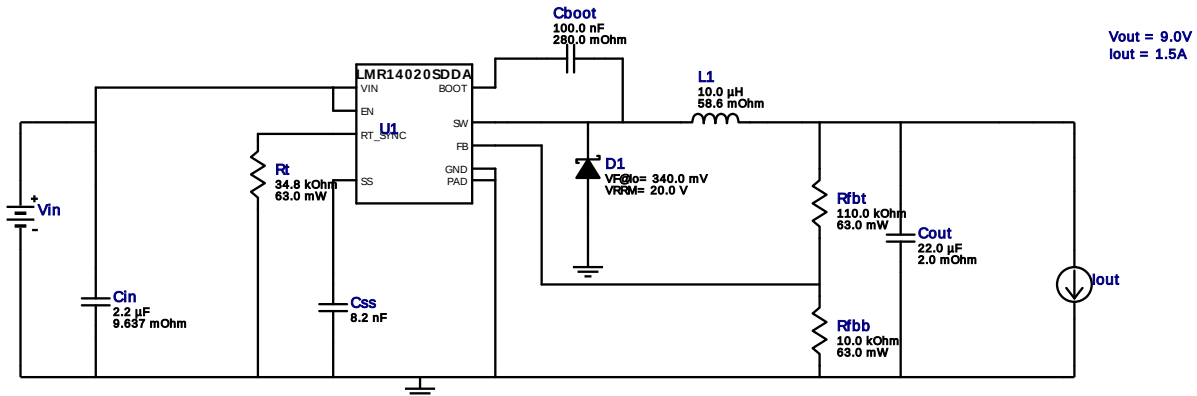


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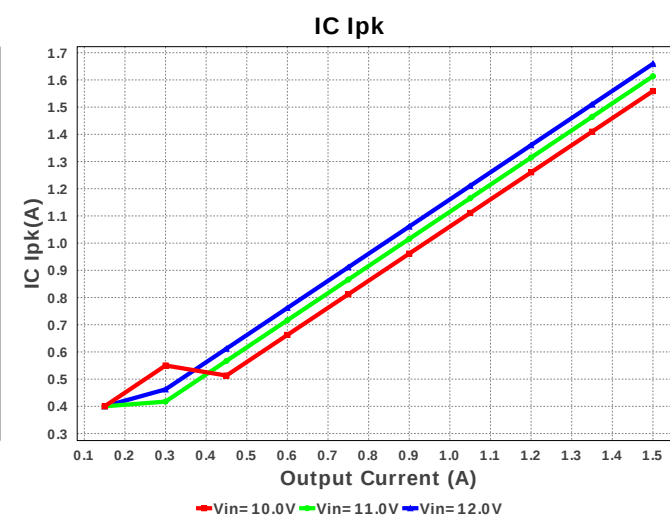
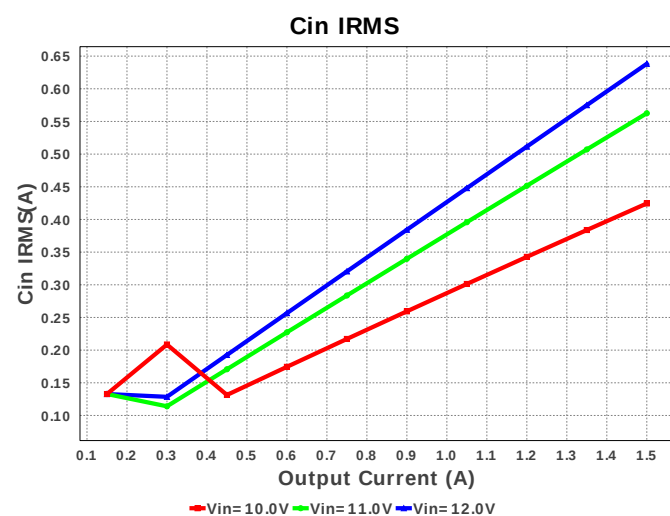
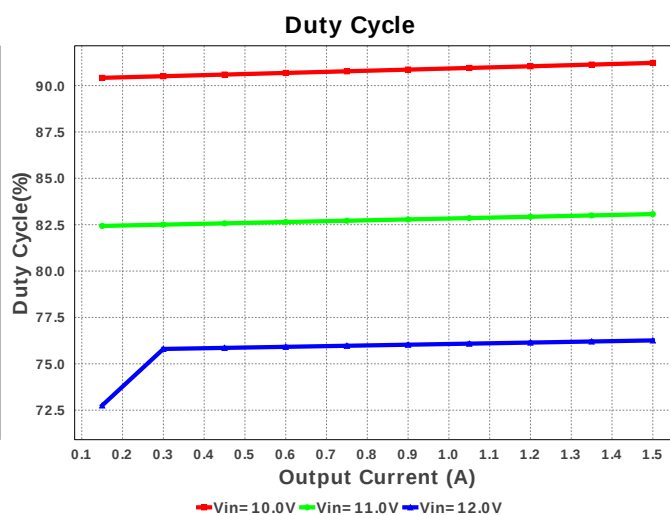
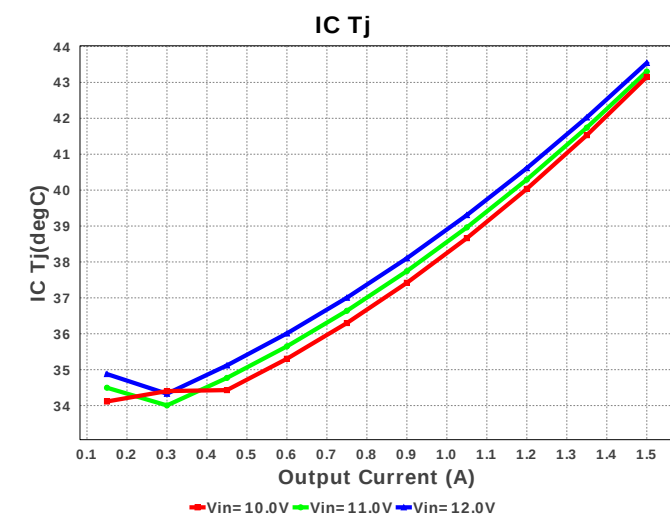
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LMR14020SDDAR 10.0V-12.0V to 9.00V @ 1.5002250000000001A

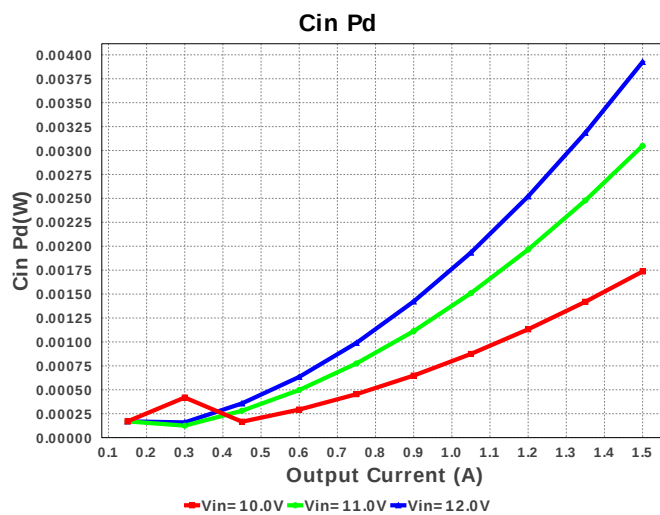
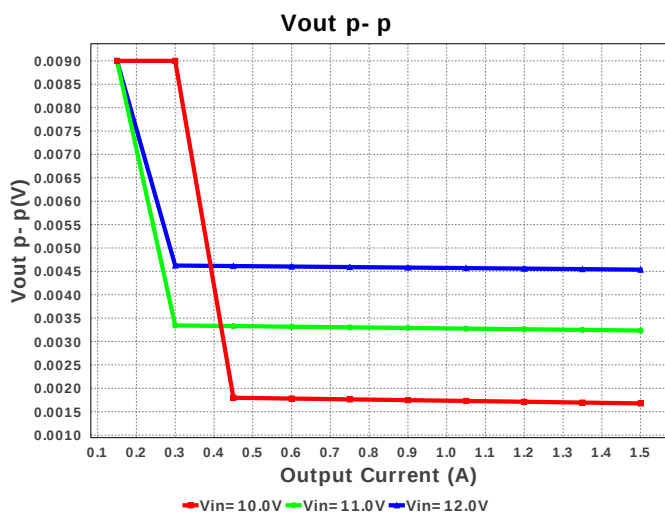
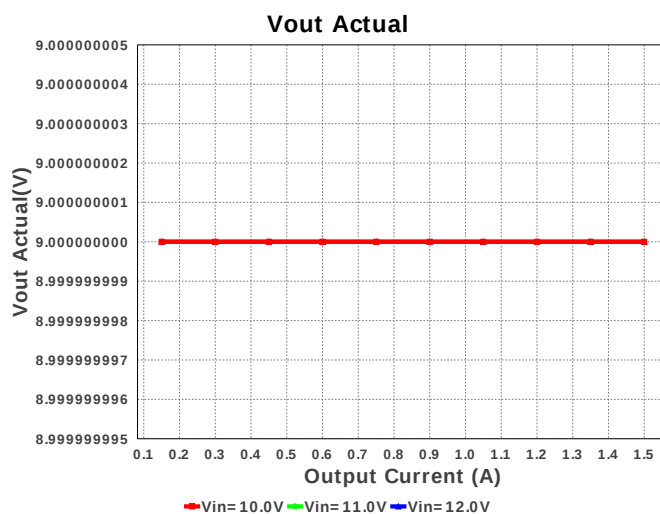
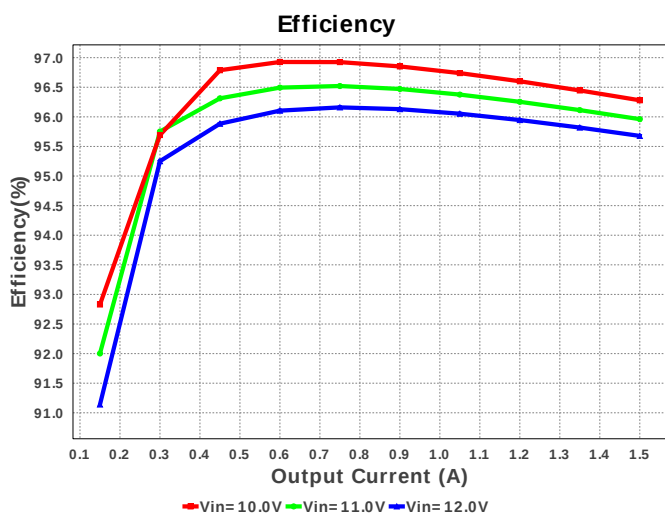
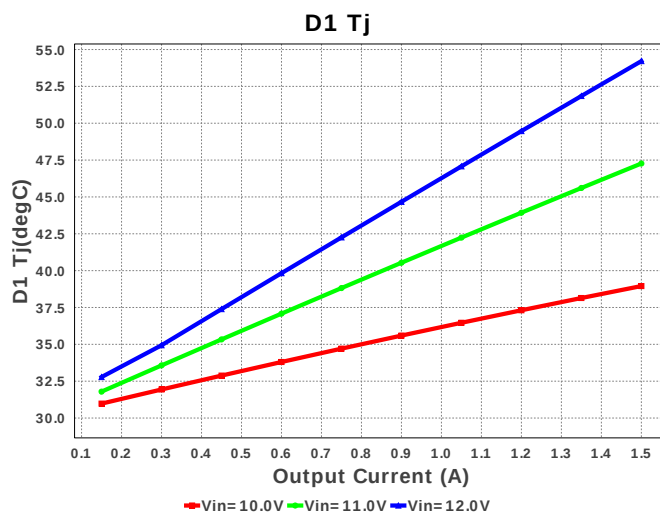
