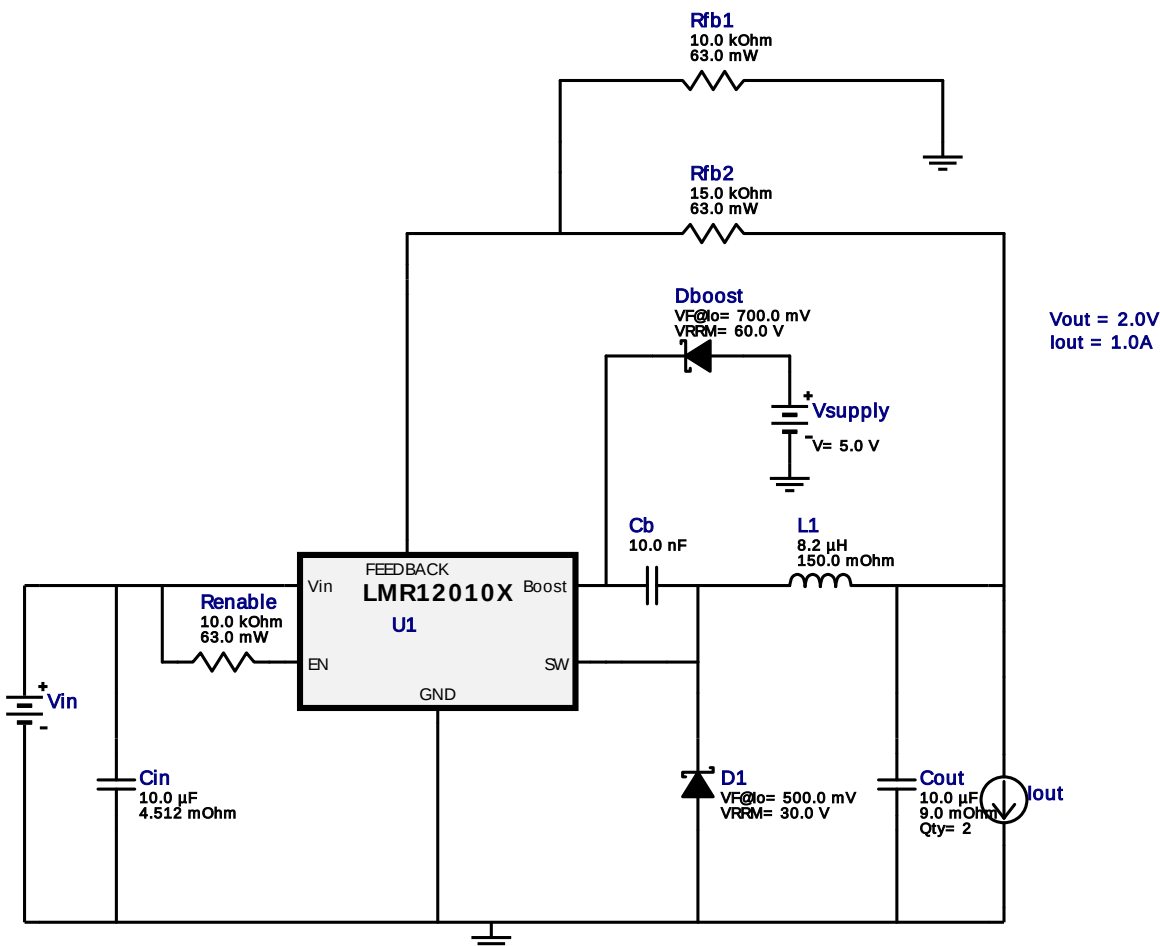


WEBENCH[®] Design Report

Design : 4728750/6 LMR12010XMK/NOPB
LMR12010XMK/NOPB 10.0V-20.0V to 2.00V @ 1.0A

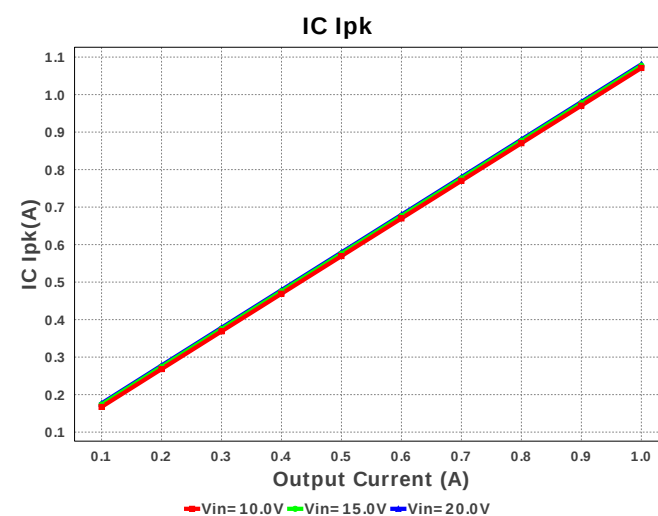
