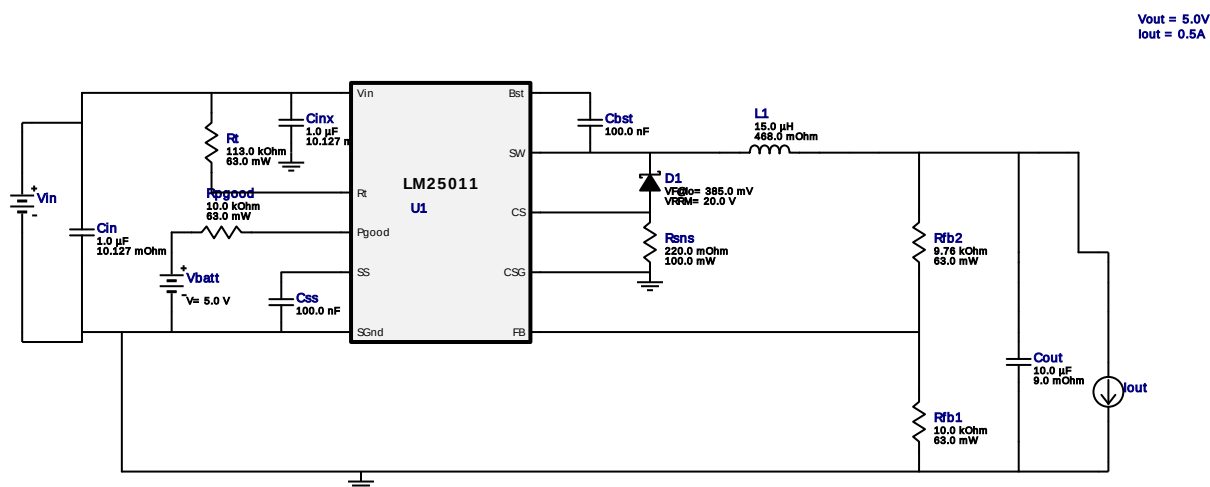


WEBENCH® Design Report

Design : 4742013/227 LM25011MYX/NOPB
LM25011MYX/NOPB 10.0V-12.0V to 5.00V @ 0.5A

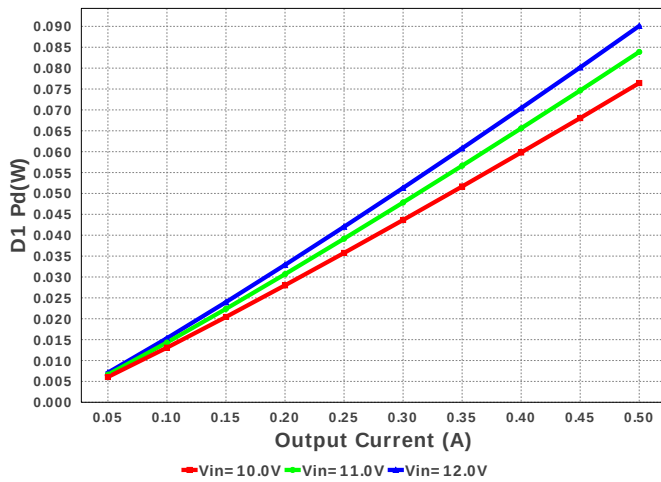


Electrical BOM

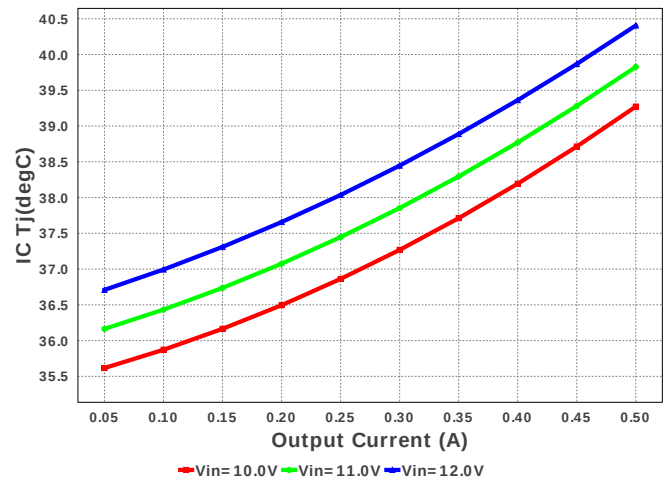
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM188R61C105KA93D Series= X5R	Cap= 1.0 uF ESR= 10.127 mOhm VDC= 16.0 V IRMS= 994.63 mA	1	\$0.01	0603 5 mm ²
3.	Cinx	MuRata	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	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	ON Semiconductor	MBR0520LT1G	VF@Io= 385.0 mV VRRM= 20.0 V	1	\$0.06	SOD-123 13 mm ²
7.	L1	Coilcraft	ME3220-153KLB	L= 15.0 uH DCR= 468.0 mOhm	1	\$0.23	ME3220 16 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
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

