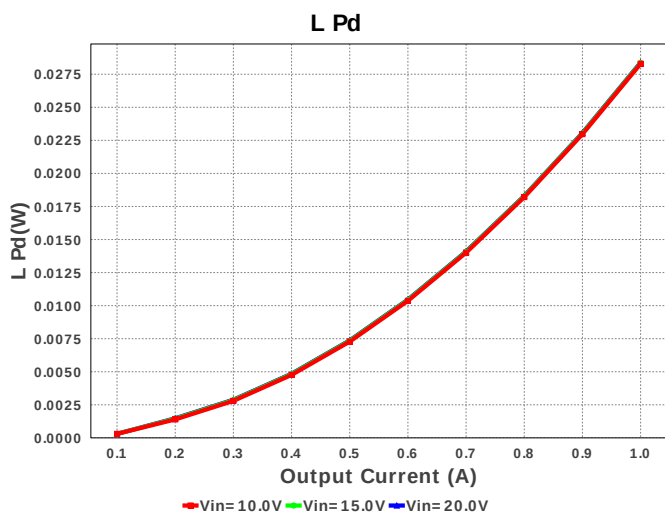


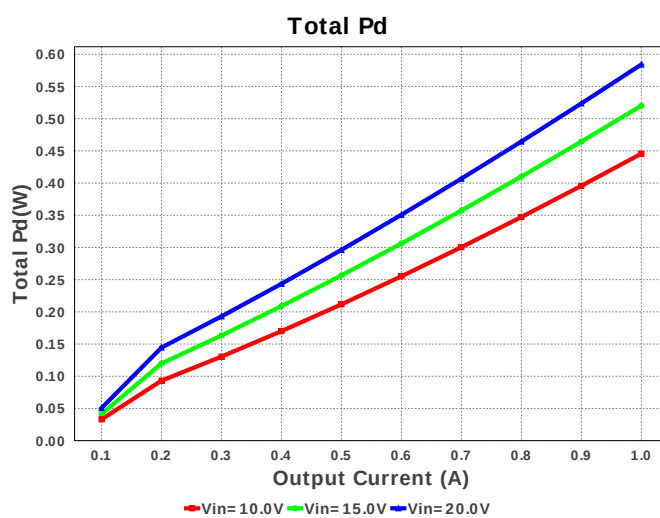
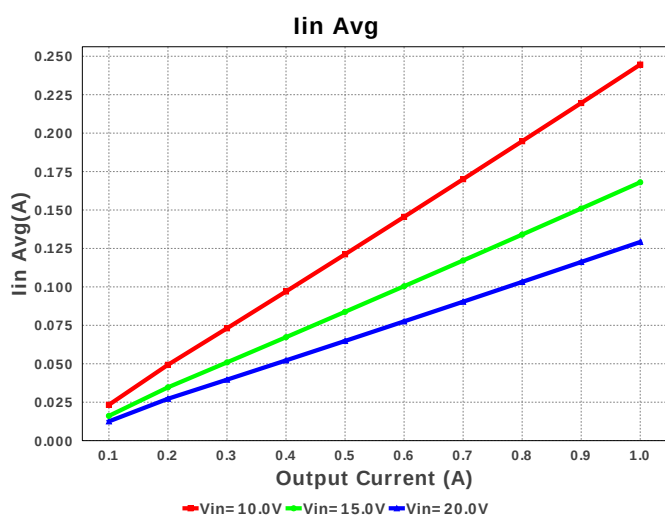
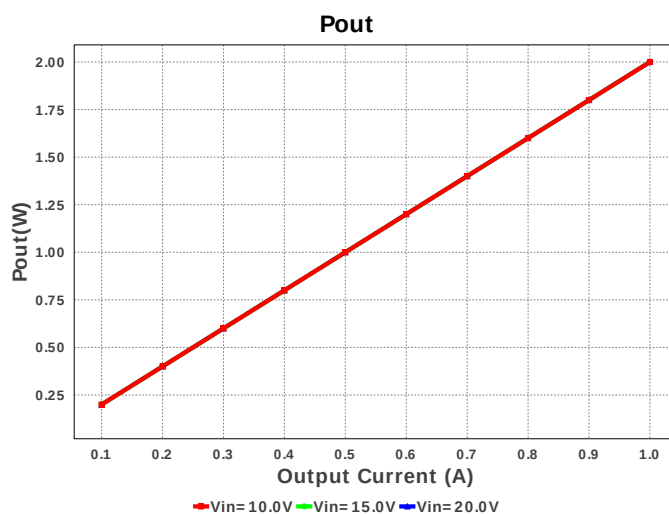
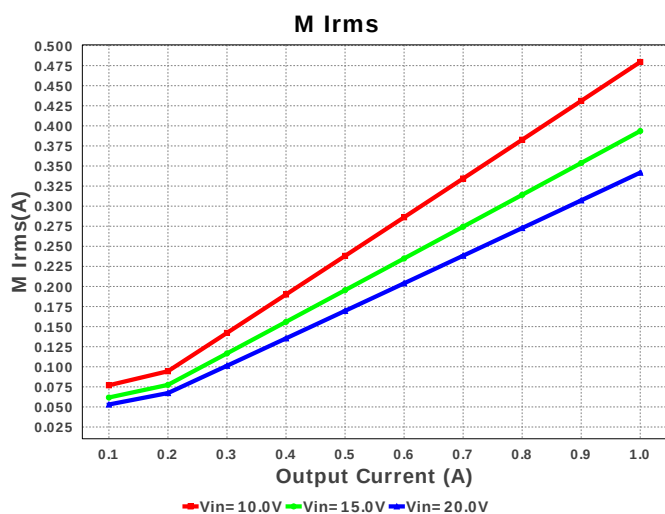
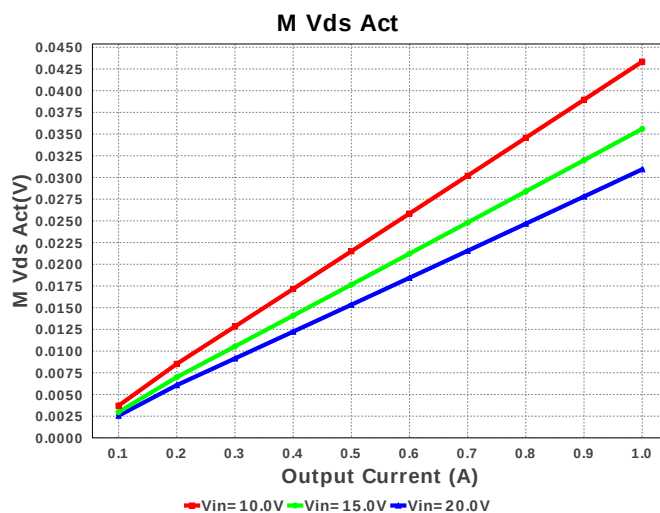
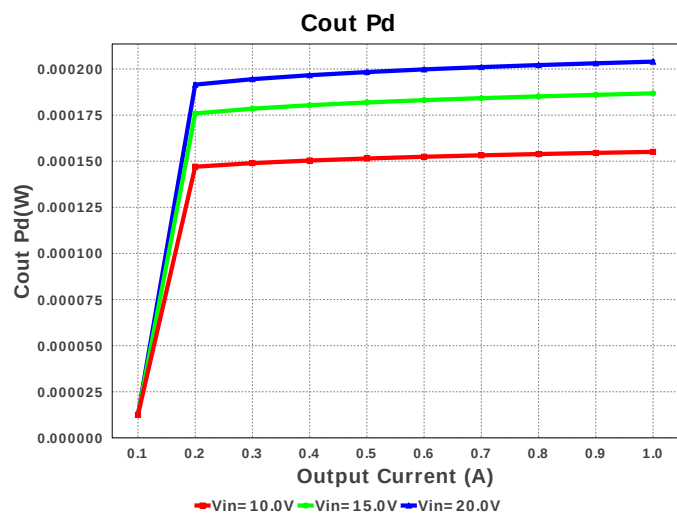
Cin IRMS

