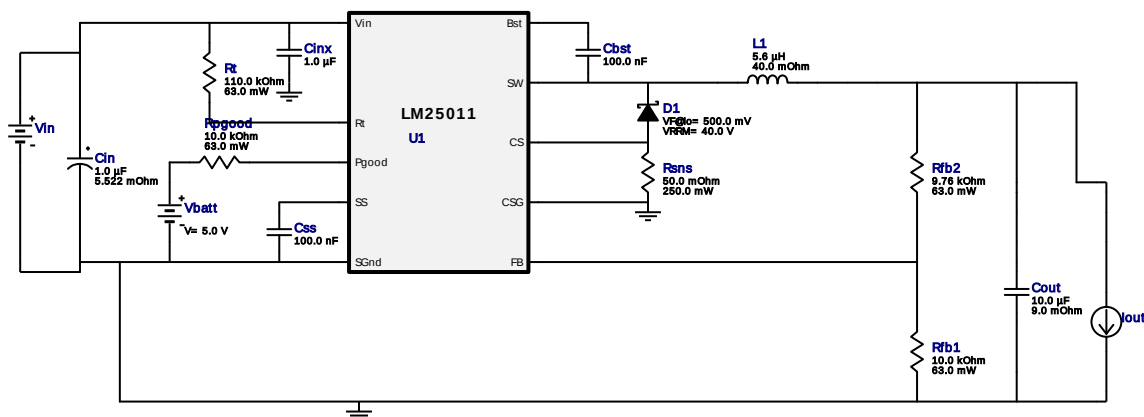


WEBENCH® Design Report

Design : 4764968/3 LM25011MYX/NOPB
LM25011MYX/NOPB 19.0V-22.0V to 5.00V @ 2.0A

Vout = 5.0V
Iout = 2.0A

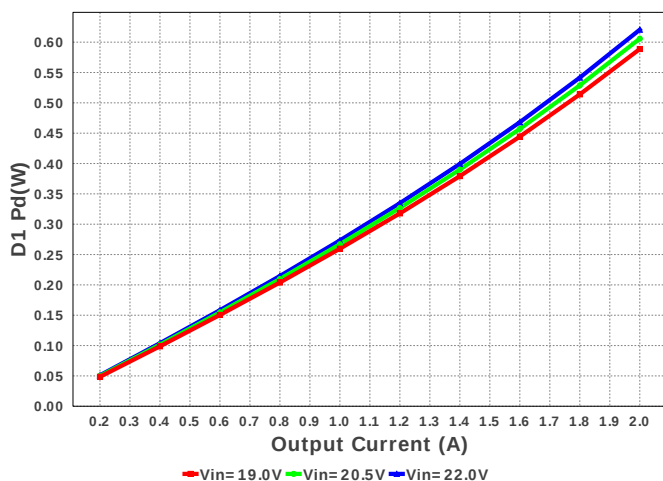


Electrical BOM

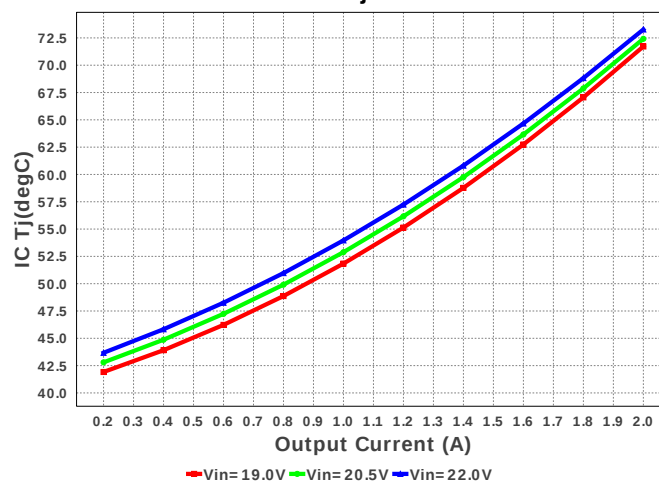
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
2.	Cin	TDK	C1608X7R1V105K080AC Series= X7R	Cap= 1.0 uF ESR= 5.522 mOhm VDC= 35.0 V IRMS= 2.2162 A	1	\$0.05	 0603 5 mm ²
3.	Cinx	Taiyo Yuden	GMK212B7105KG-T Series= X7R	Cap= 1.0 uF VDC= 35.0 V IRMS= 0.0 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.	B340A-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	\$0.11	 SMA 37 mm ²
7.	L1	Bourns	SDR0805-5R6ML	L= 5.6 uH DCR= 40.0 mOhm	1	\$0.22	 SDR0805 96 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