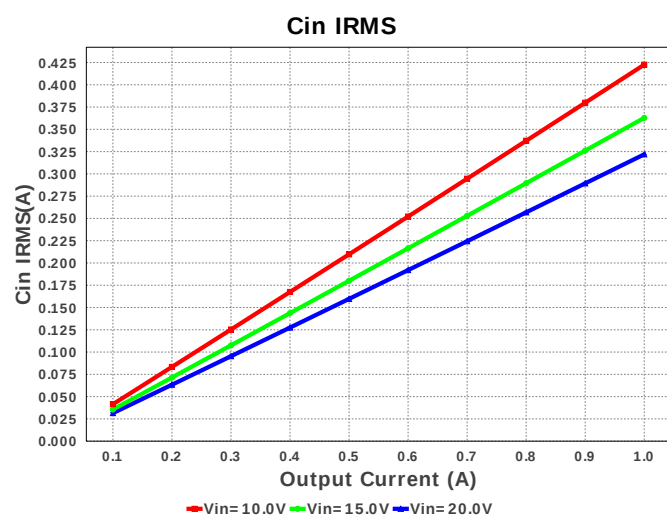
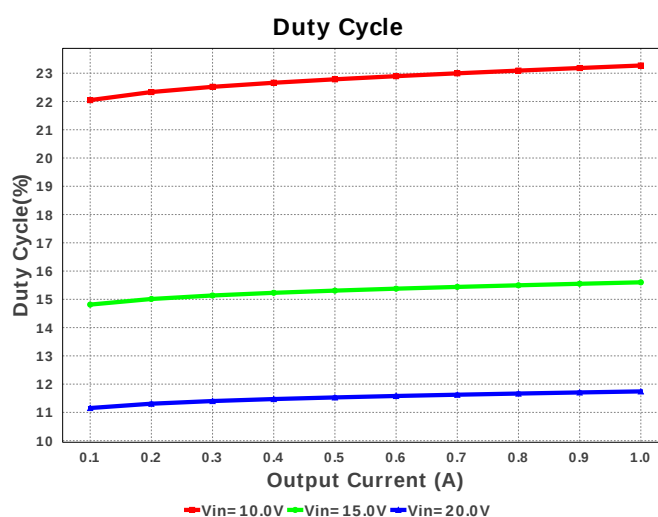
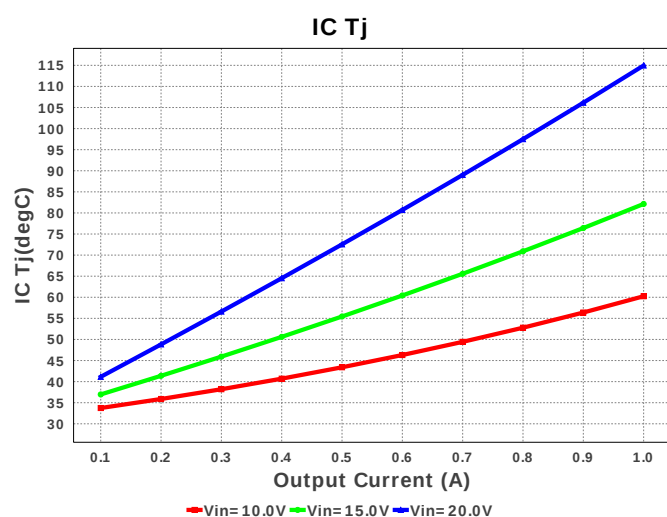


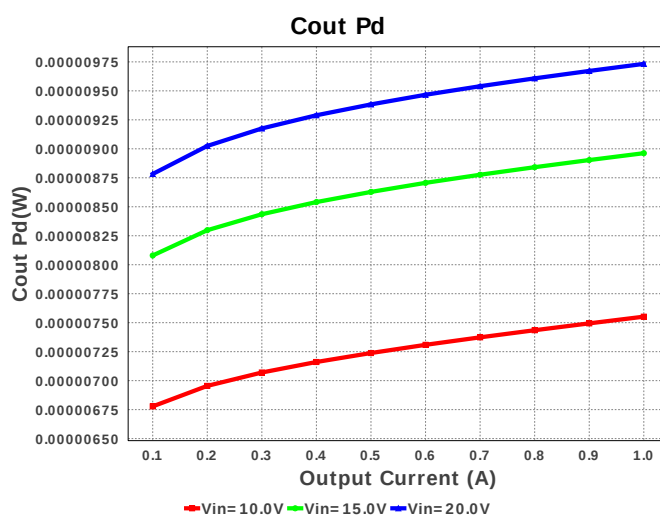
