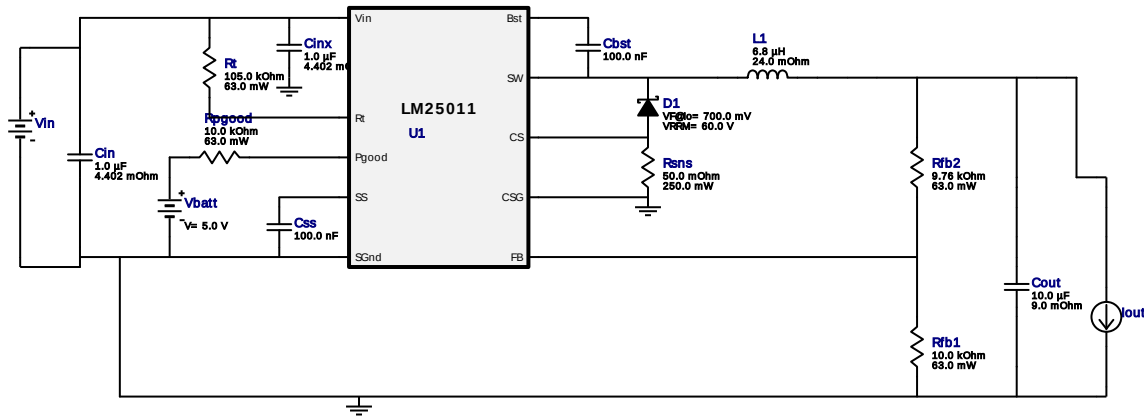


WEBENCH® Design Report

Design : 3893481/4 LM25011MYX/NOPB
LM25011MYX/NOPB 20.0V-30.0V to 5.00V @ 2.0A

Vout = 5.0V
Iout = 2.0A



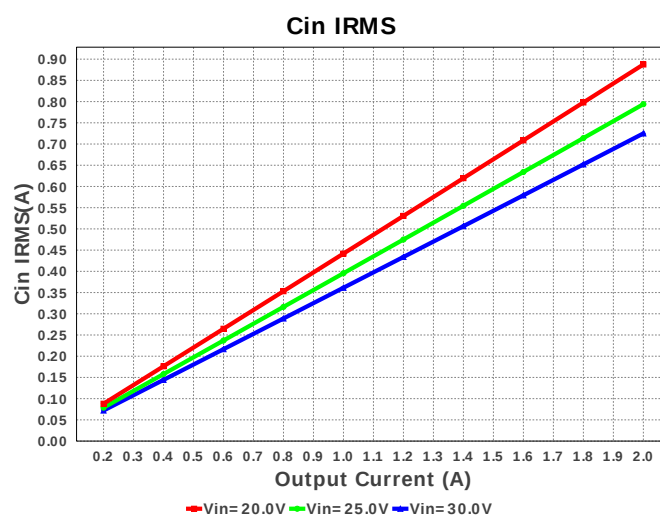
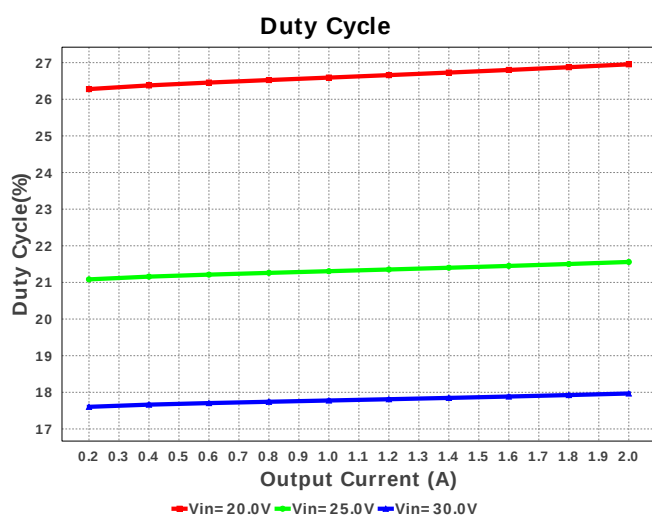
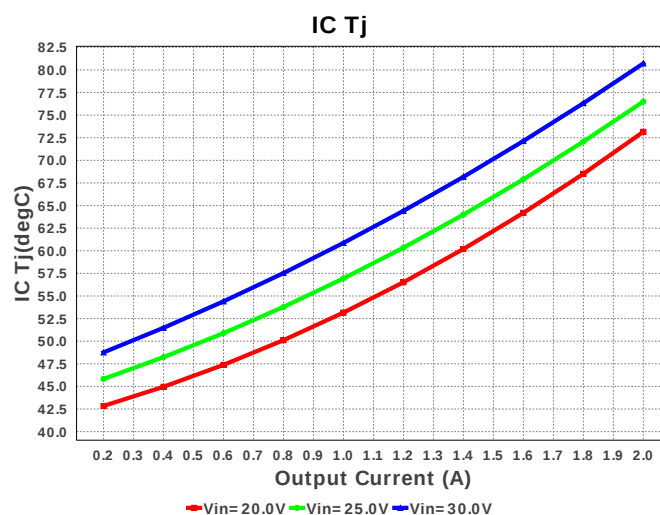
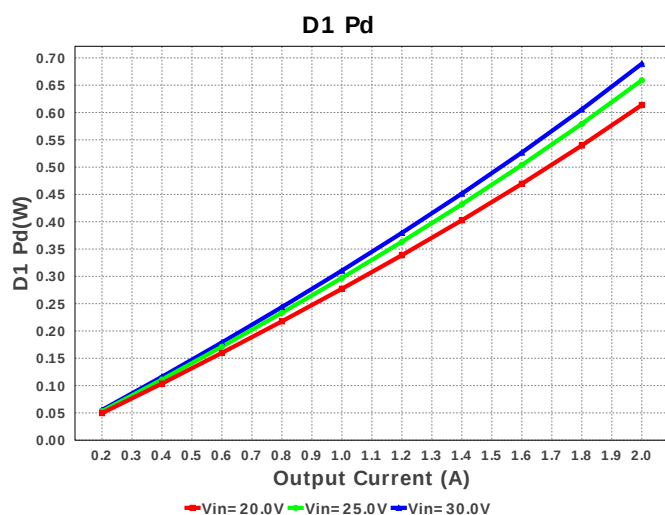
My Comments

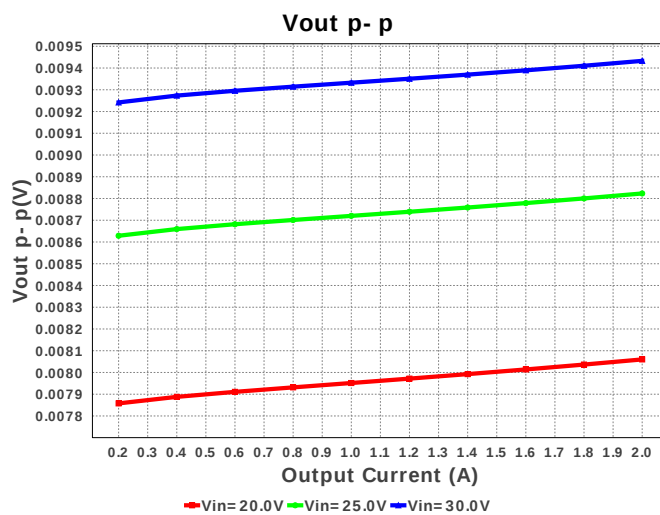
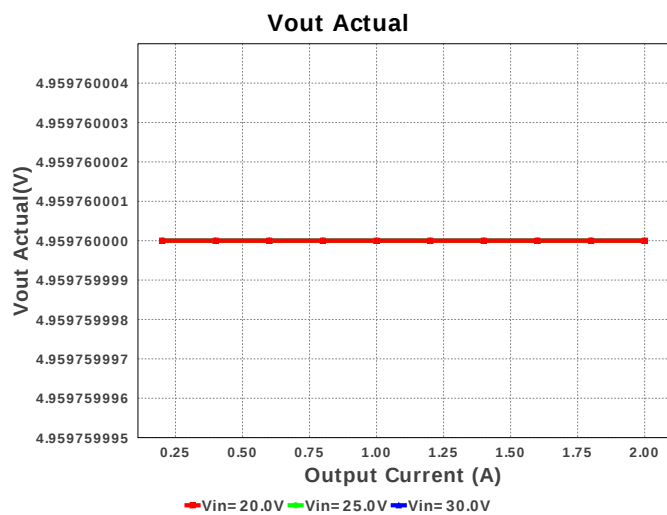
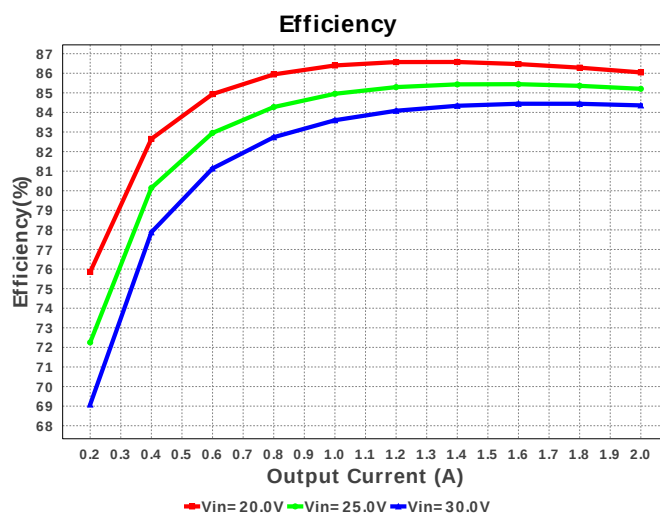
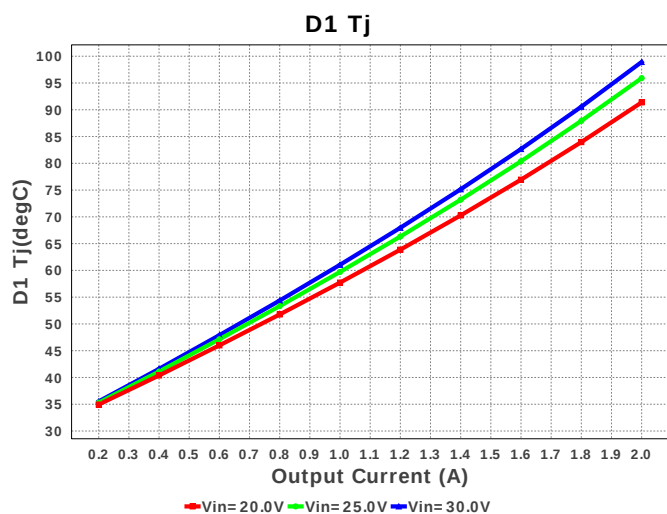
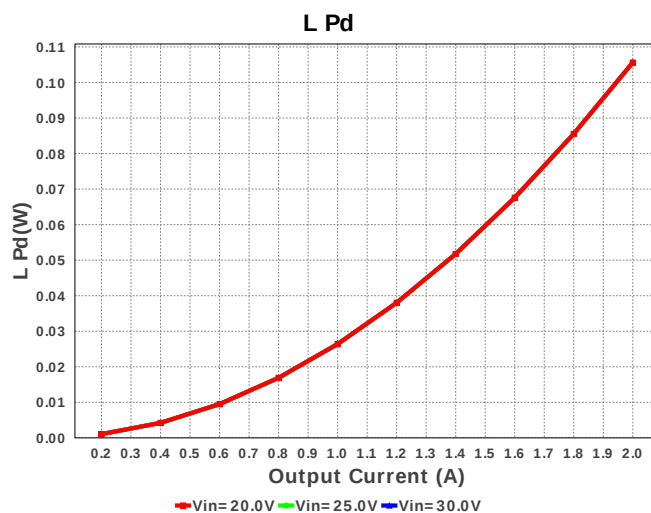