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rt	Vishay-Dale	CRCW0402113KFKED Series= CRCW..e3	Res= 113.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
13.	U1	Texas Instruments	LM25011MYX/NOPB	Switcher	1	\$0.95	 MUC10A 24 mm²

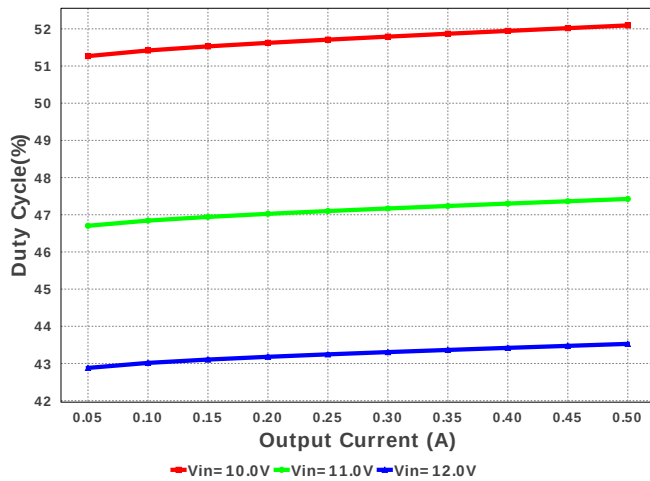
D1 Pd