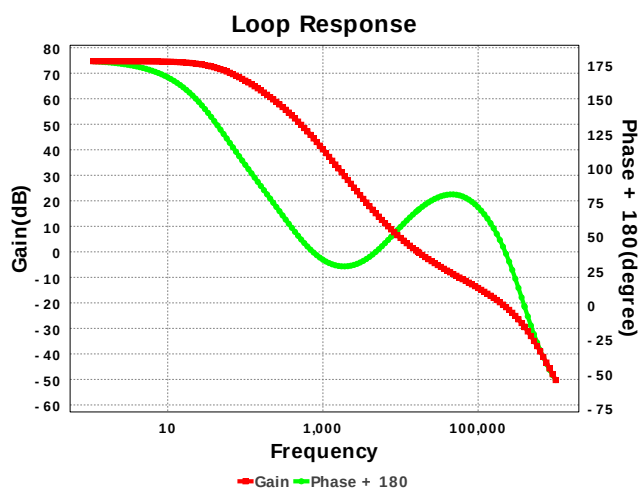
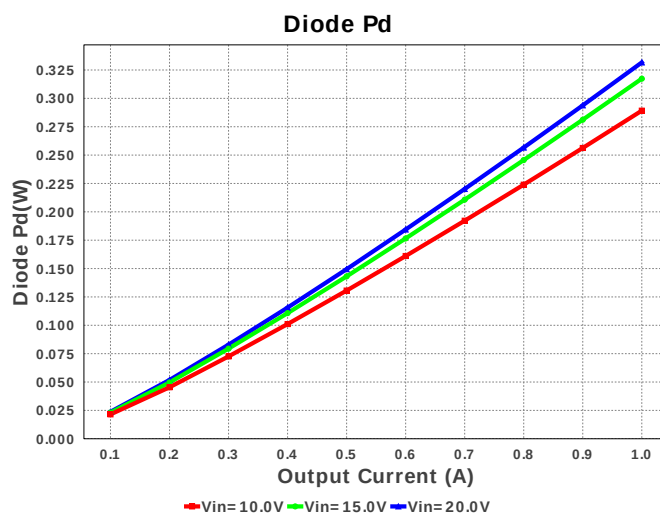
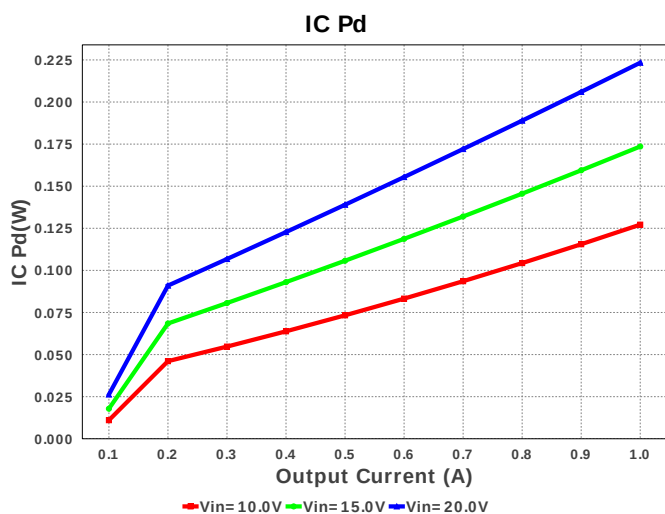
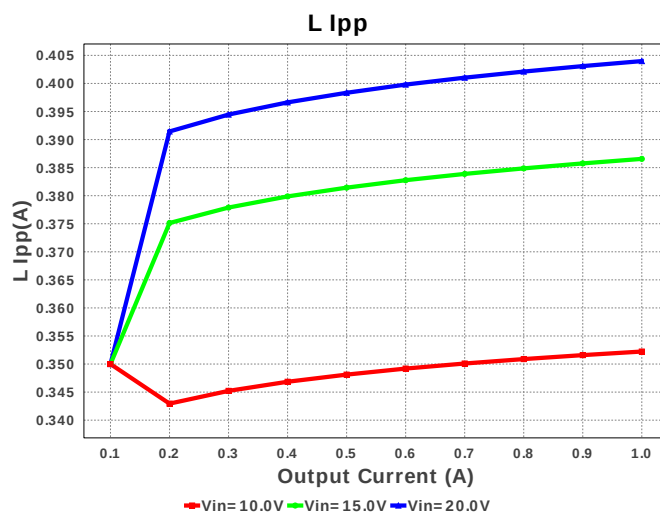
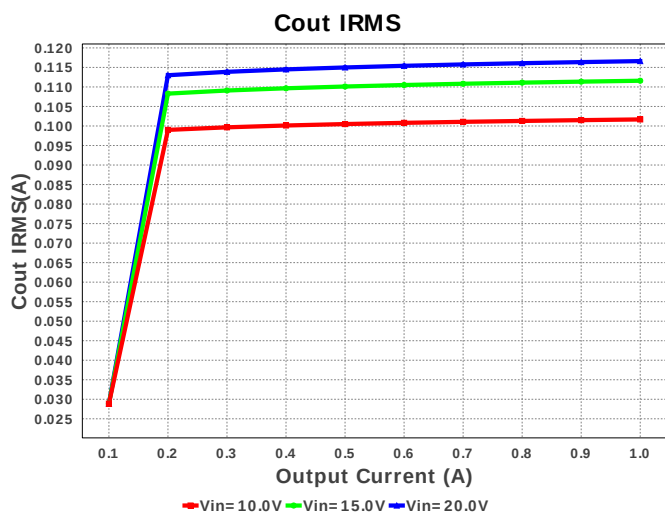


