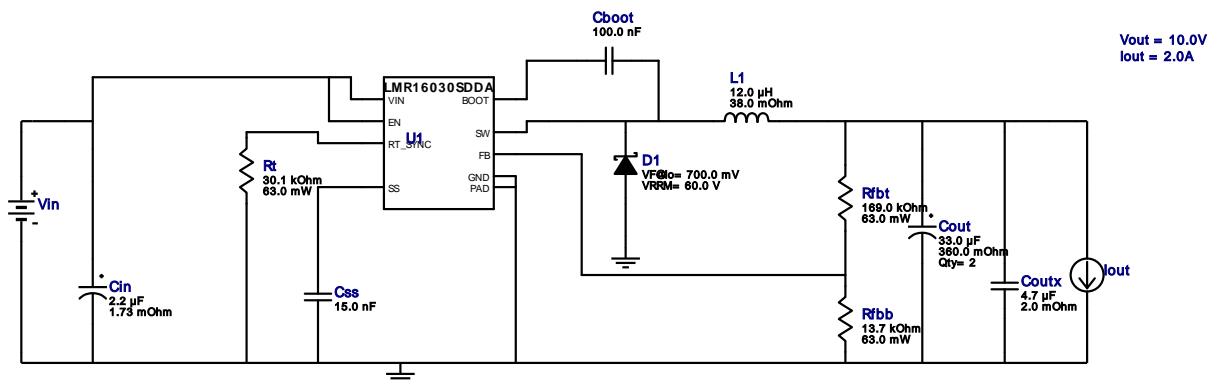



WEBENCH® Design Report

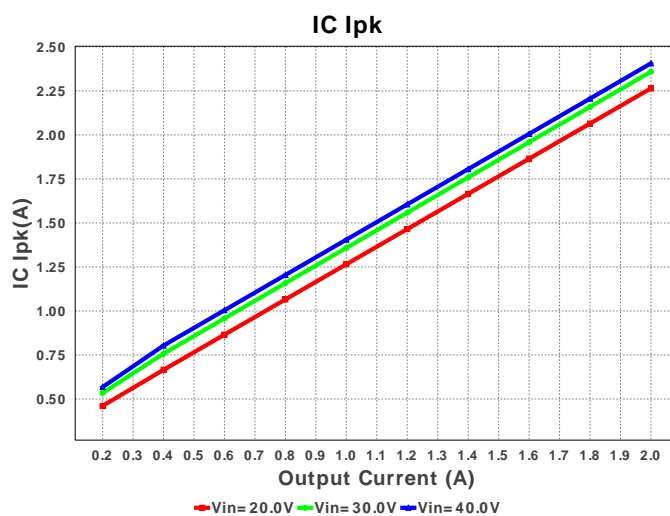
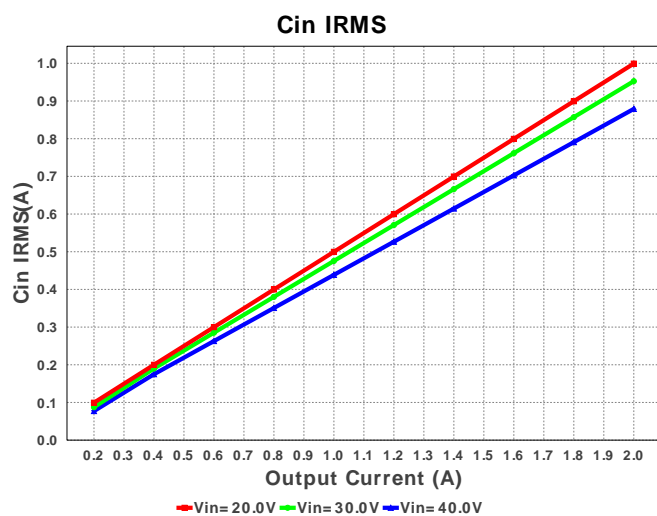
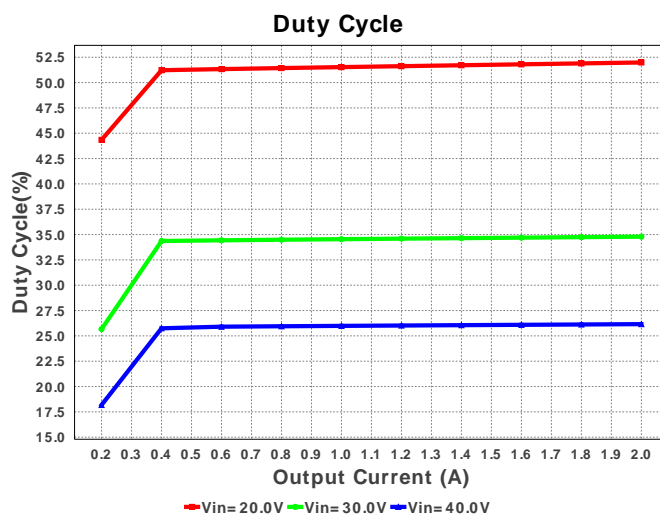
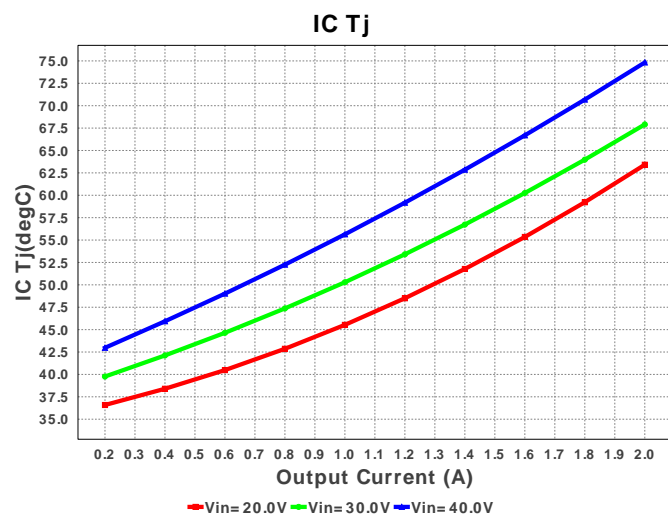
Design : 4352199/62 LMR16030SDDAR
LMR16030SDDAR 20.0V-40.0V to 10.00V @ 2.000164203612479A

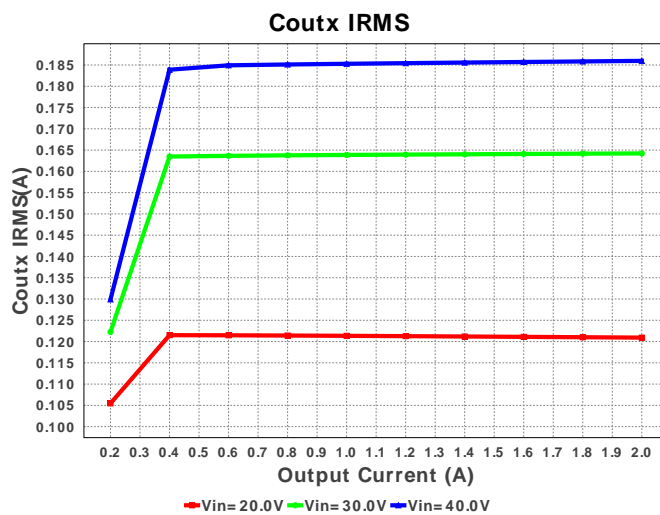
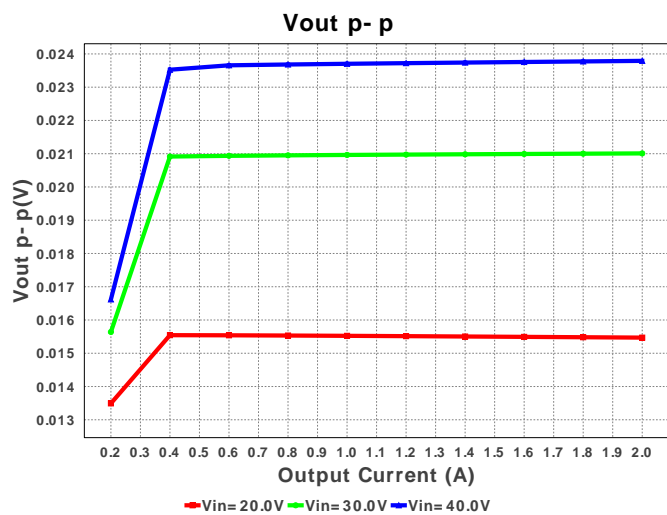
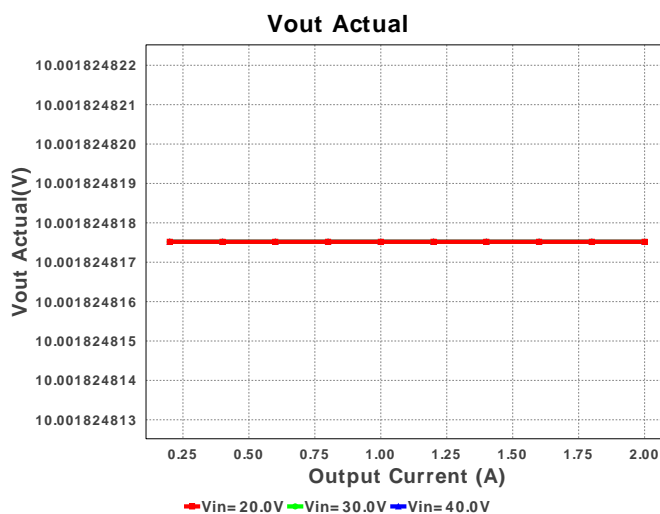
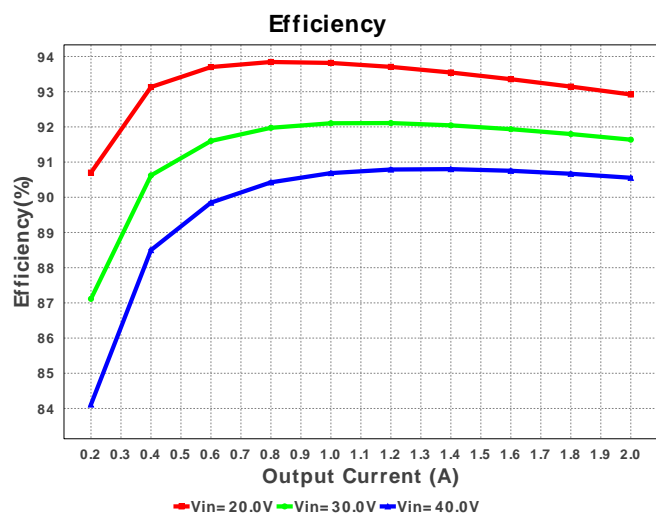
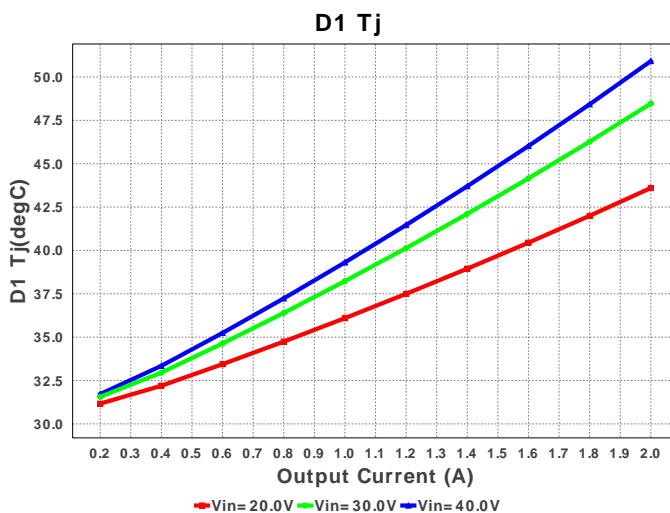
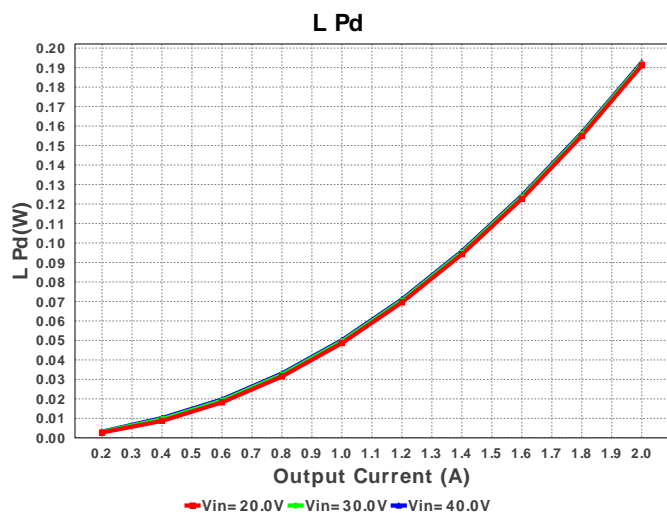