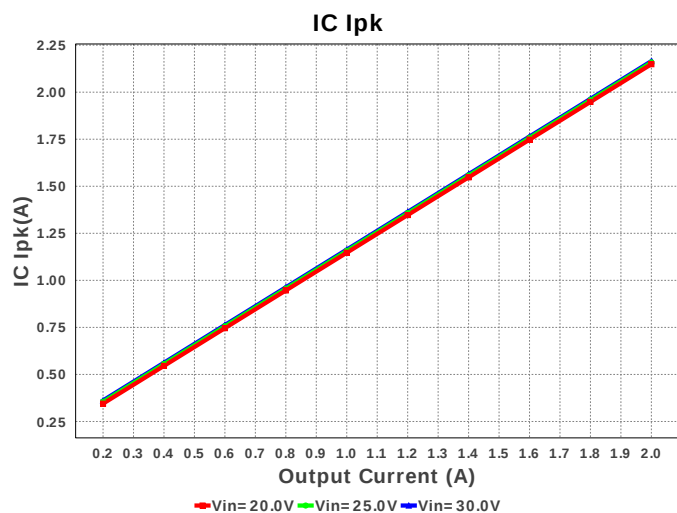
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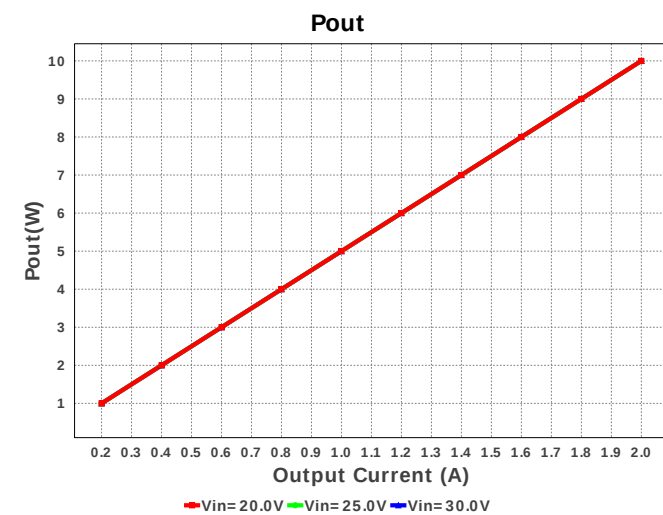
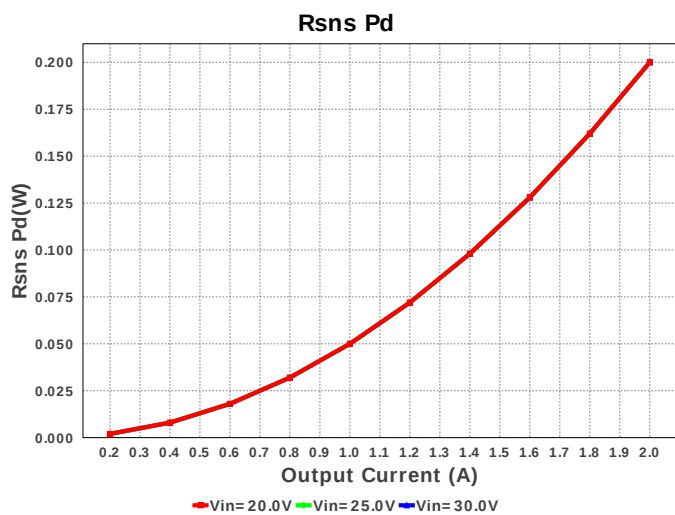
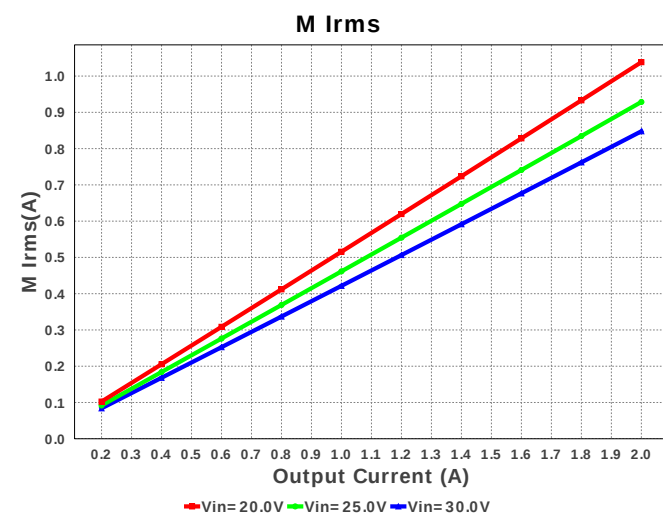
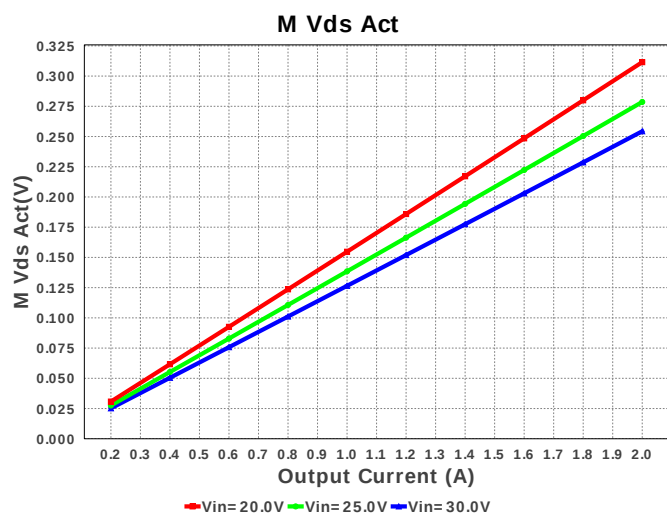
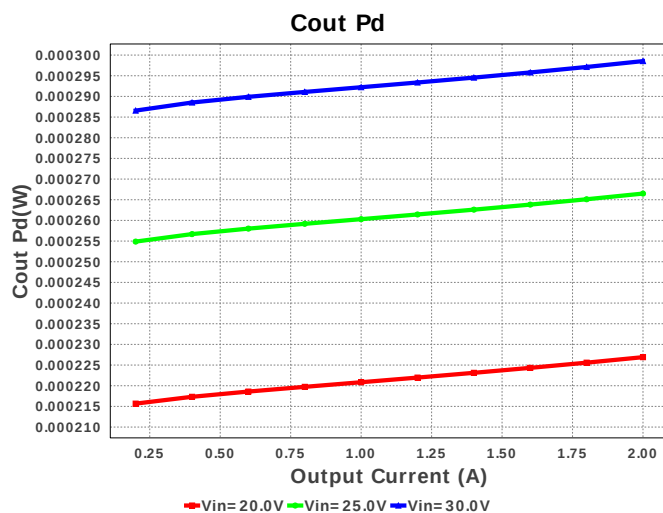
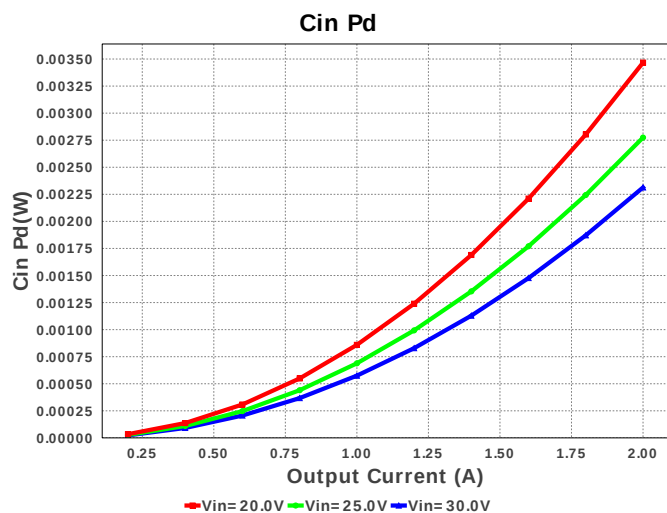
Electrical BOM

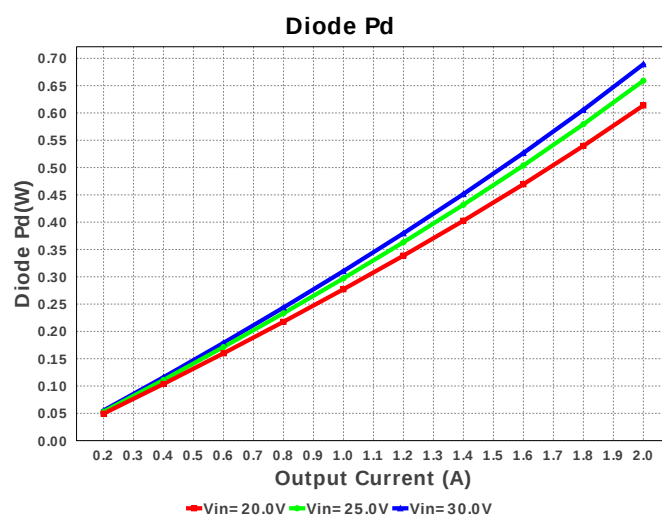
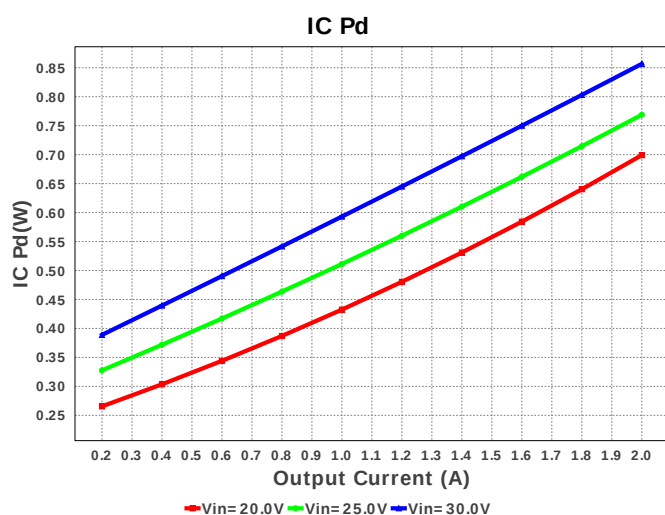
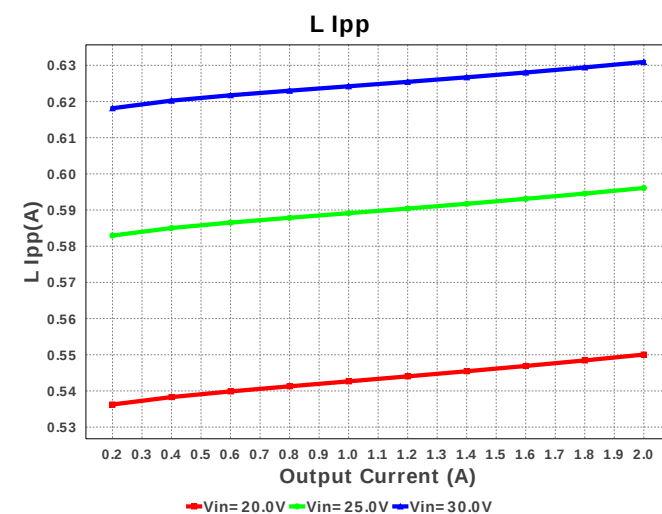
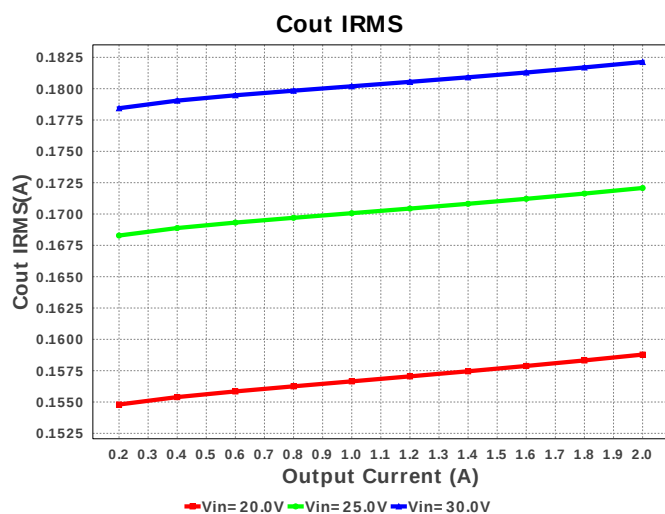
