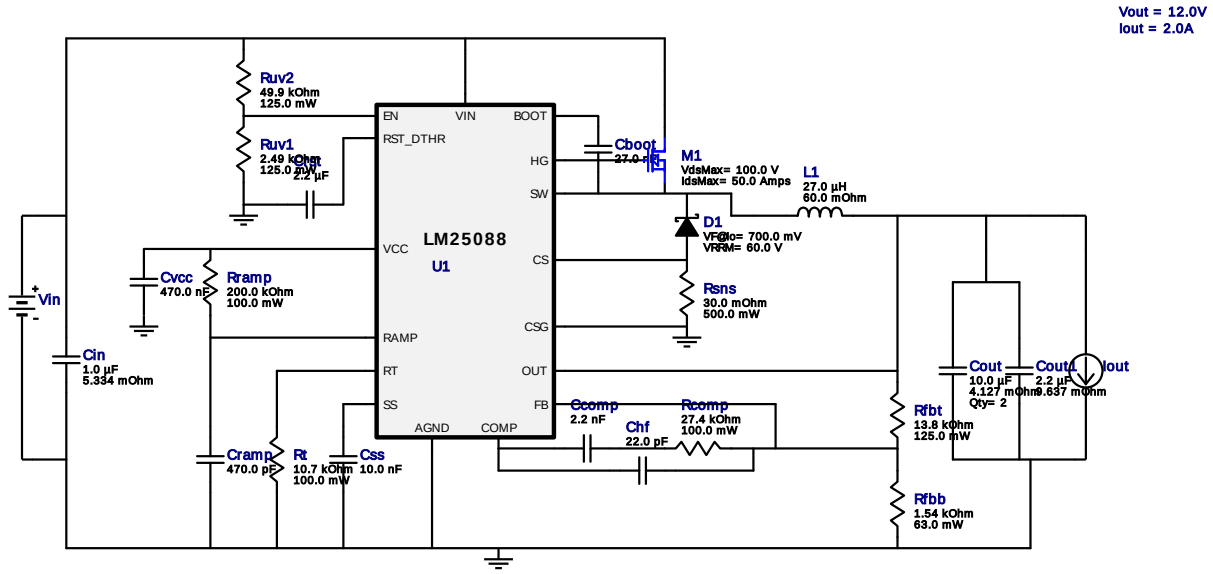
VinMin = 32.0V
VinMax = 38.0V
Vout = 12.0V
Iout = 2.0A

Device = LM25088MH-2/NOPB
Topology = Buck
Created = 9/23/16 7:56:52 PM
BOM Cost = $2.82
BOM Count = 23
Total Pd = 1.41W

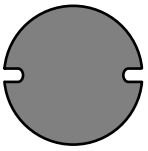
WEBENCH® Design Report

Design : 4802645/2 LM25088MH-2/NOPB
LM25088MH-2/NOPB 32.0V-38.0V to 12.00V @ 2.0A