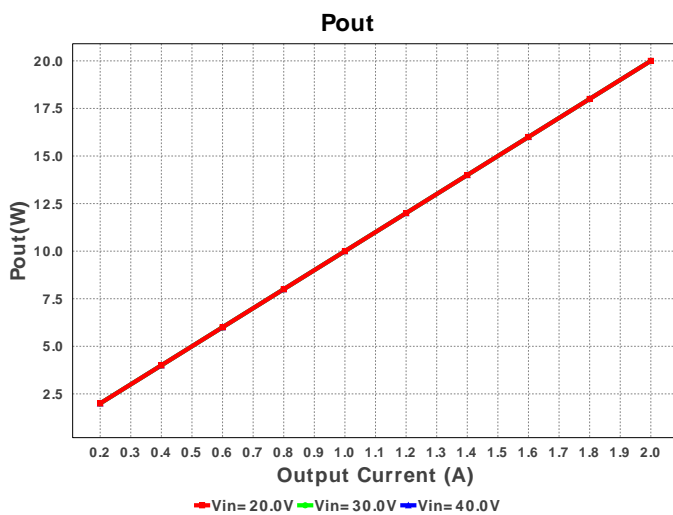
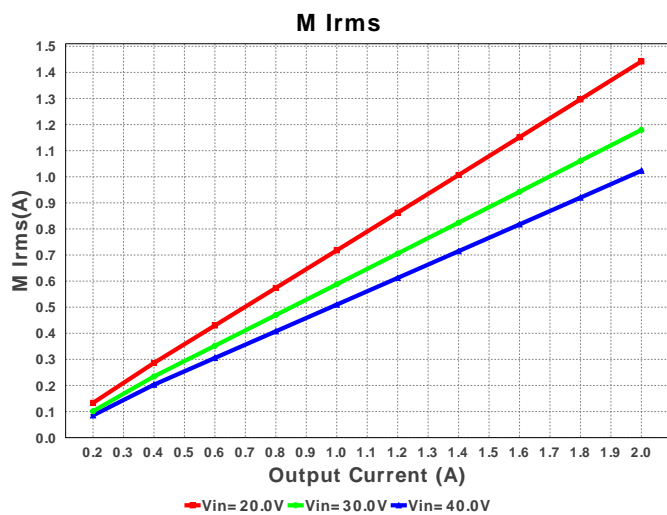
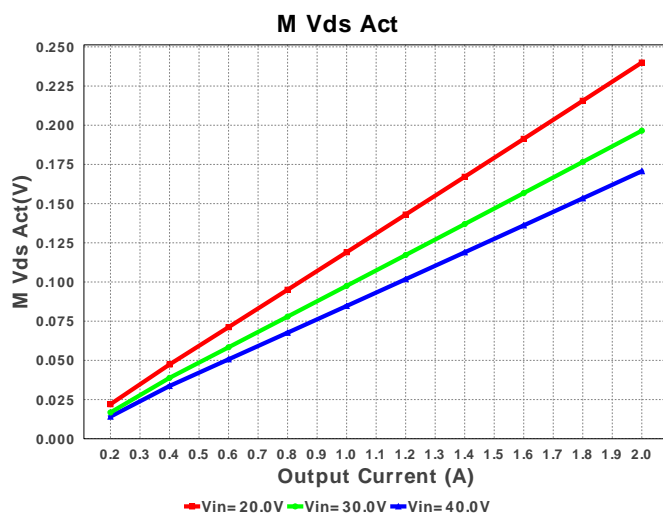
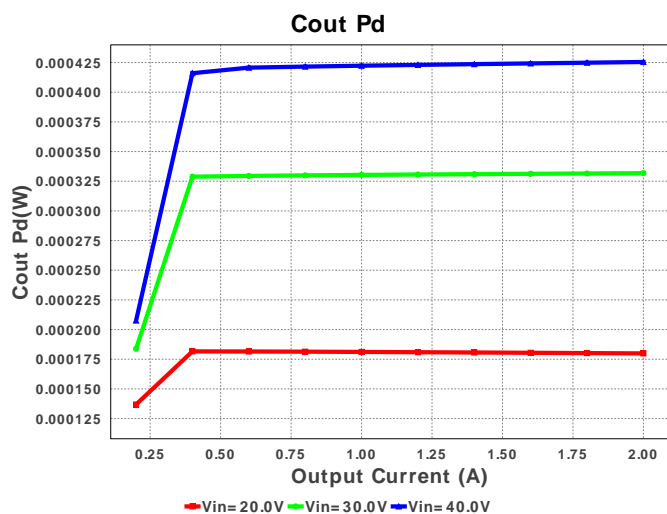
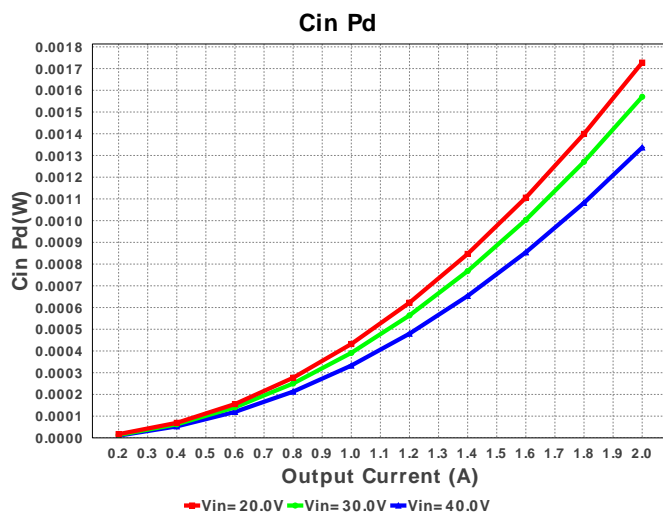
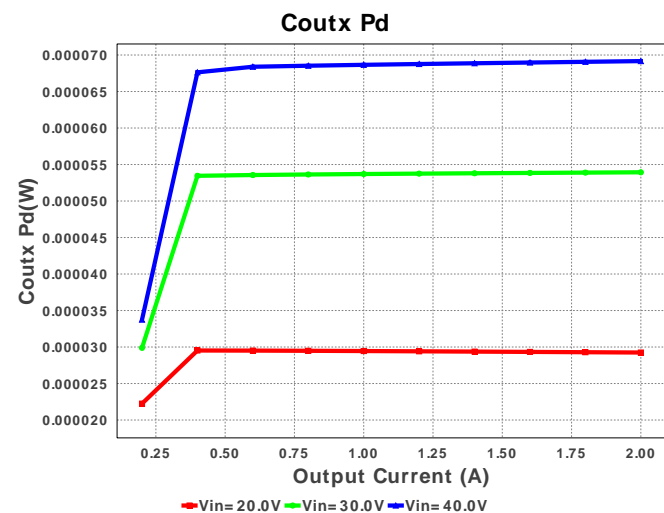
Electrical BOM

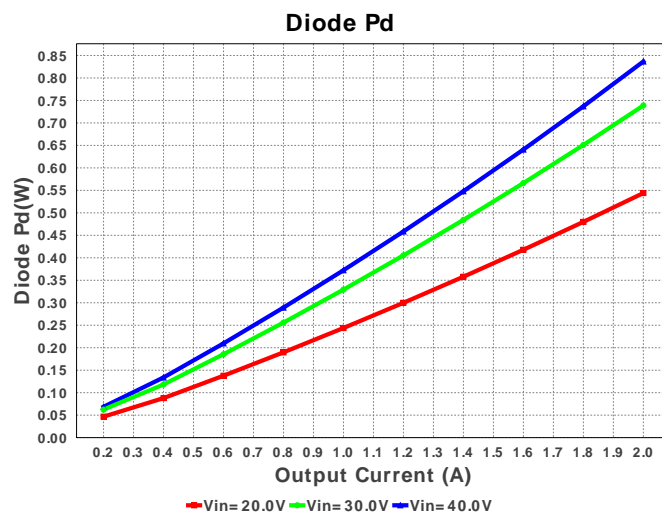
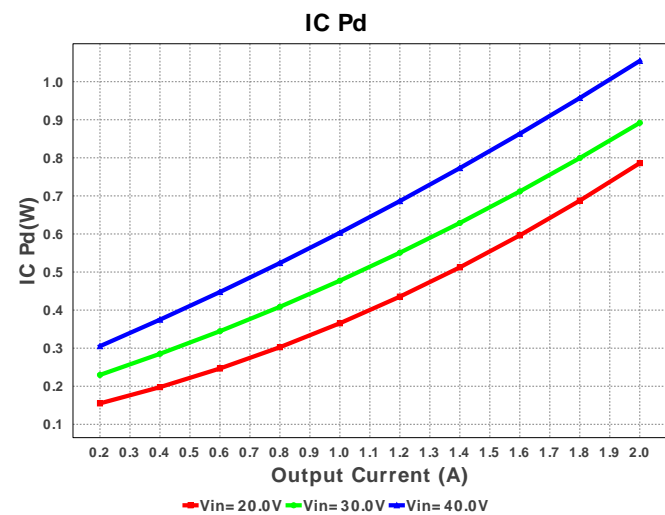
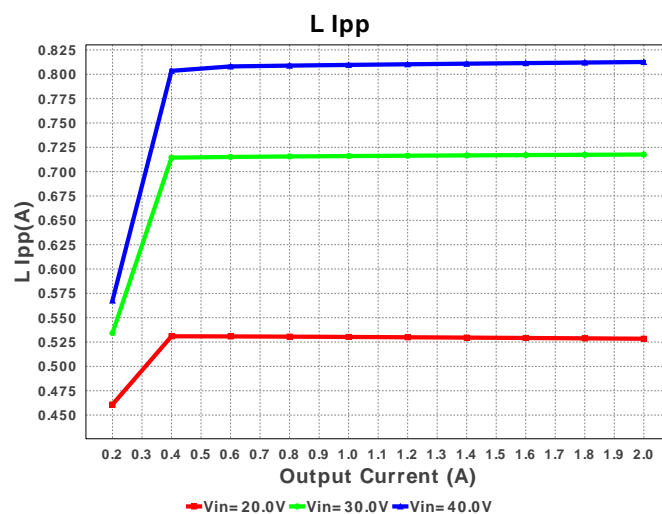
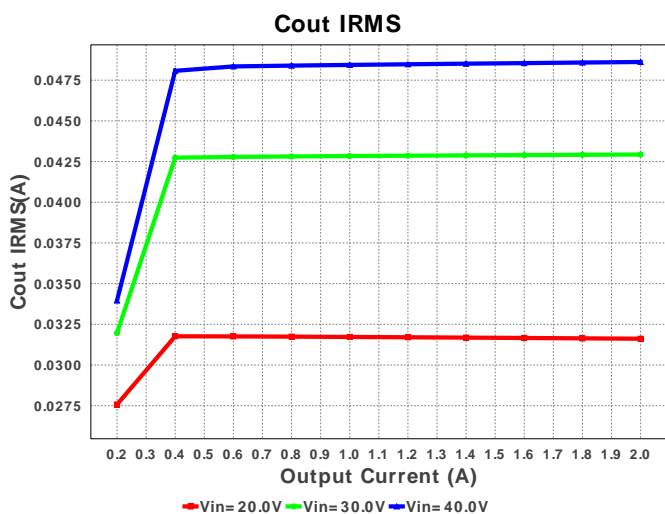
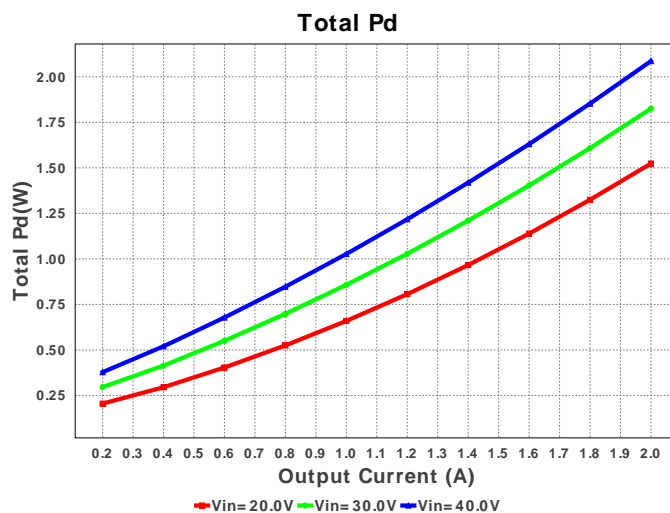
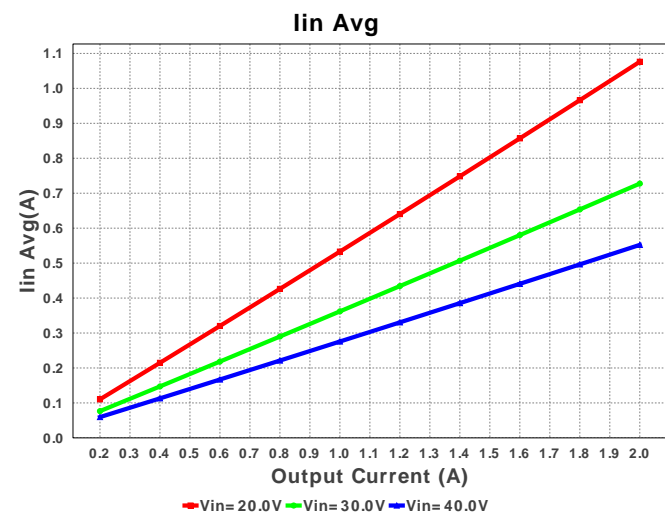
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Taiyo Yuden	HMK212B7104KG-T Series= X7R	Cap= 100.0 nF VDC= 100.0 V IRMS= 0.0 A	1	\$0.03	 0805 7 mm ²