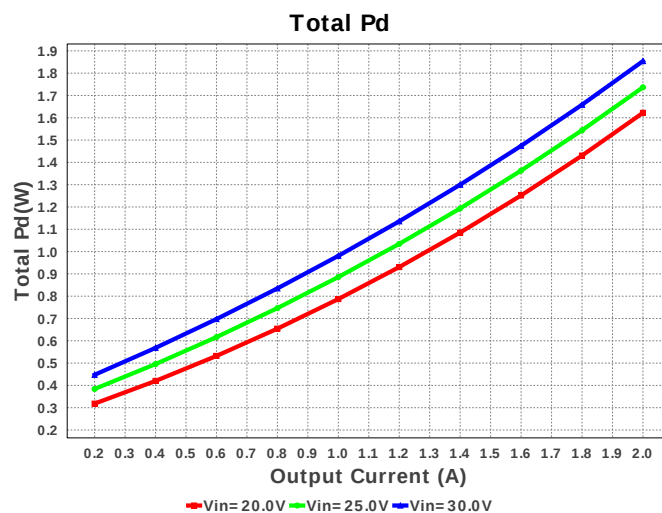
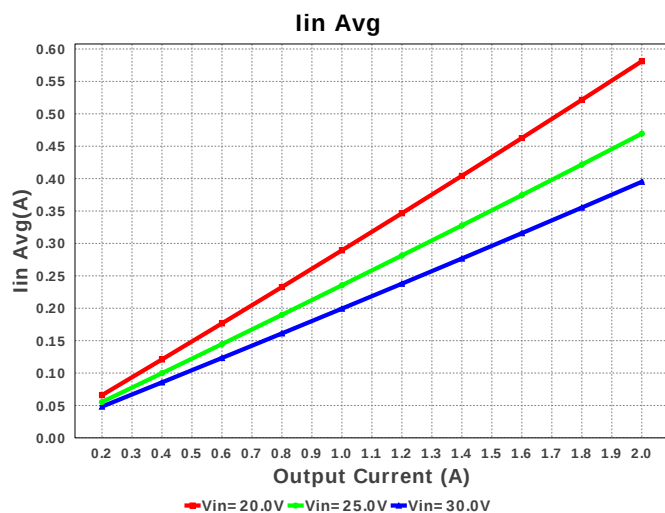
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM21BR71H105KA12L Series= X7R	Cap= 1.0 uF ESR= 4.402 mOhm VDC= 50.0 V IRMS= 1.677 A	1	\$0.05	0805 7 mm ²
3.	Cinx	MuRata	GRM21BR71H105KA12L Series= X7R	Cap= 1.0 uF ESR= 4.402 mOhm VDC= 50.0 V IRMS= 1.677 A	1	\$0.05	0805 7 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	Diodes Inc.	B360A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.12	SMA 37 mm ²
