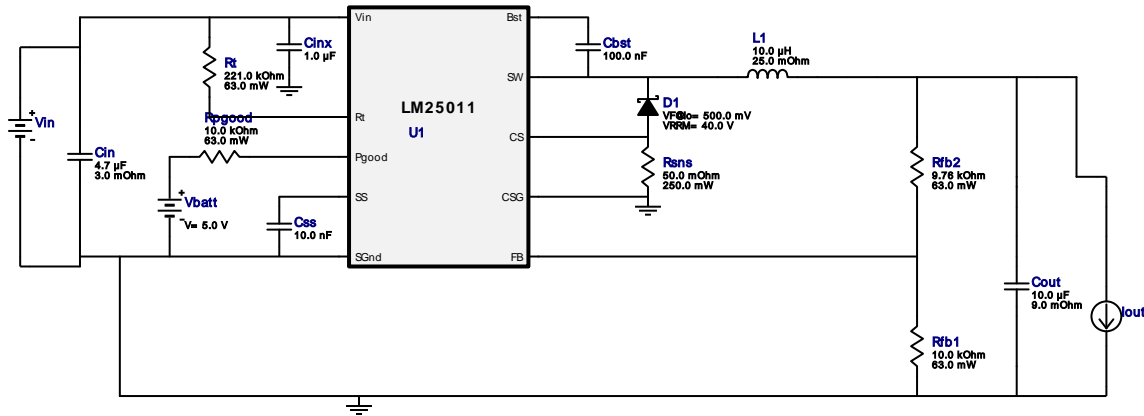





**WEBENCH<sup>®</sup> Design Report**

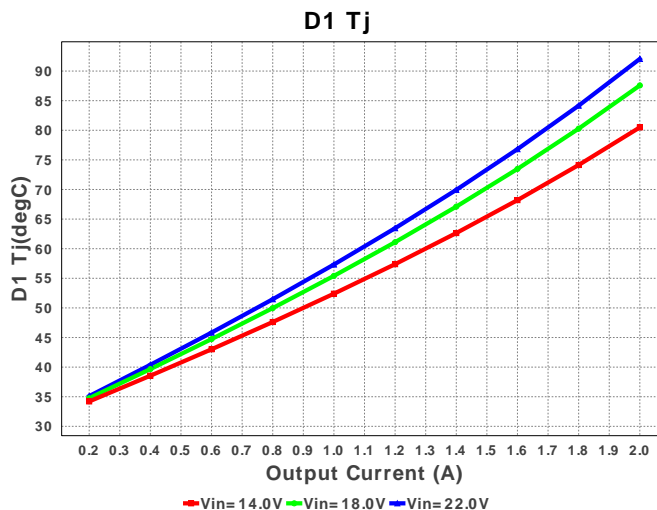
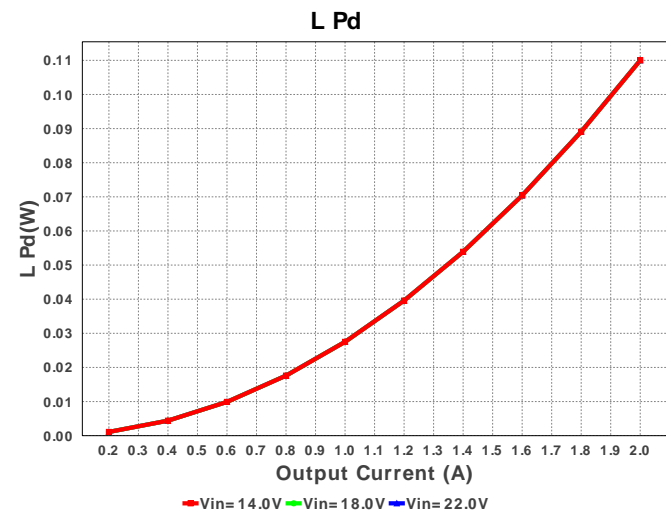
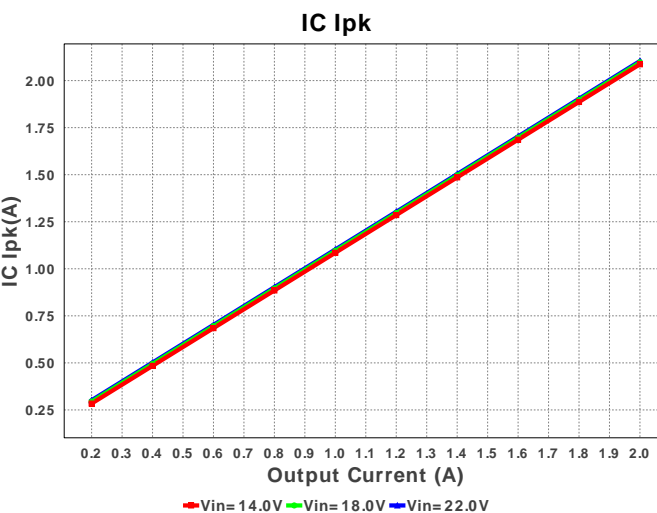
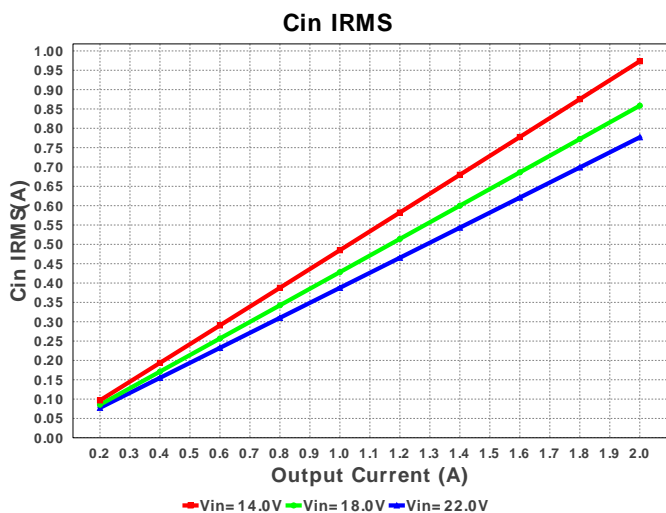
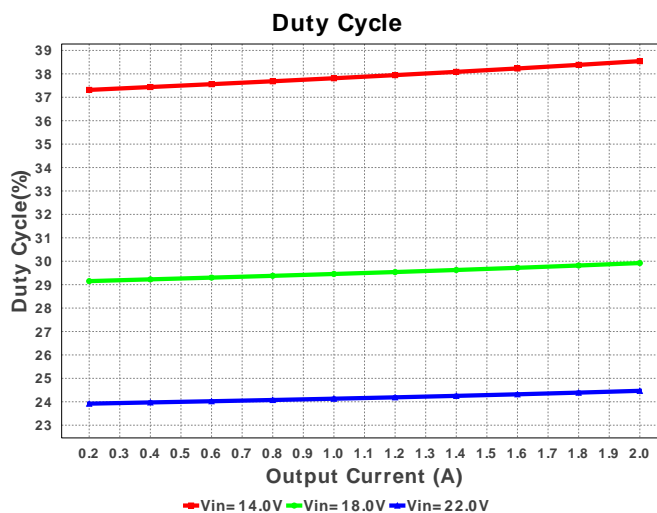
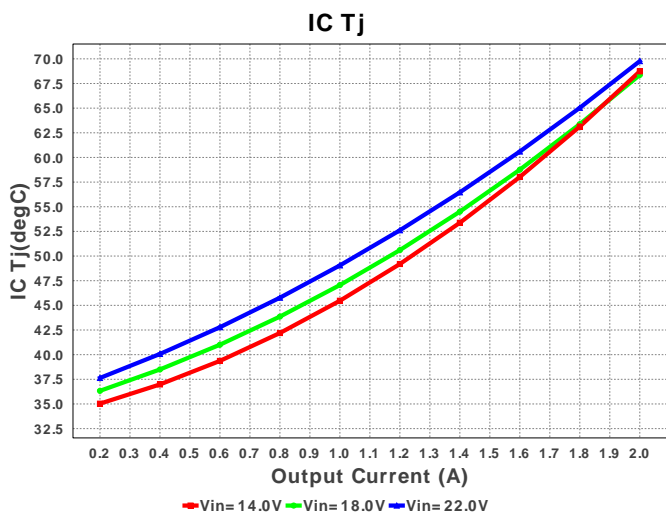
 Design : 4383255/2 LM25011MY/NOPB  
 LM25011MY/NOPB 14.0V-22.0V to 5.00V @ 2.0A

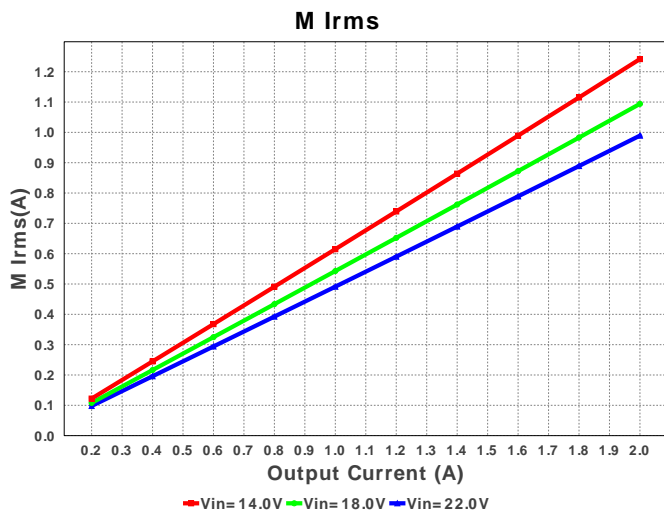
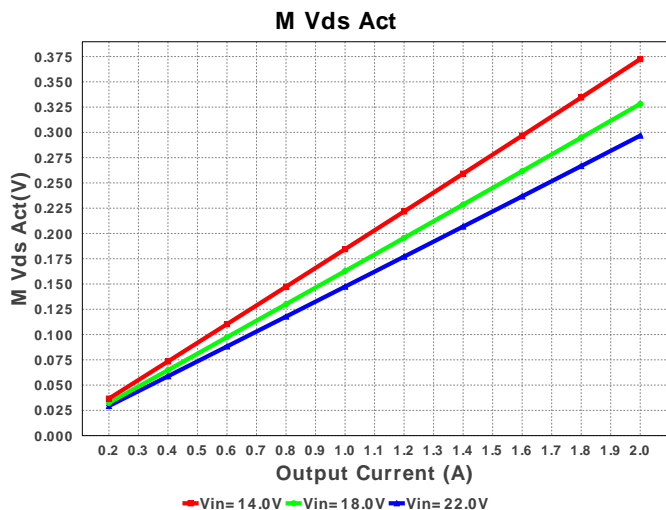
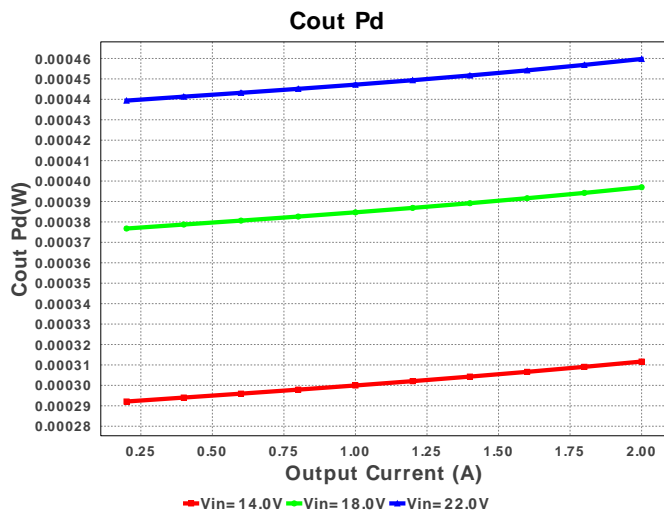
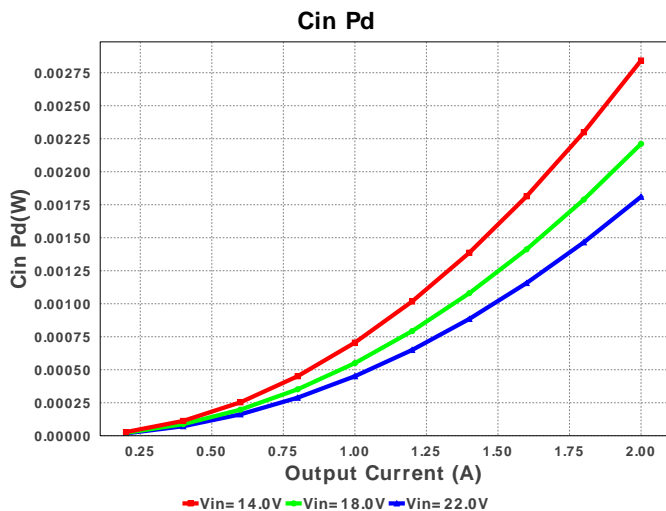
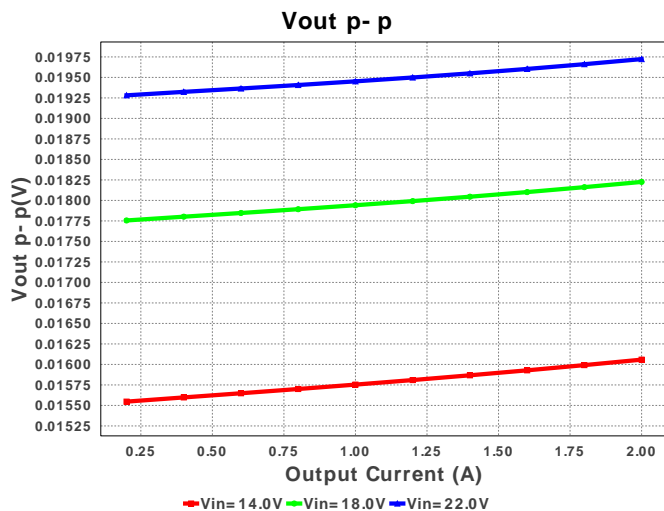
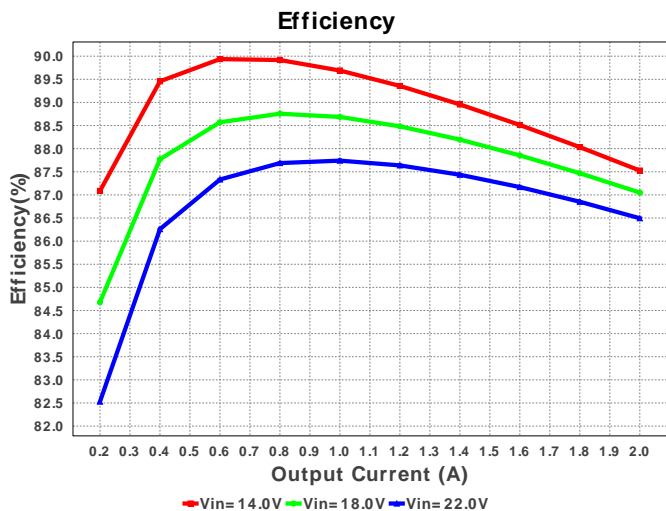
 VinMin = 14.0V  
