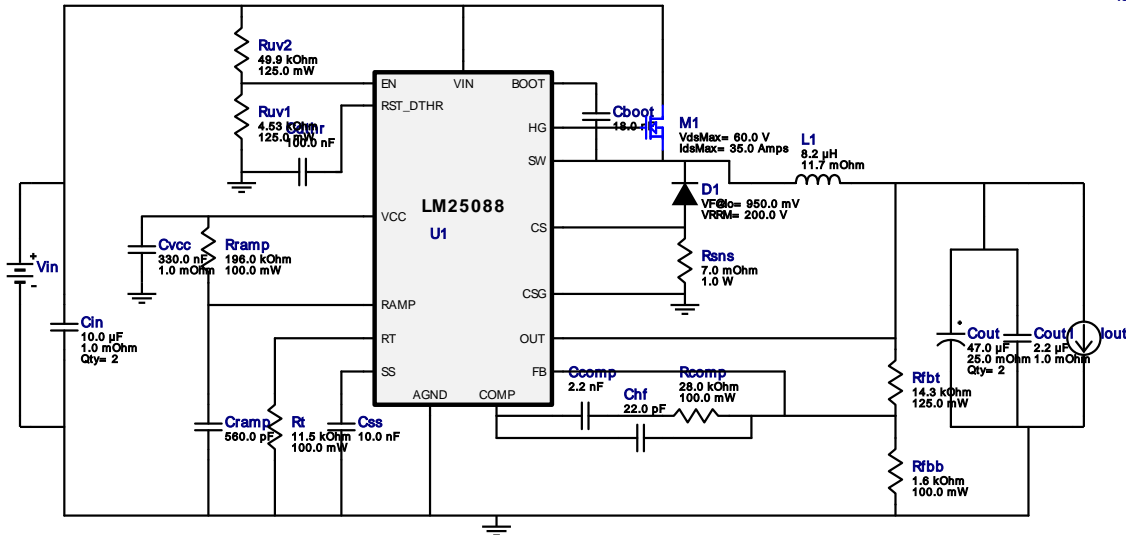


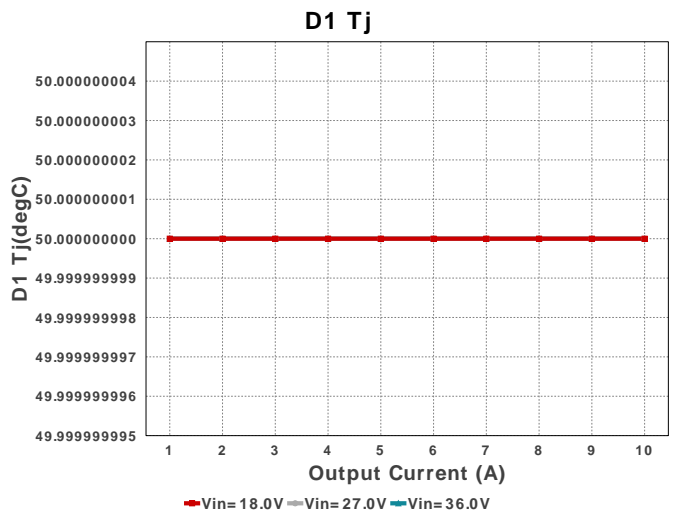
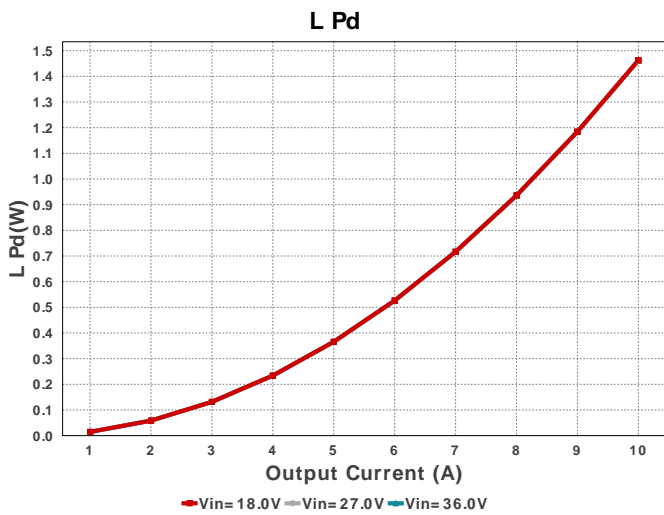
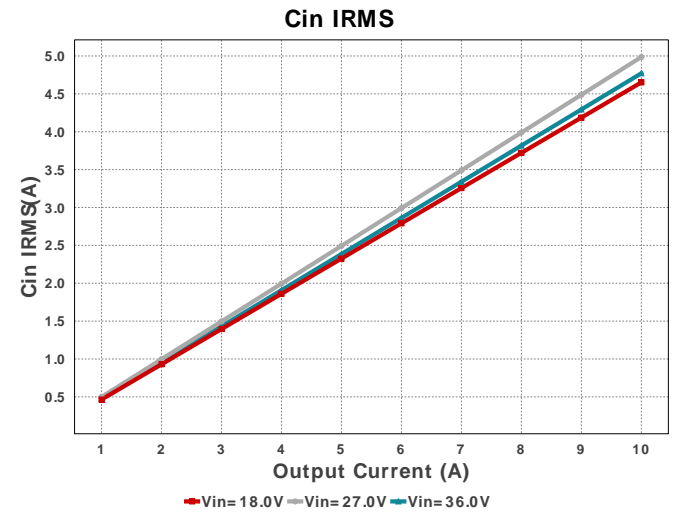
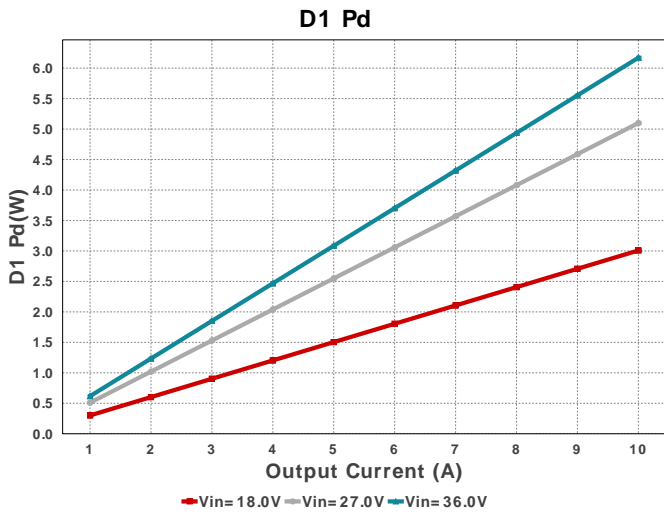
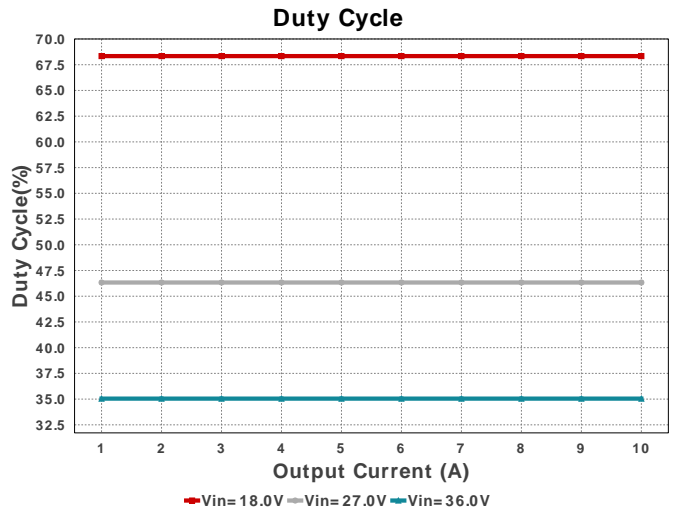
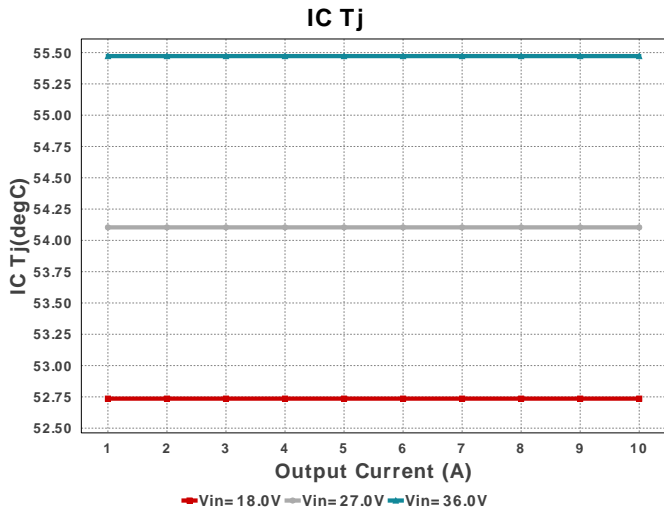
**WEBENCH® Design Report**

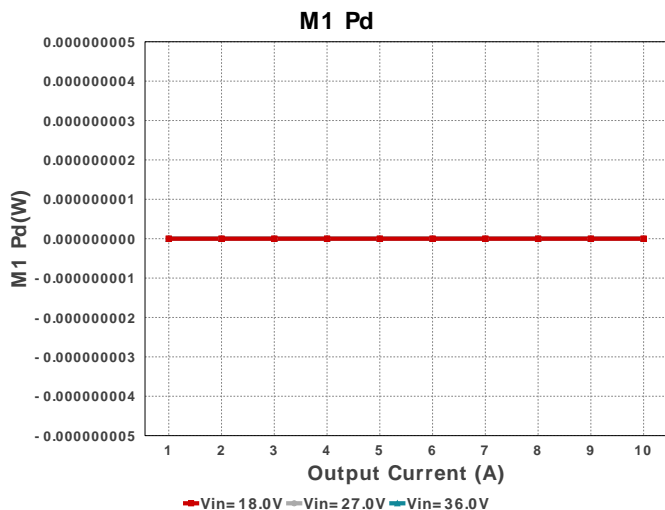
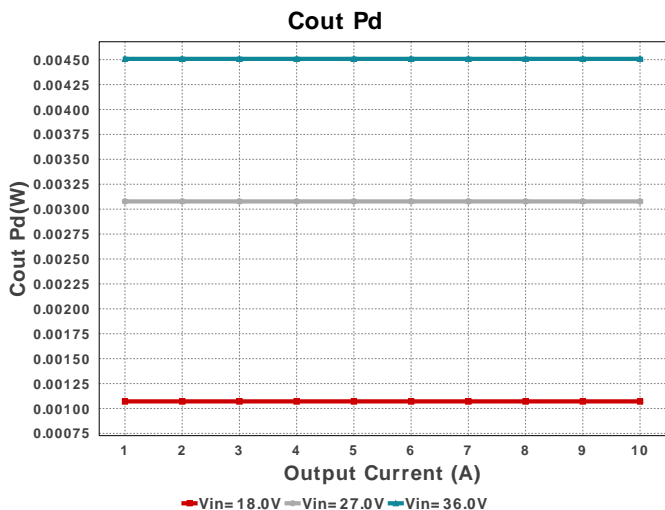
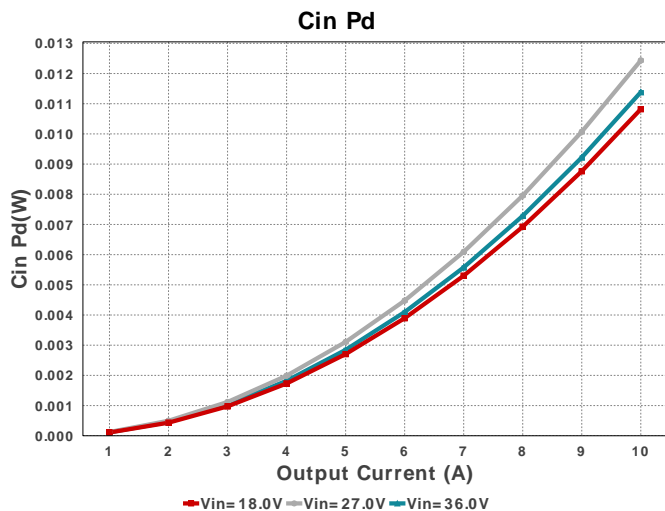
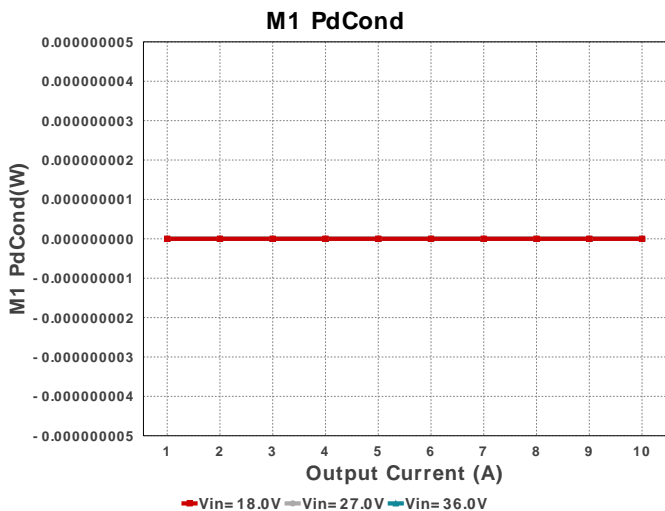
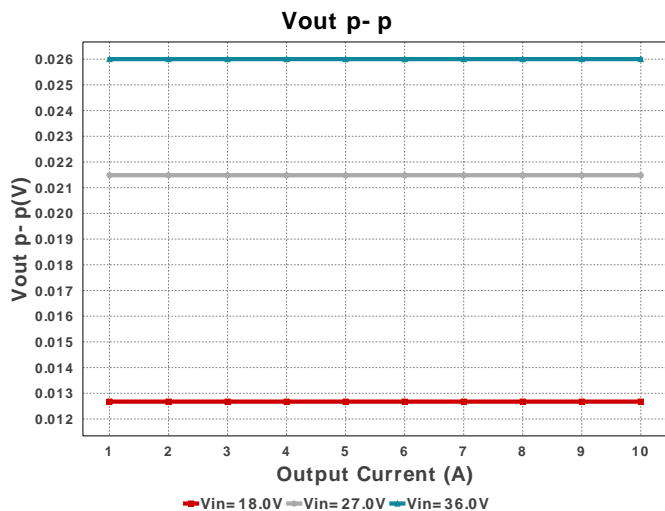
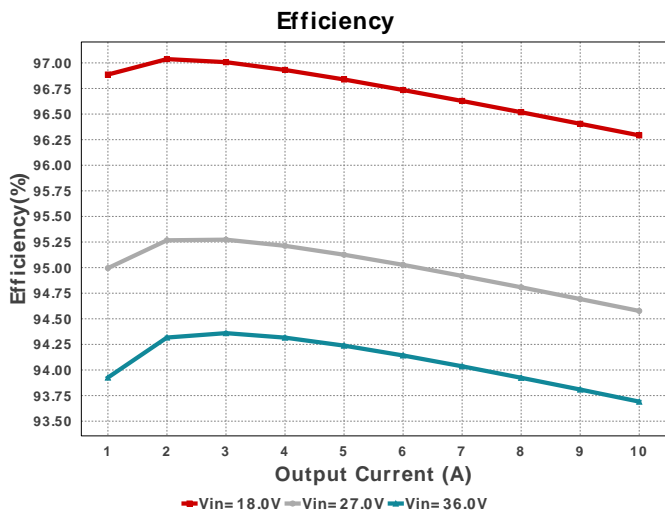
LM25088MH-1/NOPB 18V-36V to 12.00V @ 10A

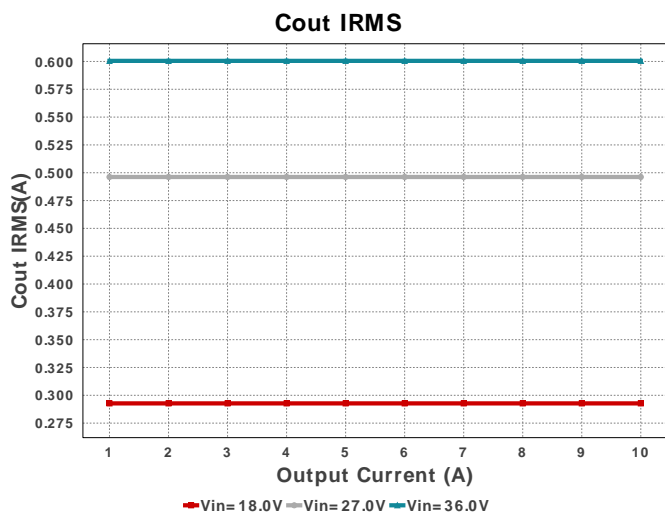
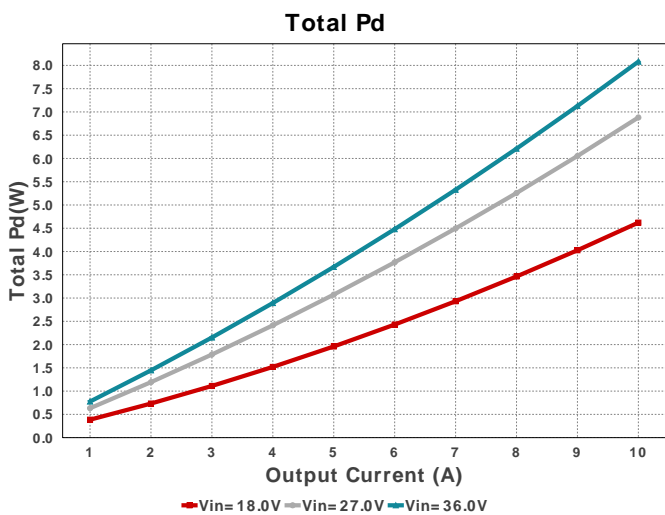
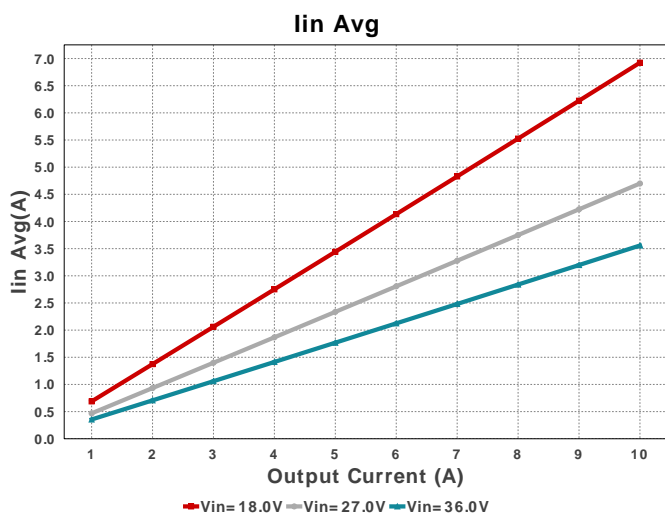
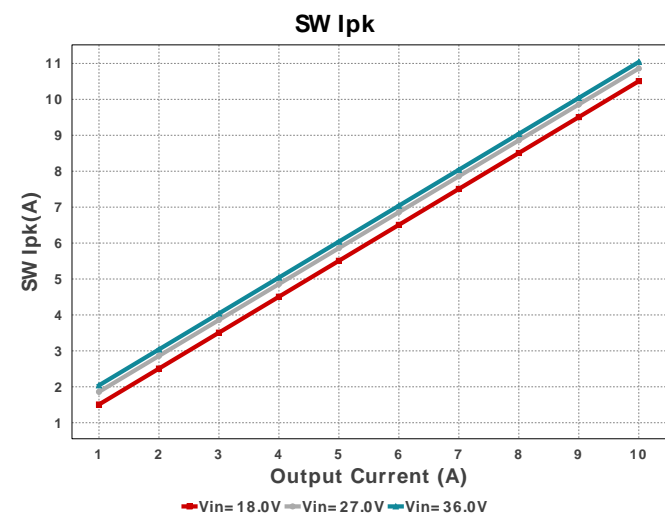
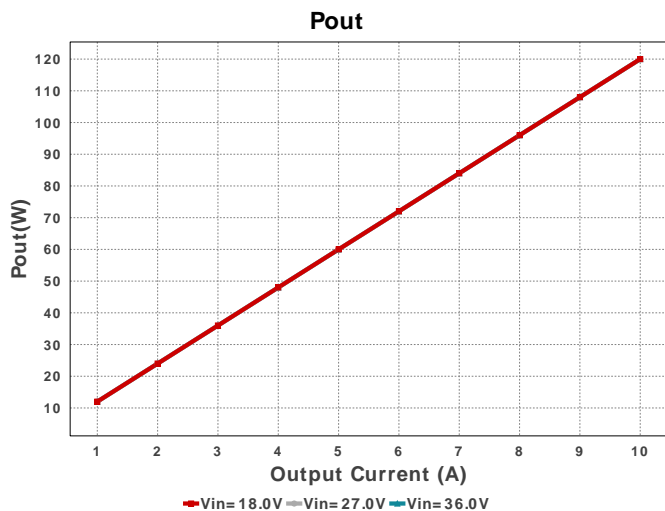
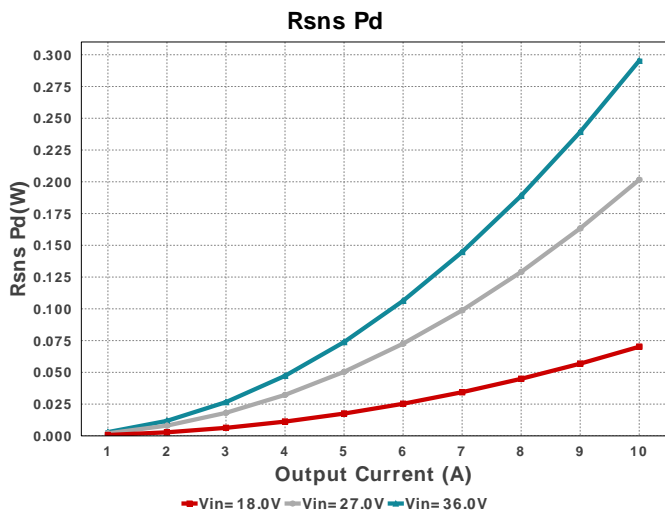
 Vout = 12.0V  
 Iout = 10.0A

