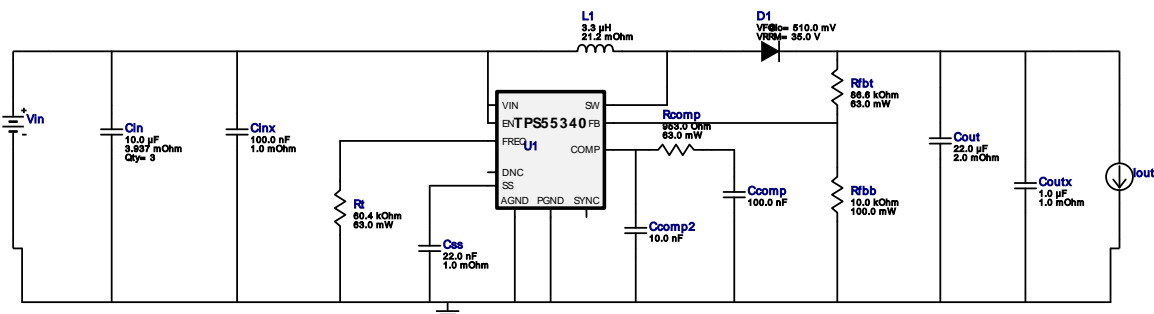





WEBENCH® Design Report

Design : 5281144/6 TPS55340RTER
TPS55340RTER 2.7V-5.0V to 12.00V @ 1.0A

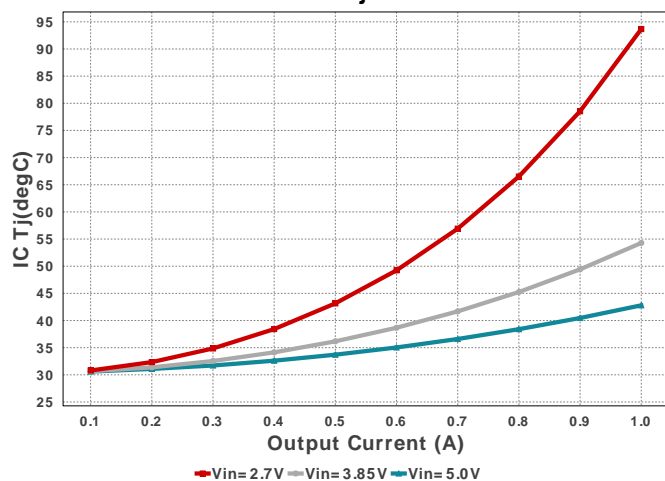


Electrical BOM

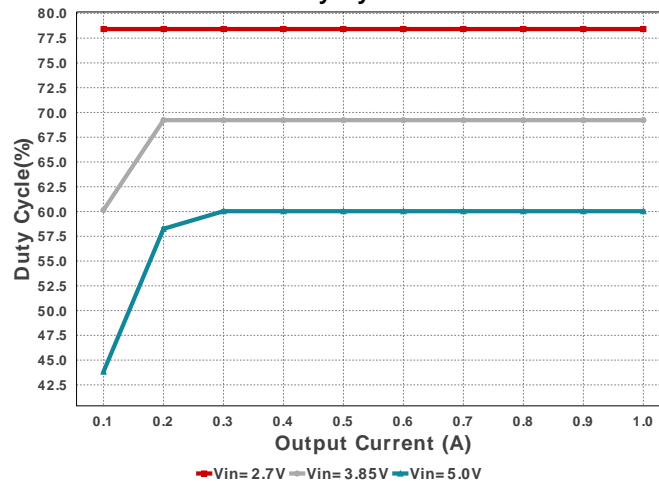
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	AVX	08053C104JAZ2A Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.09	0805 7 mm ²
2.	Ccomp2	MuRata	GCM2195C1H103JA16D Series= C0G/NP0	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.05	0805 7 mm ²
3.	Cin	MuRata	GRM219R61A106KE44D Series= X5R	Cap= 10.0 uF ESR= 3.937 mOhm VDC= 10.0 V IRMS= 2.7713 A	3	\$0.03	0805 7 mm ²