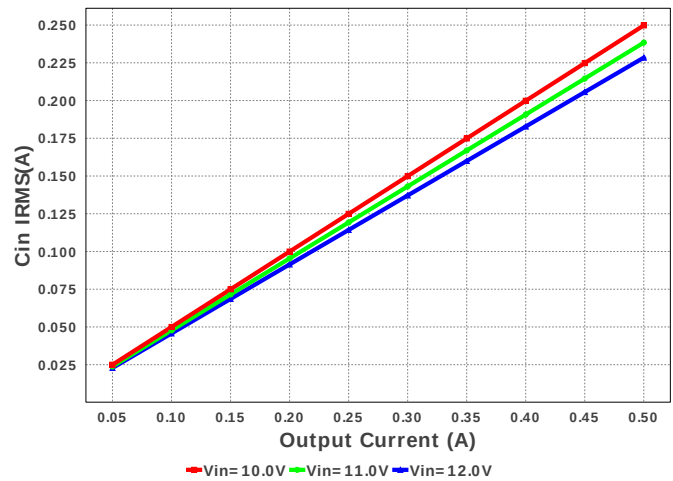
IC Tj

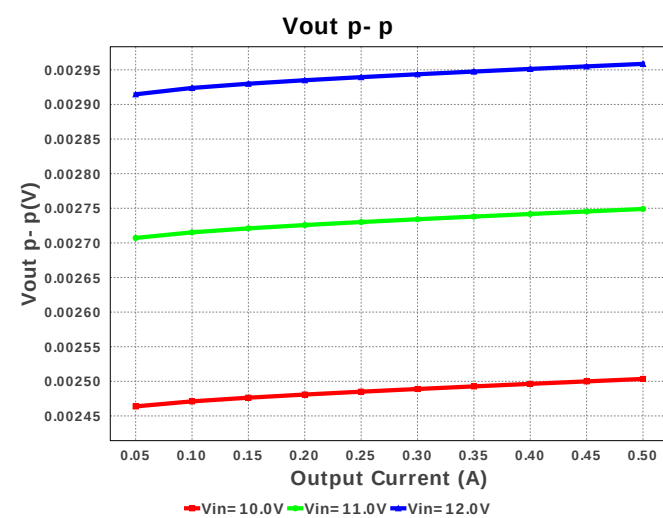
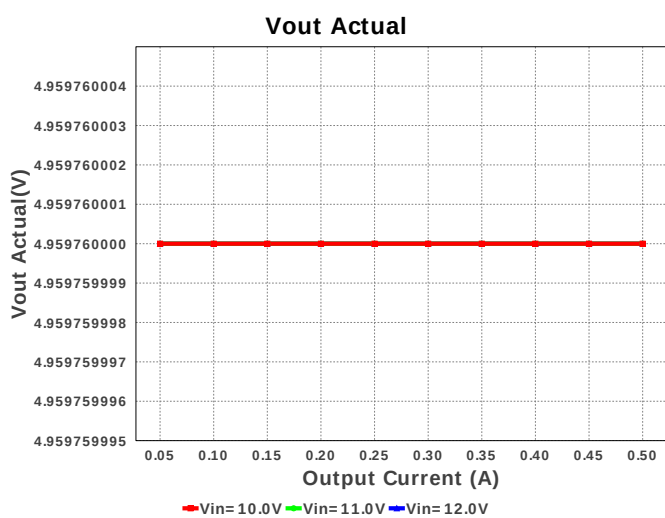
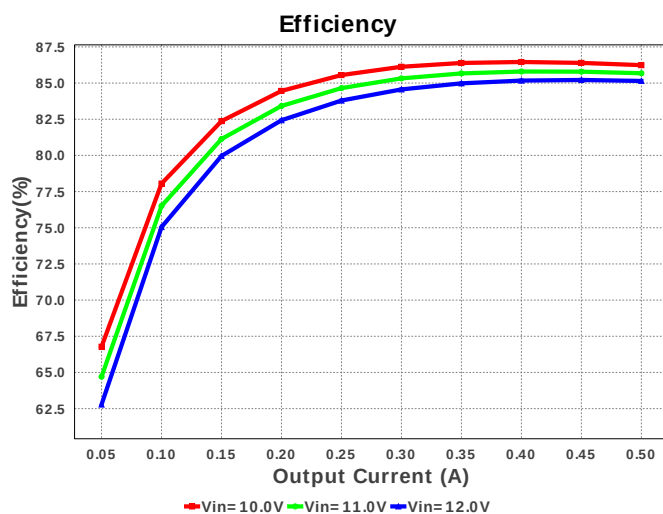
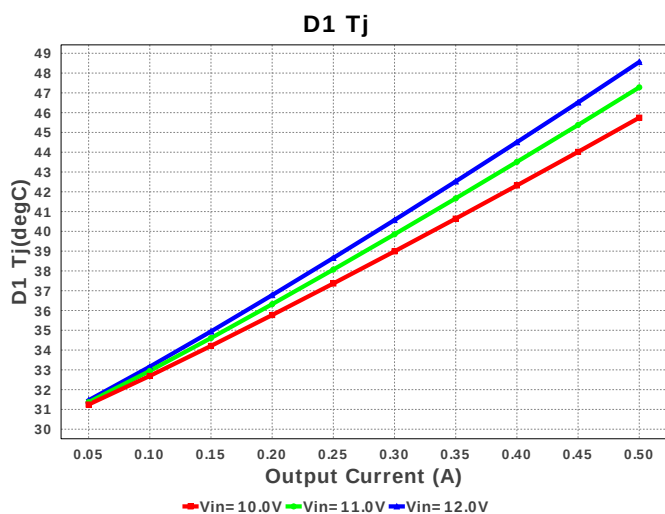
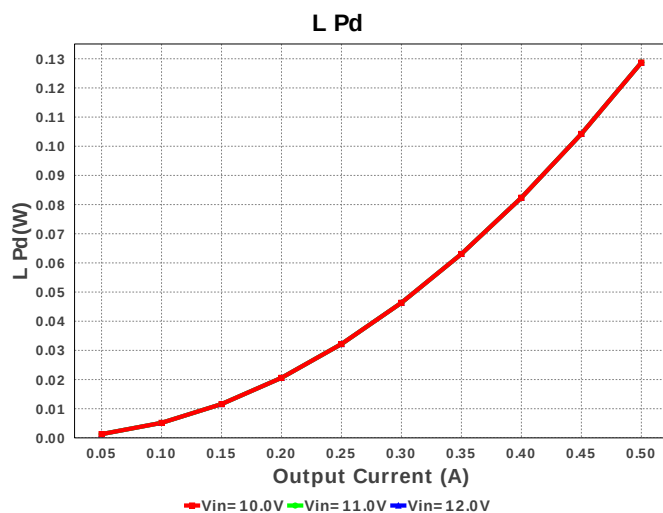
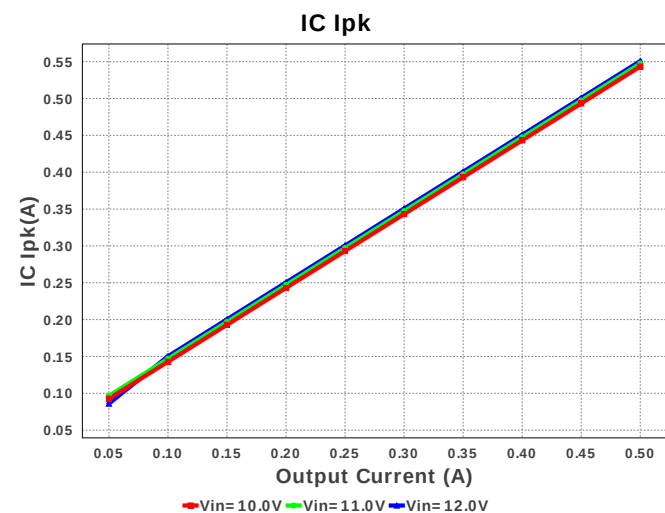


