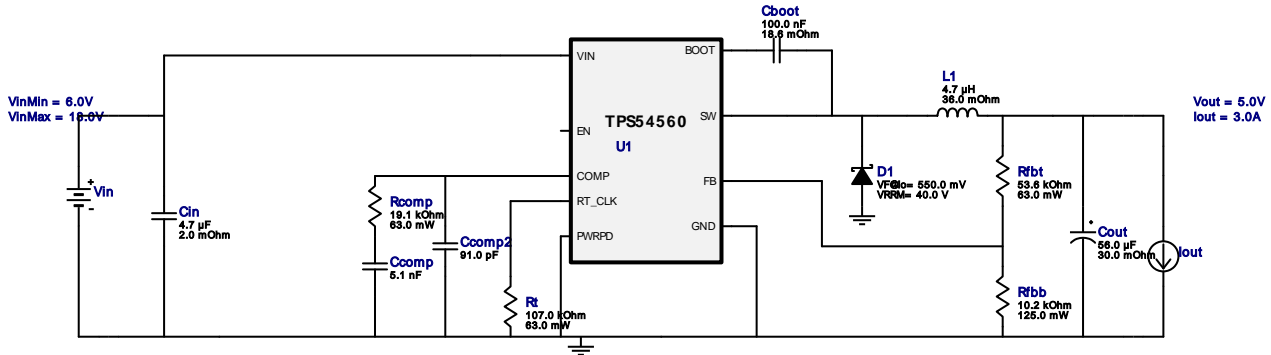


**WEBENCH<sup>®</sup> Design Report**

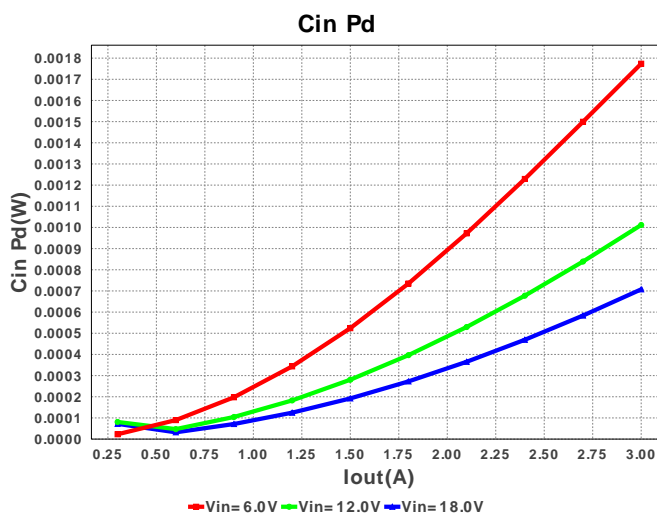
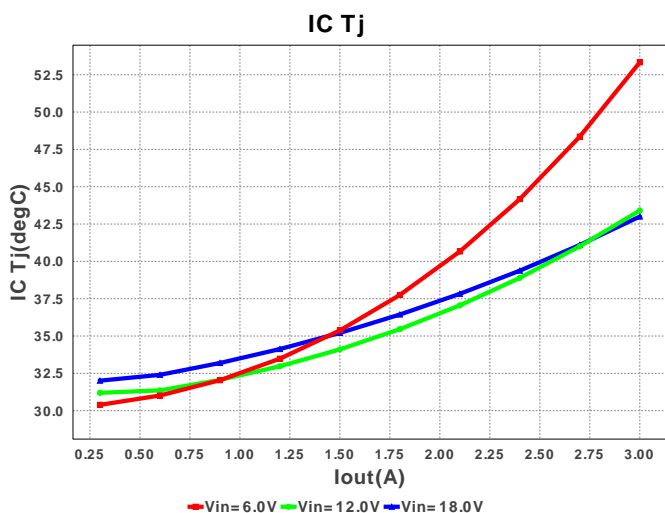
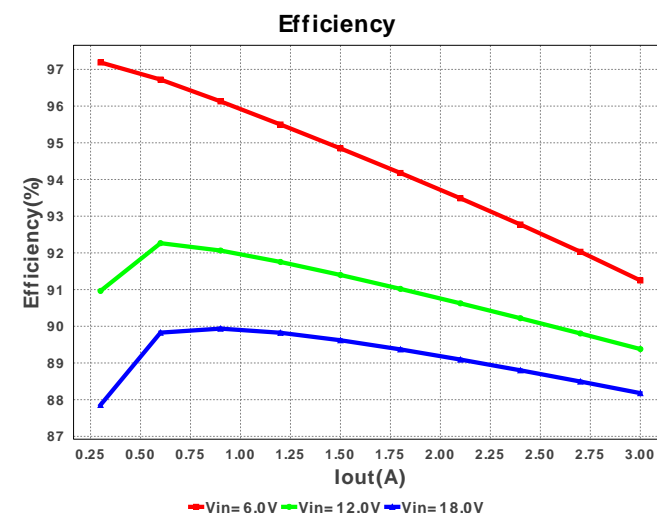
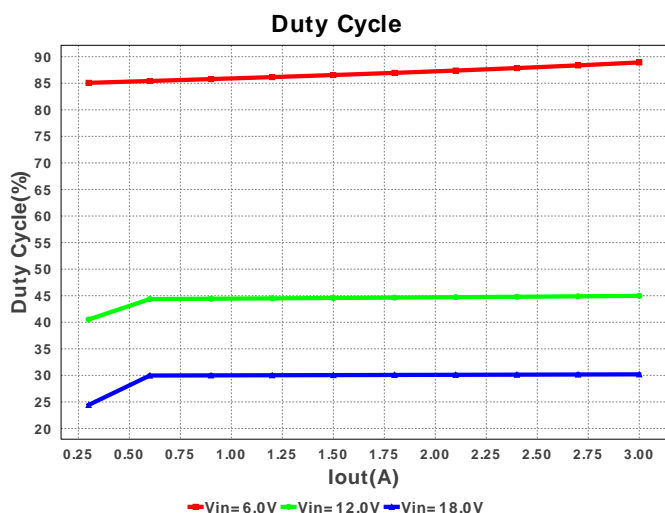
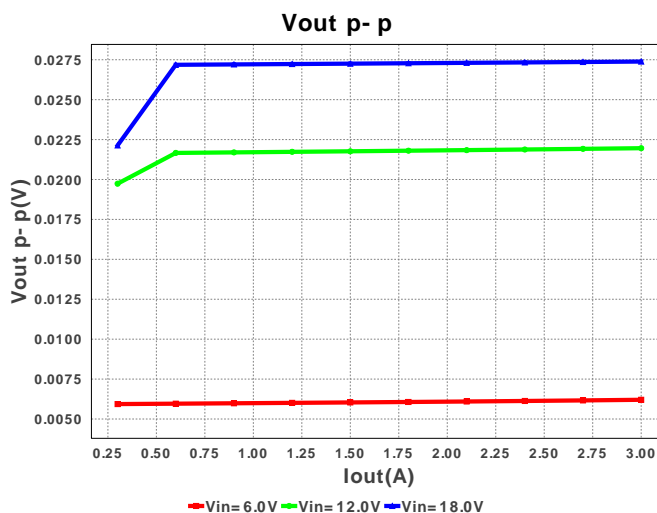
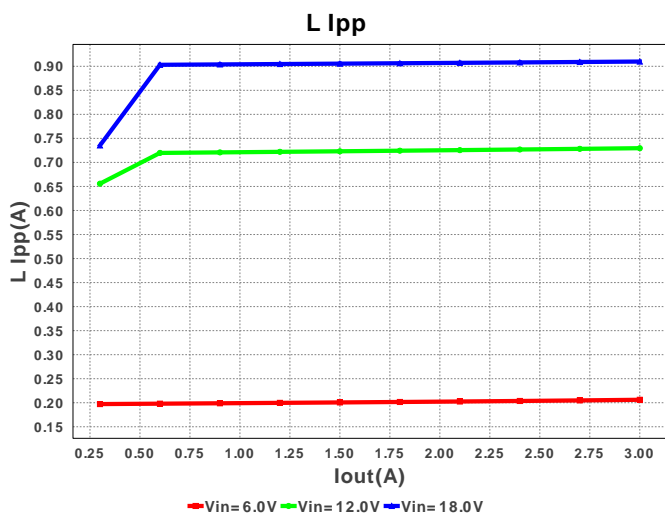
 Design : 3550864/25 TPS54560DDAR  
 TPS54560DDAR 6.0V-18.0V to 5.0V @ 3.0A