4.	Cinx	Yageo America	CC0805KRX7R8BB104 Series= X7R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
5.	Cout	MuRata	GRM32ER61C226ME20L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	1	\$0.14	1210 15 mm ²
6.	Coutx	Taiyo Yuden	EMK107B7105KA-T Series= X7R	Cap= 1.0 uF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
7.	Css	MuRata	GRM033R60J223KE01D Series= X5R	Cap= 22.0 nF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
8.	D1	ON Semiconductor	MBRD835LT4G	VF@Io= 510.0 mV VRRM= 35.0 V	1	\$0.28	 DPAK 102 mm ²
9.	L1	Coilcraft	XAL5030-332MEB	L= 3.3 uH DCR= 21.2 mOhm	1	\$0.63	 XAL5030 54 mm ²
10.	Rcomp	Vishay-Dale	CRCW0402953RFKED Series= CRCW..e3	Res= 953.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	Rfbb	Susumu Co Ltd	RR1220P-103-D Series= RR12	Res= 10.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rfbt	Vishay-Dale	CRCW040286K6FKED Series= CRCW..e3	Res= 86.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
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	\$1.40	 S-PWQFN-N16 17 mm ²

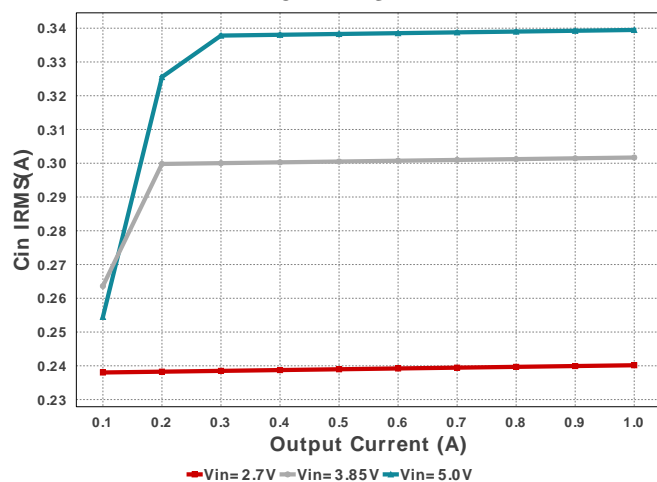
IC Tj



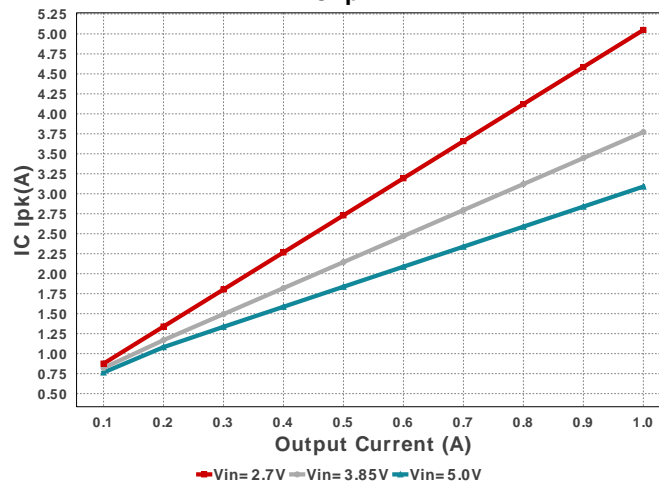
Duty Cycle

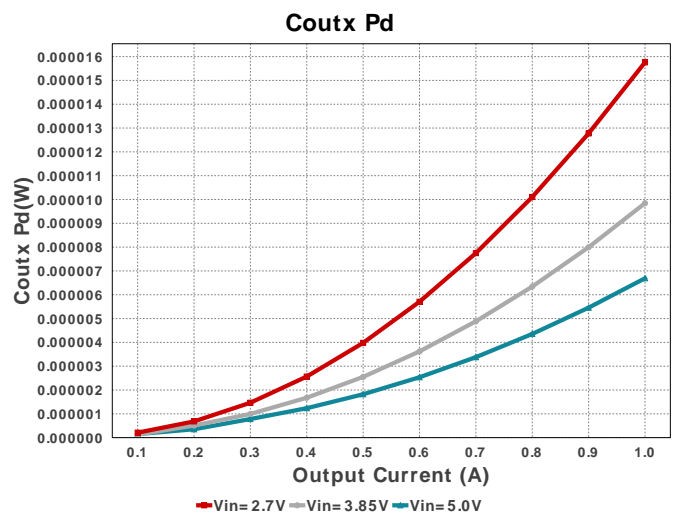
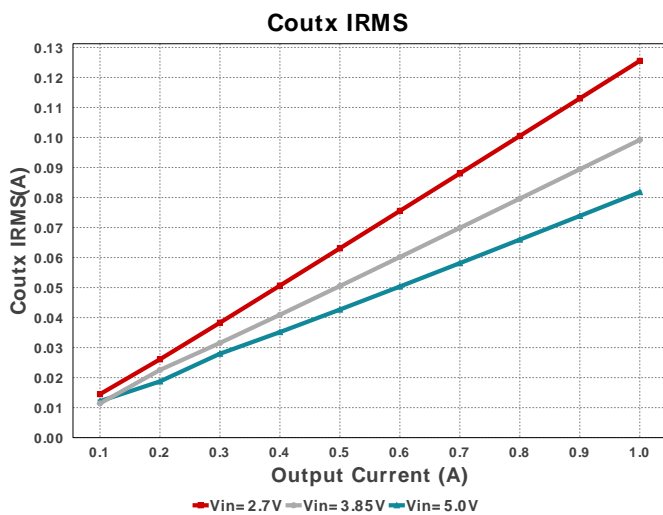