2.	Cin	TDK	C3225X7R2A225K230AB Series= X7R	Cap= 2.2 uF ESR= 1.73 mOhm VDC= 100.0 V IRMS= 5.5932 A	1	\$0.19	 1210_250 15 mm ²
3.	Cout	Panasonic	EEE-FK1E330P Series= FK	Cap= 33.0 uF ESR= 360.0 mOhm VDC= 25.0 V IRMS= 240.0 mA	2	\$0.11	 SM_RADIAL_D 84 mm ²
4.	Coutx	MuRata	GRM21BR61E475MA12L Series= X5R	Cap= 4.7 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	1	\$0.02	 0805 7 mm ²
5.	Css	MuRata	GRM155R71C153KA01D Series= X7R	Cap= 15.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
6.	D1	Diodes Inc.	B260A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.09	 SMA 37 mm ²
7.	L1	Bourns	SRR1206-120ML	L= 12.0 uH DCR= 38.0 mOhm	1	\$0.37	 SRR1206 216 mm ²
8.	Rfbb	Vishay-Dale	CRCW040213K7FKED Series= CRCW..e3	Res= 13.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
9.	Rfbs	Vishay-Dale	CRCW0402169KFKED Series= CRCW..e3	Res= 169.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	Rt	Vishay-Dale	CRCW040230K1FKED Series= CRCW..e3	Res= 30.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

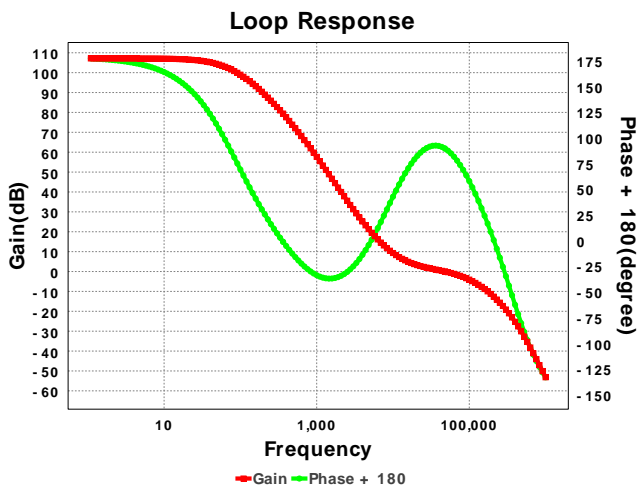