**Electrical BOM**

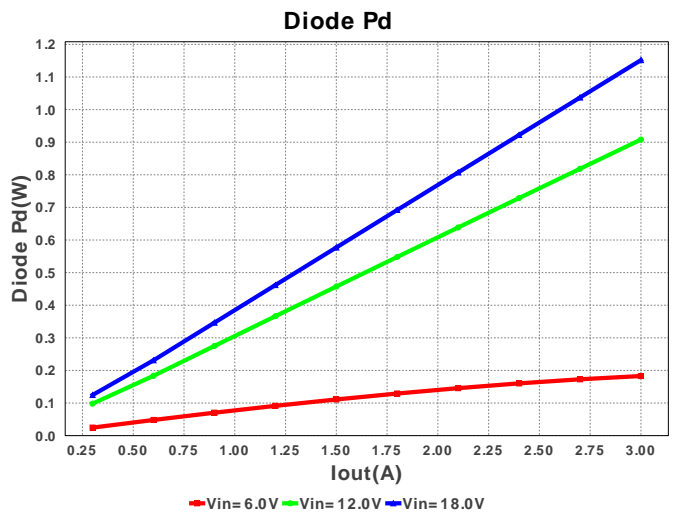
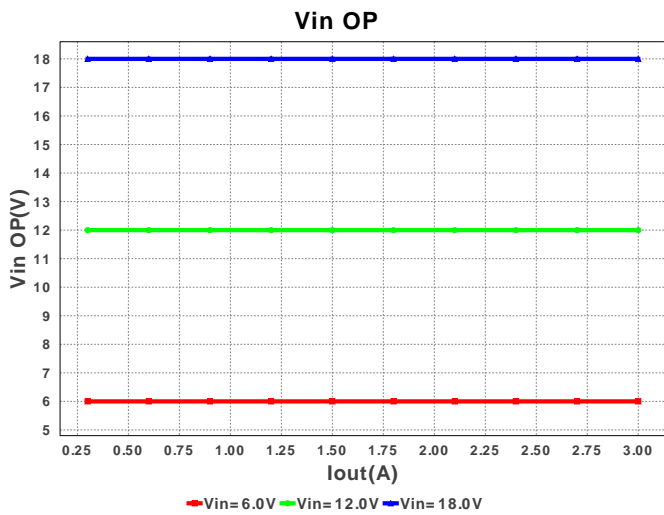
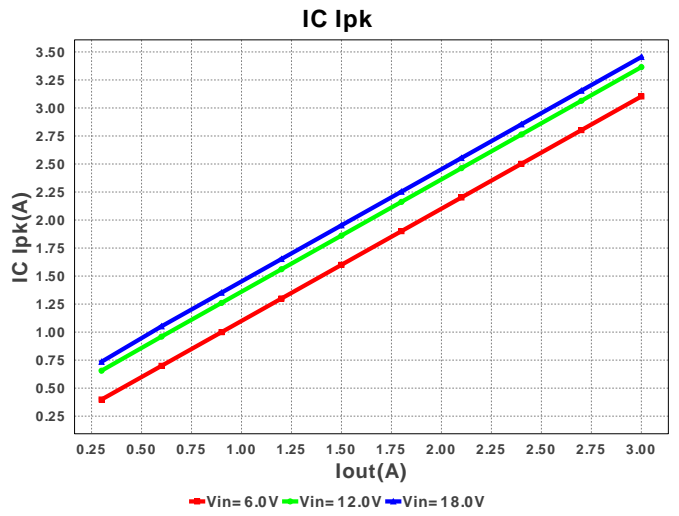
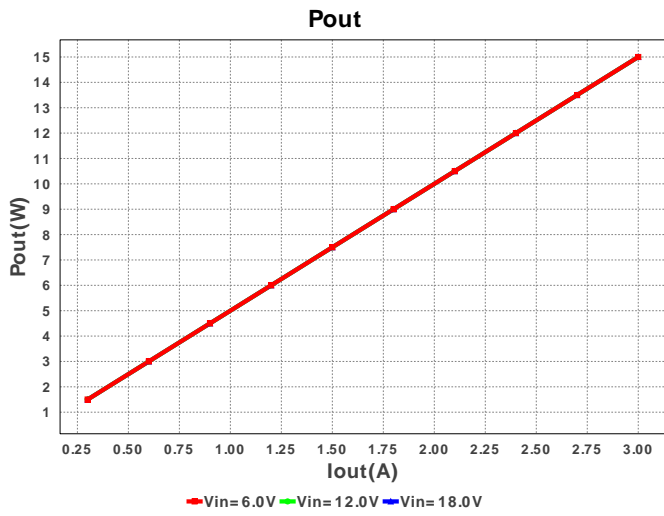
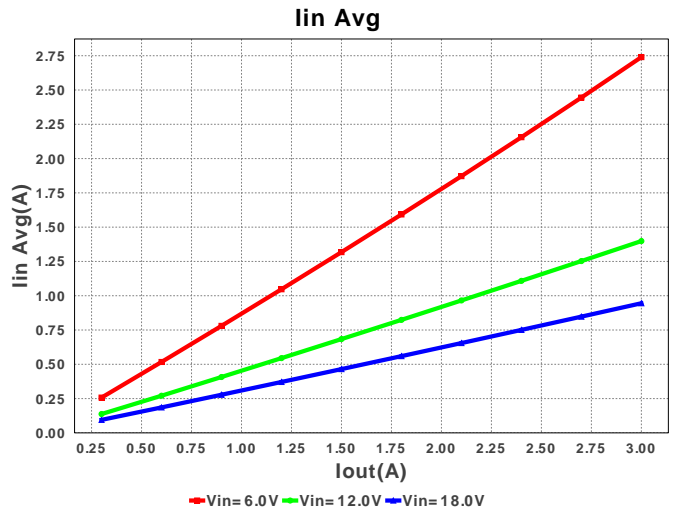
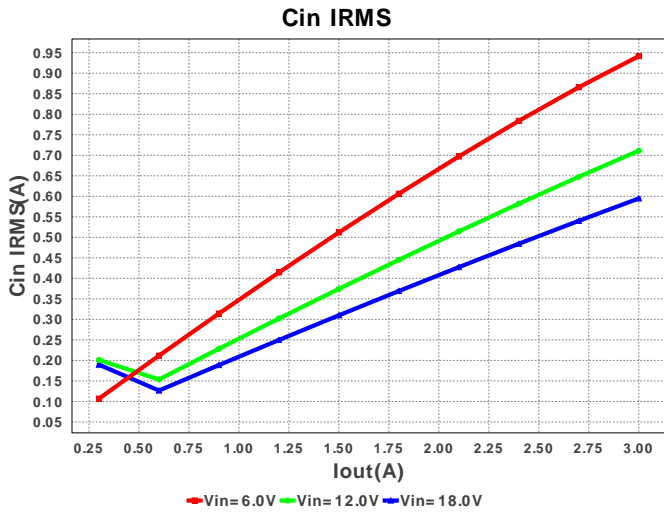
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	TDK	C1005X5R1A104K Series= X5R	Cap= 100.0 nF ESR= 18.6 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3mm2