7.	L1	TDK	VLP8040T-6R8M	L= 6.8 uH DCR= 24.0 mOhm	1	\$0.22	VLP8040 113 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 mm²
11.	Rsns	Bourns	CRM0805-FW-R050ELF Series= ?	Res= 50.0 mOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.10	 0805 7 mm²
12.	Rt	Vishay-Dale	CRCW0402105KFKED Series= CRCW..e3	Res= 105.0 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









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	724.939 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	182.13 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.315 A	Current	Peak switch current in IC
4.	Iin Avg	395.14 mA	Current	Average input current
5.	L Ipp	630.92 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	847.767 mA	Current	Q lavg
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	225.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	1.047 MHz	General	Switching frequency
10.	IC Tolerance	50.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	254.33 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	10.0 W	General	Total output power
13.	Total BOM	\$1.57	General	Total BOM Cost
14.	D1 Tj	98.925 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	17.968 %	Op_point	Duty cycle
18.	Efficiency	84.359 %	Op_point	Steady state efficiency
19.	IC Tj	80.719 degC	Op_point	IC junction temperature
20.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	2.0 A	Op_point	Iout operating point
22.	VIN_OP	30.0 V	Op_point	Vin operating point
23.	Vout p-p	9.433 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	2.313 mW	Power	Input capacitor power dissipation
25.	Cout Pd	298.544 μ W	Power	Output capacitor power dissipation
26.	D1 Pd	689.246 mW	Power	Output Diode Power Dissipation
27.	Diode Pd	689.246 mW	Power	Diode power dissipation
28.	IC Pd	1.057 W	Power	IC power dissipation
29.	L Pd	105.6 mW	Power	Inductor power dissipation
30.	Rsns Pd	145.307 mW	Power	Current Limit Sense Resistor Power Dissipation
31.	Total Pd	1.999 W	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	2.0	Maximum Output Current
2.	VinMax	30.0	Maximum input voltage
3.	VinMin	20.0	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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