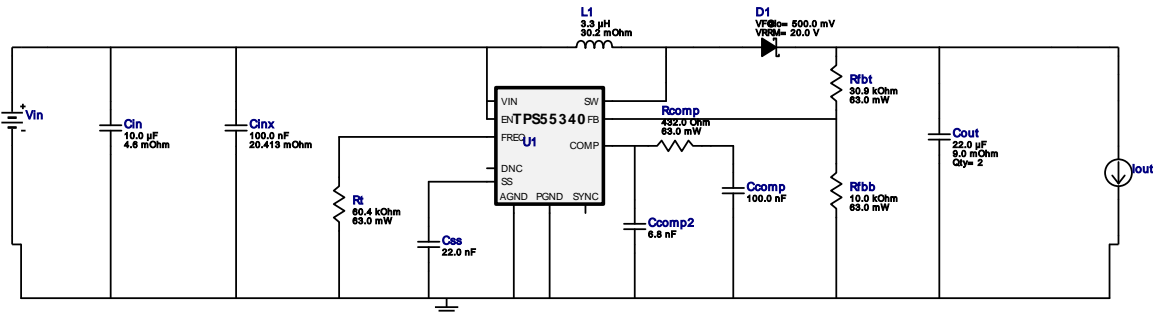


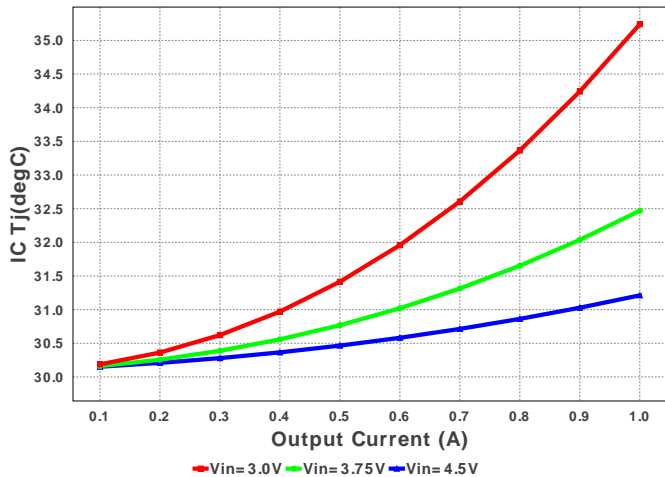
WEBENCH[®] Design Report

 Design : 4214217/9 TPS55340RTER
 TPS55340RTER 3.0V-4.5V to 5.00V @ 1.0A

Electrical BOM

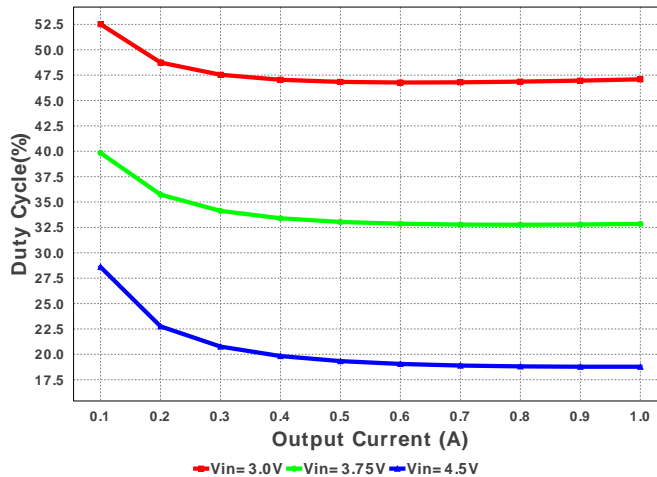
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
2.	Ccomp2	Yageo America	CC0805KRX7R9BB682 Series= X7R	Cap= 6.8 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Cin	TDK	C3216X5R1C106KT Series= X5R	Cap= 10.0 uF ESR= 4.6 mOhm VDC= 16.0 V IRMS= 2.7 A	1	\$0.08	 1206 11 mm ²
4.	Cinx	TDK	C1005X5R1A104K Series= X5R	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