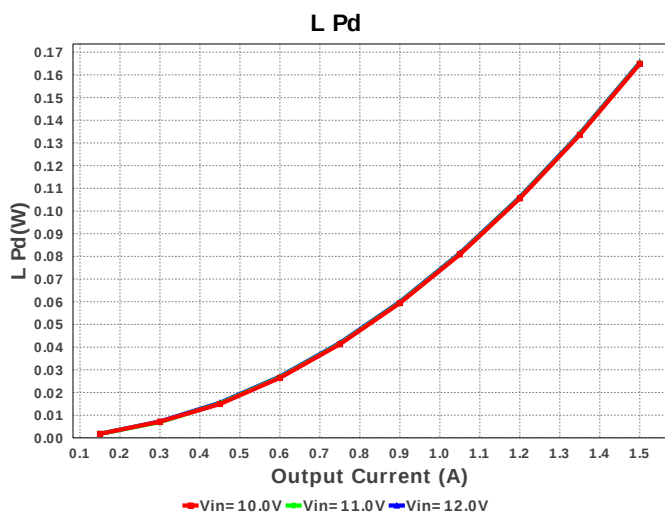


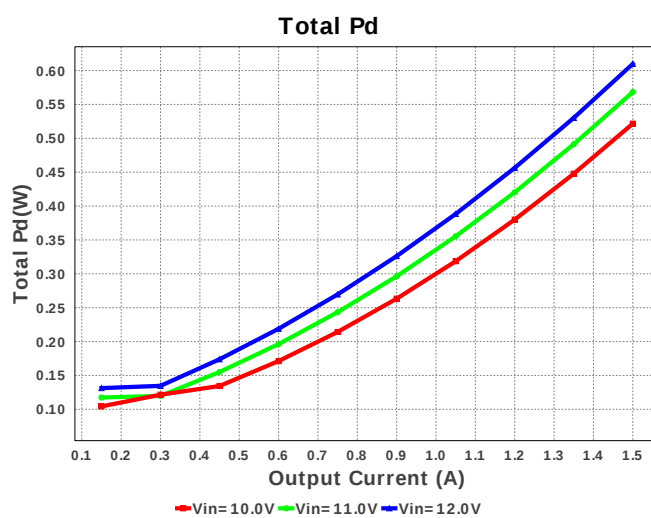
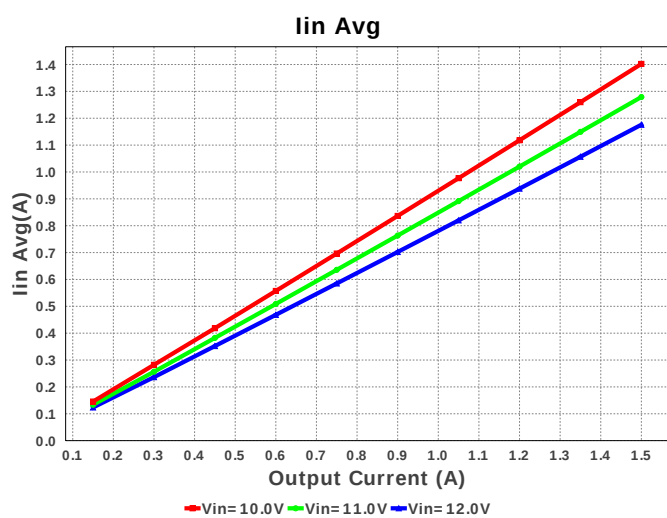
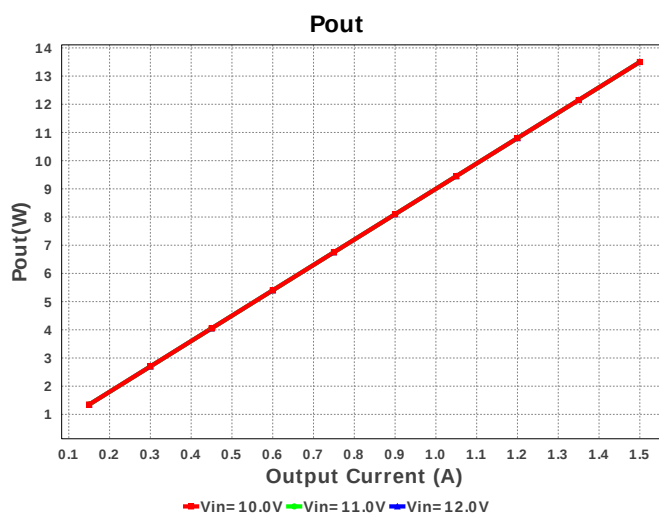
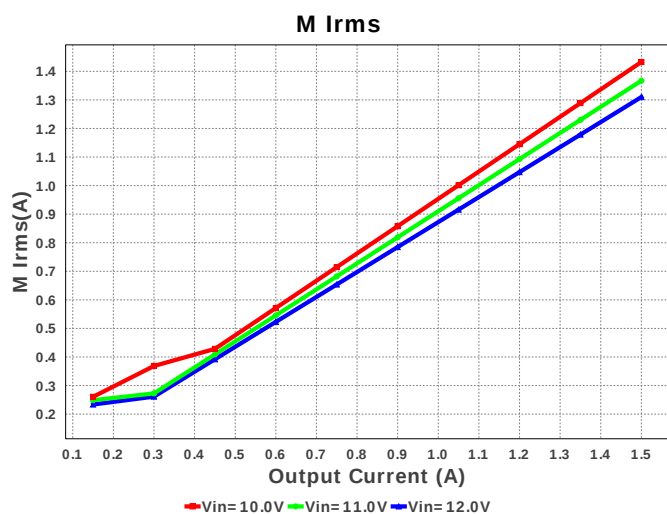
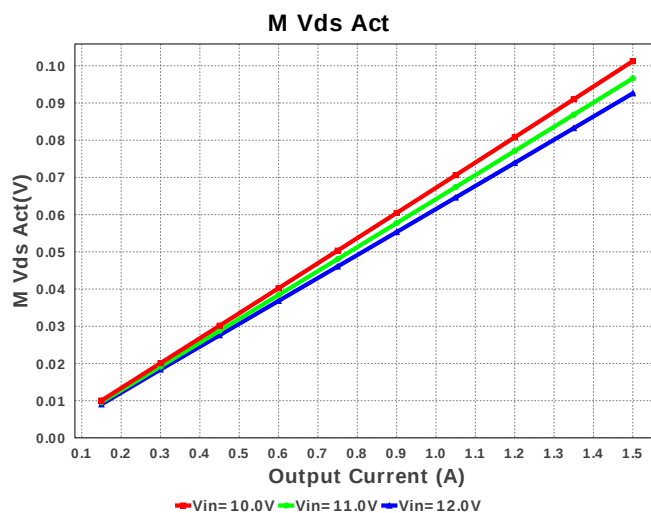
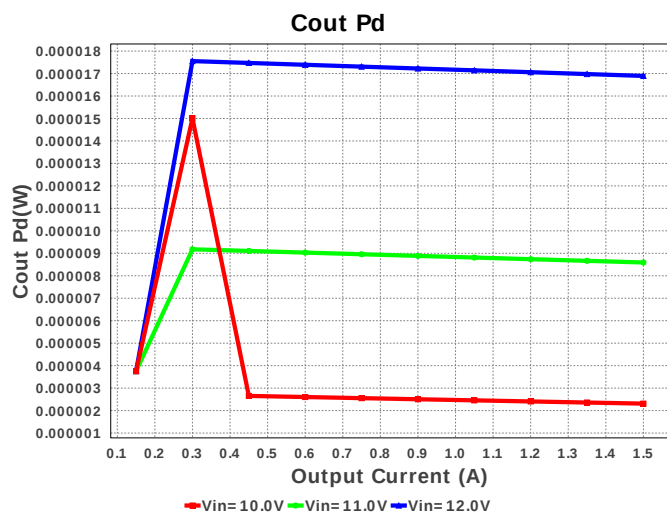
Electrical BOM

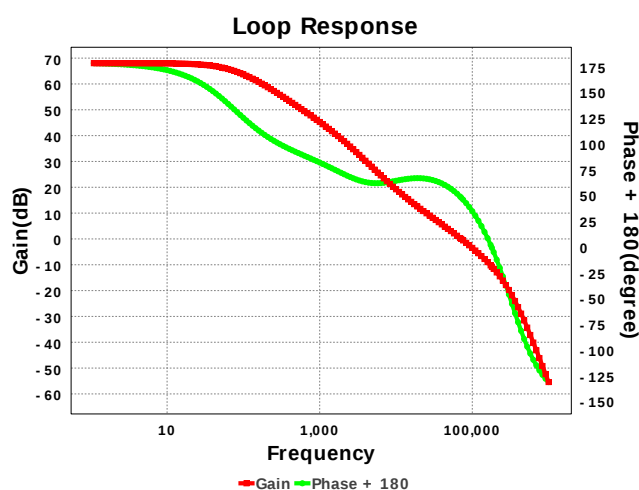
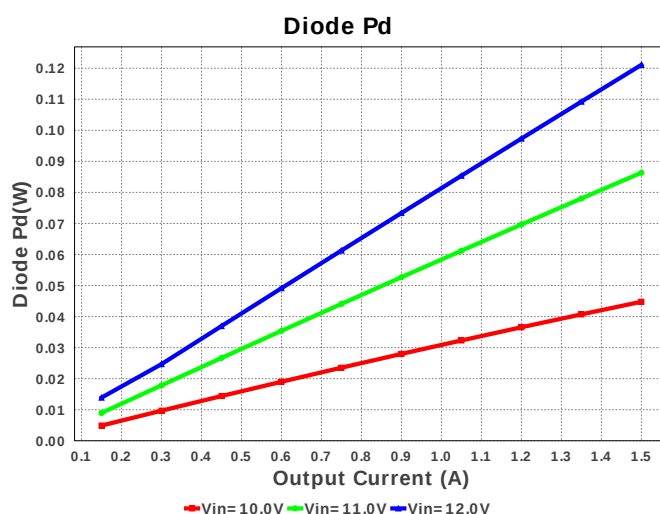
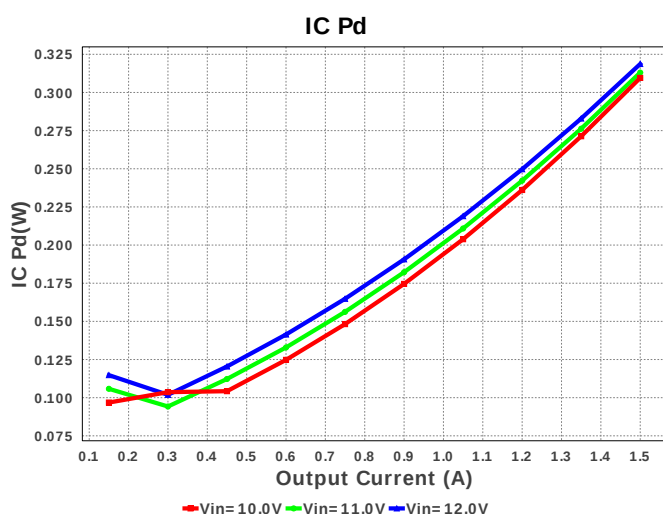
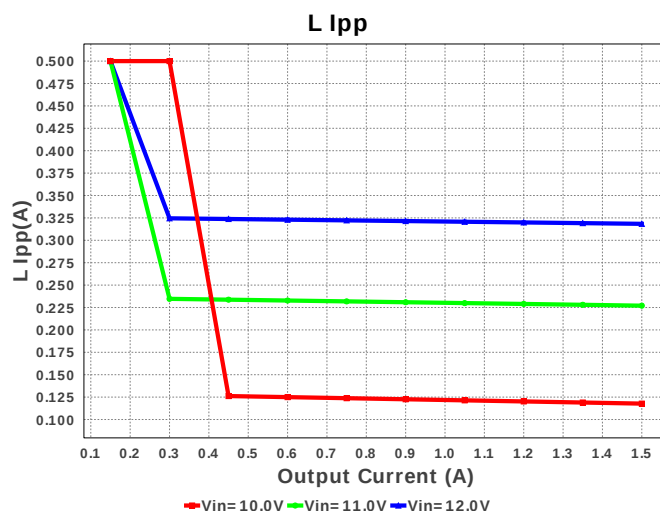
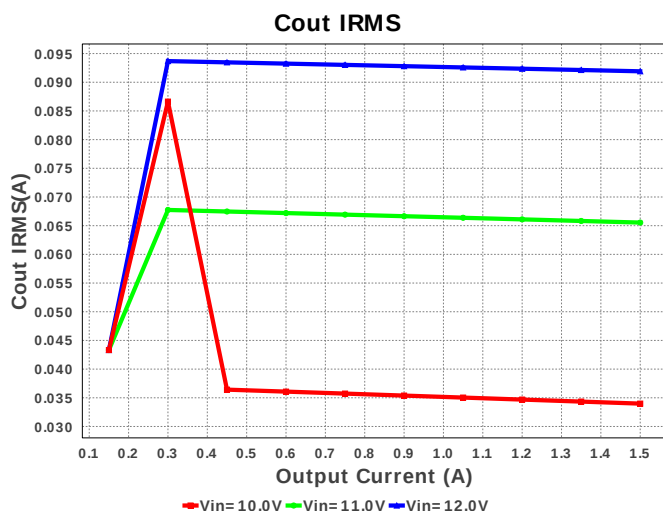