**Electrical BOM**

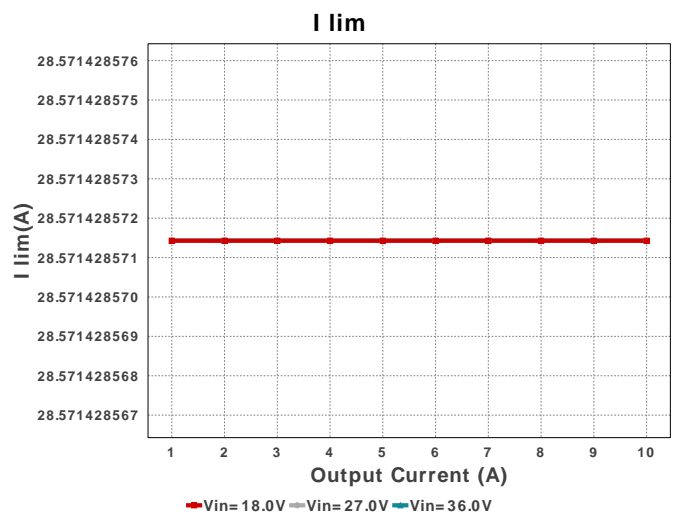
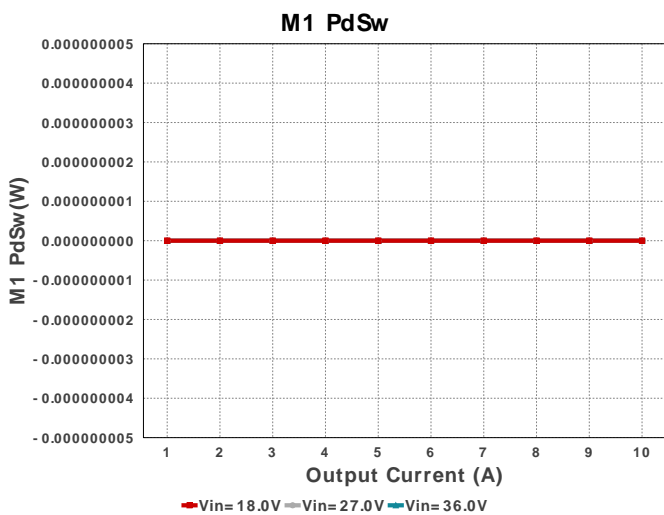
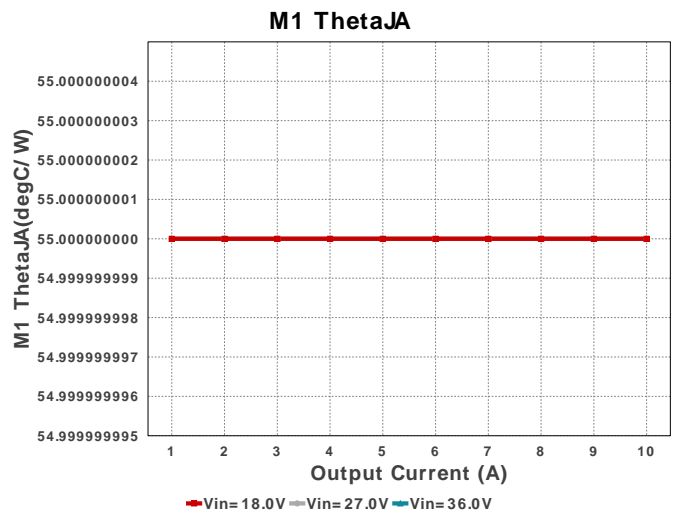
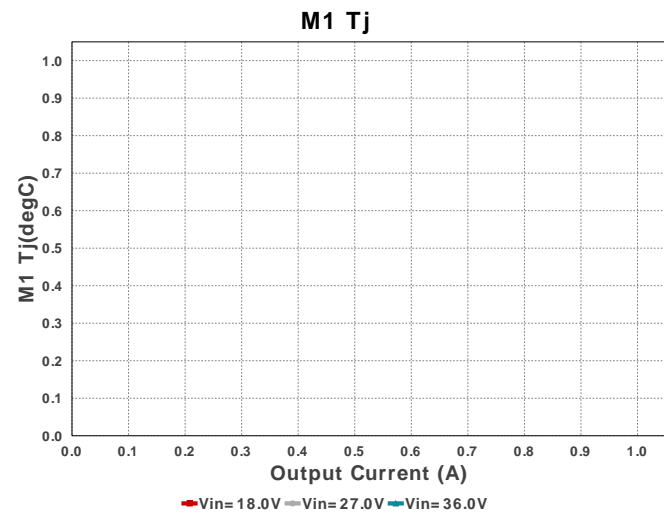
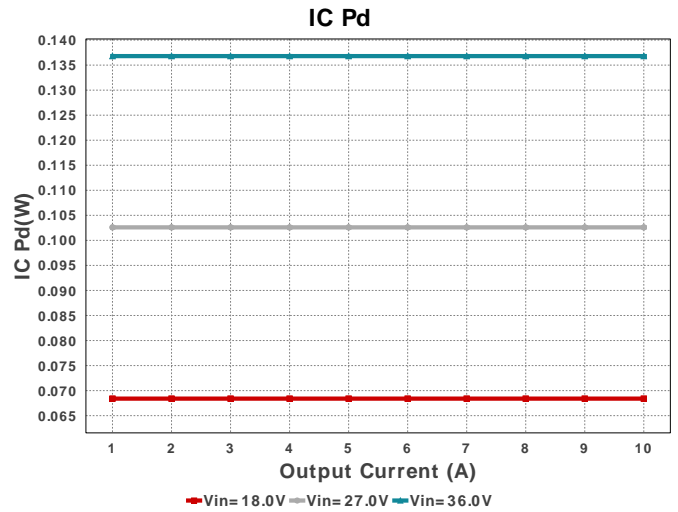
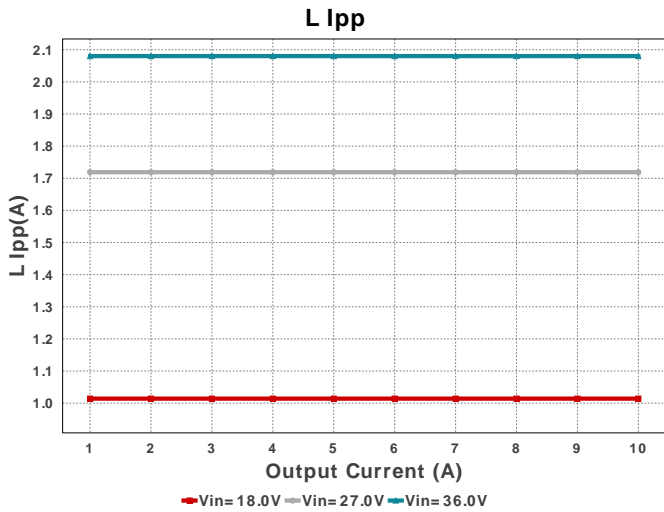
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C1812C183J5GACTU Series= C0G/NP0	Cap= 18.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.78	 1812 23 mm <sup>2</sup>
2.	Ccomp	MuRata	GRM1885C1H222JA01J Series= C0G/NP0	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.02	 0603 5 mm <sup>2</sup>
3.	Cdthr	AVX	08053C104JAZ2A Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.10	 0805 7 mm <sup>2</sup>
4.	Chf	Samsung Electro-Mechanics	CL10C220JB8NNWC Series= C0G/NP0	Cap= 22.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm <sup>2</sup>
5.	Cin	MuRata	GRM32ER71J106KA12L Series= X7R	Cap= 10.0 uF ESR= 1.0 mOhm VDC= 63.0 V IRMS= 6.0 A	2	\$0.39	 1210_280 15 mm <sup>2</sup>