 VinMax = 22.0V

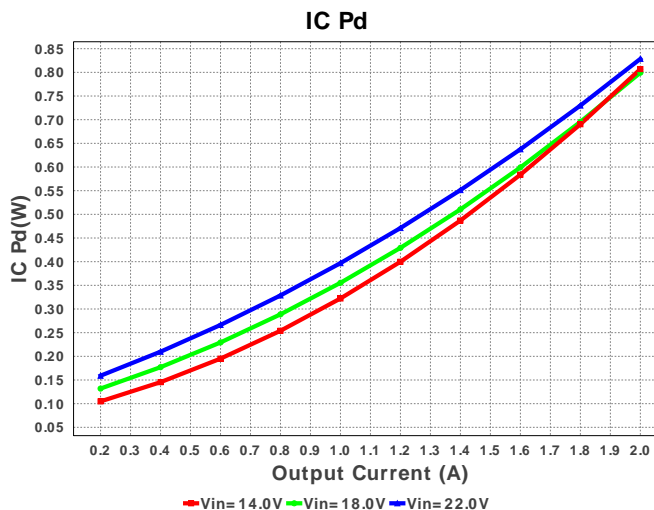
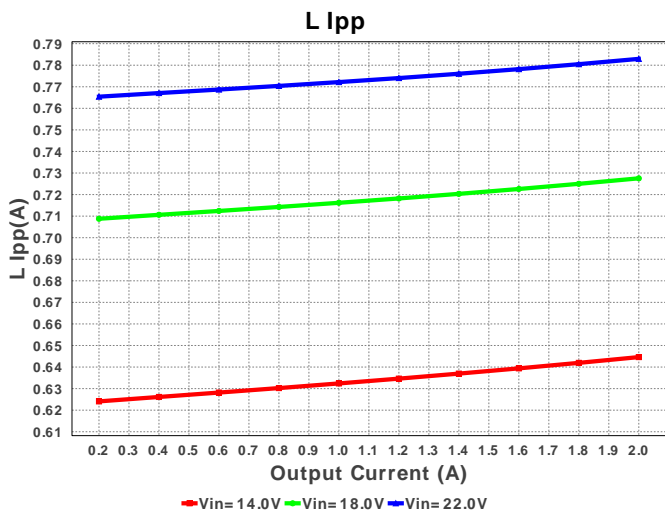
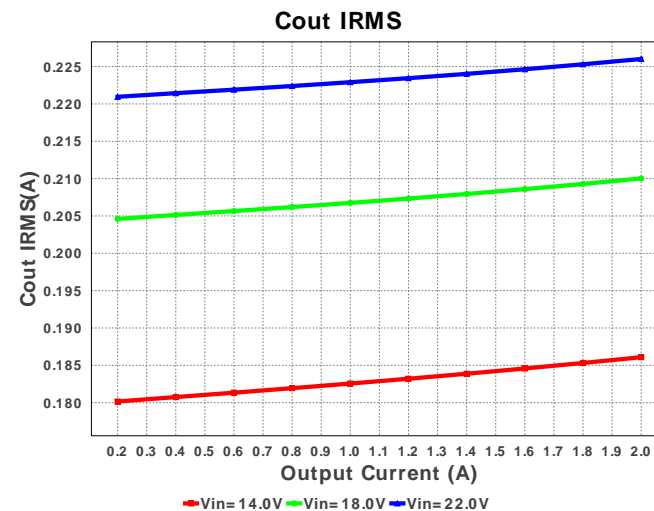
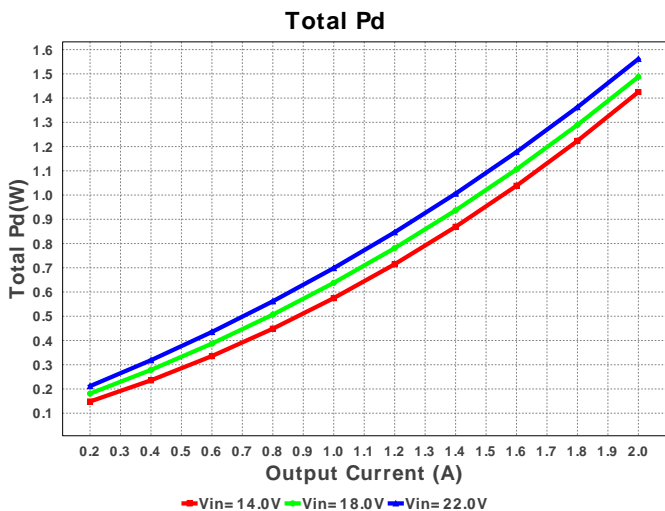
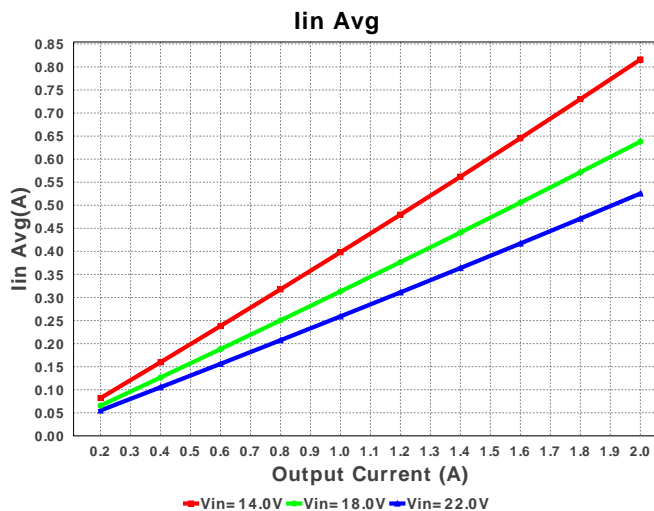
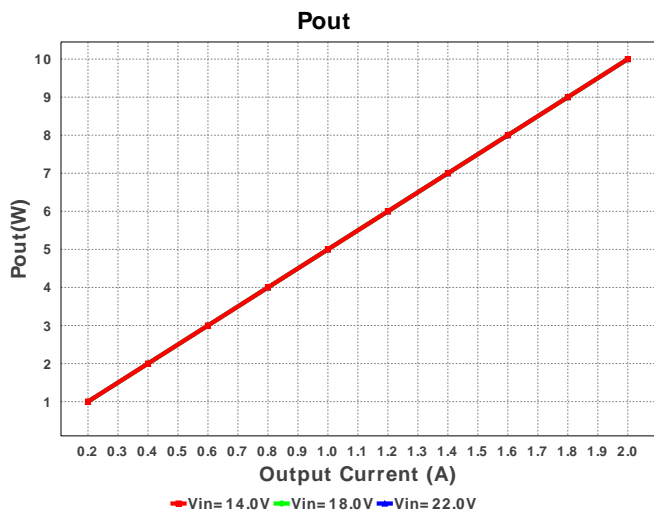
 Vout = 5.0V  
 Iout = 2.0A

**Electrical BOM**

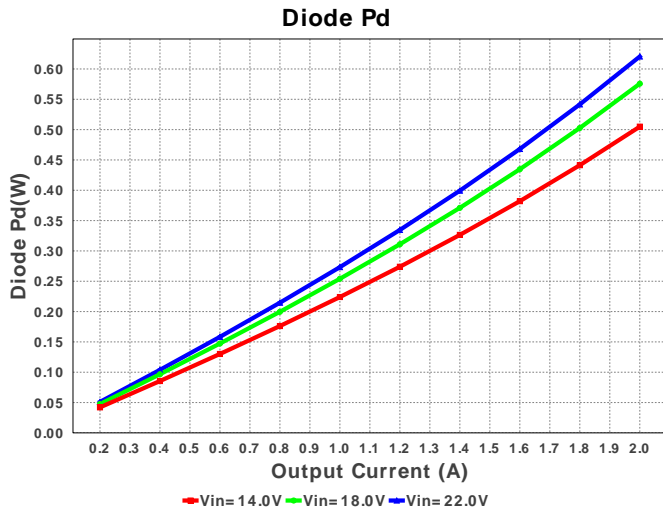
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.07	 1206 11 mm <sup>2</sup>
3.	Cinx	Taiyo Yuden	GMK212B7105KG-T Series= X7R	Cap= 1.0 uF VDC= 35.0 V IRMS= 0.0 A	1	\$0.05	 0805 7 mm <sup>2</sup>
4.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.03	 0603 5 mm <sup>2</sup>