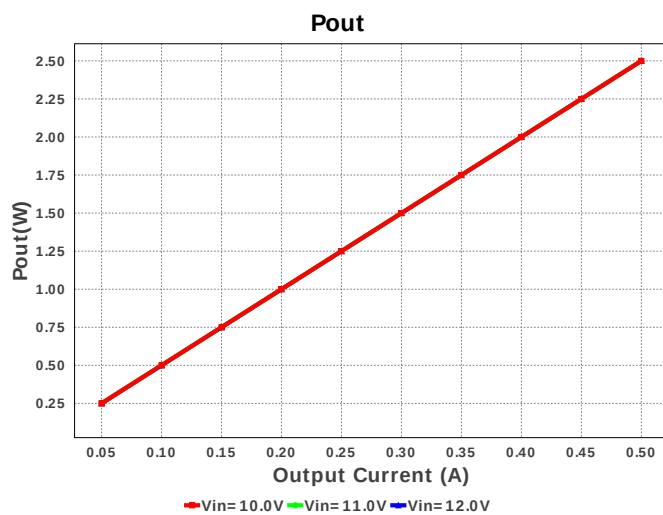
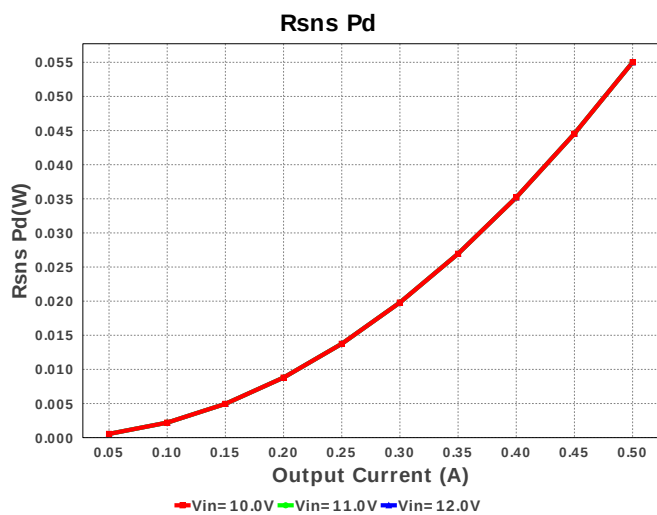
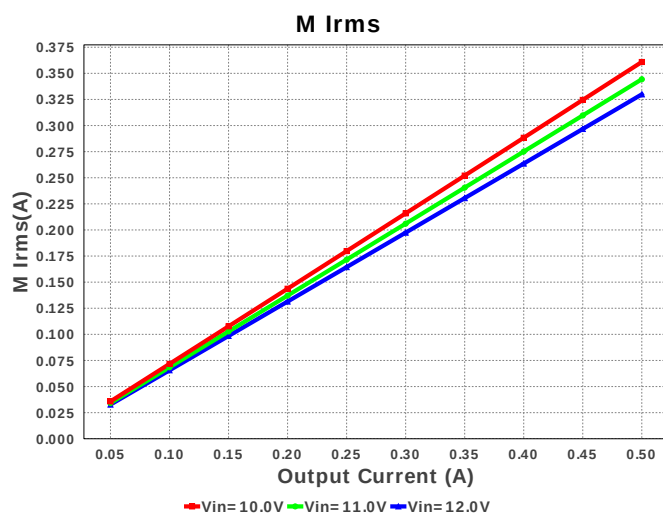