5.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	2	\$0.05	 0805 7 mm ²
6.	Coutx	Kemet	C0603C105Z9VACTU Series= Y5V	Cap= 1.0 uF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm ²
7.	Css	MuRata	GRM033R60J223KE01D Series= X5R	Cap= 22.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
8.	D1	Diodes Inc.	B220-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	\$0.08	 SMB 44 mm ²
9.	L1	Bourns	SRN6045-3R3Y	L= 3.3 uH DCR= 30.2 mOhm	1	\$0.16	 SRN6045 64 mm ²
10.	Rcomp	Vishay-Dale	CRCW0402432RFKED Series= CRCW..e3	Res= 432.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rfbt	Vishay-Dale	CRCW040230K9FKED Series= CRCW..e3	Res= 30.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
13.	Rt	Vishay-Dale	CRCW040260K4FKED Series= CRCW..e3	Res= 60.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	U1	Texas Instruments	TPS55340RTER	Switcher	1	\$1.85	S-PWQFN-N16 17 mm ²

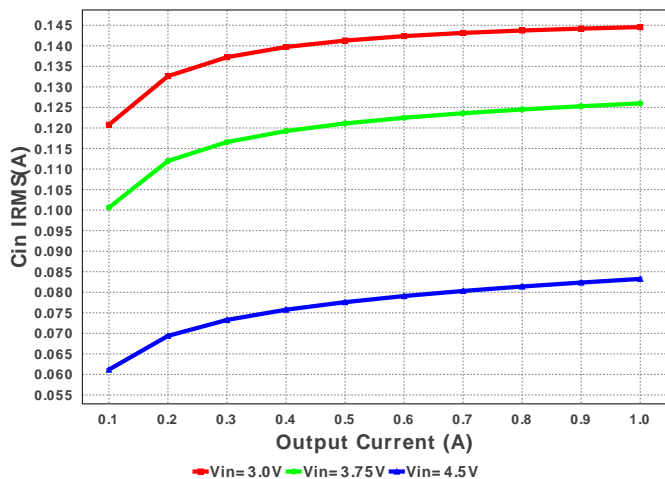
IC Tj



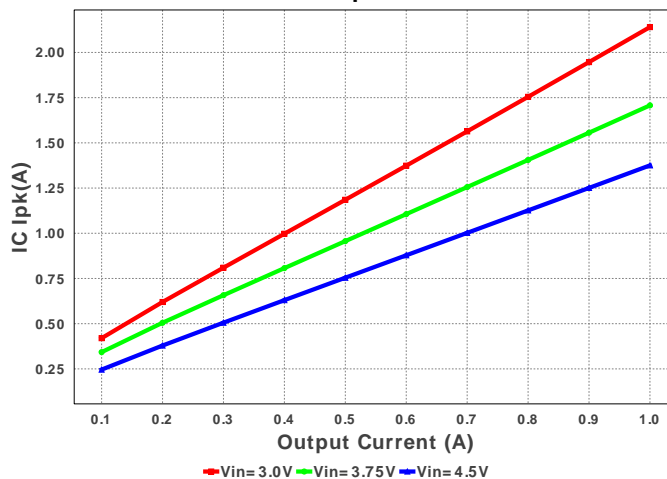
Duty Cycle



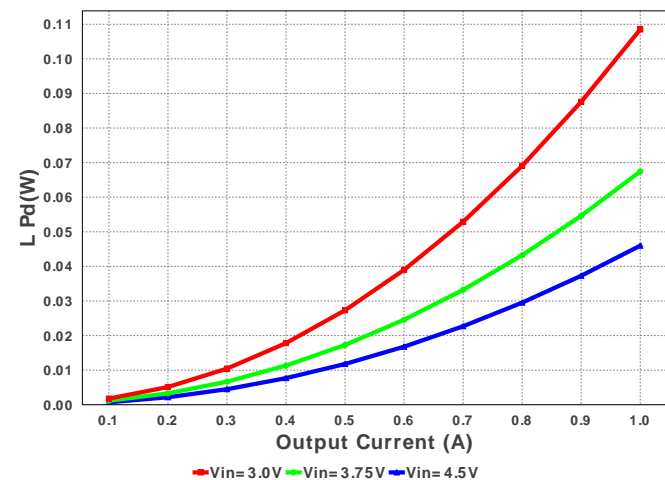
Cin IRMS



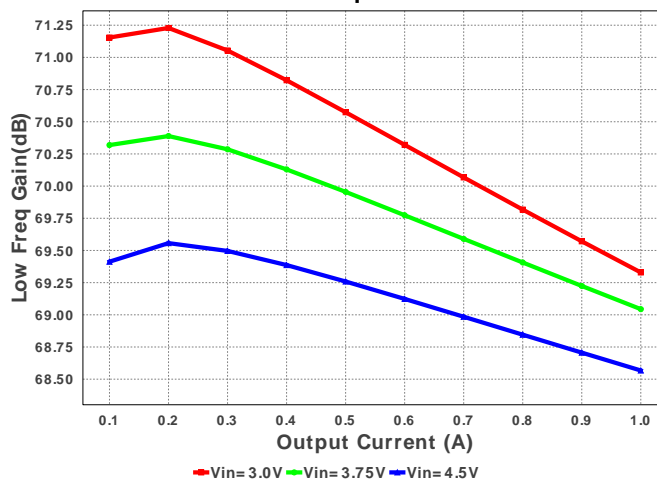
IC Ipk

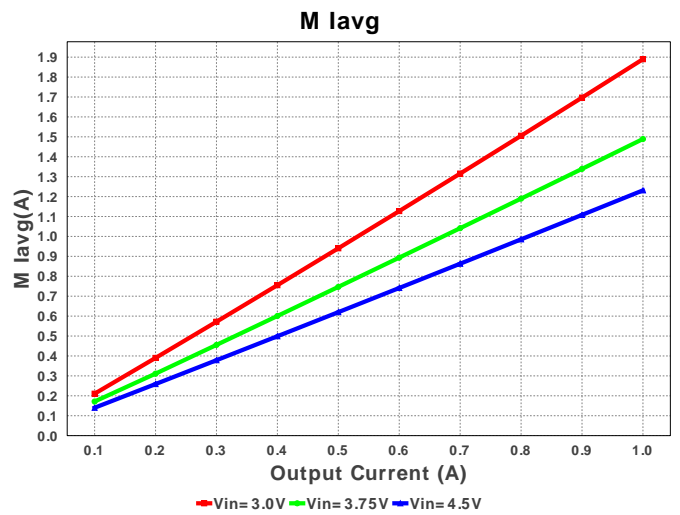
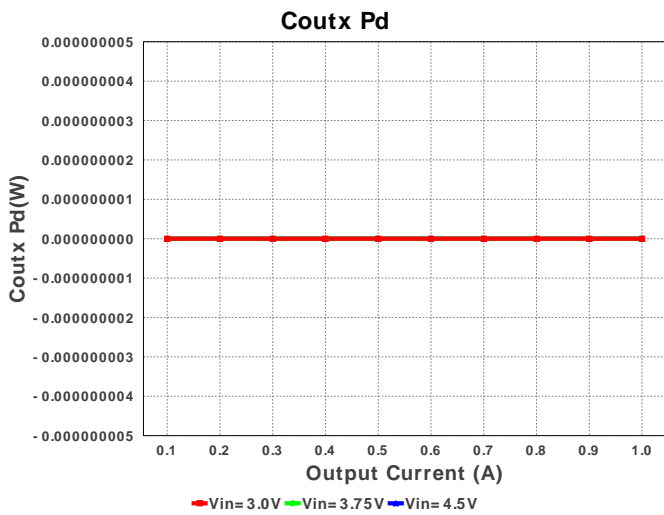
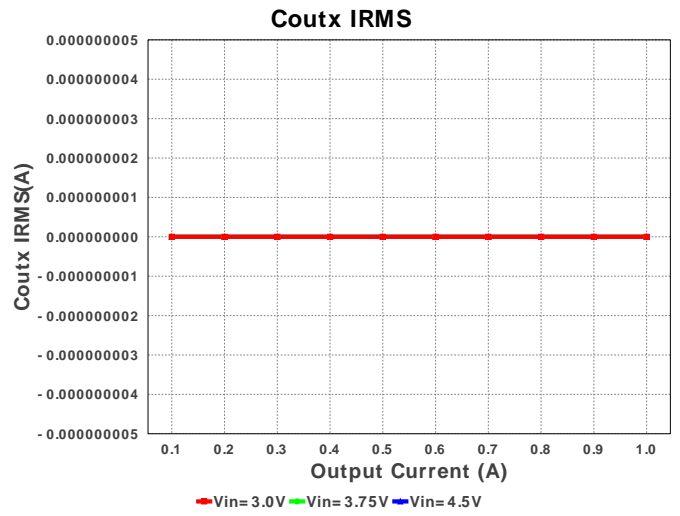
