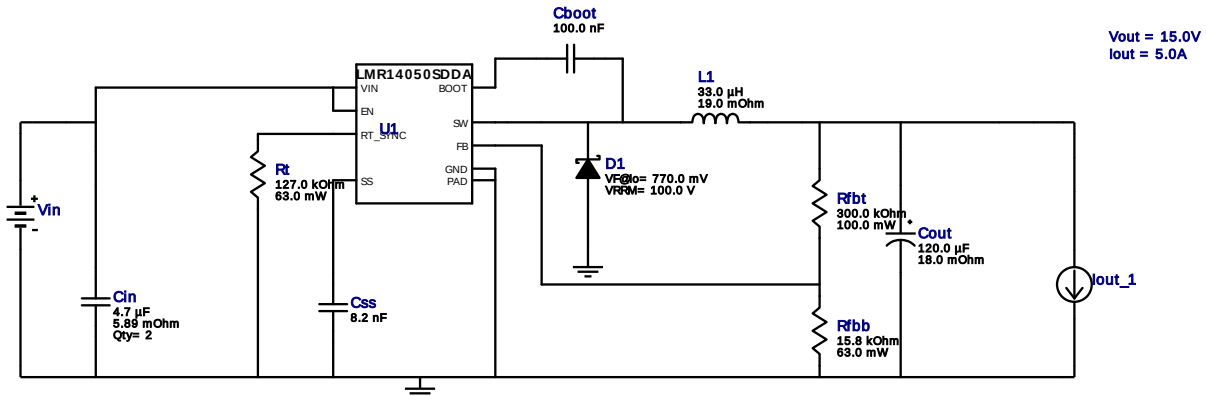




Design : 4354344/45 LMR14050SDDAR
LMR14050SDDAR 20.0V-40.0V to 14.99V @ 5.000142400253325A

VinMin = 20.0V
VinMax = 40.0V
Vout = 15.0V
Iout = 5.0A

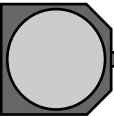
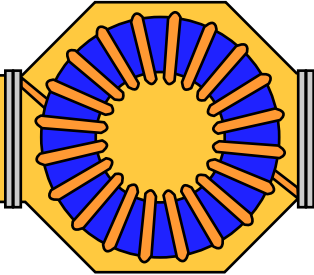
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Topology = Buck
Created = 7/13/16 1:26:47 AM
BOM Cost = \$5.51
BOM Count = 11
Total Pd = 3.99W



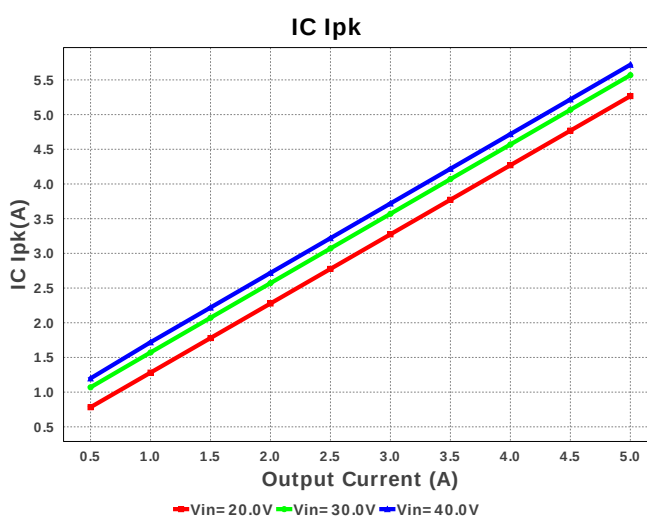
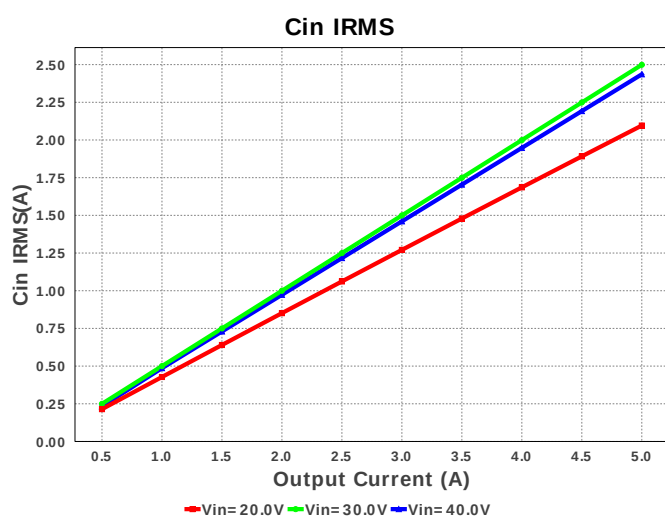
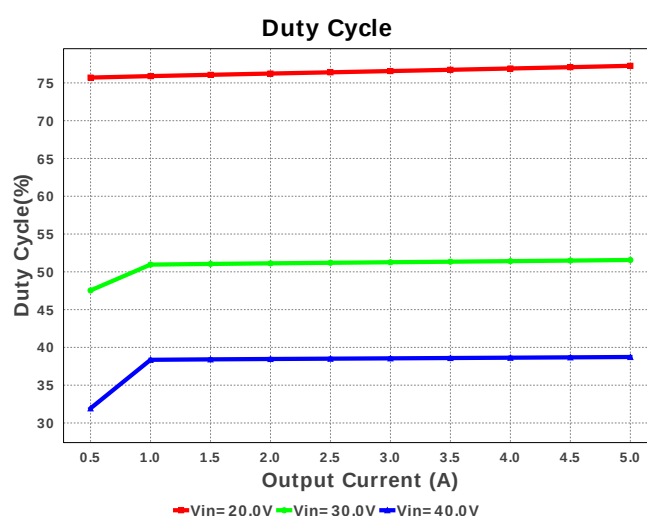
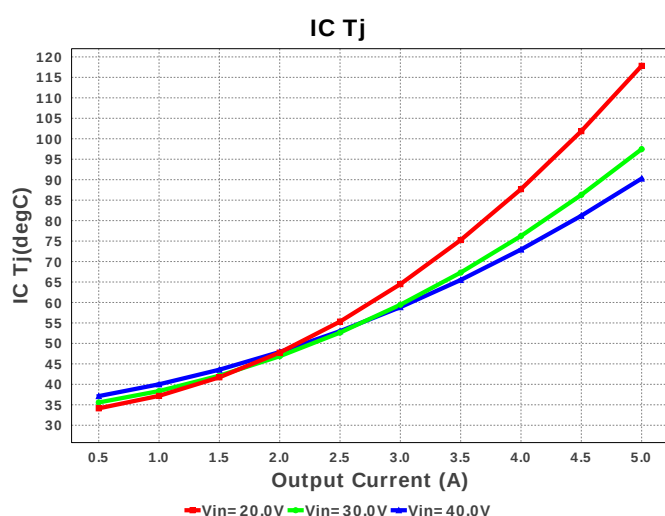
My Comments