#	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 ²
12.	Rt	Vishay-Dale	CRCW0402110KFKED Series= CRCW..e3	Res= 110.0 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

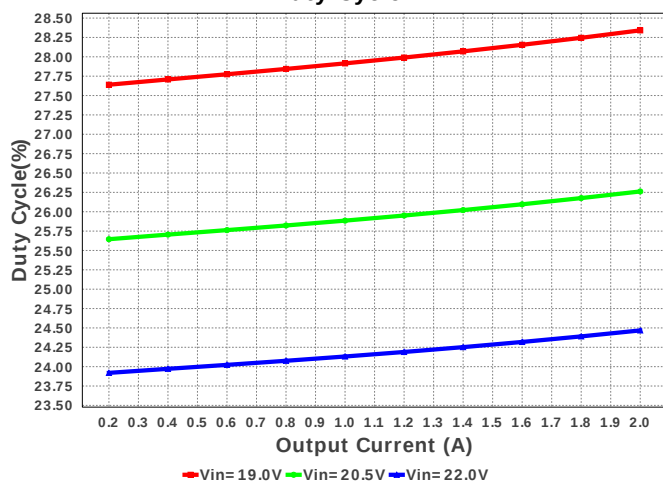
D1 Pd



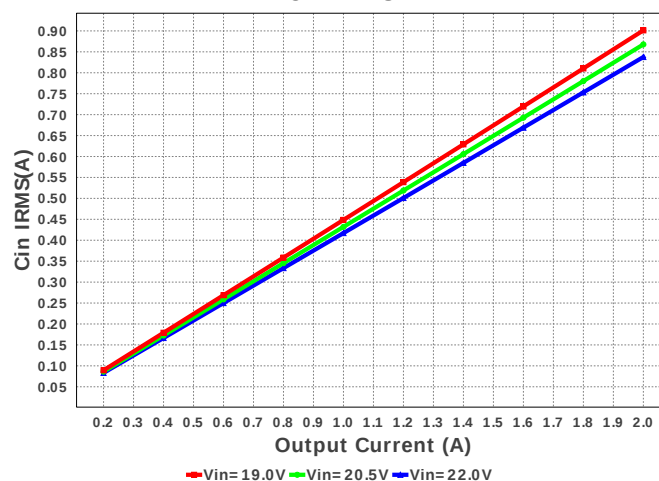
