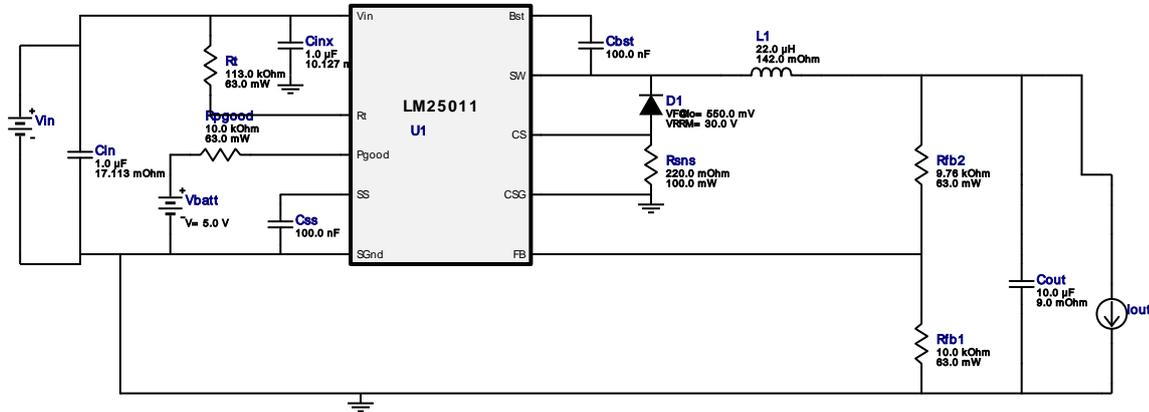


WEBENCH® Design Report

 Design : 1108023/239 LM25011MYX/NOPB
 LM25011MYX/NOPB 8.0V-13.0V to 5.00V @ 0.5A

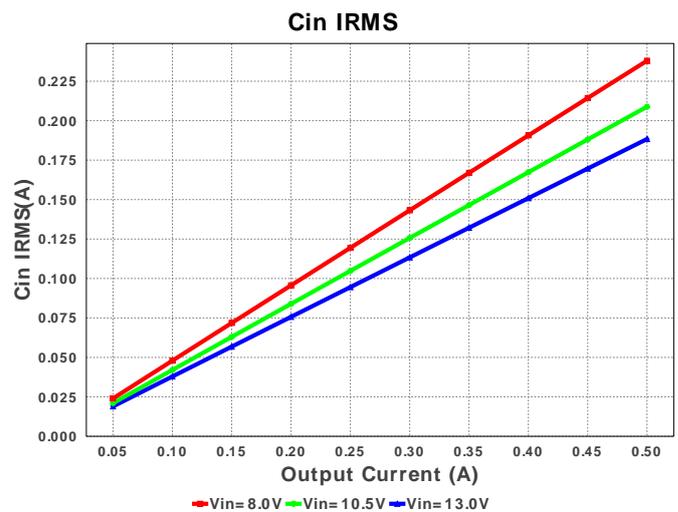
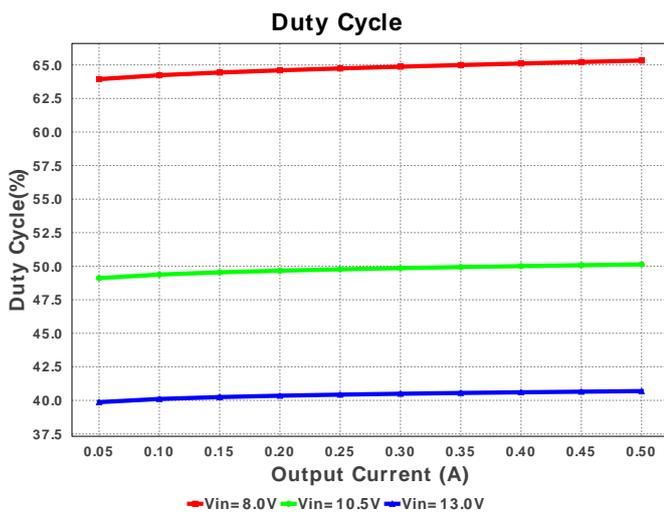
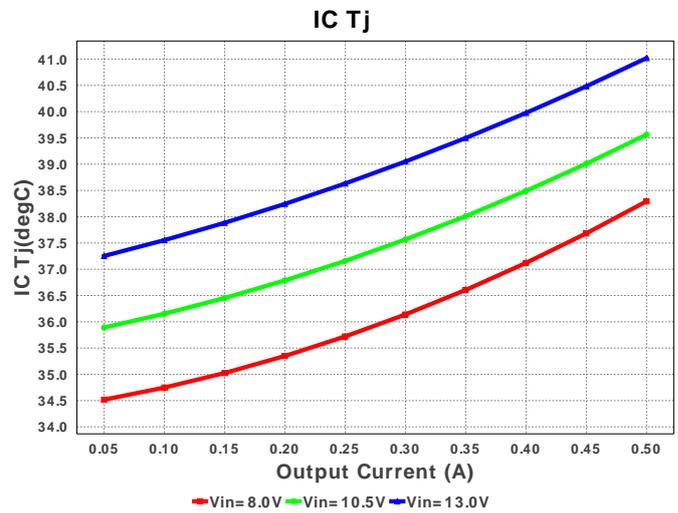
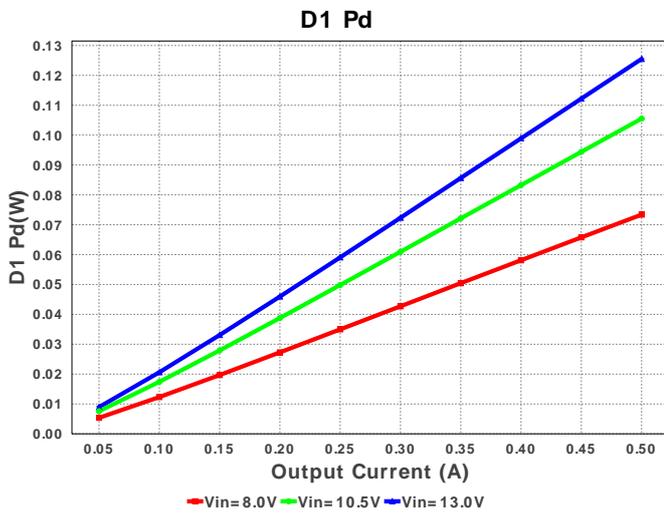
 Vout = 5.0V
 Iout = 0.5A

My Comments

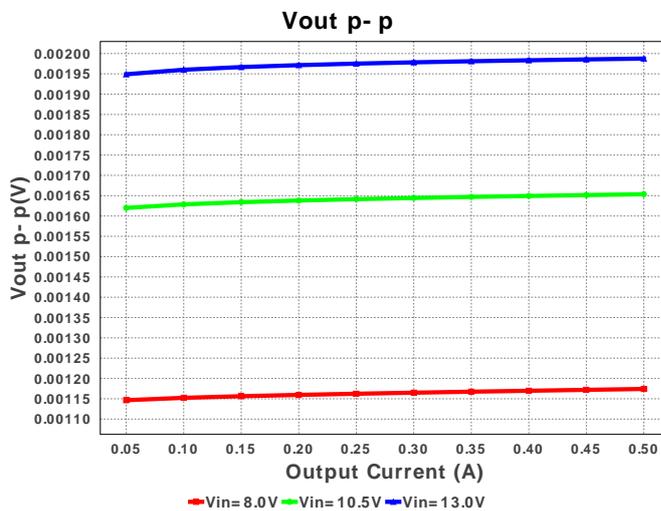
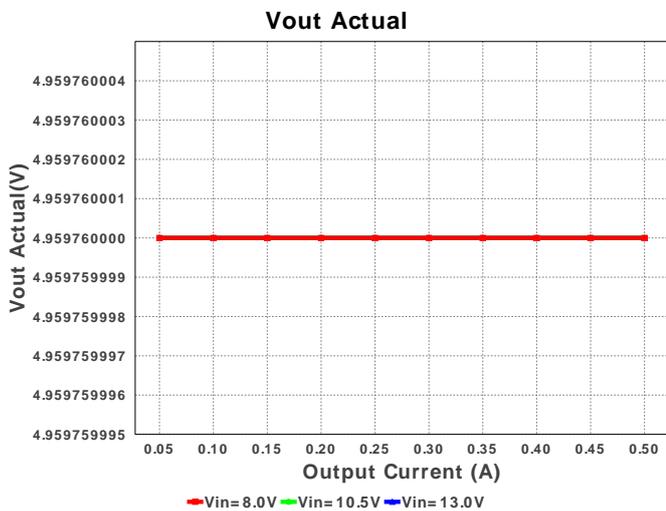
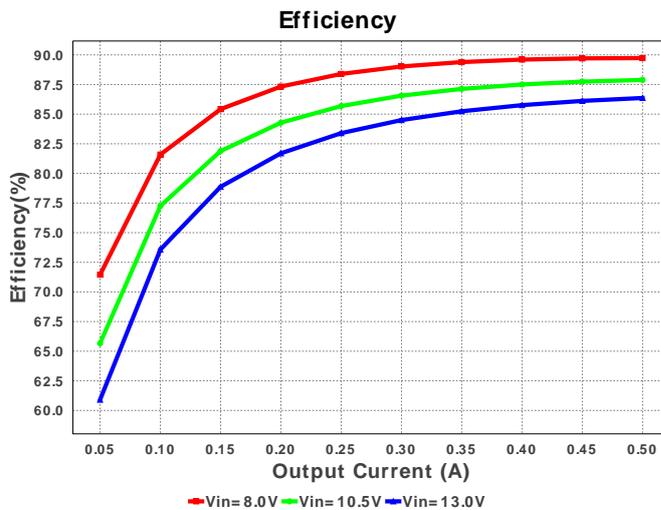
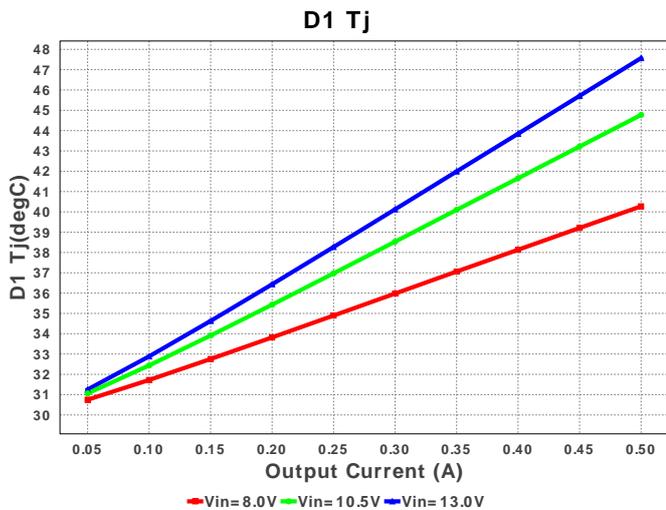
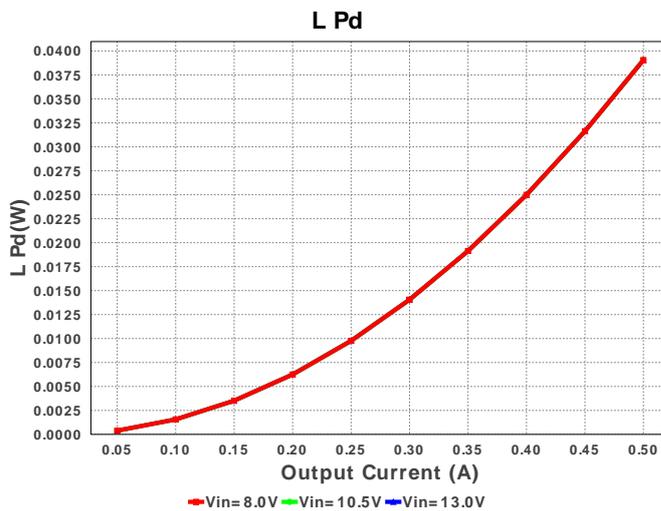