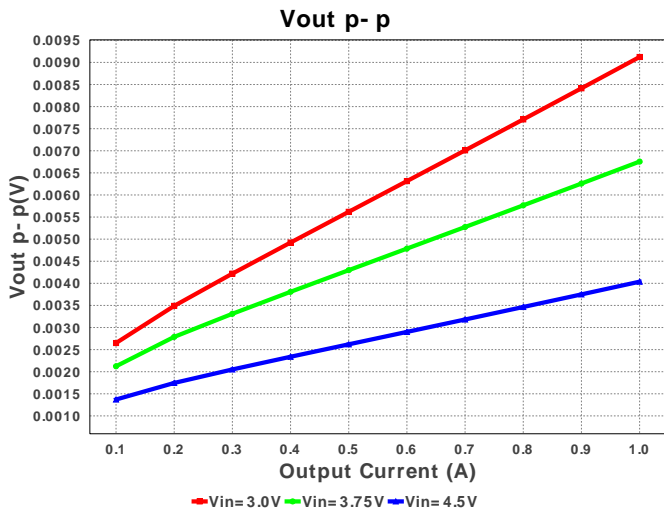
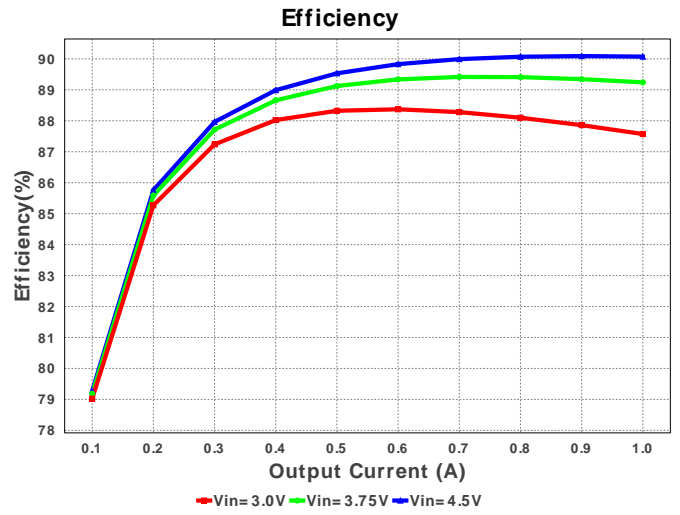
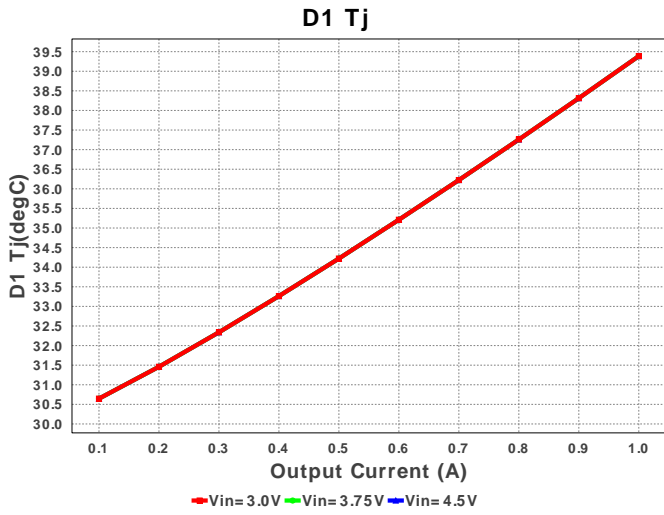


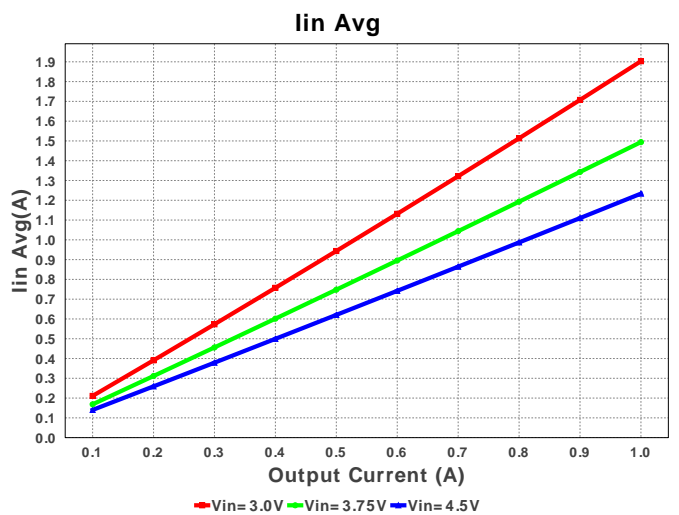
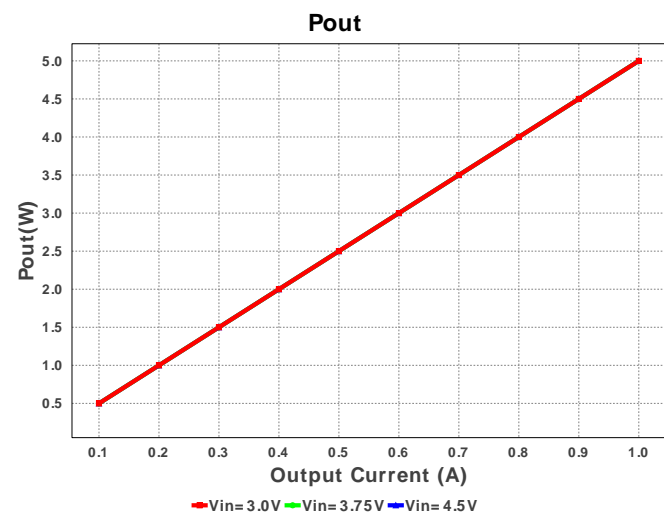
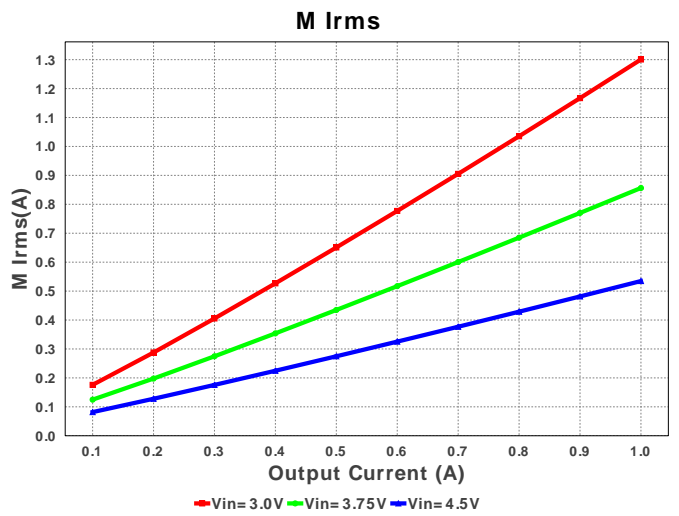
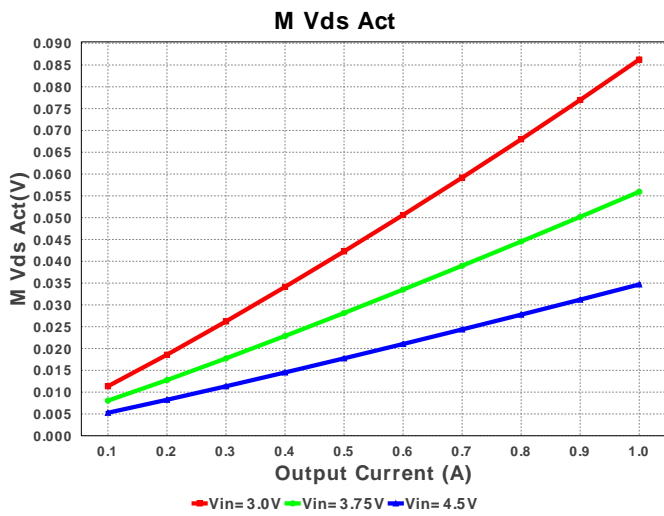
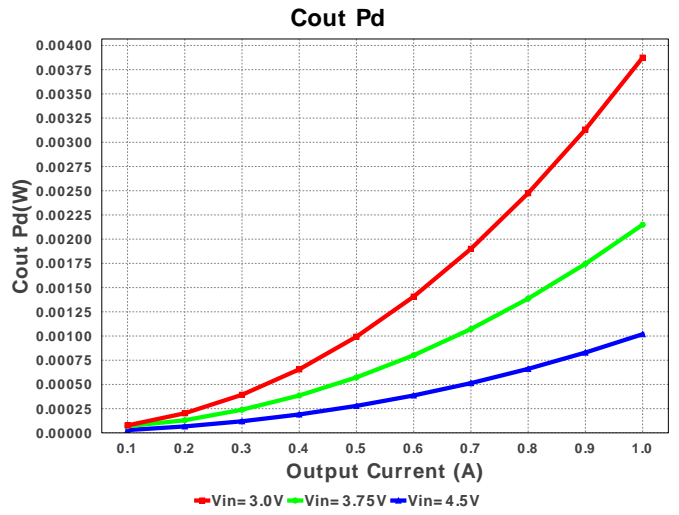
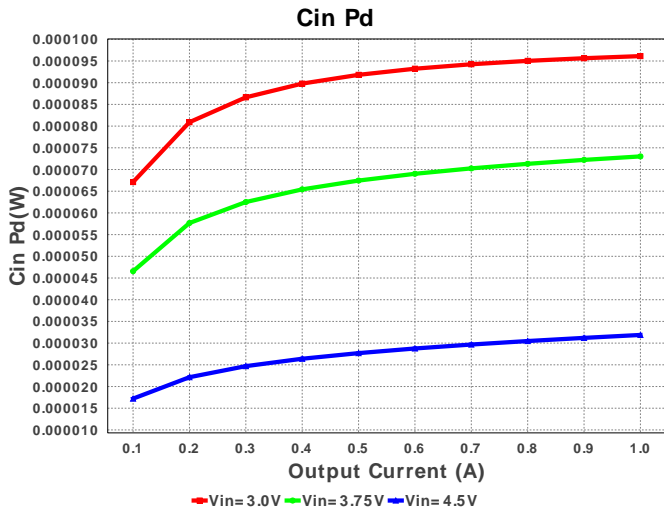
L Pd

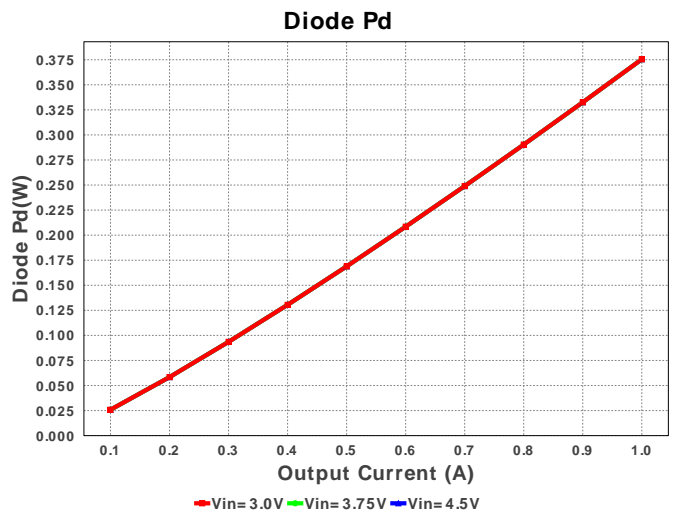
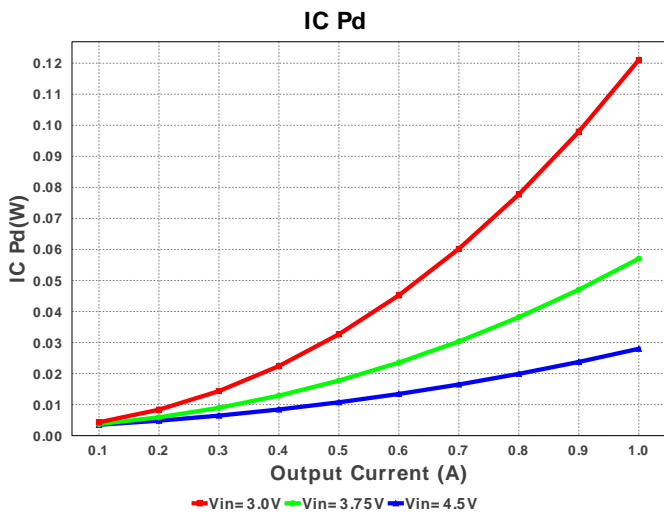
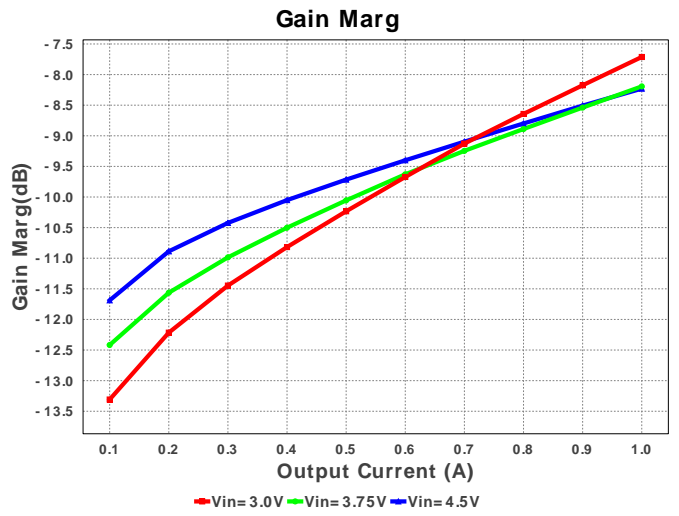
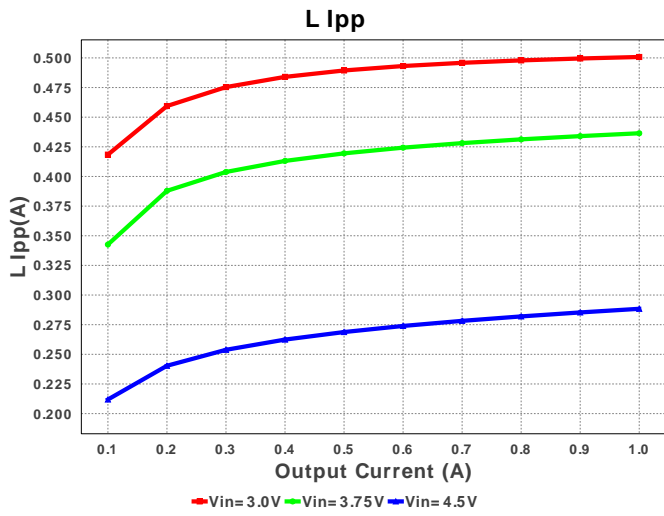
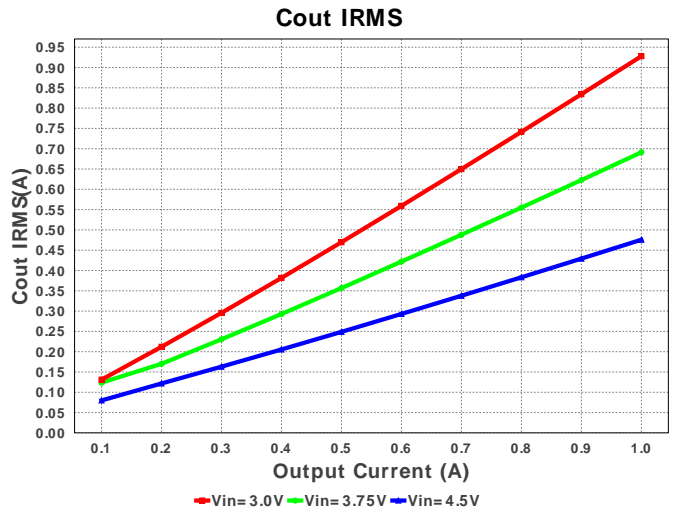
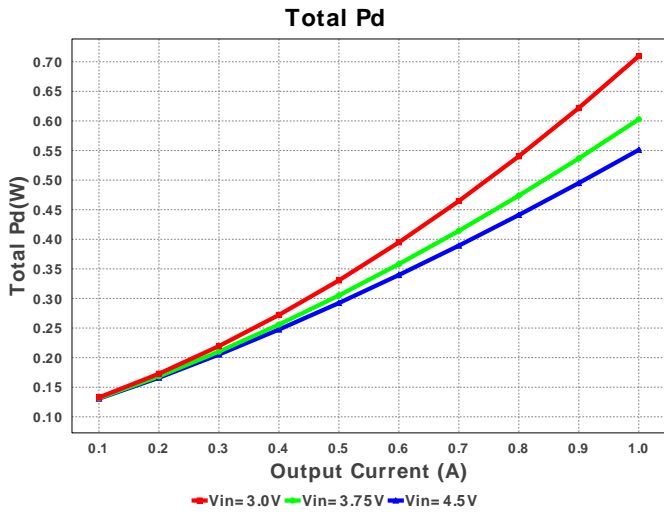