IC Tj

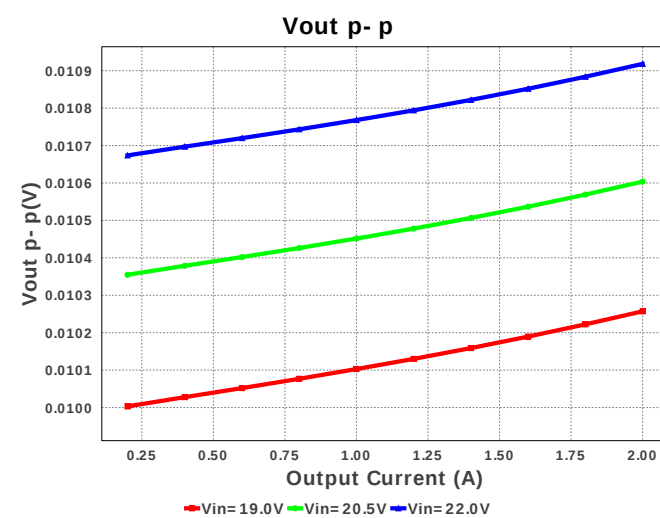
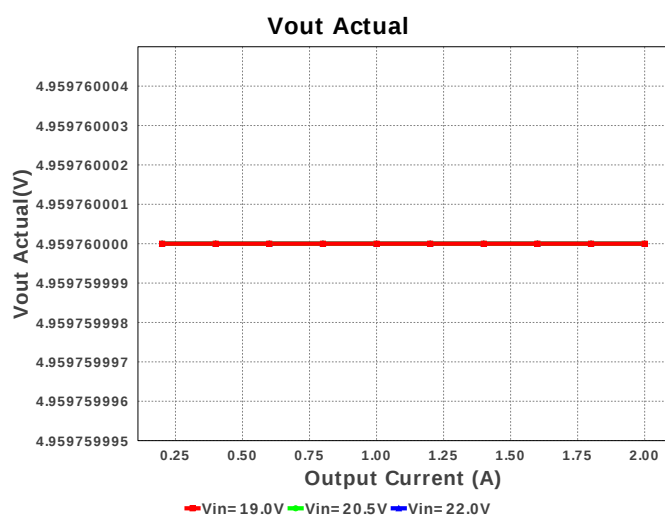
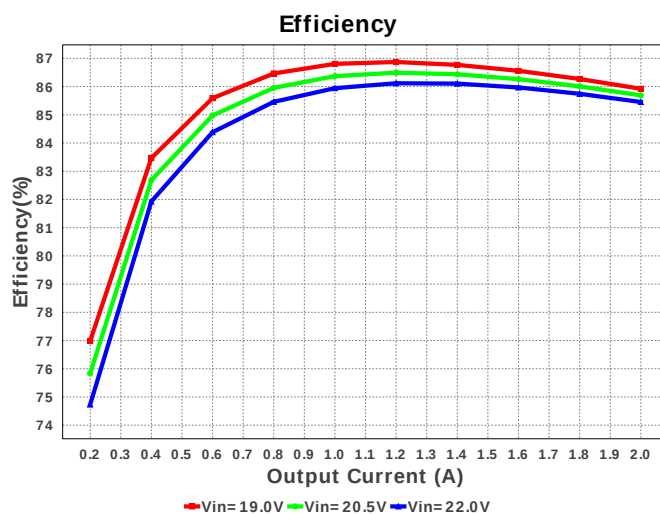
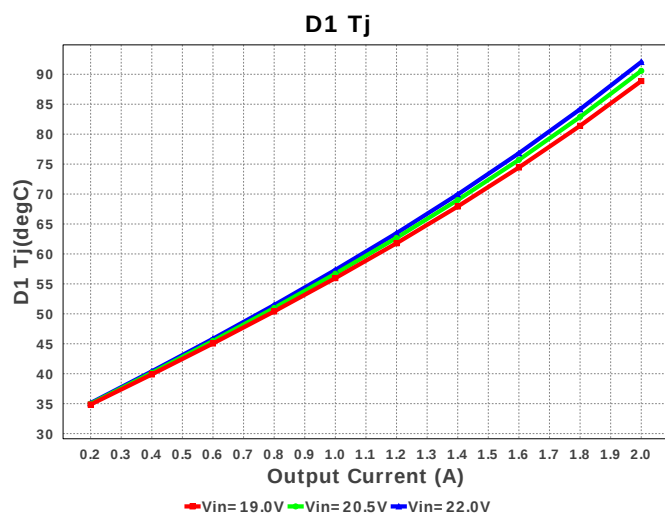
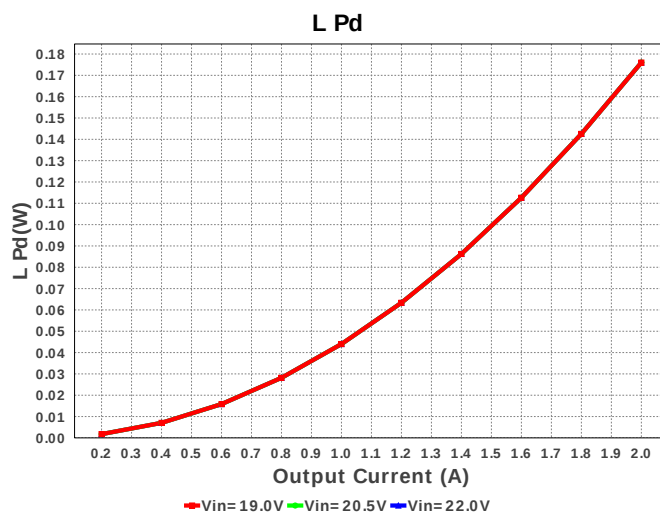
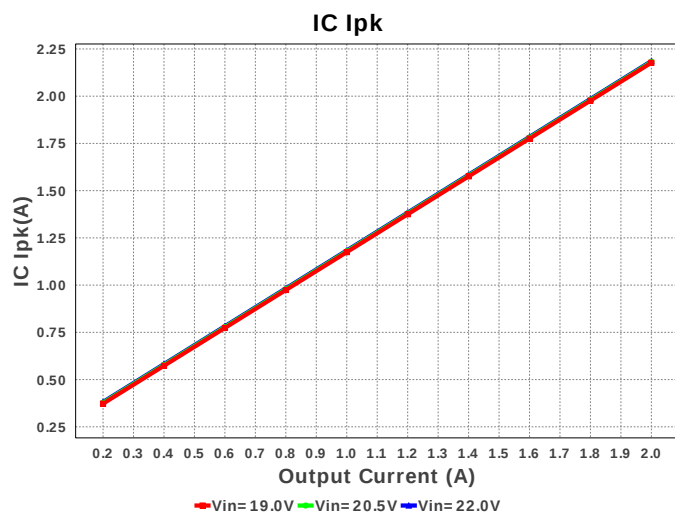