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM188R61C225KE15D Series= X5R	Cap= 2.2 uF ESR= 9.637 mOhm VDC= 16.0 V IRMS= 1.20373 A	1	\$0.02	0603 5 mm ²
3.	Cout	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.16	1210 15 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	Fairchild Semiconductor	MBR1020VL	VF@Io= 340.0 mV VRRM= 20.0 V	1	\$0.07	SOD-123F 12 mm ²
6.	L1	Bourns	SRN6045-100M	L= 10.0 uH DCR= 58.6 mOhm	1	\$0.16	SRN6045 64 mm ²
7.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
8.	Rfht	Vishay-Dale	CRCW0402110KFKED Series= CRCW..e3	Res= 110.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rt	Vishay-Dale	CRCW040234K8FKED Series= CRCW..e3	Res= 34.8 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	LMR14020SDDAR	Switcher	1	\$1.46	 DDA0008E_N 57 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	638.257 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	91.907 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.659 A	Current	Peak switch current in IC
4.	Iin Avg	1.176 A	Current	Average input current
5.	L Ipp	318.38 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.31 A	Current	Q lavg
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	171.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	696.417 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	92.589 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Mode	CCM	General	Conduction Mode
13.	Pout	13.5 W	General	Total output power
14.	Total BOM	\$1.92	General	Total BOM Cost
15.	D1 Tj	54.215 degC	Op_Point	D1 junction temperature
16.	Vout Actual	9.0 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Vout OP	9.0 V	Op_Point	Operational Output Voltage
18.	Cross Freq	71.703 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	76.261 %	Op_point	Duty cycle
20.	Efficiency	95.678 %	Op_point	Steady state efficiency
21.	IC Tj	43.383 degC	Op_point	IC junction temperature
22.	ICThetaJA	42.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	1.5 A	Op_point	Iout operating point
24.	Phase Marg	48.584 deg	Op_point	Bode Plot Phase Margin
25.	VIN_OP	12.0 V	Op_point	Vin operating point
26.	Vout p-p	4.537 mV	Op_point	Peak-to-peak output ripple voltage
27.	Cin Pd	3.926 mW	Power	Input capacitor power dissipation
28.	Cout Pd	16.894 μ W	Power	Output capacitor power dissipation
29.	Diode Pd	121.075 mW	Power	Diode power dissipation
30.	IC Pd	318.652 mW	Power	IC power dissipation
31.	L Pd	165.448 mW	Power	Inductor power dissipation
32.	Total Pd	609.869 mW	Power	Total Power Dissipation
33.	Vout Tolerance	4.296 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.5	Maximum Output Current
2.	VinMax	12.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	9.0	Output Voltage
5.	base_pn	LMR14020S	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMR14020S** Product Folder : <http://www.ti.com/product/LMR14020> : contains the data sheet and other resources.

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