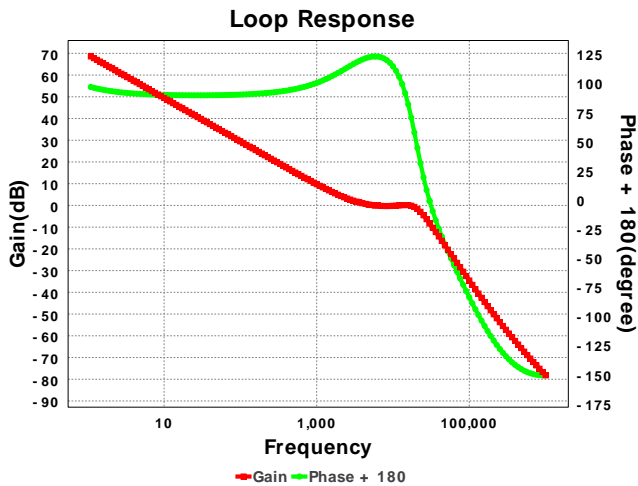
Low Freq Gain











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	146.615 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	916.882 mA	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	0.0 A	Current	Output capacitor_x RMS ripple current
4.	IC Ipk	2.164 A	Current	Peak switch current in IC
5.	Iin Avg	1.925 A	Current	Average input current
6.	L Ipp	507.89 mA	Current	Peak-to-peak inductor ripple current
7.	M Iavg	1.91 A	Current	MOSFET Average current
8.	M1 Irms	1.322 A	Current	Q Iavg
9.	BOM Count	15	General	Total Design BOM count