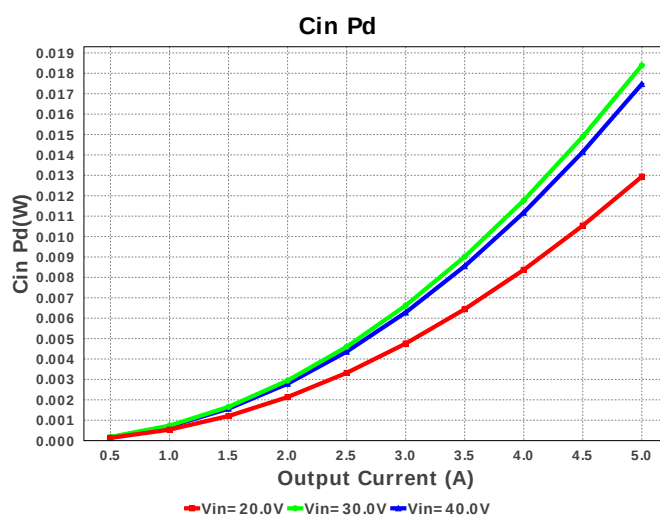
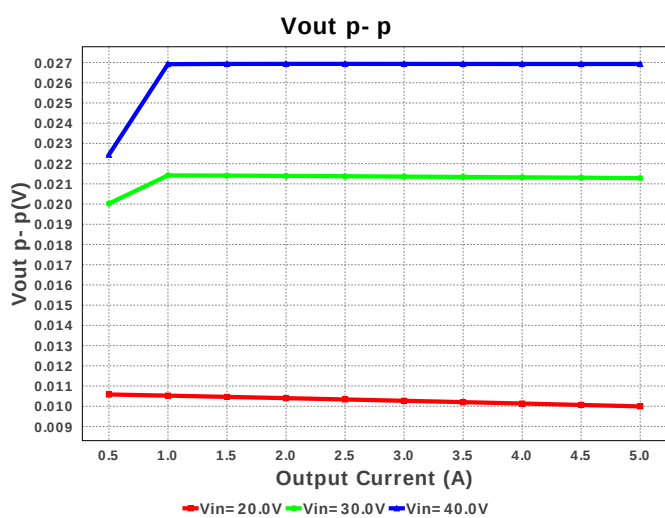
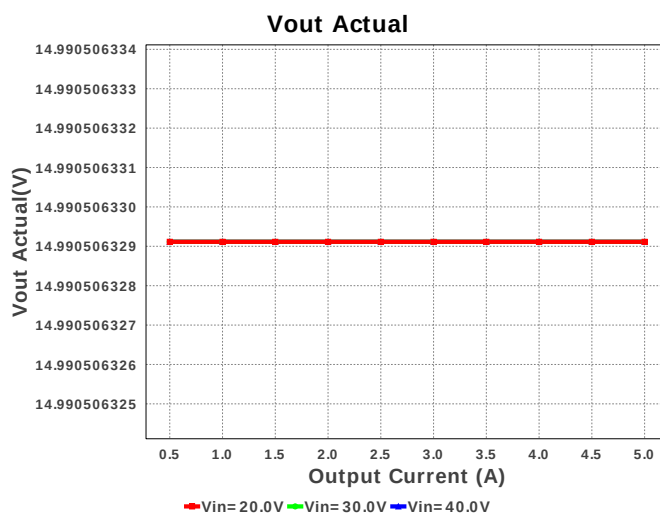
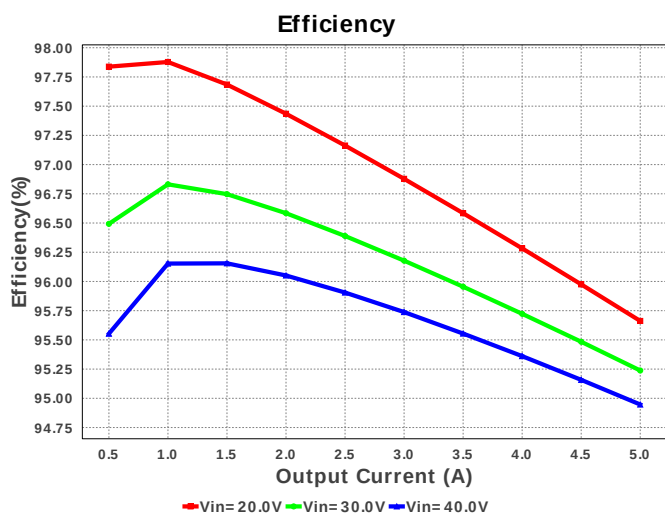
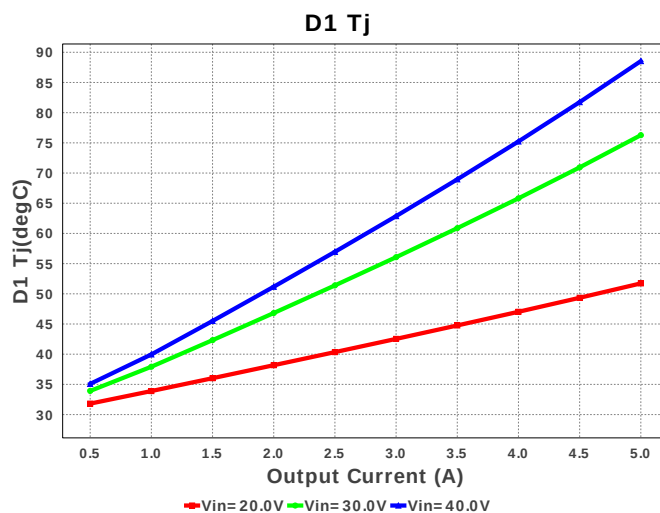
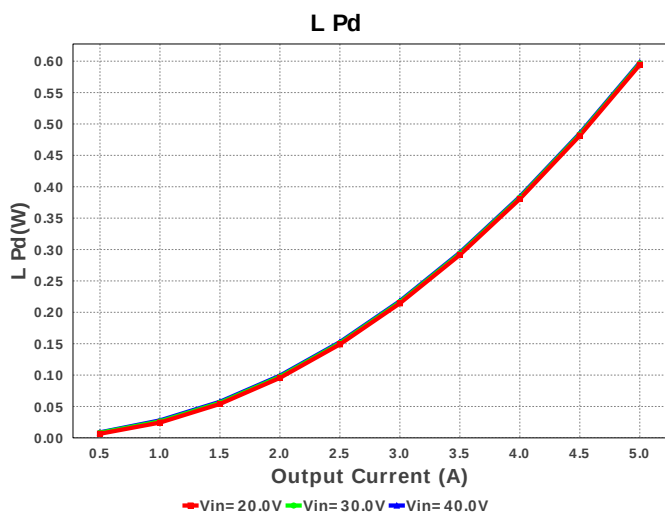
No comments

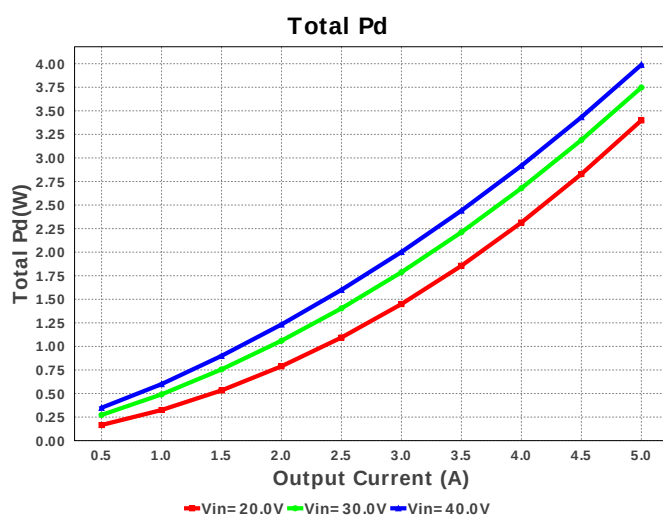
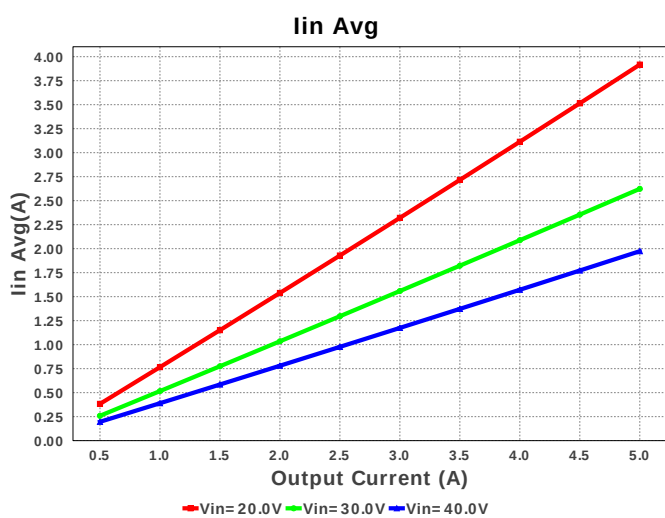
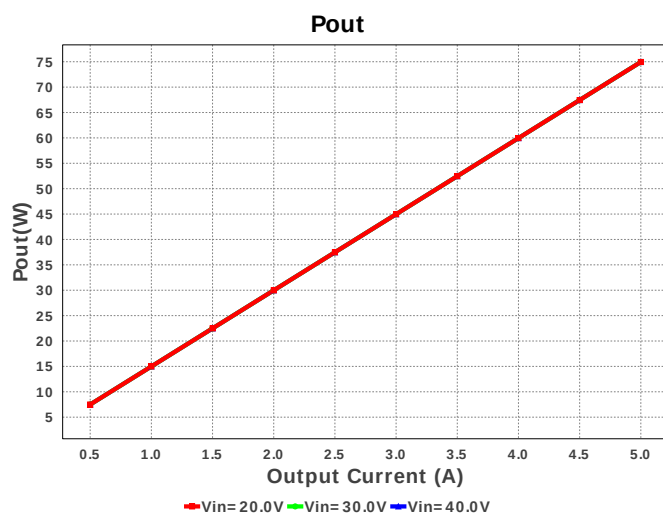
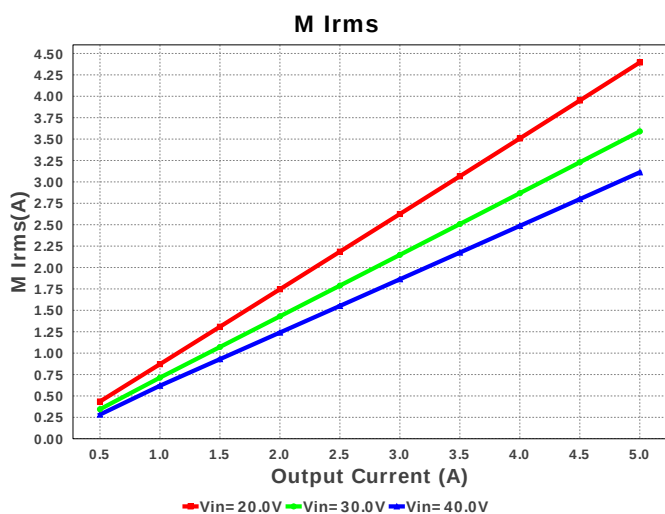
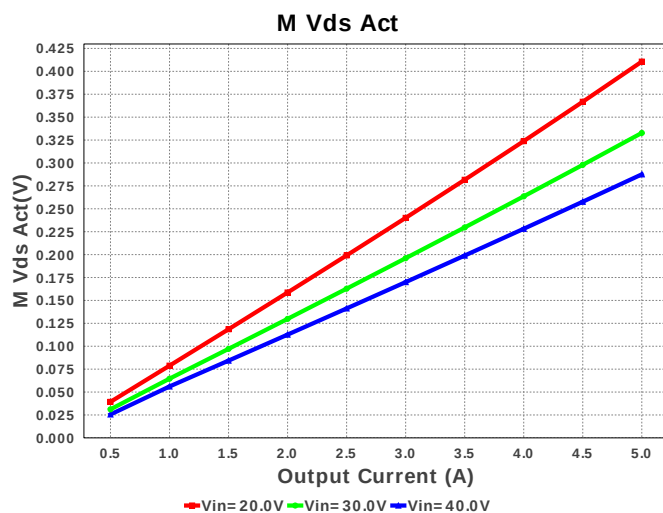
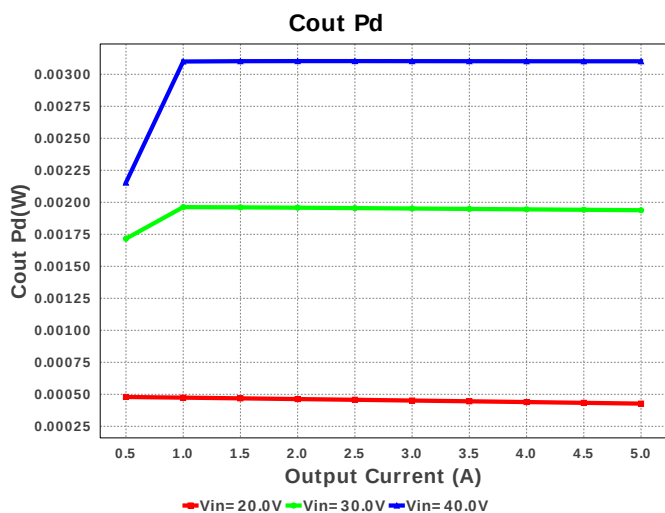
Electrical BOM

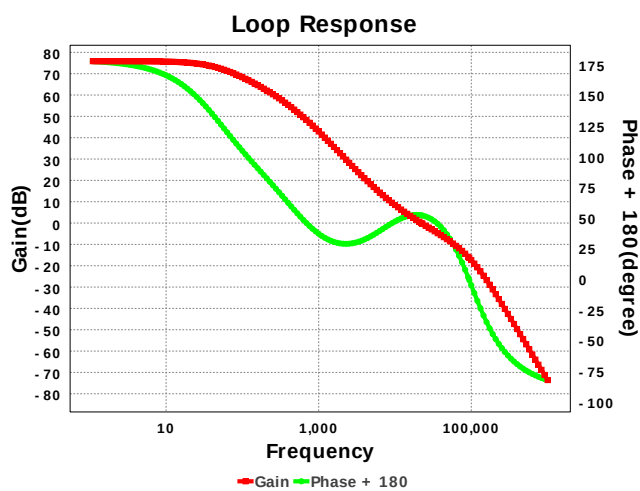
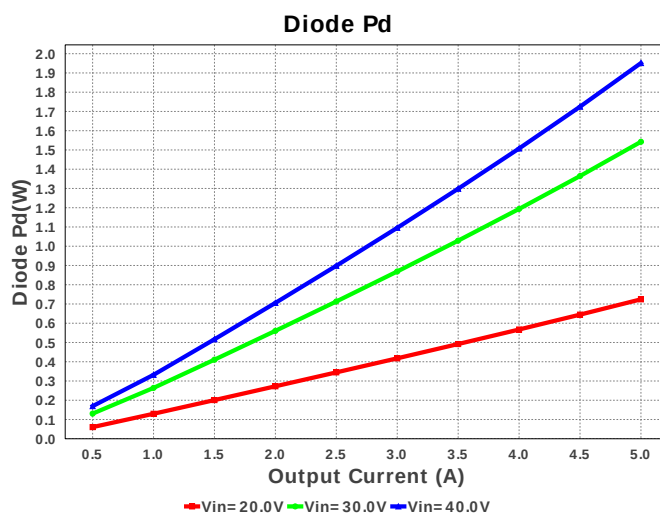
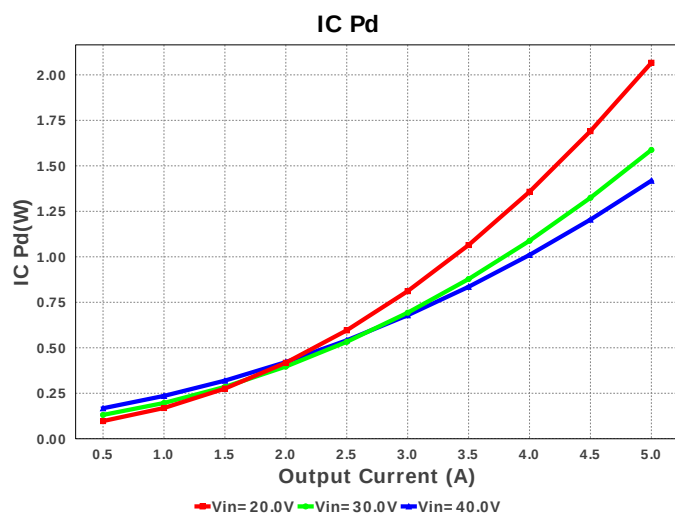