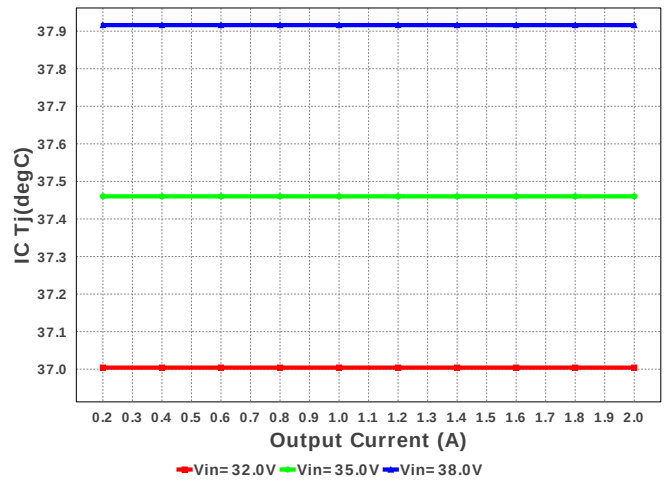


Electrical BOM

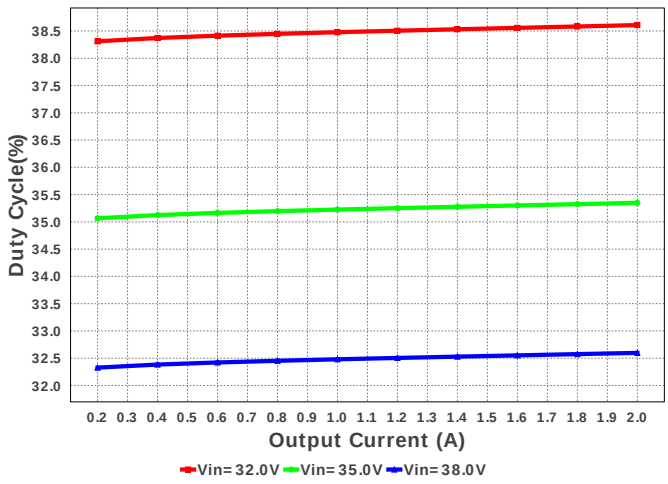
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM188R71C273KA01D Series= X7R	Cap= 27.0 nF VDC= 16.0 V IRMS= 0.0 A	1	$0.02	0603 5 mm²
2.	Ccomp	MuRata	GRM1885C1H222JA01J Series= C0G/NP0	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
3.	Chf	Kemet	C0603C220K3GACTU Series= C0G/NP0	Cap= 22.0 pF VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
4.	Cin	MuRata	GRM31CR72A105KA01L Series= X7R	Cap= 1.0 uF ESR= 5.334 mOhm VDC= 100.0 V IRMS= 1.55432 A	1	$0.11	1206_190 11 mm²
5.	Cout	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 uF ESR= 4.127 mOhm VDC= 16.0 V IRMS= 2.46634 A	2	$0.03	0805 7 mm²
6.	Cout1	MuRata	GRM188R61C225KE15D Series= X5R	Cap= 2.2 uF ESR= 9.637 mOhm VDC= 16.0 V IRMS= 1.20373 A	1	$0.02	0603 5 mm²
7.	Cramp	AVX	06035A470KAT2A Series= C0G/NP0	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
8.	Crst	Kemet	C0603C225K9PACTU Series= X5R	Cap= 2.2 uF VDC= 6.3 V IRMS= 0.0 A	1	$0.02	0603 5 mm²
9.	Css	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Cvcc	Kemet	C0603C474K4RACTU Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	$0.02	 0603 5 mm²
11.	D1	Diodes Inc.	B260A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	$0.09	 SMA 37 mm²
12.	L1	Bourns	SDR1307-270ML	L= 27.0 µH DCR= 60.0 mOhm	1	$0.35	 SDR1307 227 mm²
13.	M1	Texas Instruments	CSD19534Q5A	VdsMax= 100.0 V IdsMax= 50.0 Amps	1	$0.38	 TRANS_NexFET_Q5A 55 mm²
14.	Rcomp	Vishay-Dale	CRCW060327K4FKEA Series= CRCW..e3	Res= 27.4 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	 0603 5 mm²
15.	Rfbb	Vishay-Dale	CRCW04021K54FKED Series= CRCW..e3	Res= 1.54 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
16.	Rfbt	Yageo America	RT0805BRD0713K8L Series= RT0805	Res= 13.8 kOhm Power= 125.0 mW Tolerance= 0.1%	1	$0.05	 0805 7 mm²
17.	Rramp	Vishay-Dale	CRCW0603200KFKEA Series= CRCW..e3	Res= 200.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	 0603 5 mm²
18.	Rsns	Stackpole Electronics Inc	CSR1206FK30L0 Series= ?	Res= 30.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	$0.10	 1206 11 mm²
19.	Rt	Vishay-Dale	CRCW060310K7FKEA Series= CRCW..e3	Res= 10.7 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	 0603 5 mm²
20.	Ruv1	Panasonic	ERJ-6ENF2491V Series= ERJ-6E	Res= 2.49 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 7 mm²
21.	Ruv2	Panasonic	ERJ-6ENF4992V Series= ERJ-6E	Res= 49.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 7 mm²
22.	U1	Texas Instruments	LM25088MH-2/NOPB	Switcher	1	$1.50	 MXA16A 59 mm²