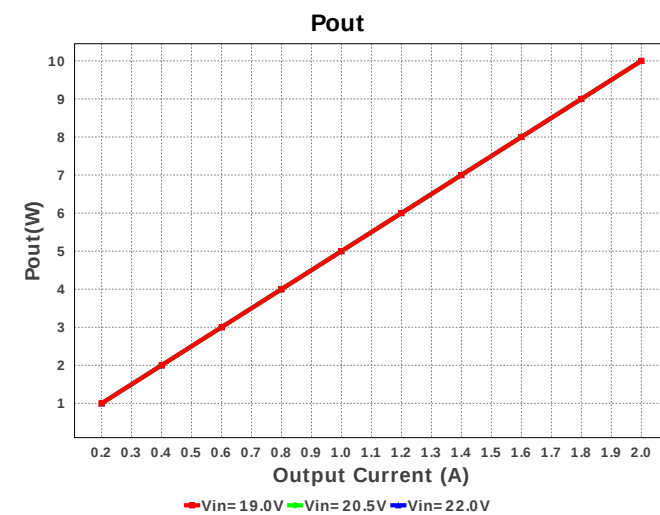
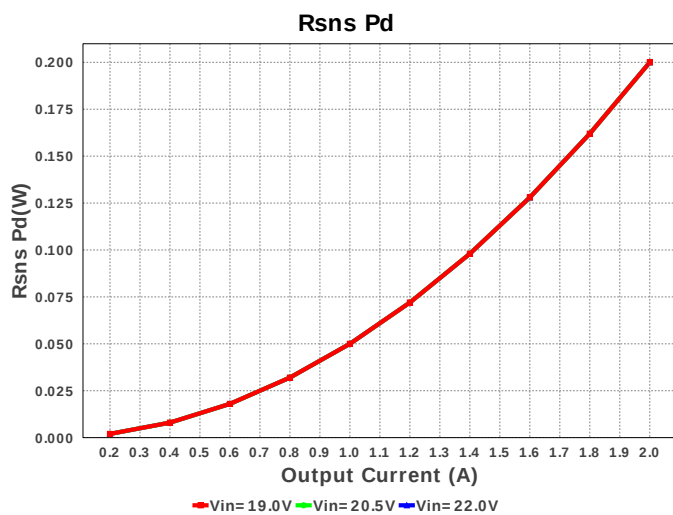
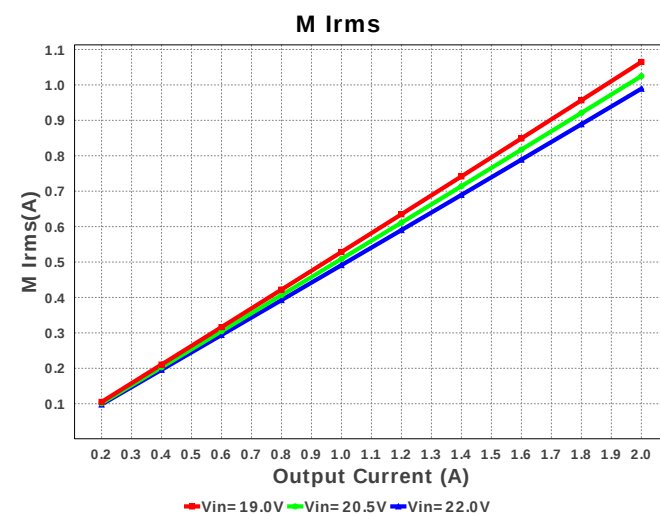