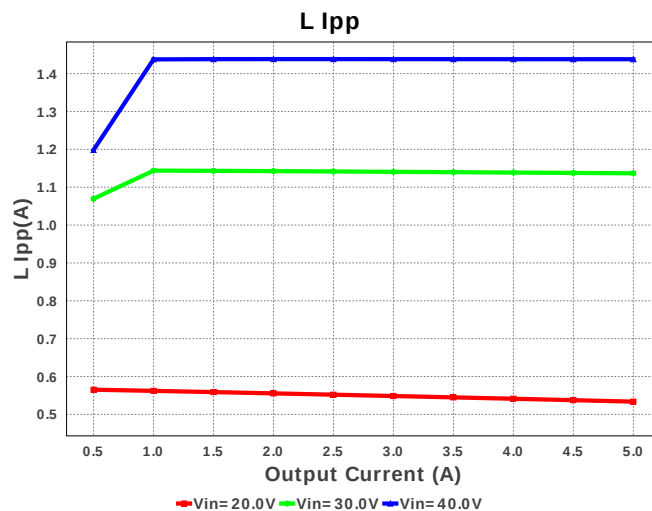
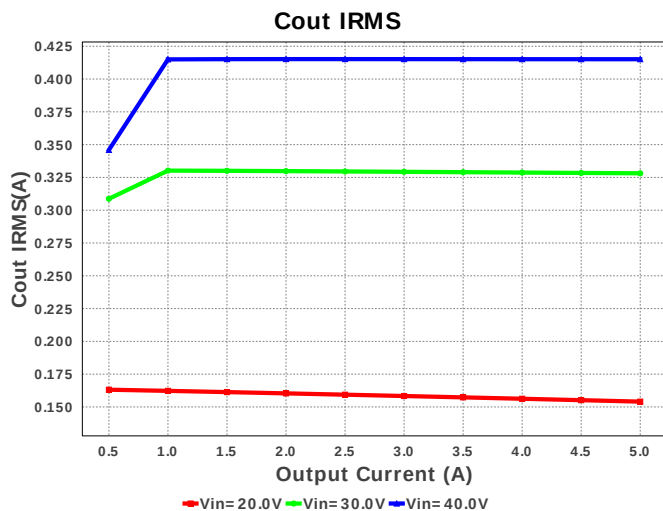
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Taiyo Yuden	HMK212B7104KG-T Series= X7R	Cap= 100.0 nF VDC= 100.0 V IRMS= 0.0 A	1	\$0.03	 0805 7 mm²
2.	Cin	TDK	C3225X7S2A475M200AB Series= X7S	Cap= 4.7 uF ESR= 5.89 mOhm VDC= 100.0 V IRMS= 6.7739 A	2	\$0.42	 1210 15 mm²
3.	Cout	Panasonic	35SVPF120M Series= ?	Cap= 120.0 uF ESR= 18.0 mOhm VDC= 35.0 V IRMS= 4.4 A	1	\$0.70	 CAPSMT_62_F12 151 mm²
4.	Css	MuRata	GRM155R71C822KA01D Series= X7R	Cap= 8.2 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm²