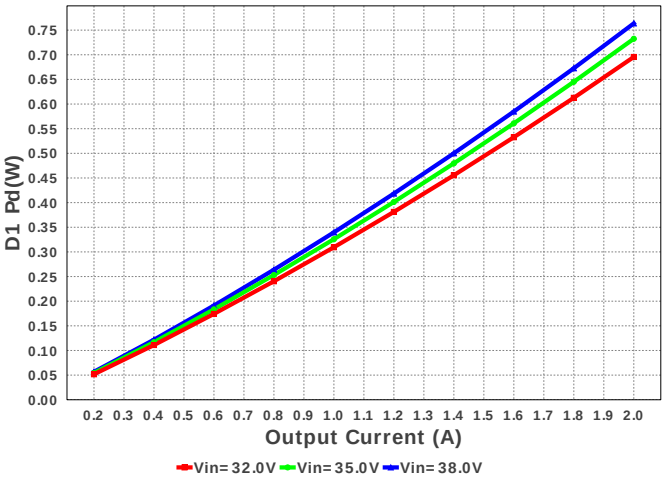
IC Tj



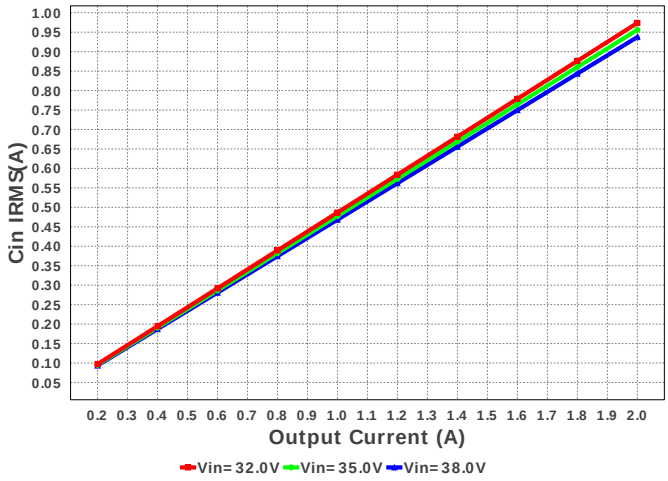
Duty Cycle



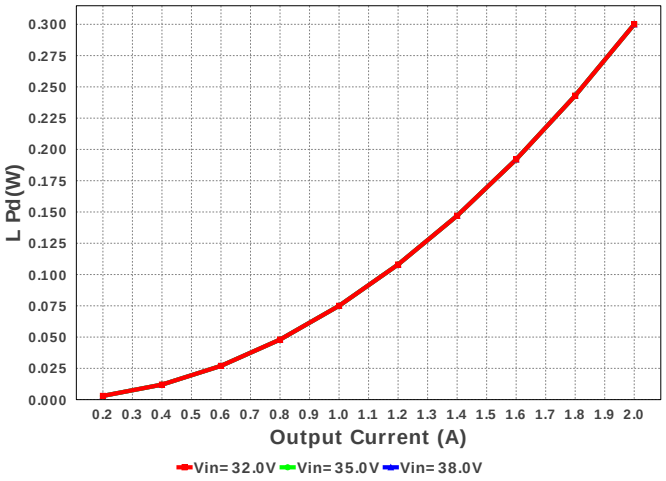
D1 Pd



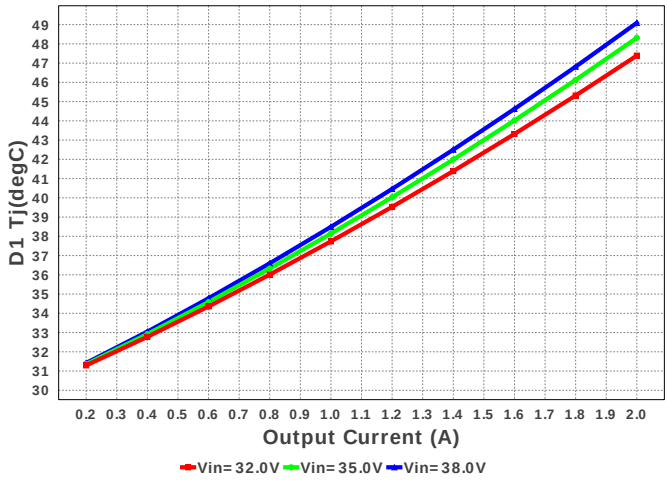
Cin IRMS



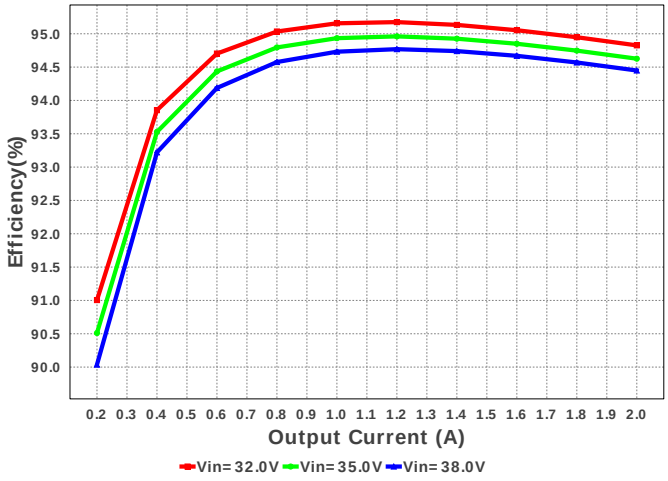
L Pd



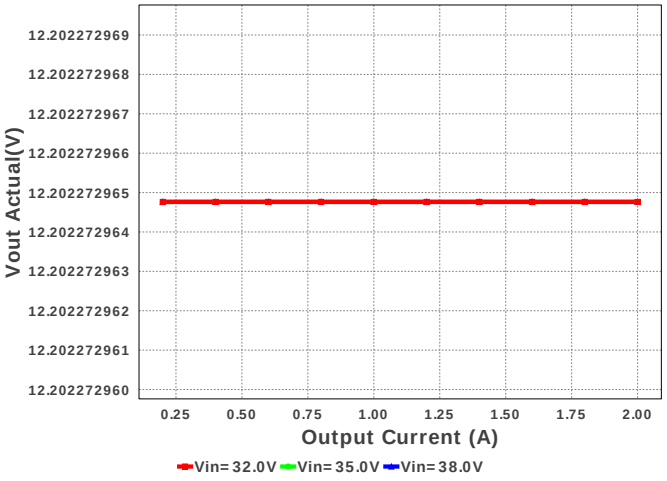
D1 Tj



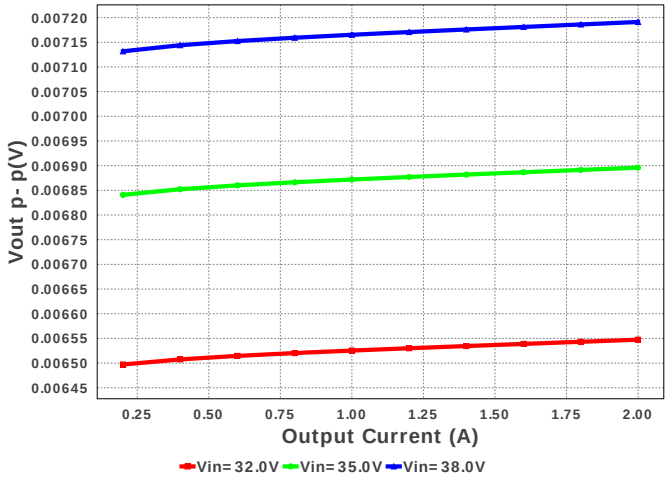
Efficiency



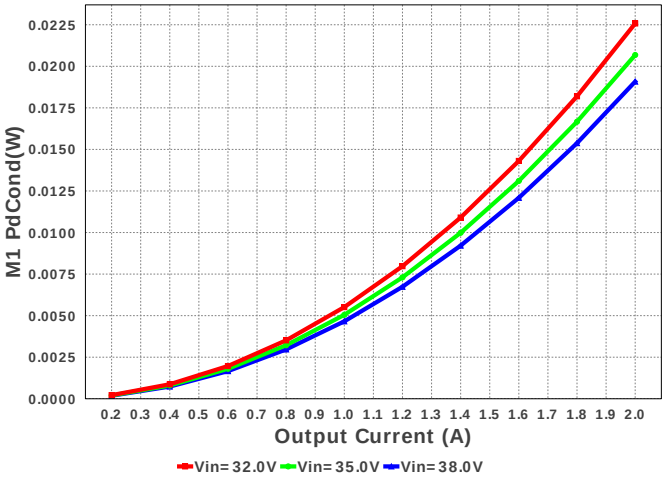
Vout Actual



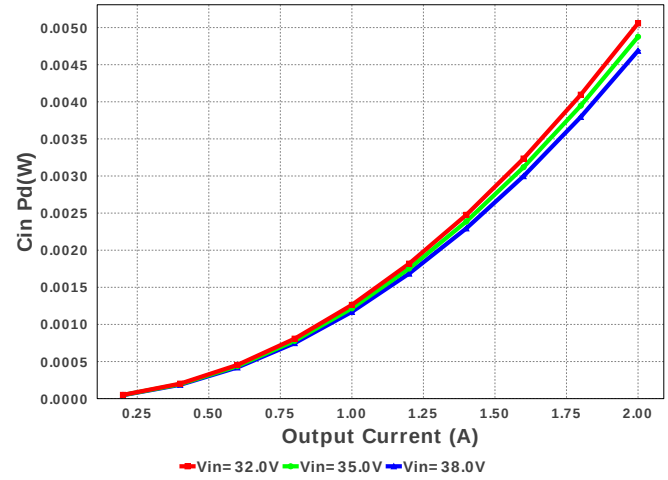
Vout p- p



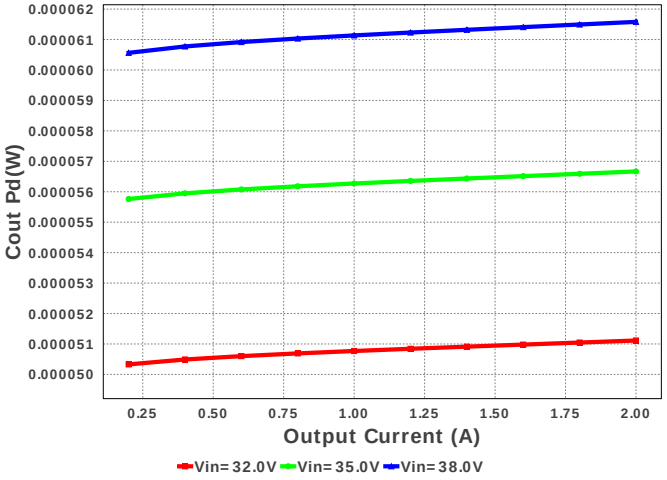
M1 PdCond