IC Ipk









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	321.157 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	116.619 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.202 A	Current	Peak switch current in IC
4.	Iin Avg	129.21 mA	Current	Average input current
5.	L Ipp	403.98 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	341.726 mA	Current	Q lavg
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	279.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	763.761 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	30.937 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	2.0 W	General	Total output power
13.	Total BOM	\$2.67	General	Total BOM Cost
14.	D1 Tj	38.291 degC	Op_Point	D1 junction temperature
15.	Vout Actual	2.0 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	2.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	16.787 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	11.676 %	Op_point	Duty cycle
19.	Efficiency	77.396 %	Op_point	Steady state efficiency
20.	IC Tj	39.38 degC	Op_point	IC junction temperature
21.	ICThetaJA	42.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	1.0 A	Op_point	Iout operating point
23.	Phase Marg	69.866 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	20.0 V	Op_point	Vin operating point
25.	Vout p-p	6.067 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	458.774 μ W	Power	Input capacitor power dissipation
27.	Cout Pd	204.001 μ W	Power	Output capacitor power dissipation
28.	Diode Pd	331.65 mW	Power	Diode power dissipation
29.	IC Pd	223.334 mW	Power	IC power dissipation
30.	L Pd	28.384 mW	Power	Inductor power dissipation
31.	Total Pd	584.133 mW	Power	Total Power Dissipation
32.	Vout Tolerance	3.693 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	20.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	2.0	Output Voltage
5.	base_pn	LMR14050S	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMR14050S** Product Folder : <http://www.ti.com/product/LMR14050> : contains the data sheet and other resources.

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