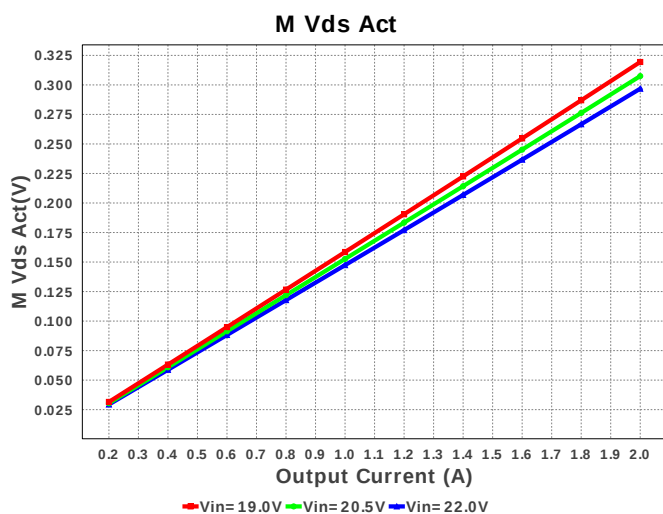
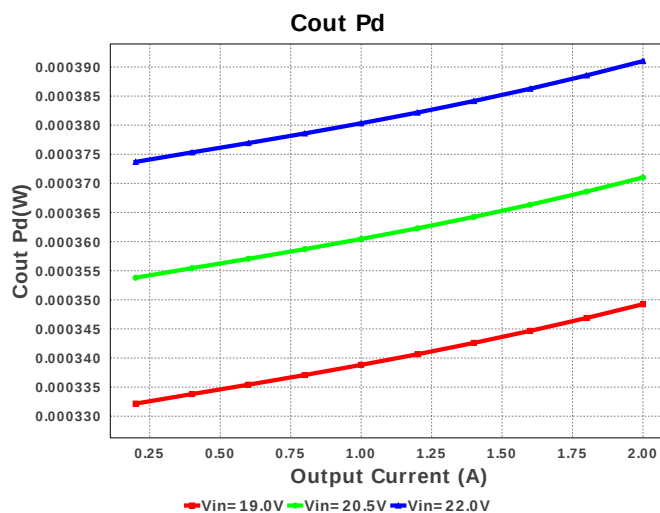
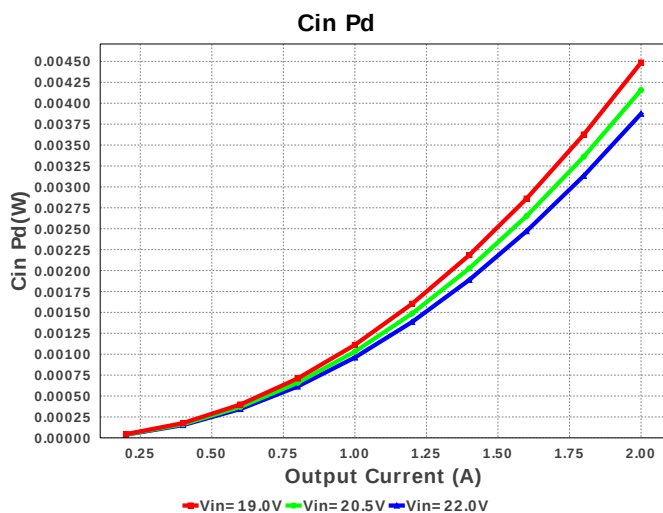
Duty Cycle