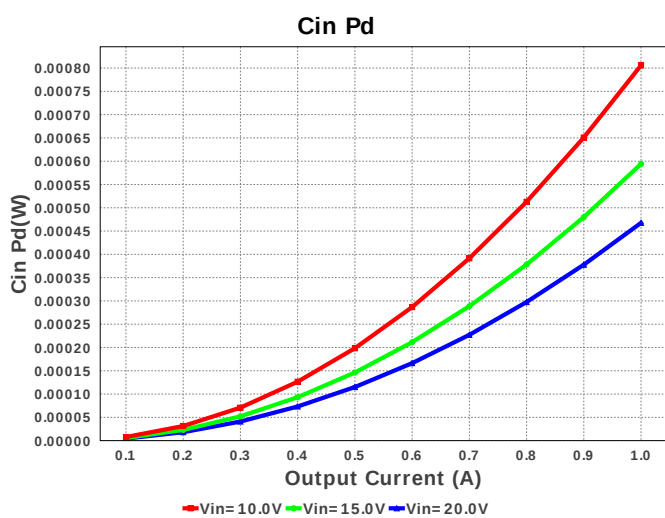
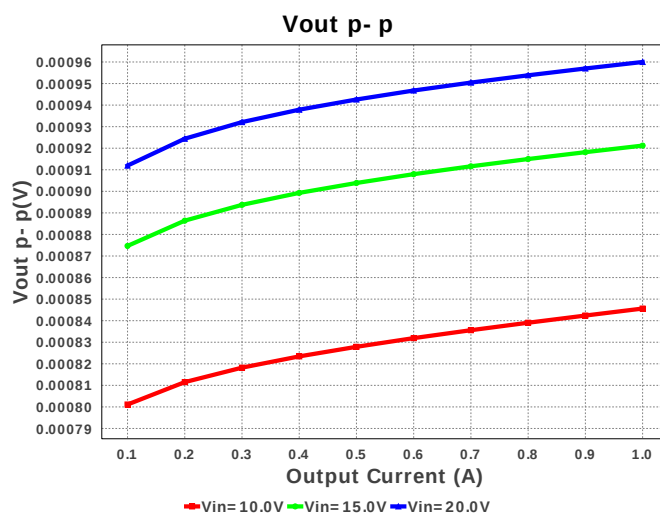
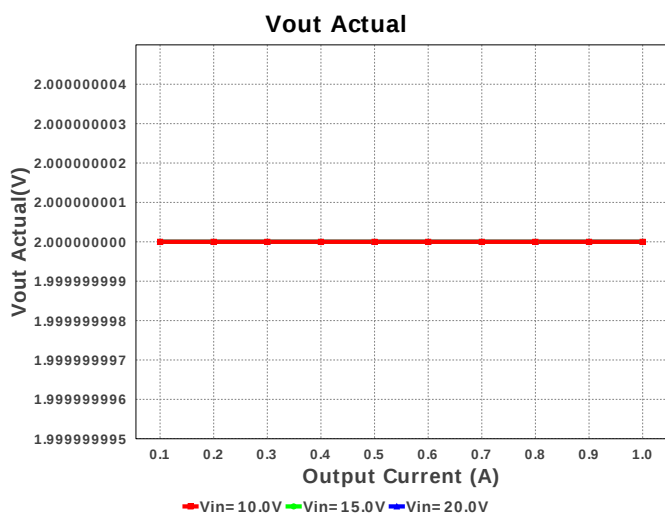
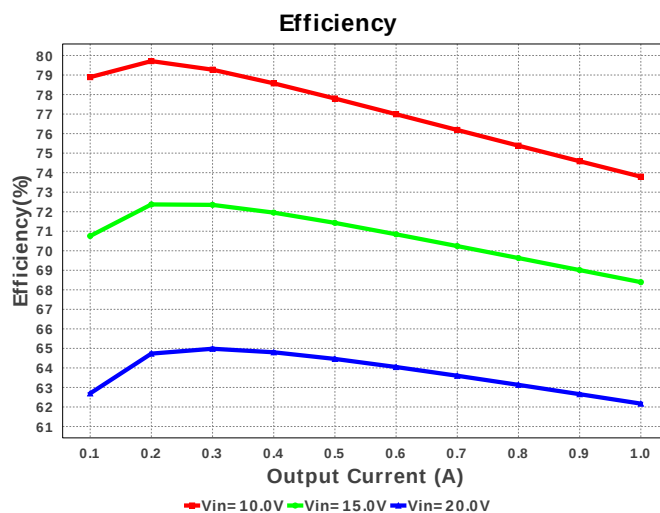