6.	Cout	Panasonic	16SVPG47M Series= SVPG	Cap= 47.0 uF ESR= 25.0 mOhm VDC= 16.0 V IRMS= 3.2 A	2	\$0.43	 CAPSMT_62_B45 53 mm <sup>2</sup>
7.	Cout1	Taiyo Yuden	EMK212BJ225KG-T Series= X5R	Cap= 2.2 uF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.03	 0805 7 mm <sup>2</sup>
8.	Cramp	Samsung Electro-Mechanics	CL10C561JB8NFNC Series= C0G/NP0	Cap= 560.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm <sup>2</sup>
9.	Css	Samsung Electro-Mechanics	CL10C103JA8NNNC Series= C0G/NP0	Cap= 10.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.06	 0603 5 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Cvcc	Kemet	C0603C334K8RACTU Series= X7R	Cap= 330.0 nF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.03	 0603 5 mm <sup>2</sup>
11.	D1	SMC Diode Solutions	SBRD10200TR	VF@Io= 950.0 mV VRRM= 200.0 V	1	\$0.12	 DPAK 102 mm <sup>2</sup>
12.	L1	Coilcraft	XAL1010-822MEB	L= 8.2 µH DCR= 11.7 mOhm	1	\$1.71	 XAL1010 160 mm <sup>2</sup>
13.	M1	Texas Instruments	CSD18543Q3A	VdsMax= 60.0 V IdsMax= 35.0 Amps	1	\$0.27	 DNH0008A 18 mm <sup>2</sup>
14.	Rcomp	Yageo	RC0603FR-0728KL Series= ?	Res= 28.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm <sup>2</sup>
15.	Rfbb	Susumu Co Ltd	RR1220P-162-D Series= RR12	Res= 1.6 kOhm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	 0805 7 mm <sup>2</sup>
16.	Rfbt	Vishay-Dale	CRCW080514K3FKEA Series= CRCW..e3	Res= 14.3 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
17.	Rramp	Yageo	RC0603FR-07196KL Series= ?	Res= 196.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm <sup>2</sup>
18.	Rsns	Susumu Co Ltd	PRL1632-R007-F-T1 Series= PRL1632	Res= 7.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.20	 0612 11 mm <sup>2</sup>
19.	Rt	Yageo	RC0603FR-0711K5L Series= ?	Res= 11.5 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm <sup>2</sup>