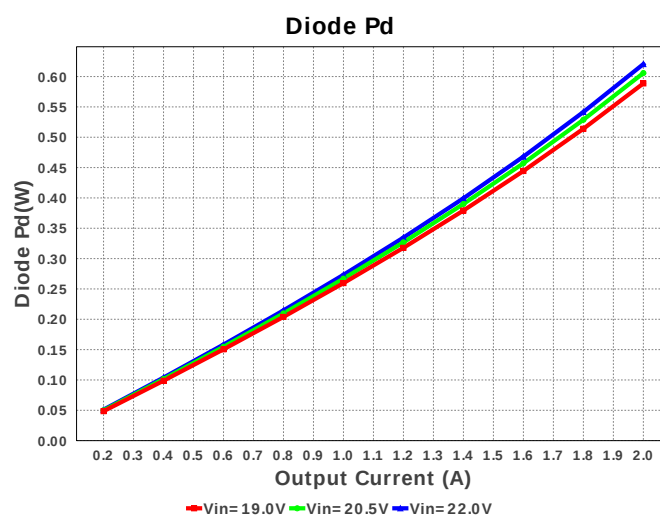
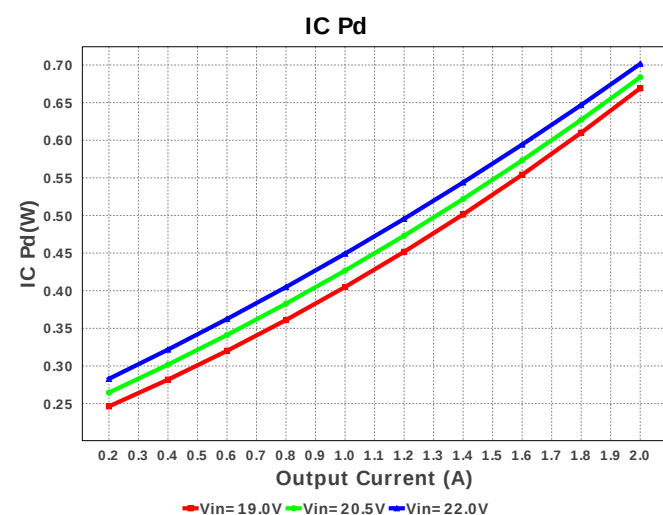
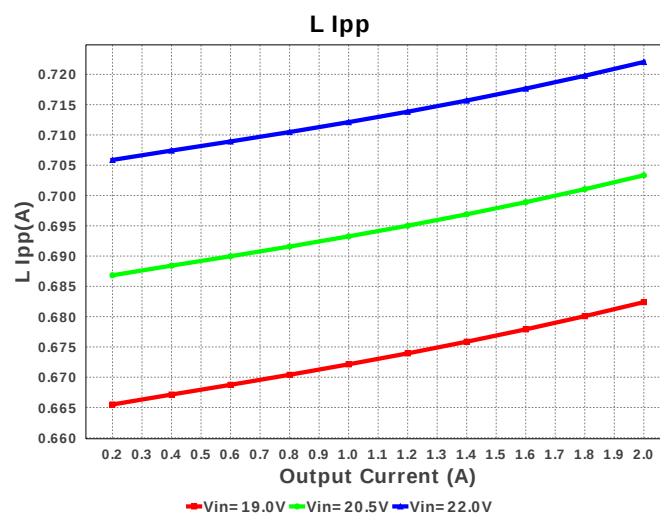
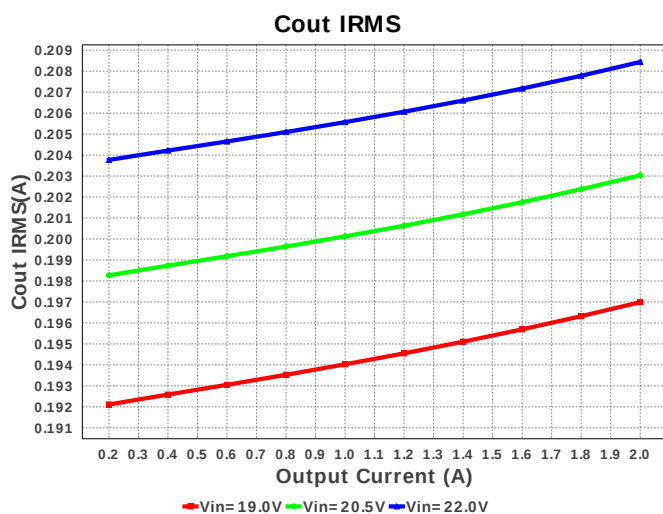
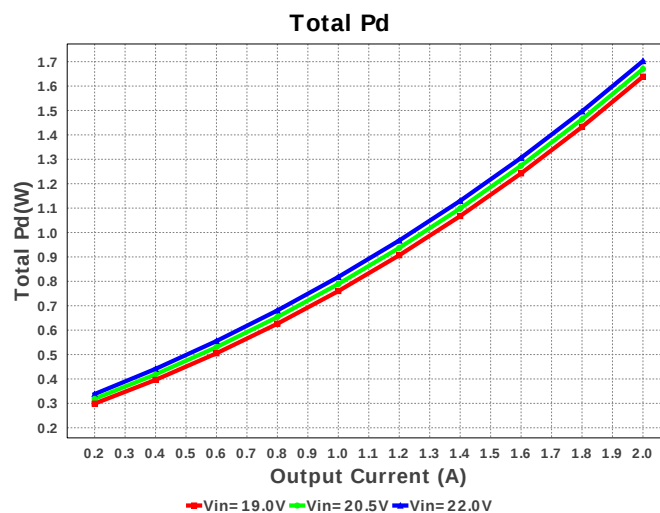
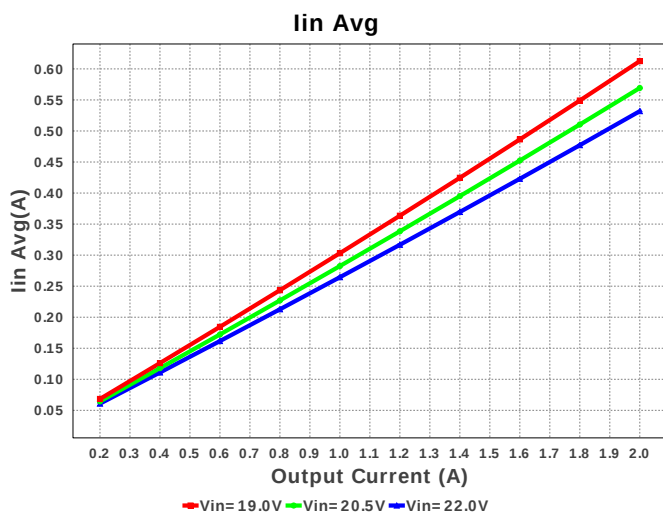