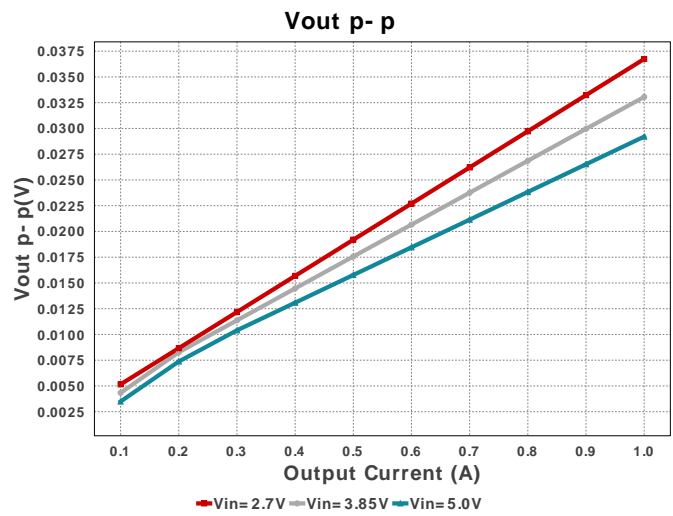
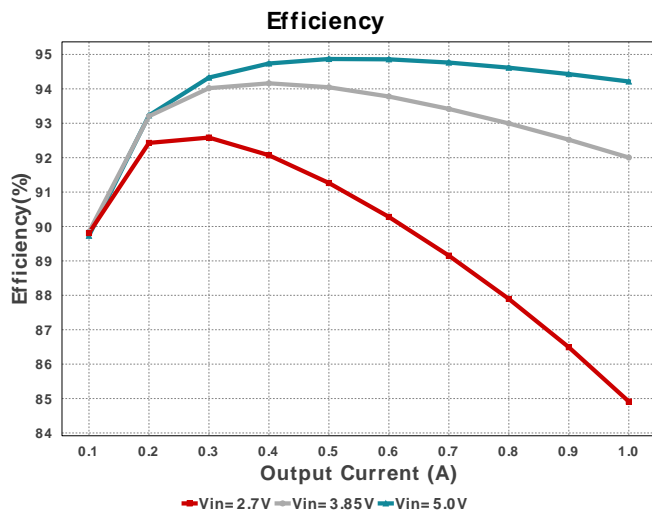
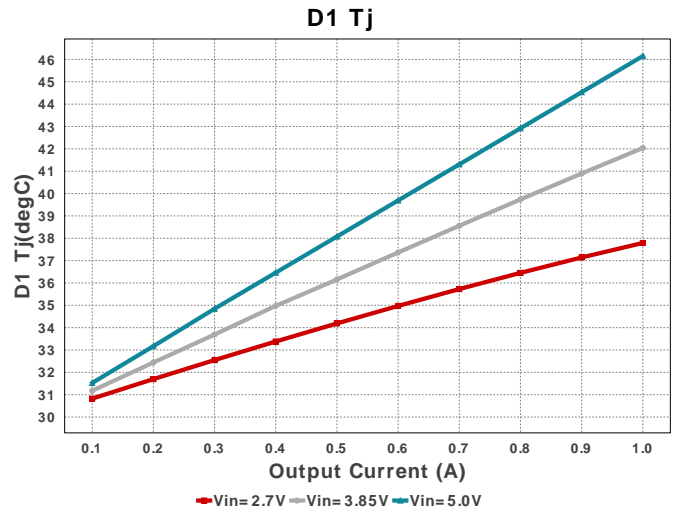
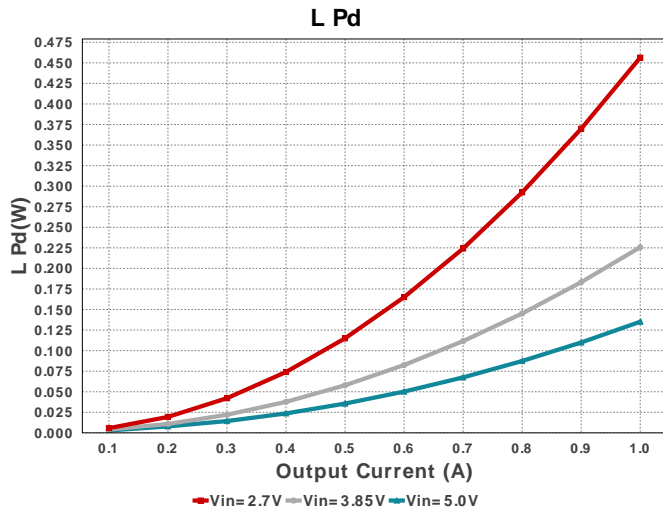


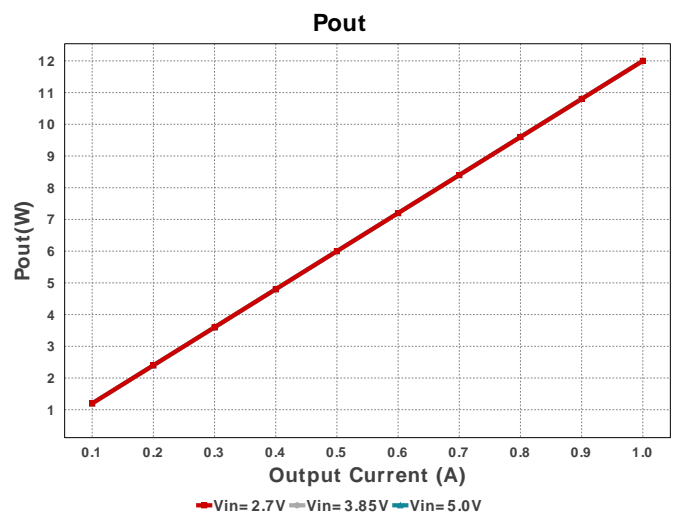
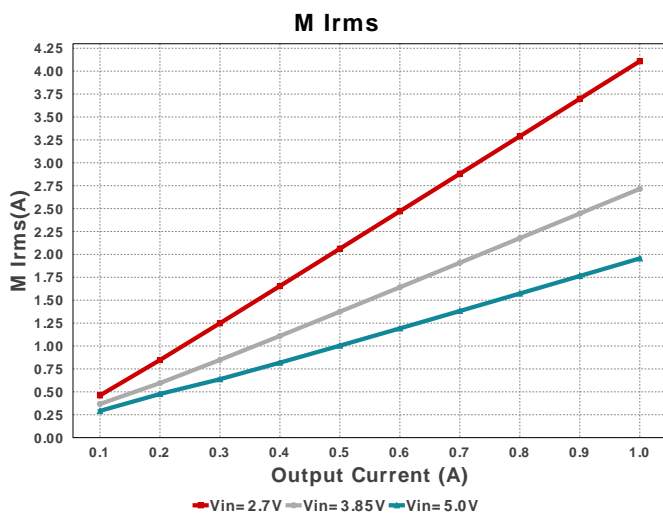
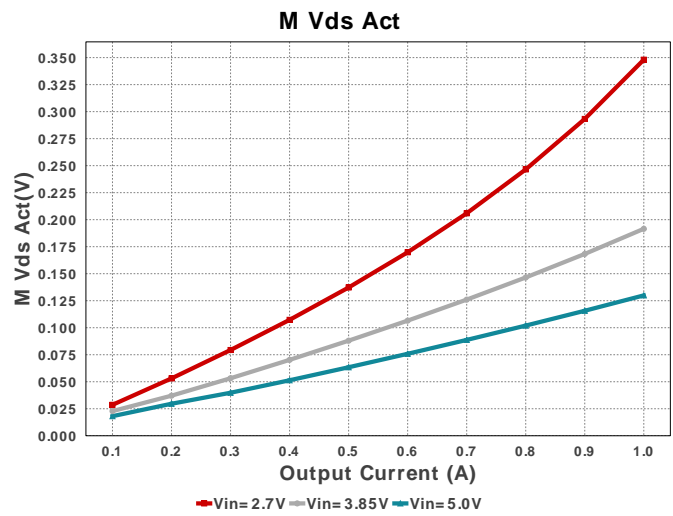
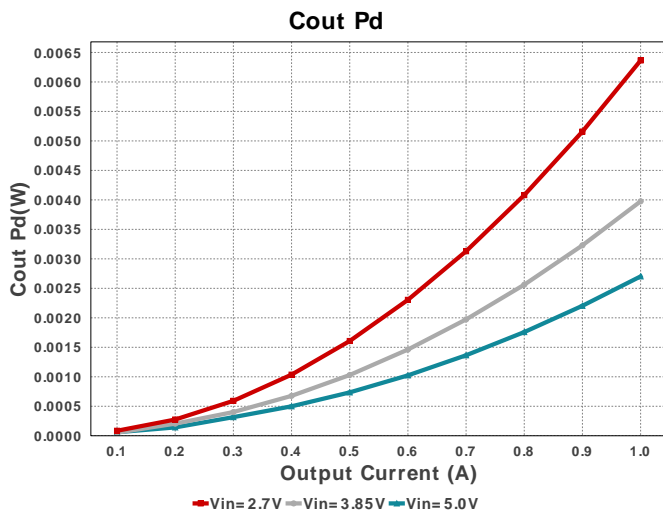
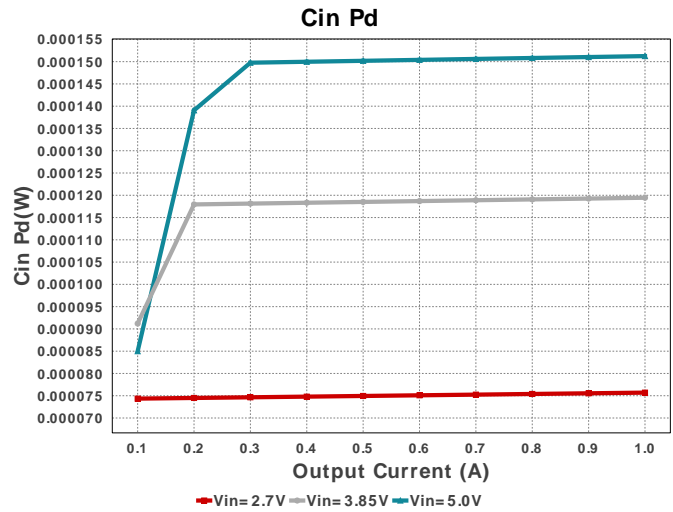
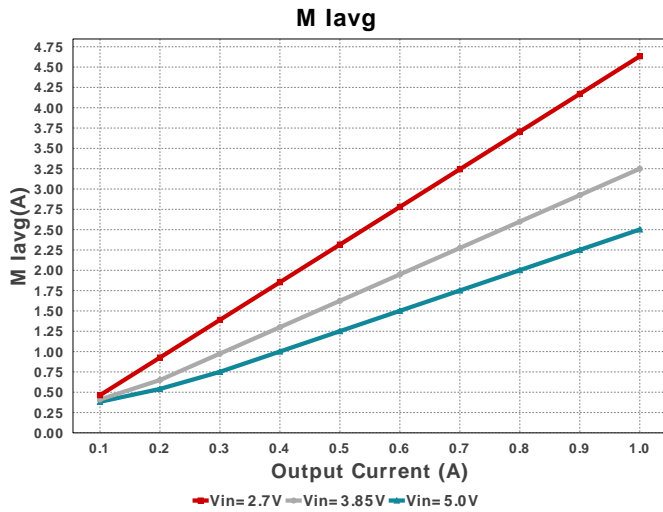
Cin IRMS

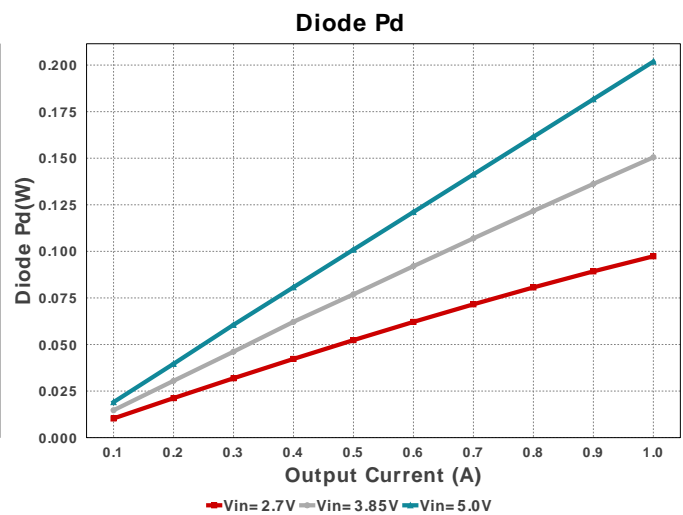
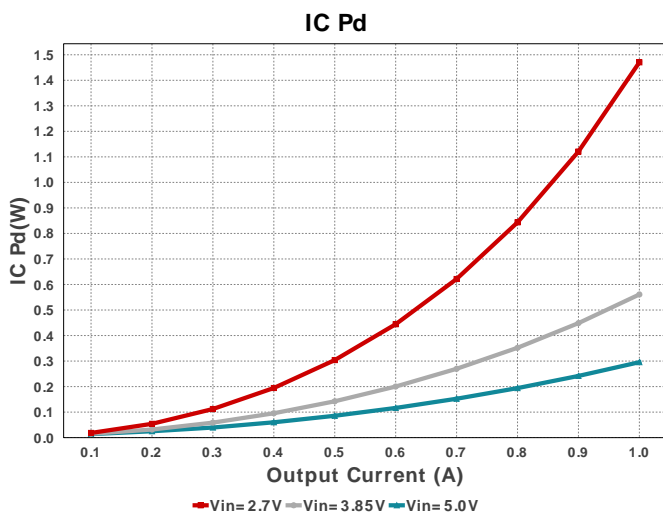
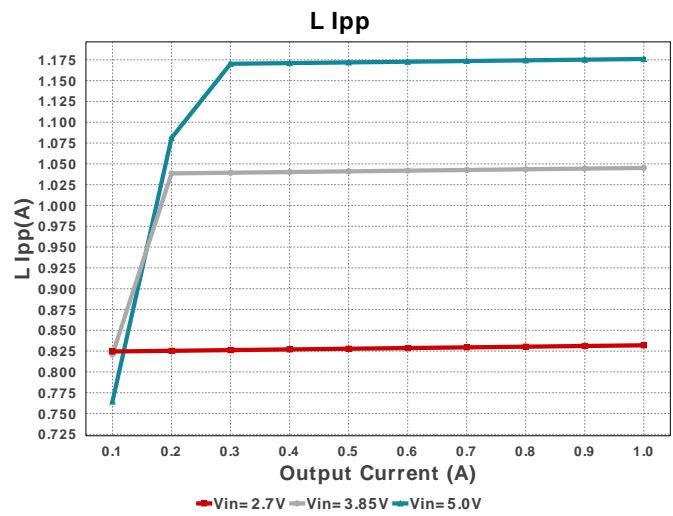
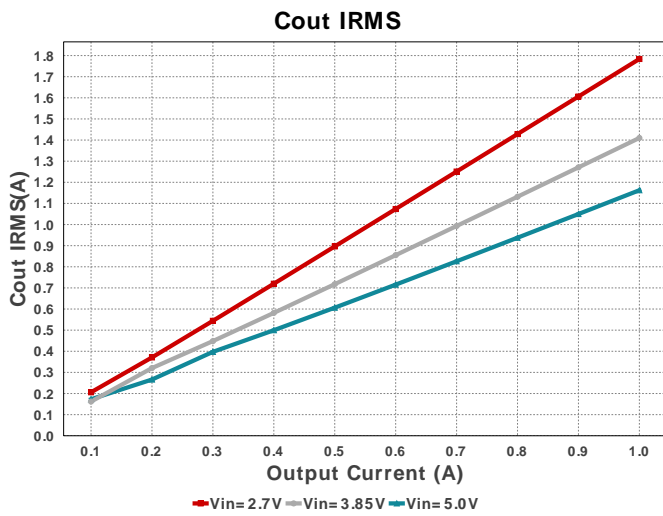
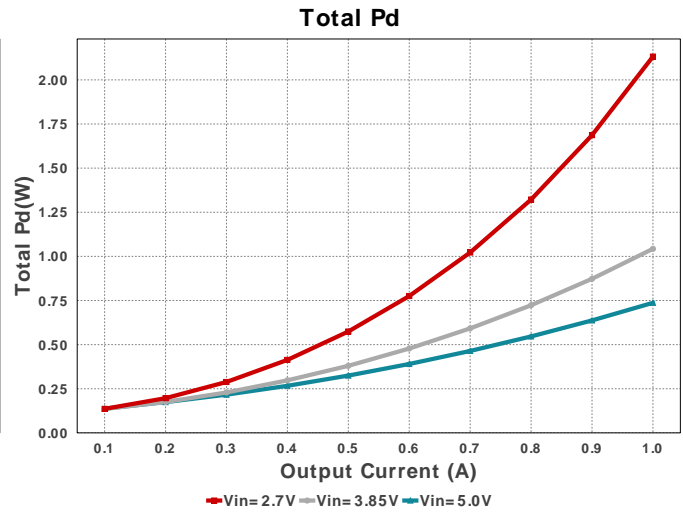