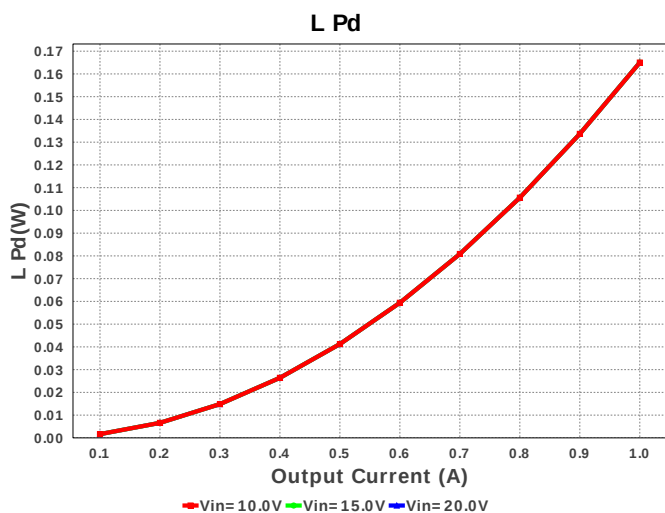
1. The Boost pin voltage must be supplied from a source of less than 5.5V. Recommended methods are described in the LM2734 datasheet Application Information.

