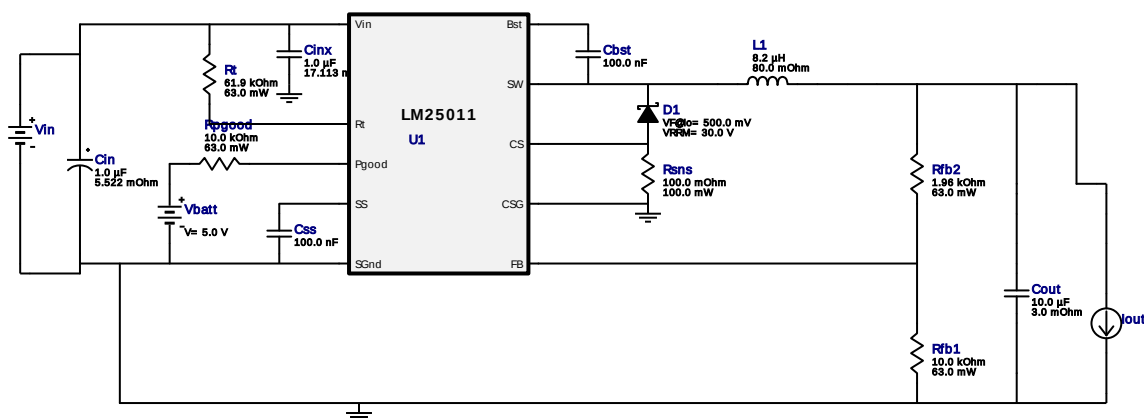


WEBENCH® Design Report

Design : 4728729/5 LM25011MYX/NOPB
LM25011MYX/NOPB 10.0V-20.0V to 3.00V @ 1.0A

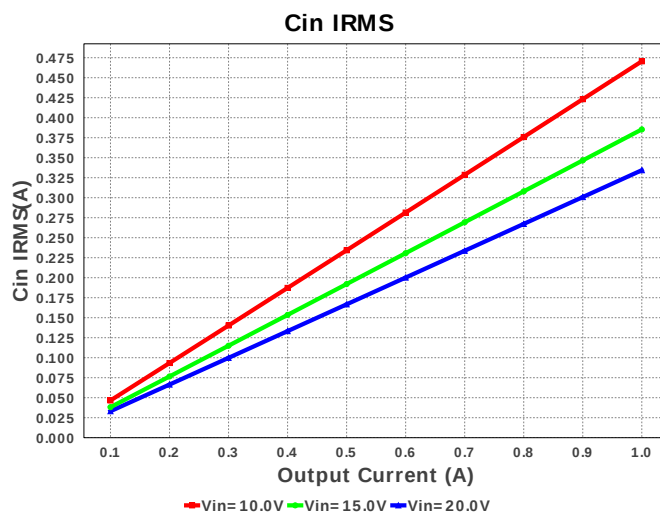
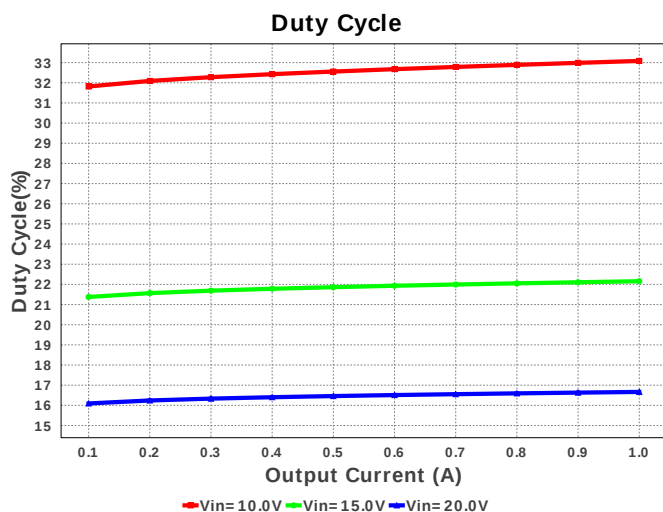
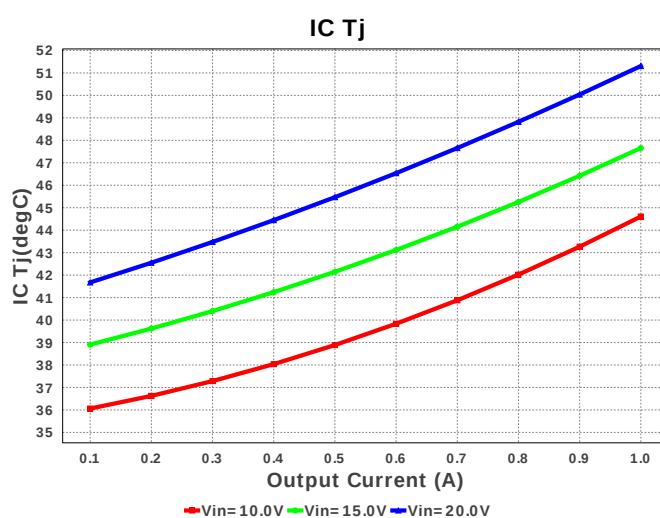
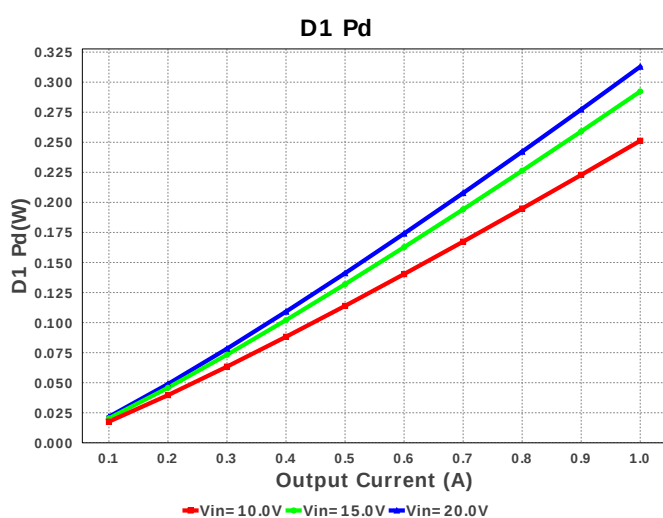
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Iout = 1.0A

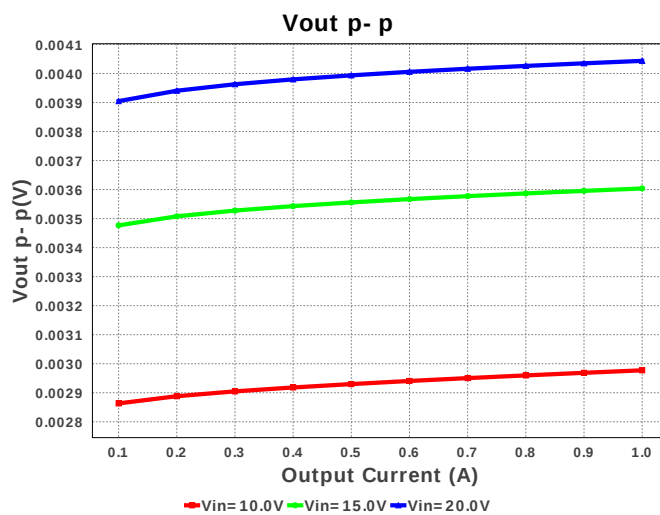
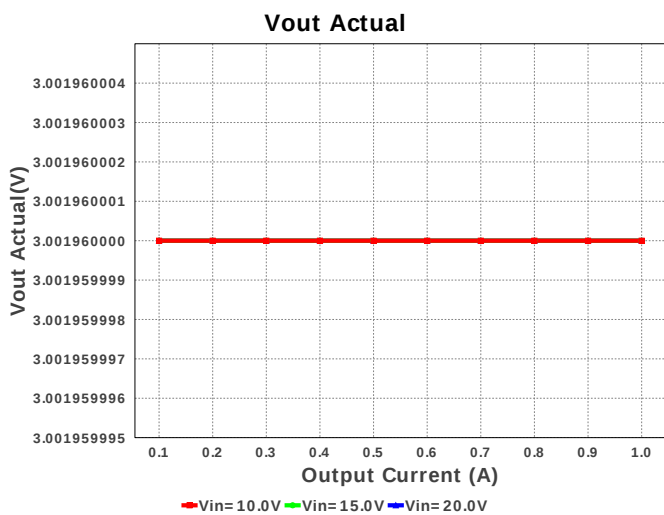
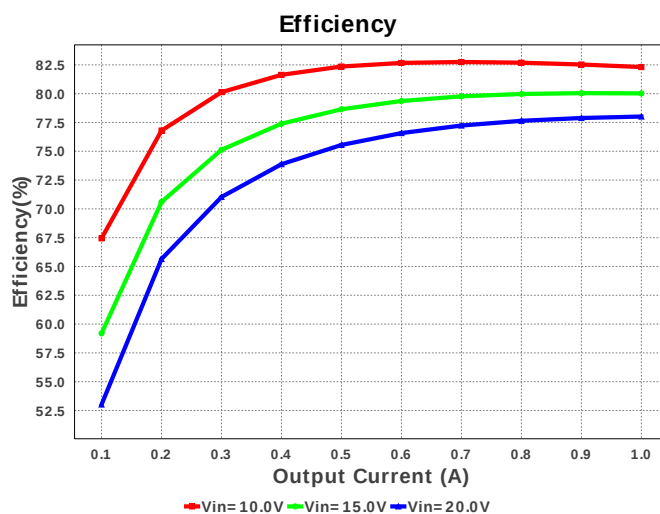
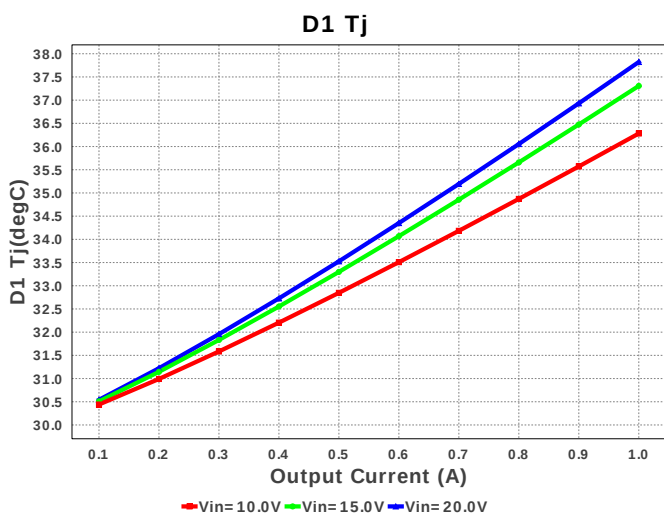
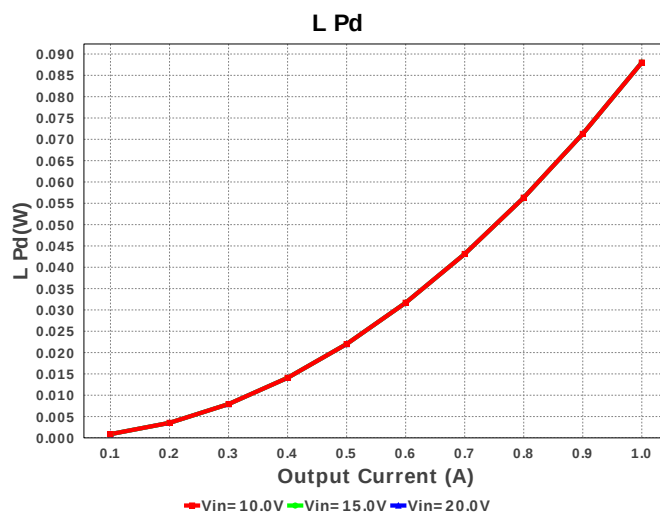