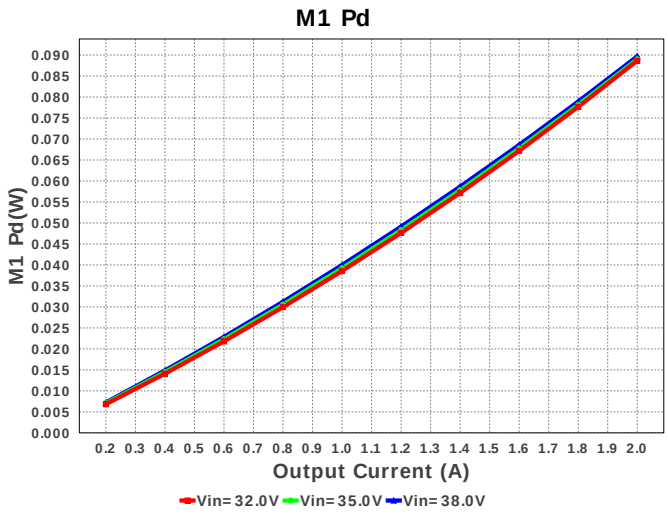


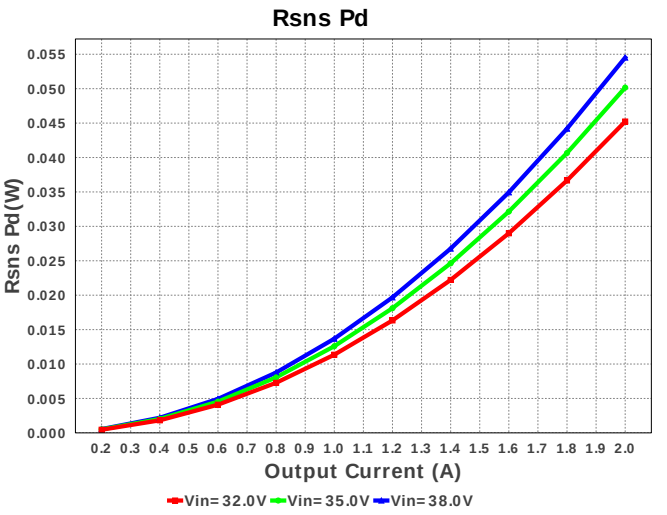
Cin Pd

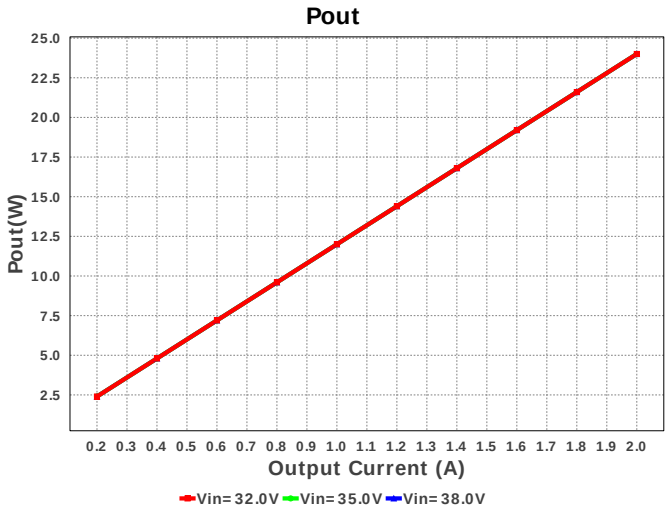


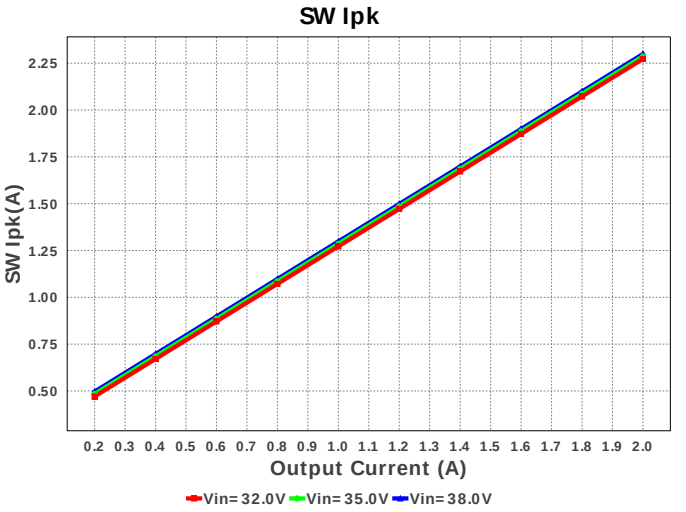
Cout Pd

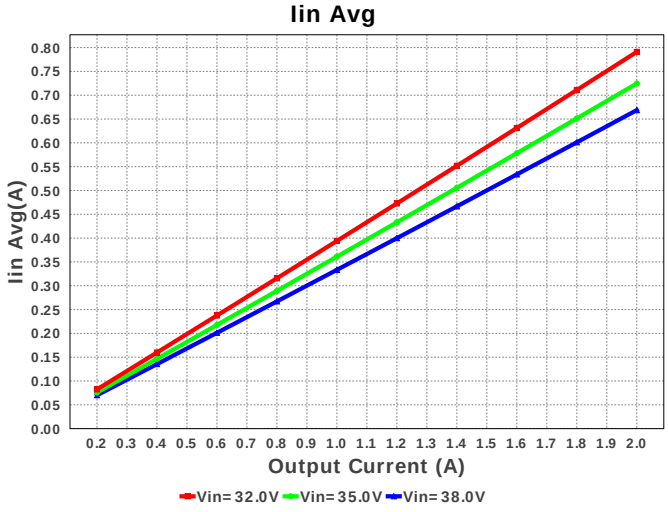


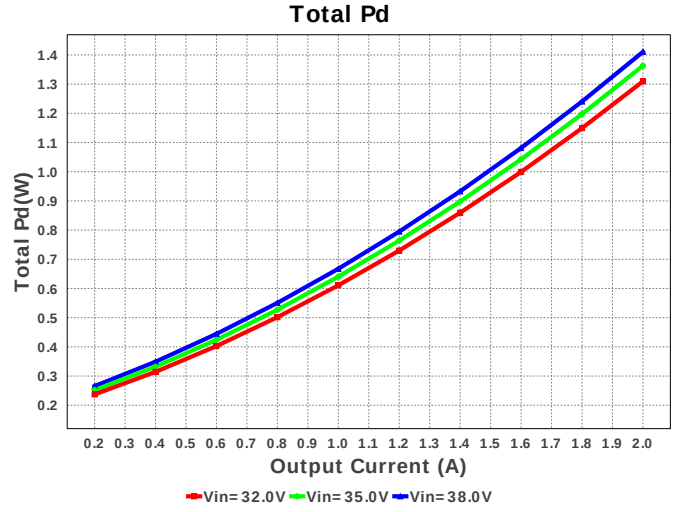


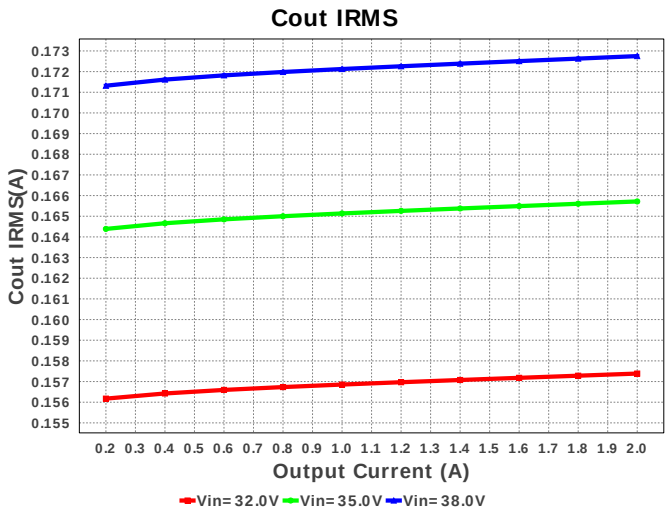


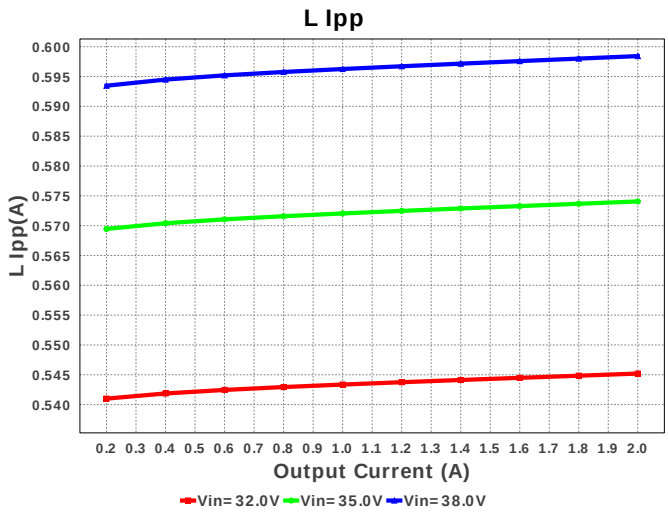


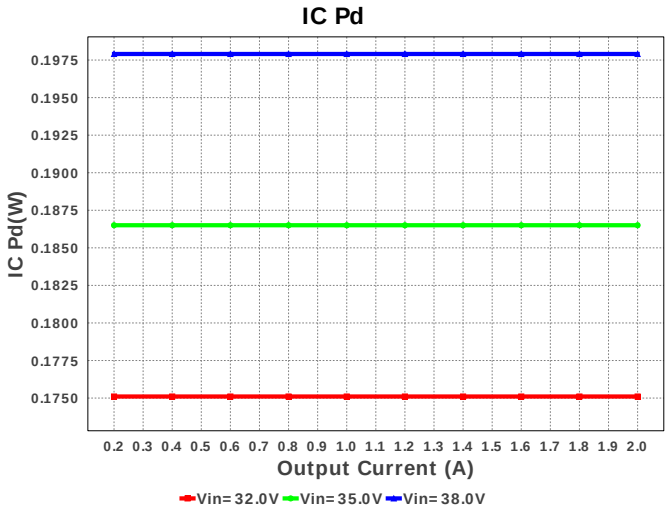


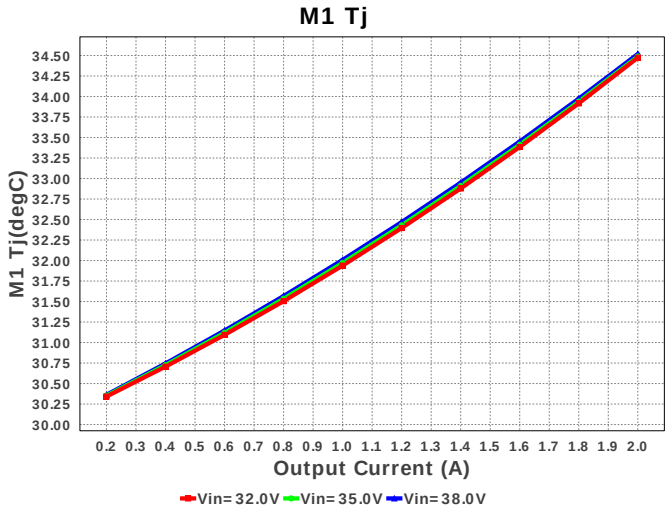


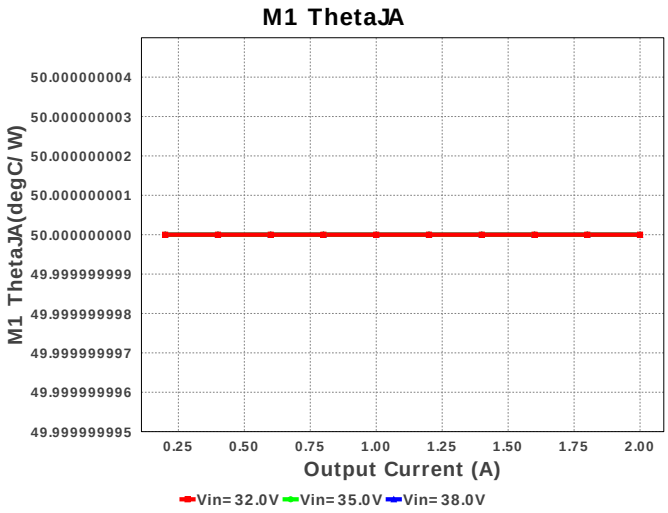


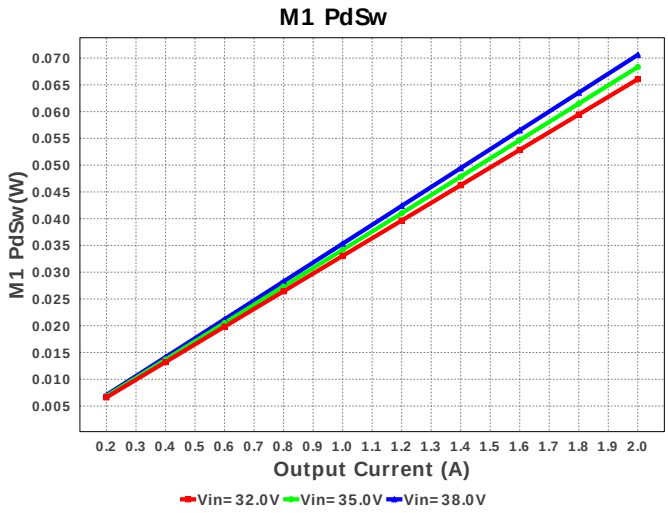


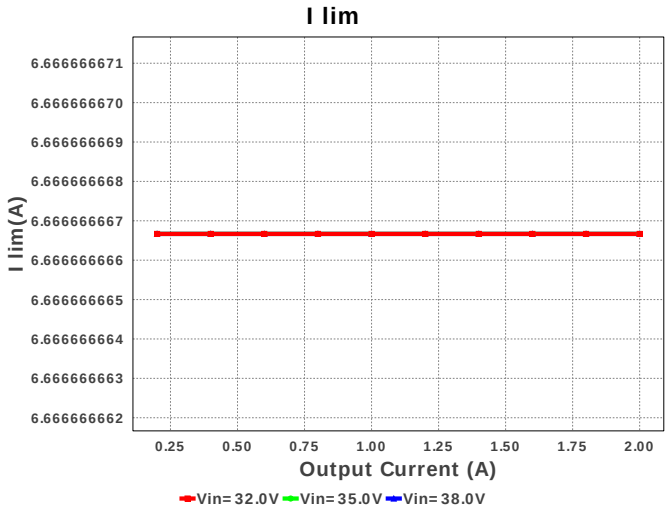