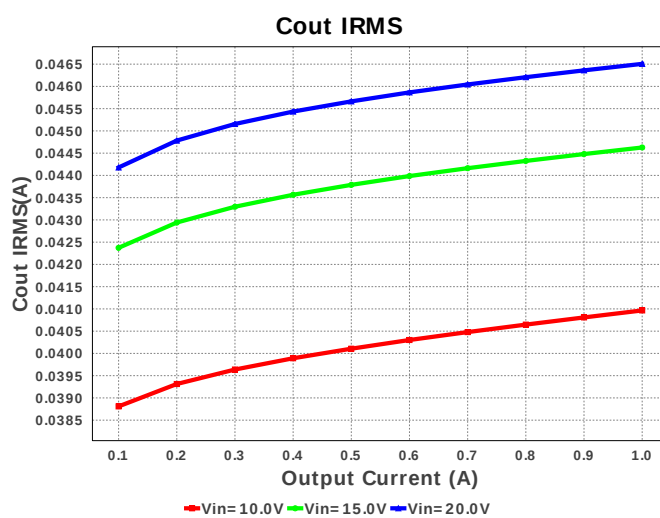
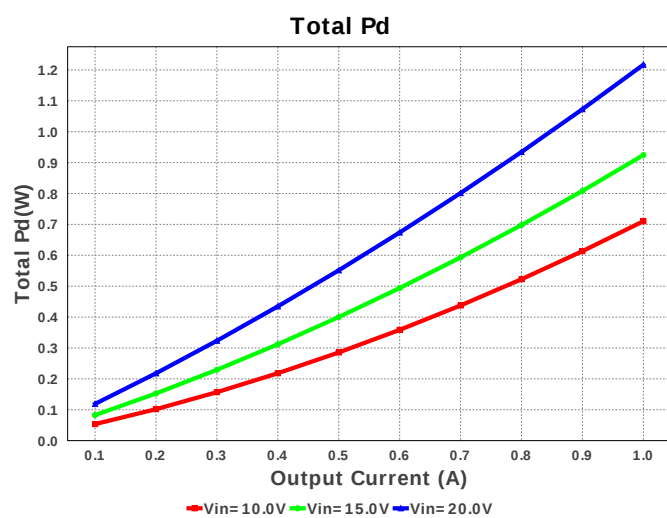
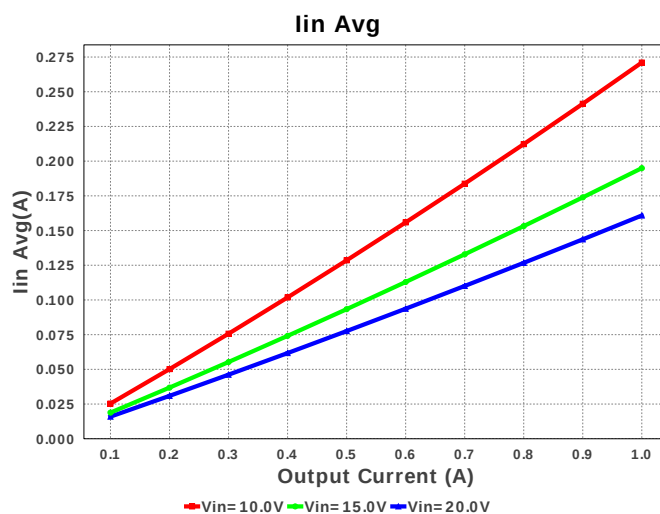
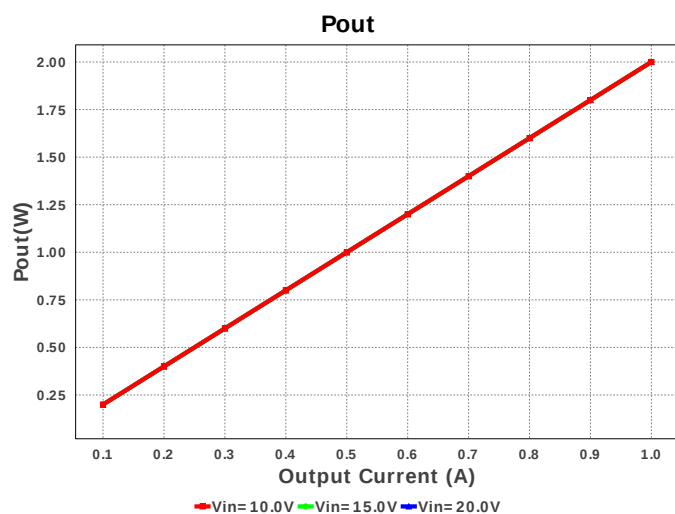
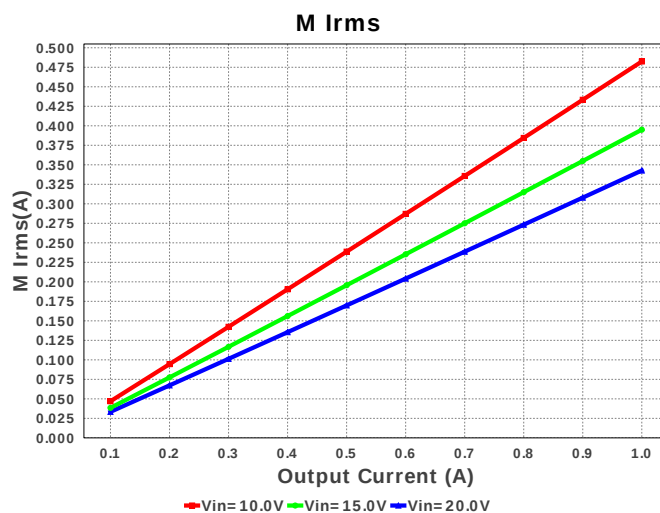
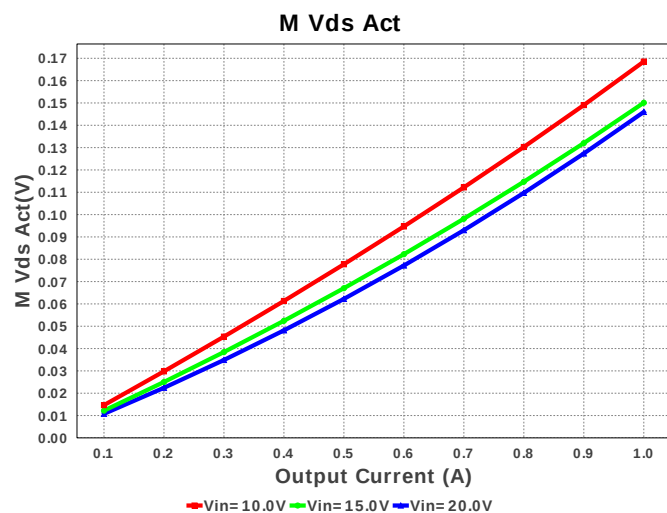
Electrical BOM

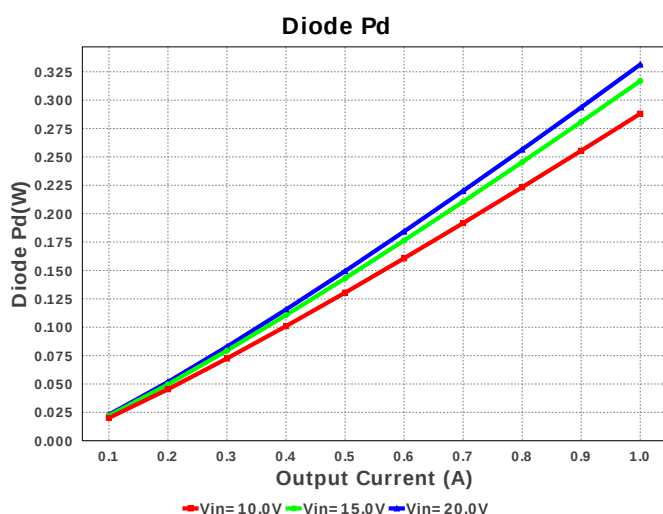
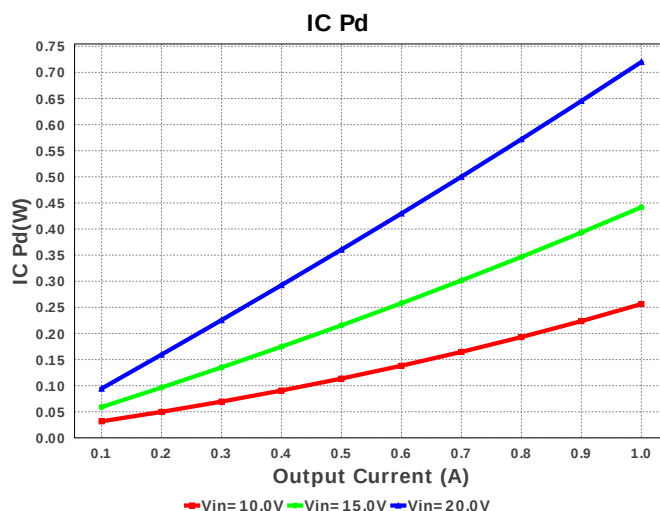
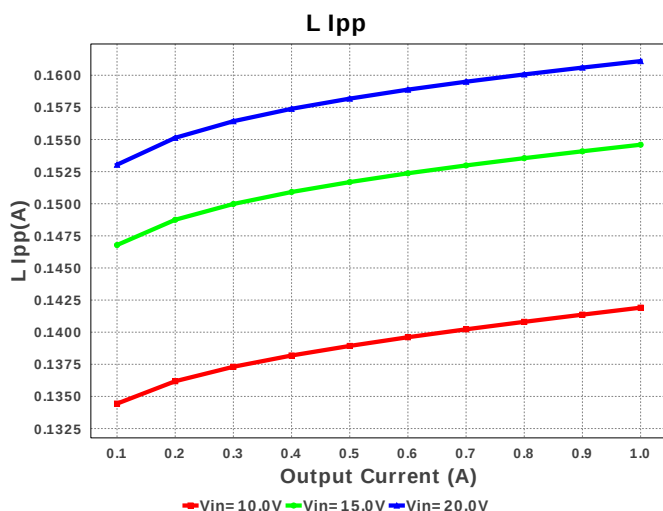
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 uF ESR= 4.512 mOhm VDC= 25.0 V IRMS= 2.447 A	1	\$0.05	1206_190 11 mm ²
3.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	2	\$0.02	0603 5 mm ²
4.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	SMA 37 mm ²
5.	Dboost	Diodes Inc.	B160-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.06	SMA 37 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
6.	L1	NIC Components	NPI43C8R2MTRF	L= 8.2 μ H DCR= 150.0 mOhm	1	\$0.07	 IND_NPI43C 31 mm ²
7.	Renale	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.	Rfb1	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