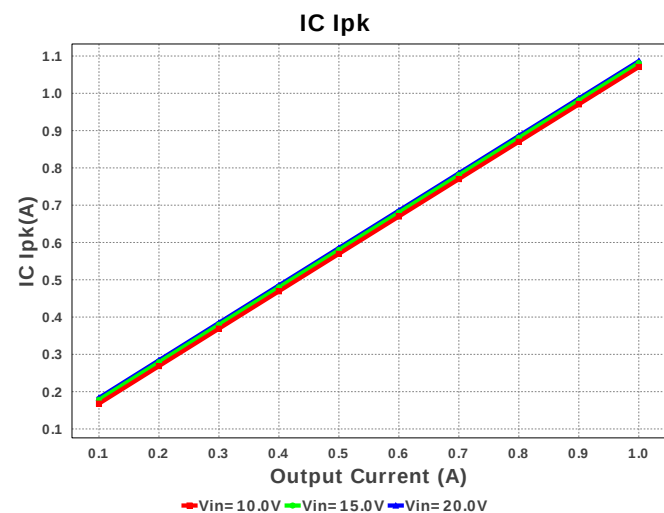


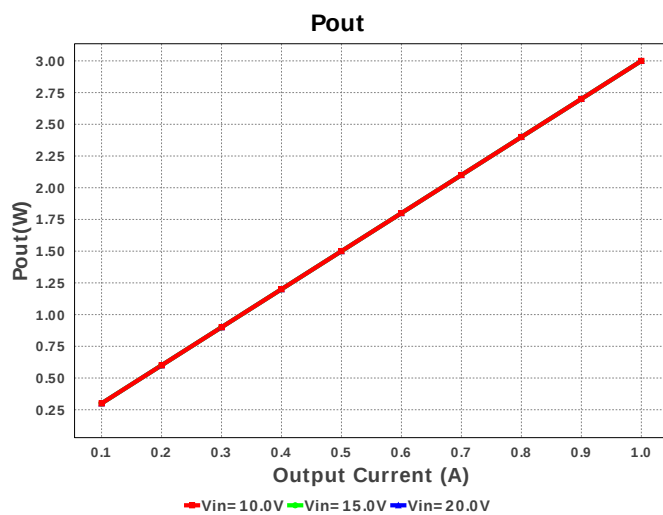
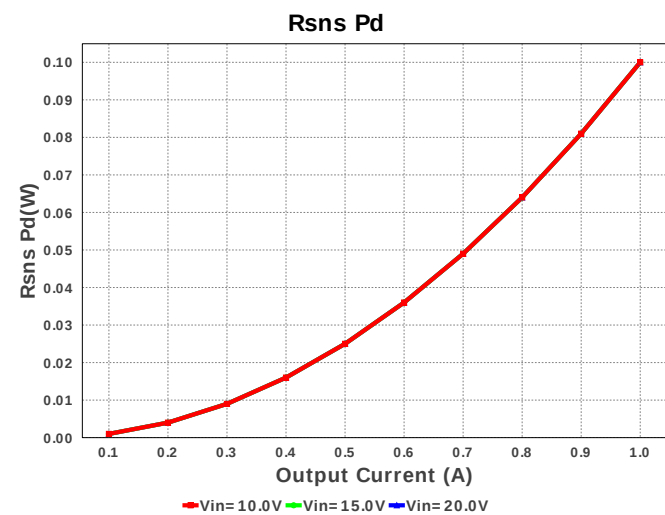
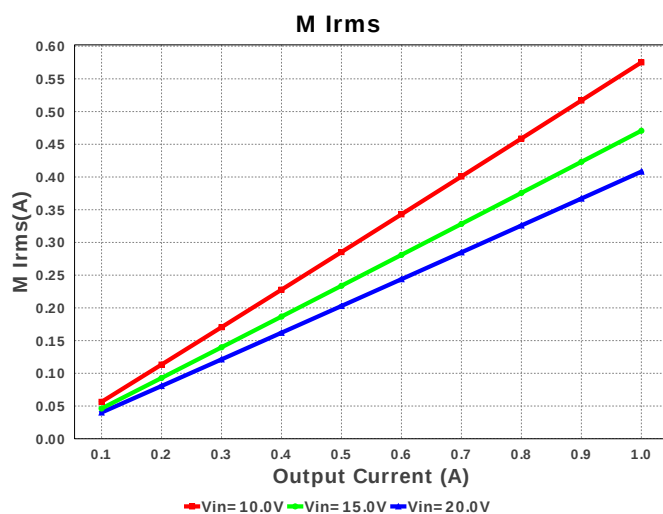
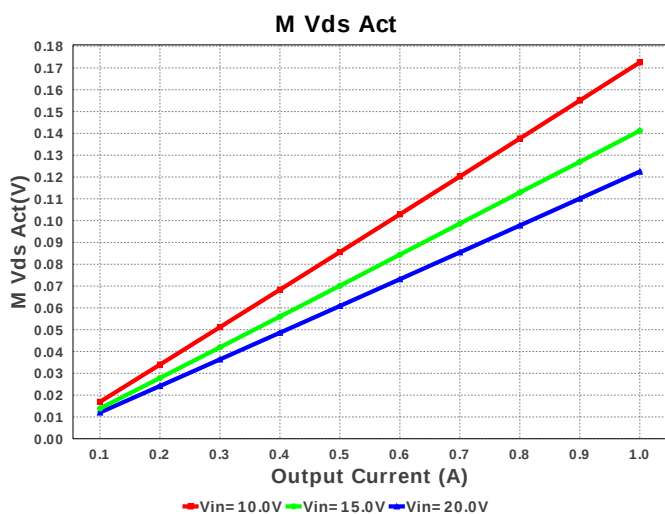
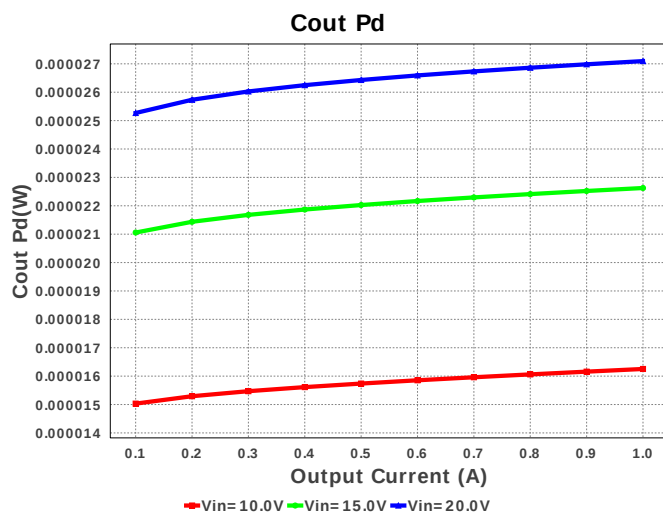
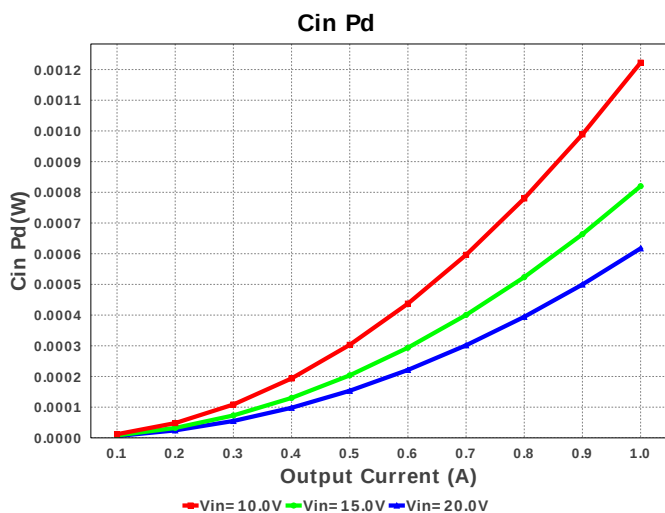
Electrical BOM

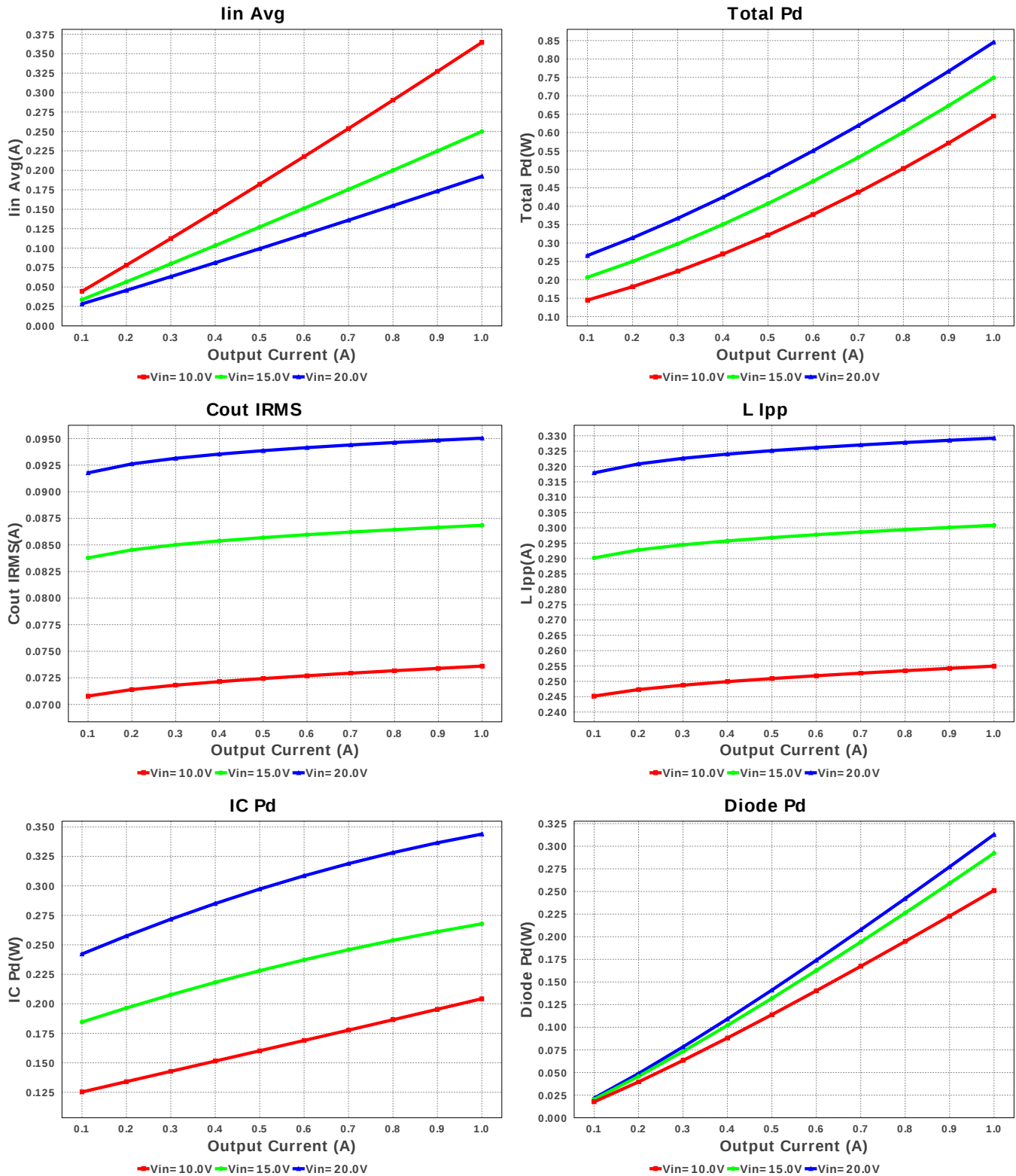
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	TDK	C1608X7R1V105K080AC Series= X7R	Cap= 1.0 uF ESR= 5.522 mOhm VDC= 35.0 V IRMS= 2.2162 A	1	\$0.05	0603 5 mm ²
3.	Cinx	MuRata	GRM188R61E105KA12D Series= X5R	Cap= 1.0 uF ESR= 17.113 mOhm VDC= 25.0 V IRMS= 979.39 mA	1	\$0.01	0603 5 mm ²