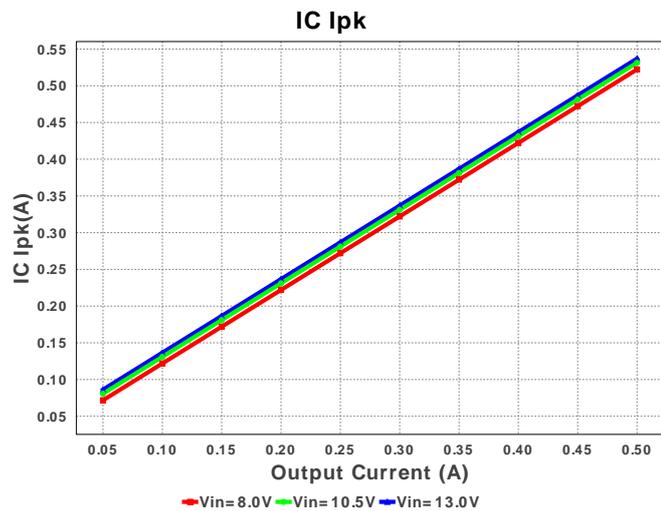
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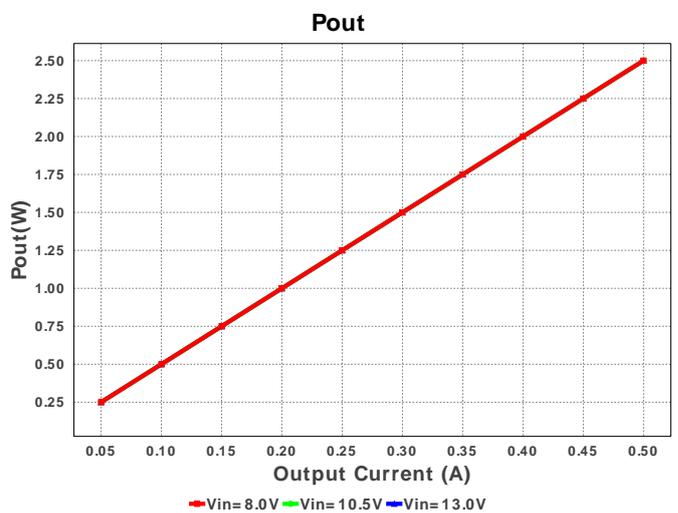
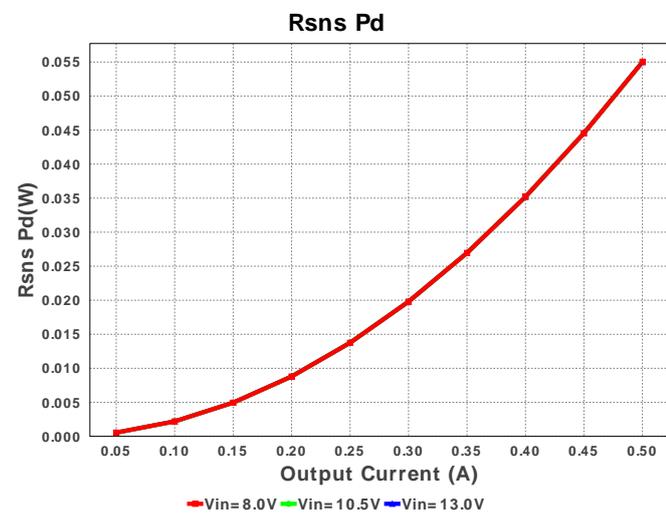
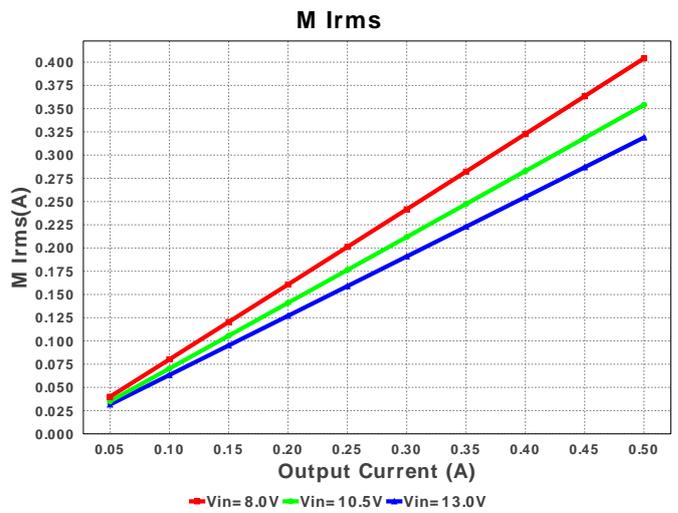
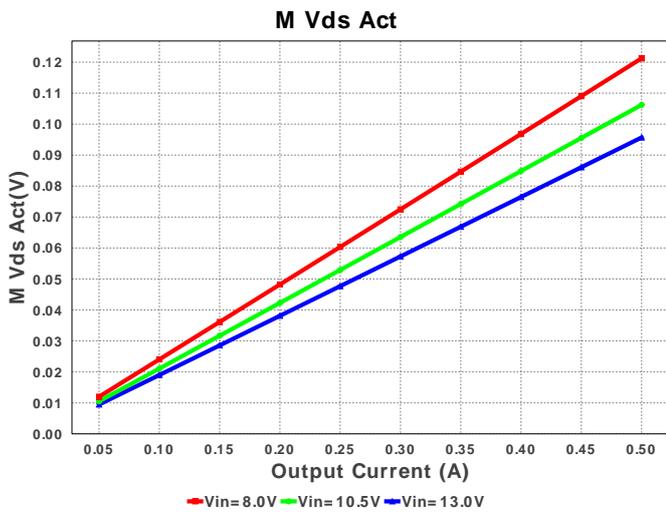
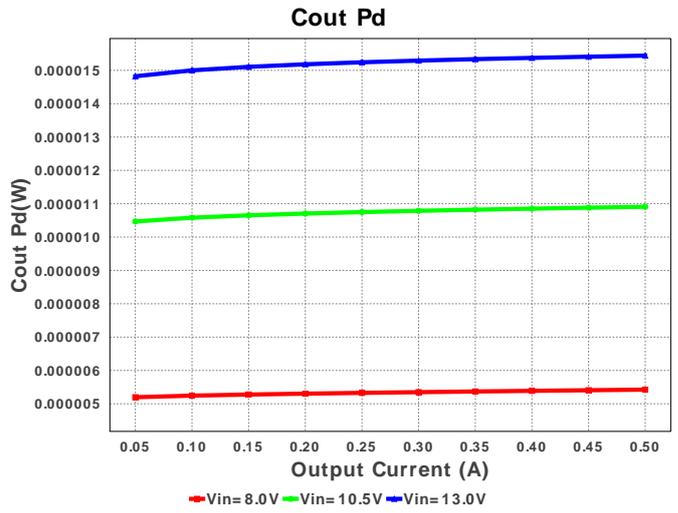
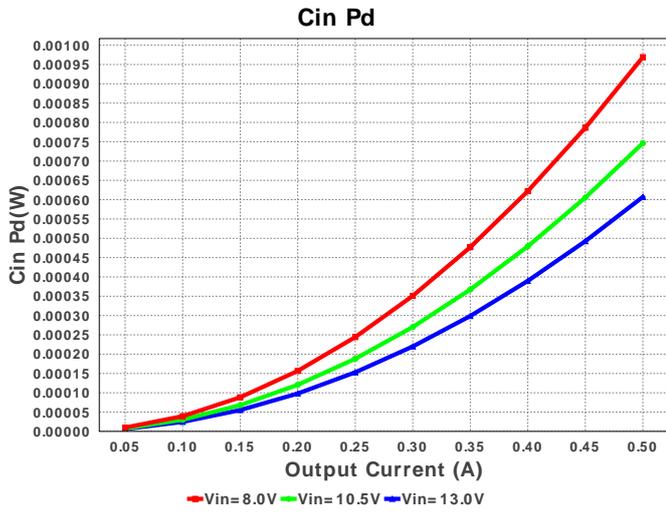
Electrical BOM

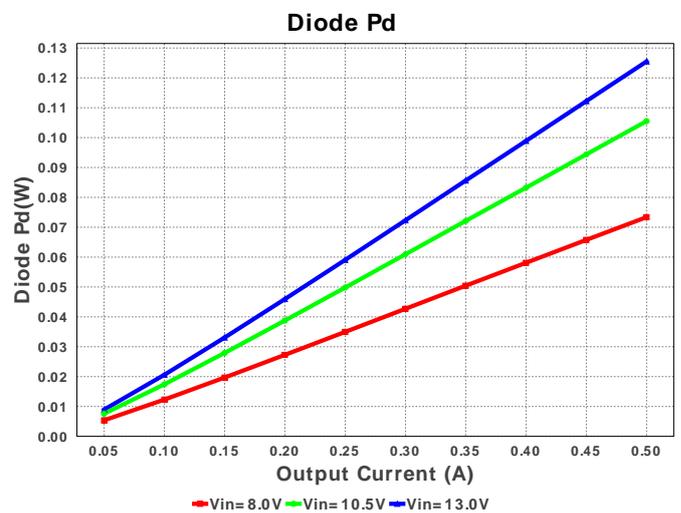
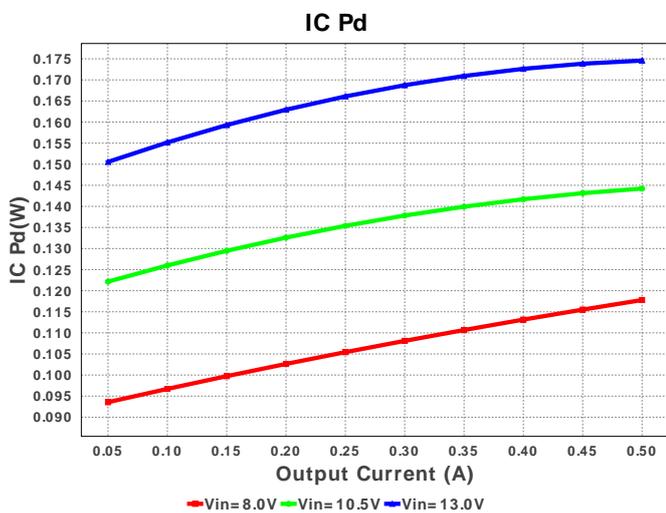
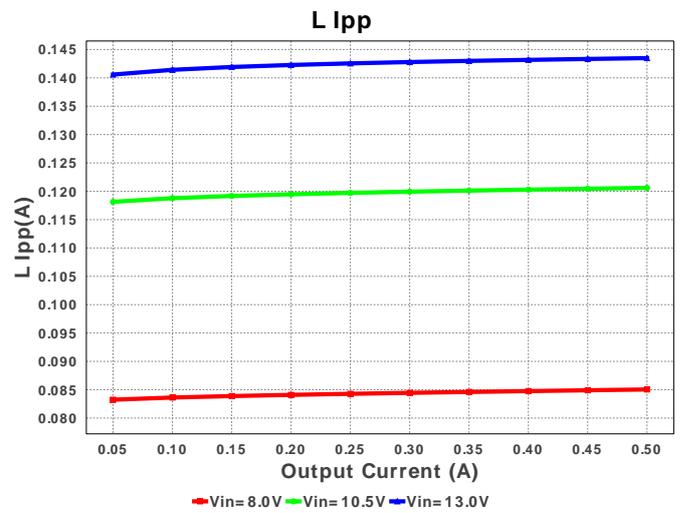
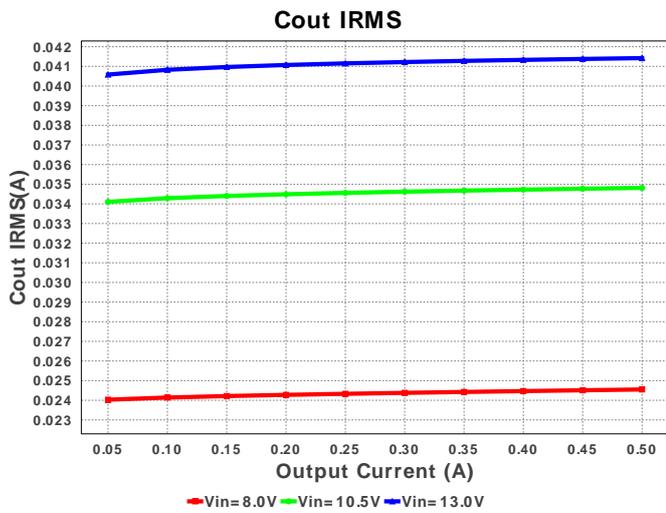