20.	Ruv1	Vishay-Dale	CRCW08054K53FKEA Series= CRCW..e3	Res= 4.53 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
21.	Ruv2	Panasonic	ERJ-6ENF4992V Series= ERJ-6E	Res= 49.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
22.	U1	Texas Instruments	LM25088MH-1/NOPB	Switcher	1	\$1.50	 MXA16A 59 mm <sup>2</sup>









### Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	4.771 A	Capacitor	Input capacitor RMS ripple current
2.	Cin Pd	11.382 mW	Capacitor	Input capacitor power dissipation
3.	Cout IRMS	614.832 mA	Capacitor	Output capacitor RMS ripple current
4.	Cout Pd	4.725 mW	Capacitor	Output capacitor power dissipation
5.	I lim	28.571 A	Current	Current limit threshold
6.	D1 Pd	6.17 W	Diode	Diode1 power dissipation
7.	D1 Tj	50.0 degC	Diode	D1 junction temperature
8.	IC Pd	136.8 mW	IC	IC power dissipation
9.	IC Tj	55.472 degC	IC	IC junction temperature
10.	IC Tolerance	18.0 mV	IC	IC Feedback Tolerance
11.	ICThetaJA	40.0 degC/W	IC	IC junction-to-ambient thermal resistance

#	Name	Value	Category	Description
12.	Iin Avg	3.558 A	IC	Average input current
13.	L Ipp	2.13 A	Inductor	Peak-to-peak inductor ripple current
14.	L Pd	1.462 W	Inductor	Inductor power dissipation
15.	M1 Pd	0.0 W	Mosfet	M1 MOSFET total power dissipation
16.	M1 PdCond	0.0 W	Mosfet	M1 MOSFET conduction losses
17.	M1 PdSw	0.0 W	Mosfet	M1 MOSFET switching losses
18.	M1 ThetaJA	55.0 degC/W	Mosfet	MOSFET junction-to-ambient thermal resistance
19.	M1 Tj	0.0 degC	Mosfet	M1 MOSFET junction temperature
20.	Cin Pd	11.382 mW	Power	Input capacitor power dissipation
21.	Cout Pd	4.725 mW	Power	Output capacitor power dissipation
22.	D1 Pd	6.17 W	Power	Diode1 power dissipation
23.	IC Pd	136.8 mW	Power	IC power dissipation
24.	L Pd	1.462 W	Power	Inductor power dissipation