5.	D1	Vishay-Semiconductor	50WQ10FNBPBF	VF@Io= 770.0 mV VRRM= 100.0 V	1	\$0.74	 DPAK 102 mm²
6.	L1	Bourns	PM2110-330K-RC	L= 33.0 µH DCR= 19.0 mOhm	1	\$1.21	 PM2110 890 mm²
7.	Rfbb	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	Rfbt	Yageo America	RC0603FR-07300KL Series= ?	Res= 300.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm ²
9.	Rt	Vishay-Dale	CRCW0402127KFKED Series= CRCW..e3	Res= 127.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	U1	Texas Instruments	LMR14050SDDAR	Switcher	1	\$1.95	 DDA0008E_N 57 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	2.436 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	415.116 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	5.719 A	Current	Peak switch current in IC
4.	Iin Avg	1.974 A	Current	Average input current
5.	L Ipp	1.438 A	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	3.112 A	Current	Q lavg
7.	BOM Count	11	General	Total Design BOM count
8.	FootPrint	1.251 k mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	201.769 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	287.481 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	74.95 W	General	Total output power
13.	Total BOM	\$5.51	General	Total BOM Cost
14.	D1 Tj	88.54 degC	Op_Point	D1 junction temperature
15.	Vout Actual	14.991 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	14.99 V	Op_Point	Operational Output Voltage
17.	Cross Freq	22.236 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	38.729 %	Op_point	Duty cycle
19.	Efficiency	94.947 %	Op_point	Steady state efficiency
20.	IC Tj	89.56 degC	Op_point	IC junction temperature
21.	ICThetaJA	42.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	5.0 A	Op_point	Iout operating point
23.	Phase Marg	52.792 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	40.0 V	Op_point	Vin operating point
25.	Vout p-p	26.928 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	17.471 mW	Power	Input capacitor power dissipation
27.	Cout Pd	3.102 mW	Power	Output capacitor power dissipation
28.	Diode Pd	1.951 W	Power	Diode power dissipation
29.	IC Pd	1.418 W	Power	IC power dissipation
30.	L Pd	597.854 mW	Power	Inductor power dissipation
31.	Total Pd	3.989 W	Power	Total Power Dissipation
32.	Vout Tolerance	4.365 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	5.0	Maximum Output Current
2.	VinMax	40.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	15.0	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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