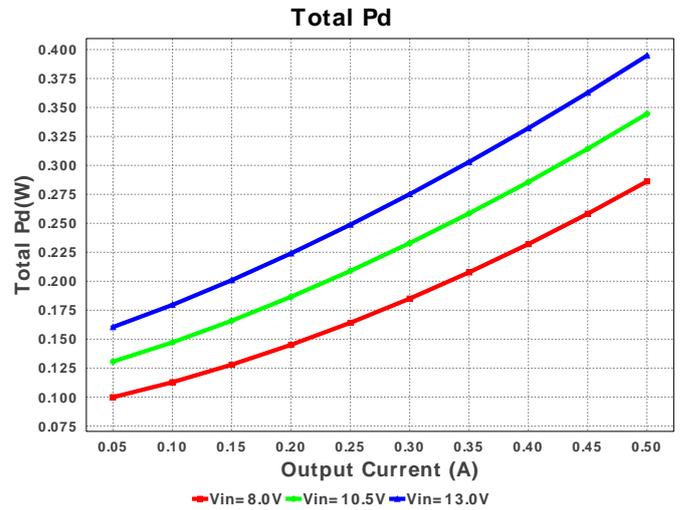
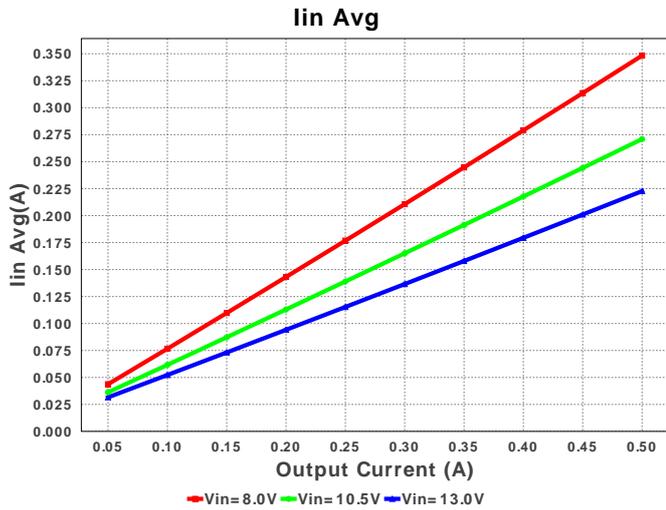
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Yageo America	CC0805KRX7R8BB104 Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM188R61E105KA12D Series= X5R	Cap= 1.0 uF ESR= 17.113 mOhm VDC= 25.0 V IRMS= 979.39 mA	1	\$0.01	0603 5 mm ²
3.	Cinx	MuRata	GRM188R61C105KA93D Series= X5R	Cap= 1.0 uF ESR= 10.127 mOhm VDC= 16.0 V IRMS= 994.63 mA	1	\$0.01	0603 5 mm ²
4.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.02	0603 5 mm ²