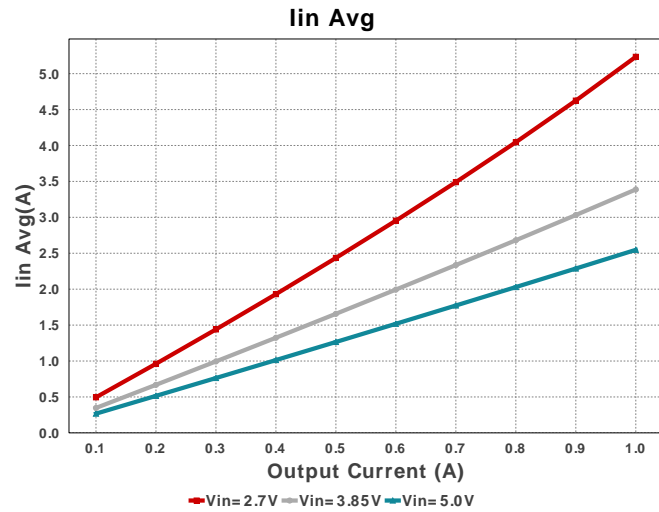


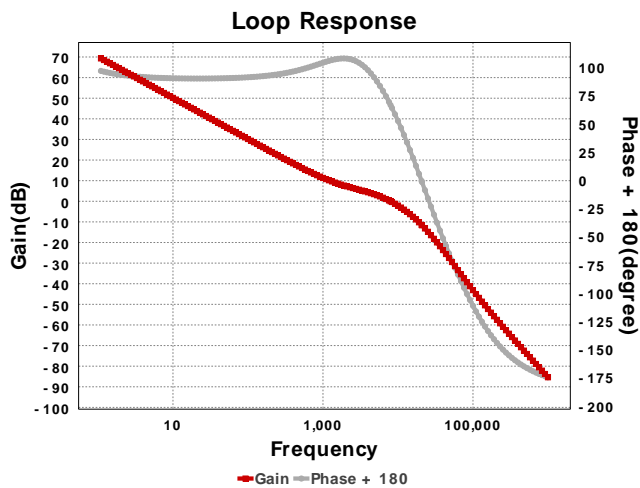
IC Ipk











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	240.165 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.784 A	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	125.532 mA	Current	Output capacitor_x RMS ripple current
4.	IC Ipk	5.049 A	Current	Peak switch current in IC
5.	Iin Avg	5.234 A	Current	Average input current
6.	L Ipp	831.96 mA	Current	Peak-to-peak inductor ripple current
7.	M Iavg	4.633 A	Current	MOSFET Average current
8.	M1 Irms	4.108 A	Current	Q Iavg