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	937.476 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	172.602 mA	Current	Output capacitor RMS ripple current
3.	I lim	6.667 A	Current	Current limit threshold
4.	Iin Avg	668.7 mA	Current	Average input current
5.	L Ipp	597.91 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.299 A	Current	Peak switch current
7.	BOM Count	23	General	Total Design BOM count
8.	FootPrint	488.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	524.549 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M1 ThetaJA	50.0 degC/W	General	MOSFET junction-to-ambient thermal resistance
12.	Mode	CCM	General	Conduction Mode
13.	Pout	24.0 W	General	Total output power
14.	Total BOM	$2.82	General	Total BOM Cost
15.	D1 Tj	49.091 degC	Op_Point	D1 junction temperature
16.	Vout Actual	12.003 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Duty Cycle	32.598 %	Op_point	Duty cycle
18.	Efficiency	94.449 %	Op_point	Steady state efficiency
19.	IC Tj	37.916 degC	Op_point	IC junction temperature
20.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	2.0 A	Op_point	Iout operating point
22.	M1 Tj	34.519 degC	Op_point	M1 MOSFET junction temperature
23.	VIN_OP	38.0 V	Op_point	Vin operating point
24.	Vout p-p	7.185 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	4.688 mW	Power	Input capacitor power dissipation
26.	Cout Pd	61.474 µW	Power	Output capacitor power dissipation
27.	D1 Pd	763.646 mW	Power	Diode1 power dissipation
28.	IC Pd	197.904 mW	Power	IC power dissipation
29.	L Pd	300.0 mW	Power	Inductor power dissipation
30.	M1 Pd	89.682 mW	Power	M1 MOSFET total power dissipation
31.	M1 PdCond	19.08 mW	Power	M1 MOSFET conduction losses
32.	M1 PdSw	70.601 mW	Power	M1 MOSFET switching losses
33.	Rsns Pd	54.517 mW	Power	Current Limit Sense Resistor Power Dissipation
34.	Total Pd	1.411 W	Power	Total Power Dissipation
35.	Vout Tolerance	2.508 %		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	38.0	Maximum input voltage
3.	VinMin	32.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	LM25088	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

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