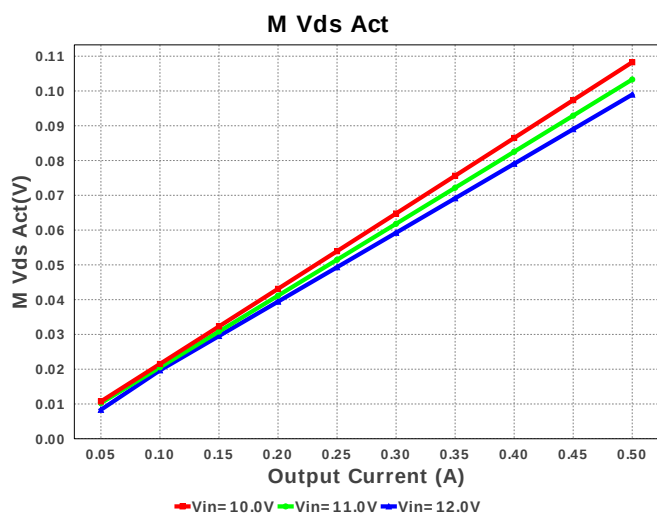
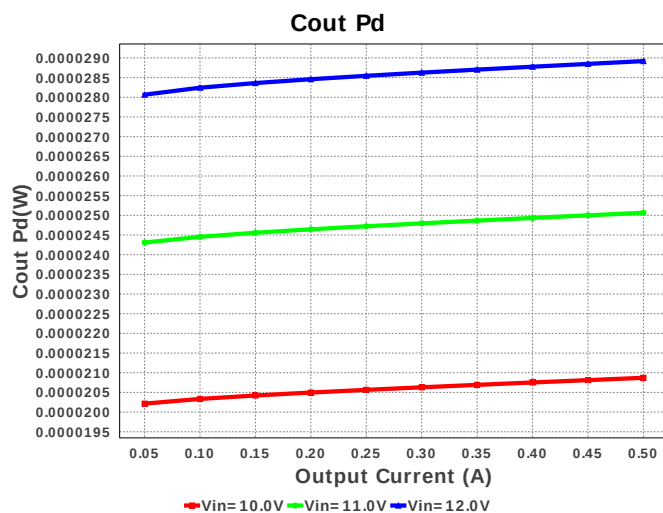
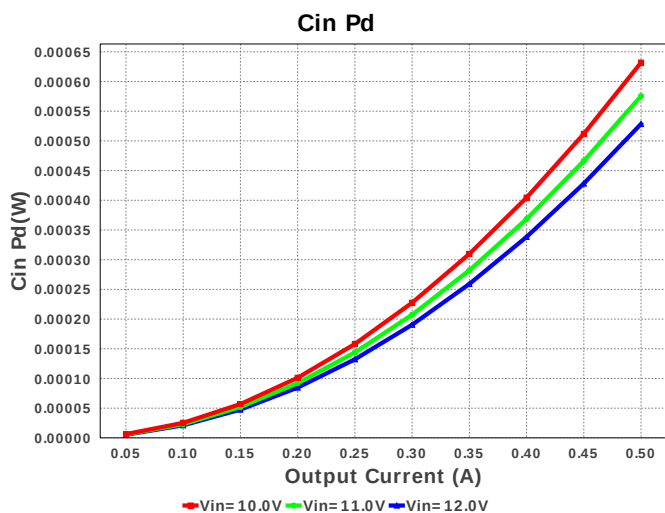
Duty Cycle