9.	Rfb2	Vishay-Dale	CRCW040215K0FKED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	U1	Texas Instruments	LMR12010XMK/NOPB	Switcher	1	\$0.80	 MK06A 11 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	322.283 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	46.625 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.081 A	Current	Peak switch current in IC
4.	Iin Avg	161.15 mA	Current	Average input current
5.	L Ipp	161.51 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	343.112 mA	Current	Q lavg
7.	BOM Count	11	General	Total Design BOM count
8.	FootPrint	152.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	1.6 MHz	General	Switching frequency
10.	IC Tolerance	16.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	146.155 mV	General	
12.	Pout	2.0 W	General	Total output power
13.	Total BOM	\$1.15	General	Total BOM Cost
14.	Vout Actual	2.0 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Duty Cycle	11.773 %	Op_point	Duty cycle
16.	Efficiency	62.055 %	Op_point	Steady state efficiency
17.	IC Tj	114.977 degC	Op_point	IC junction temperature
18.	ICThetaJA	118.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	1.0 A	Op_point	Iout operating point
20.	VIN_OP	20.0 V	Op_point	Vin operating point
21.	Vout p-p	962.452 μ V	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	468.646 μ W	Power	Input capacitor power dissipation
23.	Cout Pd	9.783 μ W	Power	Output capacitor power dissipation
24.	Diode Pd	337.314 mW	Power	Diode power dissipation
25.	IC Pd	720.148 mW	Power	IC power dissipation
26.	L Pd	165.0 mW	Power	Inductor power dissipation
27.	Total Pd	1.223 W	Power	Total Power Dissipation
28.	Vout Tolerance	3.236 %		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	LMR12010X	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMR12010X** Product Folder : <http://www.ti.com/product/LMR12010> : contains the data sheet and other resources.

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