5.	Css	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
6.	D1	Diodes Inc.	B340A-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	\$0.11	 SMA 37 mm <sup>2</sup>
7.	L1	Bourns	SRU1038-100Y	L= 10.0 uH DCR= 25.0 mOhm	1	\$0.33	 SRU1038 144 mm <sup>2</sup>
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 <sup>2</sup>
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 <sup>2</sup>
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 <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rsns	Bourns	CRM0805-FW-R050ELF Series= ?	Res= 50.0 mOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.10	 0805 7 mm <sup>2</sup>
12.	Rt	Vishay-Dale	CRCW0402221KFKED Series= CRCW..e3	Res= 221.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
13.	U1	Texas Instruments	LM25011MY/NOPB	Switcher	1	\$0.95	 MUC10A 24 mm <sup>2</sup>









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	776.97 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	226.151 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.392 A	Current	Peak switch current in IC
4.	Iin Avg	525.81 mA	Current	Average input current
5.	L Ipp	783.41 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	989.59 mA	Current	MOSFET RMS current
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	260.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
9.	Frequency	531.265 kHz	General	Switching frequency
10.	IC Tolerance	50.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	296.877 mV	General	Voltage drop across the MosFET
12.	Pout	10.0 W	General	Total output power
13.	Total BOM	\$1.7	General	Total BOM Cost
14.	D1 Tj	92.681 degC	Op_Point	D1 junction temperature
15.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	24.482 %	Op_point	Duty cycle
17.	Efficiency	86.447 %	Op_point	Steady state efficiency
18.	IC Tj	69.776 degC	Op_point	IC junction temperature
19.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	2.0 A	Op_point	Iout operating point
21.	VIN_OP	22.0 V	Op_point	Vin operating point
22.	Vout p-p	19.735 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	1.811 mW	Power	Input capacitor power dissipation
24.	Cout Pd	460.297 μW	Power	Output capacitor power dissipation
25.	Diode Pd	626.807 mW	Power	Diode power dissipation
26.	IC Pd	828.675 mW	Power	IC power dissipation
27.	L Pd	110.0 mW	Power	Inductor power dissipation
28.	Total Pd	1.568 W	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	Iout1	2.0	Output Current #1
3.	VinMax	22.0	Maximum input voltage
4.	VinMin	14.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	LM25011	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	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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