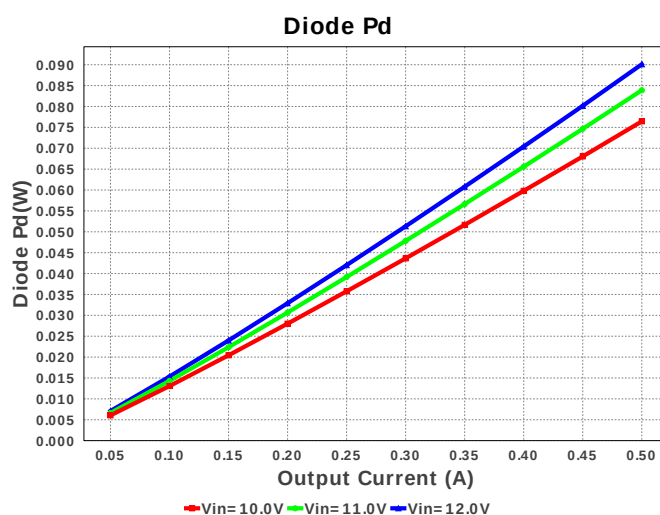
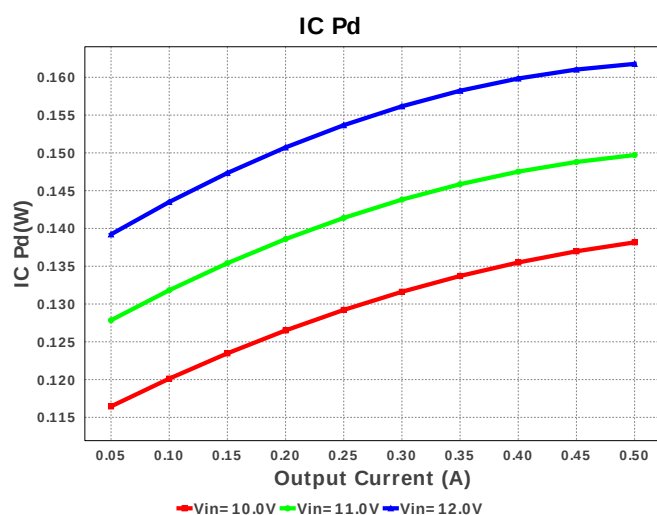
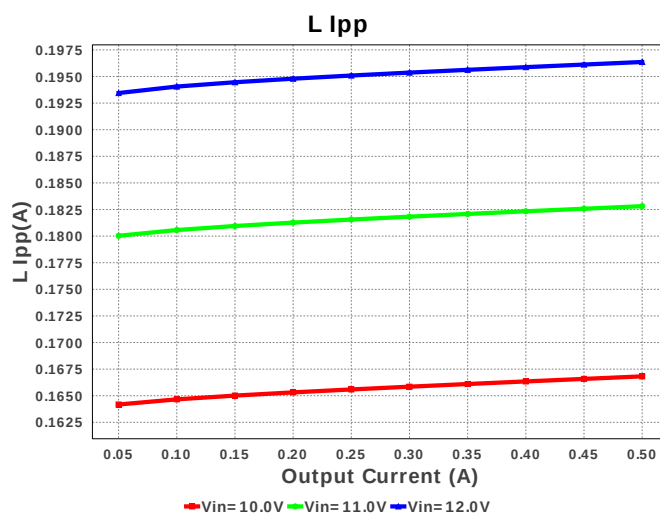
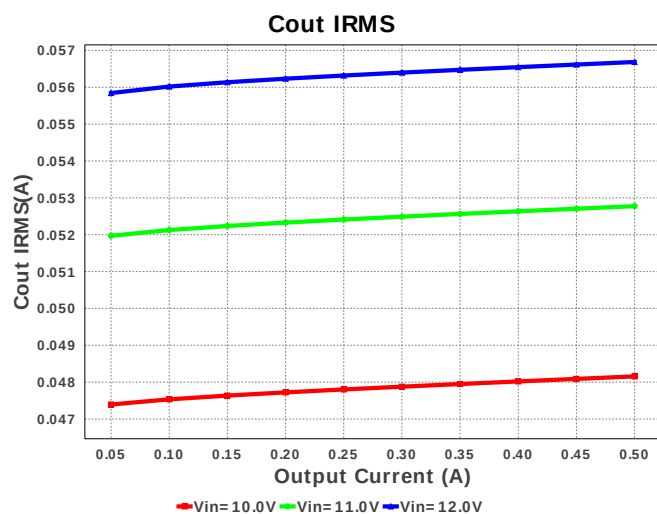
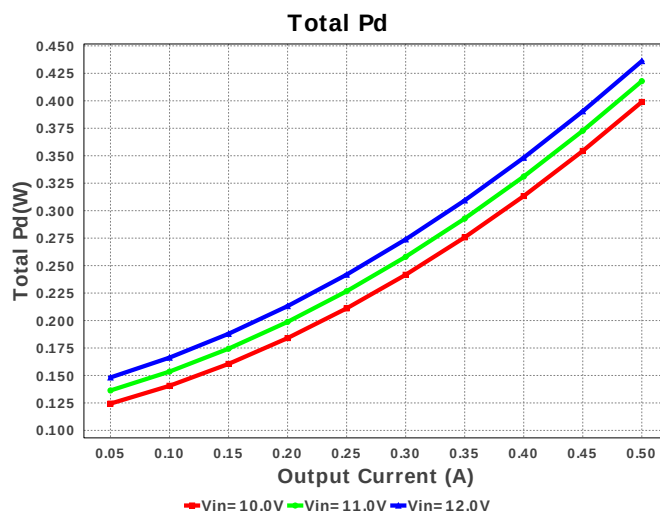
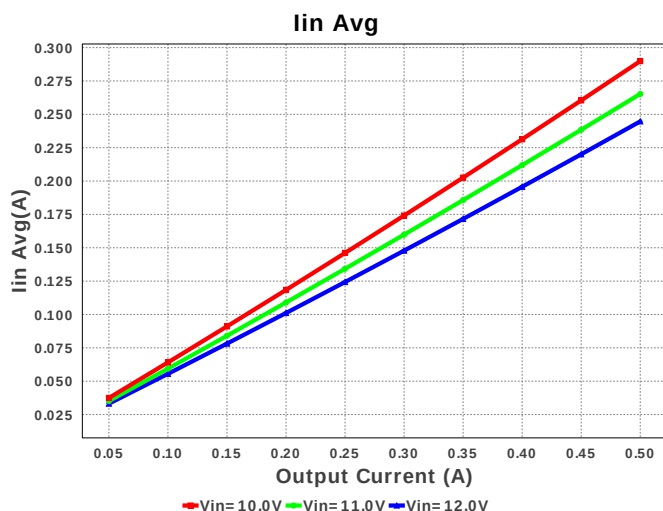