25.	M1 Pd	0.0 W	Power	M1 MOSFET total power dissipation
26.	M1 PdCond	0.0 W	Power	M1 MOSFET conduction losses
27.	M1 PdSw	0.0 W	Power	M1 MOSFET switching losses
28.	Rsns Pd	295.32 mW	Power	Current Limit Sense Resistor Power Dissipation
29.	Total Pd	8.081 W	Power	Total Power Dissipation
30.	Rsns Pd	295.32 mW	Resistor	Current Limit Sense Resistor Power Dissipation
31.	BOM Count	24	System	Total Design BOM count
32.	Duty Cycle	35.047 %	System Information	Duty cycle
33.	Efficiency	93.691 %	System Information	Steady state efficiency
34.	FootPrint	587.0 mm <sup>2</sup>	System Information	Total Foot Print Area of BOM components
35.	Frequency	493.097 kHz	System Information	Switching frequency
36.	Iout	10.0 A	System Information	Iout operating point
37.	Mode	CCM	System Information	Conduction Mode
38.	Pout	120.0 W	System Information	Total output power
39.	SW Ipk	11.065 A	System Information	Peak switch current
40.	Total BOM	\$6.55	System Information	Total BOM Cost
41.	Vin	36.0 V	System Information	Vin operating point
42.	Vout Actual	11.975 V	System Information	Vout Actual calculated based on selected voltage divider resistors
43.	Vout Tolerance	2.87 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
44.	Vout p-p	26.623 mV	System Information	Peak-to-peak output ripple voltage

## Design Inputs

#	Name	Value	Description
1.	Iout	10.0	Maximum Output Current
2.	VinMax	36.0	Maximum input voltage
3.	VinMin	18.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	acFrequency	60.0	AC Frequency
6.	base_pn	LM25088	Base Product Number
7.	source	DC	Input Source Type
8.	Ta	50.0	Ambient temperature

## Design Assistance

1. **LM25088** Product Folder : <http://www.ti.com/product/LM25088> : contains the data sheet and other resources.

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