9.	BOM Count	16	General	Total Design BOM count
10.	FootPrint	251.0 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	348.071 mV	General	Voltage drop across the MosFET
14.	Mode	CCM	General	Conduction Mode
15.	Pout	12.0 W	General	Total output power
16.	Total BOM	\$2.75	General	Total BOM Cost
17.	Cross Freq	4.757 kHz	Op Point	Bode plot crossover frequency
18.	D1 Tj	37.789 degC	Op Point	D1 junction temperature
19.	Duty Cycle	78.417 %	Op Point	Duty cycle
20.	Efficiency	84.914 %	Op Point	Steady state efficiency
21.	Gain Marg	-9.774 dB	Op Point	Bode Plot Gain Margin
22.	IC Tj	93.667 degC	Op Point	IC junction temperature
23.	ICThetaJA	43.3 degC/W	Op Point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	1.0 A	Op Point	Iout operating point
25.	Low Freq Gain	67.779 dB	Op Point	Gain at 1Hz
26.	Phase Marg	67.829 deg	Op Point	Bode Plot Phase Margin
27.	VIN_OP	2.7 V	Op Point	Vin operating point
28.	Vout Actual	11.872 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
29.	Vout OP	12.0 V	Op Point	Operational Output Voltage
30.	Vout Tolerance	2.094 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
31.	Vout p-p	36.743 mV	Op Point	Peak-to-peak output ripple voltage
32.	Cin Pd	75.695 μW	Power	Input capacitor power dissipation
33.	Cout Pd	6.364 mW	Power	Output capacitor power dissipation
34.	Coutx Pd	15.758 μW	Power	Output capacitor_x power loss
35.	Diode Pd	97.358 mW	Power	Diode power dissipation
36.	IC Pd	1.47 W	Power	IC power dissipation
37.	L Pd	456.34 mW	Power	Inductor power dissipation
38.	Total Pd	2.132 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	5.0	Maximum input voltage
3.	VinMin	2.7	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	TPS55340	Base Product Number
6.	source	DC	Input Source Type
7.	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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