10.	FootPrint	185.0 mm ²	General	Total Foot Print Area of BOM components
11.	Frequency	778.91 kHz	General	Switching frequency
12.	IC Tolerance	9.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	87.764 mV	General	Voltage drop across the MosFET
14.	Pout	5.0 W	General	Total output power
15.	Total BOM	\$2.36	General	Total BOM Cost
16.	D1 Tj	40.889 degC	Op_Point	D1 junction temperature
17.	Low Freq Gain	69.28 dB	Op_Point	Gain at 10Hz
18.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
19.	Cross Freq	11.975 kHz	Op_point	Bode plot crossover frequency
20.	Duty Cycle	47.639 %	Op_point	Duty cycle
21.	Efficiency	86.568 %	Op_point	Steady state efficiency
22.	Gain Marg	-7.672 dB	Op_point	Bode Plot Gain Margin
23.	IC Tj	35.411 degC	Op_point	IC junction temperature
24.	ICThetaJA	43.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
25.	IOUT_OP	1.0 A	Op_point	Iout operating point
26.	Phase Marg	67.77 deg	Op_point	Bode Plot Phase Margin
27.	VIN_OP	3.0 V	Op_point	Vin operating point
28.	Vout p-p	20.854 mV	Op_point	Peak-to-peak output ripple voltage
29.	Cin Pd	98.881 μW	Power	Input capacitor power dissipation
30.	Cout Pd	3.783 mW	Power	Output capacitor power dissipation
31.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
32.	Diode Pd	435.56 mW	Power	Diode power dissipation
33.	IC Pd	124.968 mW	Power	IC power dissipation
34.	L Pd	110.802 mW	Power	Inductor power dissipation
35.	Total Pd	775.819 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	Iout1	1.0	Output Current #1
3.	VinMax	4.5	Maximum input voltage
4.	VinMin	3.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	TPS55340	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS55340** Product Folder : <http://www.ti.com/product/TPS55340> : contains the data sheet and other resources.

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