5.	Css	Yageo America	CC0805KRX7R8BB104 Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
6.	D1	Fairchild Semiconductor	SS13FL	VF@Io= 550.0 mV VRRM= 30.0 V	1	\$0.06	SOD-123F 12 mm ²
7.	L1	Bourns	SRN6045-220M	L= 22.0 uH DCR= 142.0 mOhm	1	\$0.16	SRN6045 64 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	CRCW04029K76FKED Series= CRCW..e3	Res= 9.76 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
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
11.	Rsns	Panasonic	ERJ-3RQFR22V Series= ERJ-3R	Res= 220.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.02	0603 5 mm ²
12.	Rt	Vishay-Dale	CRCW0402113KFKED Series= CRCW..e3	Res= 113.0 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.	BOM Count	13		Total Design BOM count
2.	Total BOM	\$1.29		Total BOM Cost
3.	Cin IRMS	188.359 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	41.421 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	536.993 mA	Current	Peak switch current in IC
6.	Iin Avg	222.67 mA	Current	Average input current
7.	L Ipp	143.487 mA	Current	Peak-to-peak inductor ripple current
8.	M1 Irms	318.951 mA	Current	Q lavg
9.	FootPrint	144.0 mm ²	General	Total Foot Print Area of BOM components
10.	Frequency	1.031 MHz	General	Switching frequency
11.	IC Tolerance	50.0 mV	General	IC Feedback Tolerance

#	Name	Value	Category	Description
12.	M Vds Act	95.685 mV	General	Voltage drop across the MosFET
13.	Mode	CCM	General	Conduction Mode
14.	Pout	2.5 W	General	Total output power
15.	D1 Tj	47.57 degC	Op_Point	D1 junction temperature
16.	Vout Actual	4.96 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
18.	Duty Cycle	40.692 %	Op_point	Duty cycle
19.	Efficiency	86.363 %	Op_point	Steady state efficiency
20.	IC Tj	41.02 degC	Op_point	IC junction temperature
21.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	500.0 mA	Op_point	Iout operating point
23.	VIN_OP	13.0 V	Op_point	Vin operating point
24.	Vout p-p	1.988 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	607.157 µW	Power	Input capacitor power dissipation
26.	Cout Pd	15.441 µW	Power	Output capacitor power dissipation
27.	D1 Pd	125.502 mW	Power	Output Diode Power Dissipation
28.	Diode Pd	125.502 mW	Power	Diode power dissipation
29.	IC Pd	174.581 mW	Power	IC power dissipation
30.	L Pd	39.05 mW	Power	Inductor power dissipation
31.	Rsns Pd	55.0 mW	Power	Current Limit Sense Resistor Power Dissipation
32.	Total Pd	394.756 mW	Power	Total Power Dissipation
33.	Vout Tolerance	3.01 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	13.0	Maximum input voltage
3.	VinMin	8.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	LM25011	Base Product 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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