Cin IRMS









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	228.437 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	56.685 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	598.182 mA	Current	Peak switch current in IC
4.	Iin Avg	244.68 mA	Current	Average input current
5.	L Ipp	196.36 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	329.876 mA	Current	Q lavg
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	97.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	1.034 MHz	General	Switching frequency
10.	IC Tolerance	50.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	98.963 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	2.5 W	General	Total output power
13.	Total BOM	\$1.36	General	Total BOM Cost
14.	D1 Tj	48.561 degC	Op_Point	D1 junction temperature
15.	Vout Actual	4.96 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
17.	Duty Cycle	43.527 %	Op_point	Duty cycle
18.	Efficiency	85.146 %	Op_point	Steady state efficiency
19.	IC Tj	40.405 degC	Op_point	IC junction temperature
20.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	500.0 mA	Op_point	Iout operating point
22.	VIN_OP	12.0 V	Op_point	Vin operating point
23.	Vout p-p	2.959 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	528.462 μ W	Power	Input capacitor power dissipation
25.	Cout Pd	28.919 μ W	Power	Output capacitor power dissipation
26.	D1 Pd	90.101 mW	Power	Output Diode Power Dissipation
27.	Diode Pd	90.101 mW	Power	Diode power dissipation
28.	IC Pd	216.779 mW	Power	IC power dissipation
29.	L Pd	128.7 mW	Power	Inductor power dissipation
30.	Rsns Pd	26.231 mW	Power	Current Limit Sense Resistor Power Dissipation
31.	Total Pd	462.369 mW	Power	Total Power Dissipation
32.	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	12.0	Maximum input voltage
3.	VinMin	10.0	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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