4.	Cout	MuRata	GRM188R60G106ME47D Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 4.0 V IRMS= 3.0 A	1	\$0.02	0603 5 mm ²
5.	Css	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
6.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	SMA 37 mm ²
7.	L1	NIC Components	NPI54C8R2MTRF	L= 8.2 uH DCR= 80.0 mOhm	1	\$0.09	IND_NPI54C 61 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	CRCW04021K96FKED Series= CRCW..e3	Res= 1.96 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rpgood	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rsns	Panasonic	ERJ-3RSFR10V Series= ERJ-3R	Res= 100.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.03	 0603 5 mm ²
12.	Rt	Vishay-Dale	CRCW040261K9FKED Series= CRCW..e3	Res= 61.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
13.	U1	Texas Instruments	LM25011MYX/NOPB	Switcher	1	\$0.95	 MUC10A 24 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	334.359 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	95.037 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.165 A	Current	Peak switch current in IC
4.	Iin Avg	192.27 mA	Current	Average input current
5.	L Ipp	329.22 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	408.247 mA	Current	MOSFET RMS current
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	166.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	1.05 MHz	General	Switching frequency
10.	IC Tolerance	50.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	122.474 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	3.0 W	General	Total output power
13.	Total BOM	\$1.3	General	Total BOM Cost
14.	D1 Tj	37.822 degC	Op_Point	D1 junction temperature
15.	Vout Actual	3.002 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
17.	Duty Cycle	16.667 %	Op_point	Duty cycle
18.	Efficiency	78.015 %	Op_point	Steady state efficiency
19.	IC Tj	51.306 degC	Op_point	IC junction temperature
20.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	1.0 A	Op_point	Iout operating point
22.	VIN_OP	20.0 V	Op_point	Vin operating point
23.	Vout p-p	4.043 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	617.338 μW	Power	Input capacitor power dissipation
25.	Cout Pd	27.096 μW	Power	Output capacitor power dissipation
26.	D1 Pd	312.892 mW	Power	Output Diode Power Dissipation
27.	Diode Pd	312.892 mW	Power	Diode power dissipation
28.	IC Pd	443.87 mW	Power	IC power dissipation
29.	L Pd	88.0 mW	Power	Inductor power dissipation
30.	Rsns Pd	66.498 mW	Power	Current Limit Sense Resistor Power Dissipation
31.	Total Pd	911.905 mW	Power	Total Power Dissipation
32.	Vout Tolerance	2.33 %		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	3.0	Output Voltage
5.	base_pn	LM25011	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. LM25011 Product Folder : <http://www.ti.com/product/LM25011> : contains the data sheet and other resources.

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