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11. U1		Texas Instruments	LMR16030SDDAR	Switcher	1	\$1.95	 DDA0008E_N 57 mm²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	879.007 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	48.618 mA	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	185.966 mA	Current	Output capacitor_x RMS ripple current
4.	IC IpK	2.406 A	Current	Peak switch current in IC
5.	Iin Avg	552.17 mA	Current	Average input current
6.	L Ipp	812.62 mA	Current	Peak-to-peak inductor ripple current
7.	M Irms	1.023 A	Current	MOSFET RMS current
8.	BOM Count	12	General	Total Design BOM count
9.	FootPrint	520.0 mm ²	General	Total Foot Print Area of BOM components
10.	Frequency	800.145 kHz	General	Switching frequency
11.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
12.	M Vds Act	170.647 mV	General	Voltage drop across the MosFET
13.	Pout	20.0 W	General	Total output power
14.	Total BOM	\$2.91	General	Total BOM Cost
15.	D1 Tj	50.916 degC	Op_Point	D1 junction temperature
16.	Vout Actual	10.002 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Vout OP	10.0 V	Op_Point	Operational Output Voltage
18.	Cross Freq	56.523 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	26.157 %	Op_point	Duty cycle
20.	Efficiency	90.554 %	Op_point	Steady state efficiency
21.	IC Tj	74.297 degC	Op_point	IC junction temperature
22.	ICThetaJA	42.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	2.0 A	Op_point	Iout operating point
24.	Phase Marg	83.838 deg	Op_point	Bode Plot Phase Margin
25.	VIN_OP	40.0 V	Op_point	Vin operating point
26.	Vout p-p	23.791 mV	Op_point	Peak-to-peak output ripple voltage
27.	Cin Pd	1.337 mW	Power	Input capacitor power dissipation
28.	Cout Pd	425.464 μ W	Power	Output capacitor power dissipation
29.	Coutx Pd	69.166 μ W	Power	Output capacitor_x power loss
30.	Diode Pd	836.634 mW	Power	Diode power dissipation
31.	IC Pd	1.055 W	Power	IC power dissipation
32.	L Pd	192.624 mW	Power	Inductor power dissipation
33.	Total Pd	2.086 W	Power	Total Power Dissipation
34.	Vout Tolerance	4.314 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	40.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	10.0	Output Voltage
5.	base_pn	LMR16030S	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. LMR16030S Product Folder : <http://www.ti.com/product/LMR16030> : contains the data sheet and other resources.

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