Cin IRMS









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	837.648 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	208.436 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.361 A	Current	Peak switch current in IC
4.	Iin Avg	531.92 mA	Current	Average input current
5.	L Ipp	722.05 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	989.296 mA	Current	Q lavg
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	205.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	1.029 MHz	General	Switching frequency
10.	IC Tolerance	50.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	296.789 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Mode	CCM	General	Conduction Mode
13.	Pout	10.0 W	General	Total output power
14.	Total BOM	\$1.56	General	Total BOM Cost
15.	D1 Tj	92.054 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	24.468 %	Op_point	Duty cycle
19.	Efficiency	85.453 %	Op_point	Steady state efficiency
20.	IC Tj	73.272 degC	Op_point	IC junction temperature
21.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	2.0 A	Op_point	Iout operating point
23.	VIN_OP	22.0 V	Op_point	Vin operating point
24.	Vout p-p	10.918 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	3.875 mW	Power	Input capacitor power dissipation
26.	Cout Pd	391.012 μW	Power	Output capacitor power dissipation
27.	D1 Pd	620.537 mW	Power	Output Diode Power Dissipation
28.	Diode Pd	620.537 mW	Power	Diode power dissipation
29.	IC Pd	901.503 mW	Power	IC power dissipation
30.	L Pd	176.0 mW	Power	Inductor power dissipation
31.	Rsns Pd	142.472 mW	Power	Current Limit Sense Resistor Power Dissipation
32.	Total Pd	1.845 W	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	2.0	Maximum Output Current
2.	VinMax	22.0	Maximum input voltage
3.	VinMin	19.0	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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