2.	Ccomp	MuRata	GRM2195C1H512JA01D Series= C0G/NP0	Cap= 5.1 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.05	0805 7mm2
3.	Ccomp2	MuRata	GRM1885C1H910JA01D Series= C0G/NP0	Cap= 91.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0603 5mm2
4.	Cin	MuRata	GRM21BR61E475MA12L Series= X5R	Cap= 4.7 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	1	\$0.06	0805 7mm2
5.	Cout	Sanyo	20SVPF56MX Series= 1273	Cap= 56.0 µF ESR= 30.0 mOhm VDC= 20.0 V IRMS= 2.8 A	1	\$0.35	 CAPSMT_62_E61 53mm2
6.	D1	Comchip Technology	CDBC540-G	VF@Io= 550.0 mV VRRM= 40.0 V	1	\$0.23	 SMC 83mm2
7.	L1	Coilcraft	XAL5030-472MEB	L= 4.7 µH DCR= 36.0 mOhm	1	\$0.55	 XAL5030 54mm2
8.	Rcomp	Vishay-Dale	CRCW040219K1FKED Series= CRCW..e3	Res= 19.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
9.	Rfbb	Panasonic	ERJ-6ENF1022V Series= 225	Res= 10.2 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7mm2
10.	Rfbt	Vishay-Dale	CRCW040253K6FKED Series= CRCW..e3	Res= 53.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
11.	Rt	Vishay-Dale	CRCW0402107KFKED Series= CRCW..e3	Res= 107.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2

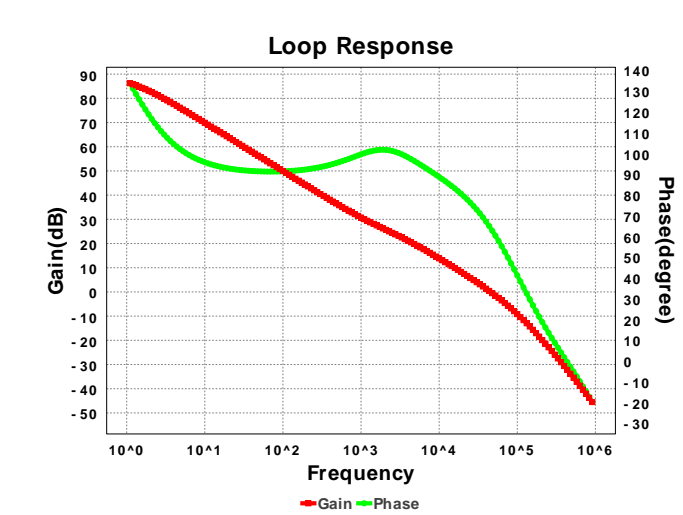
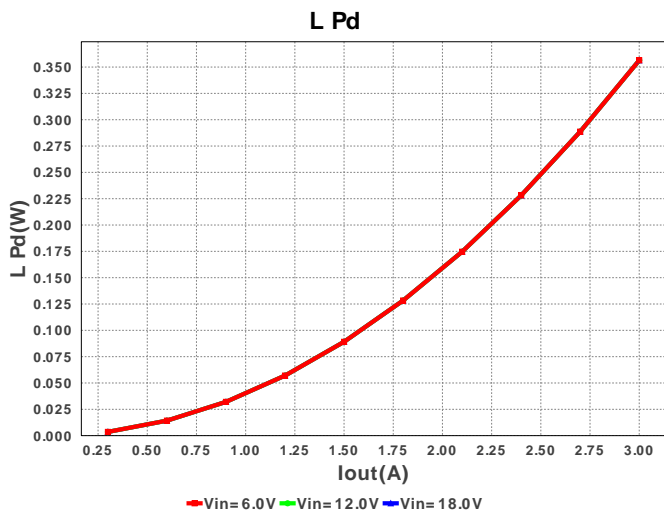
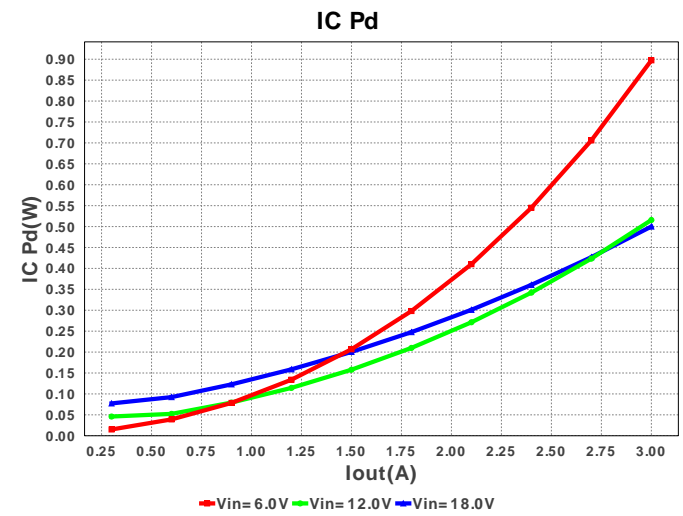
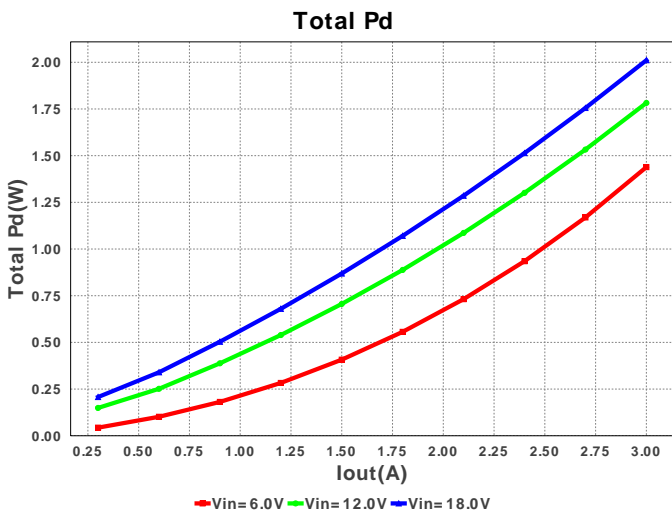
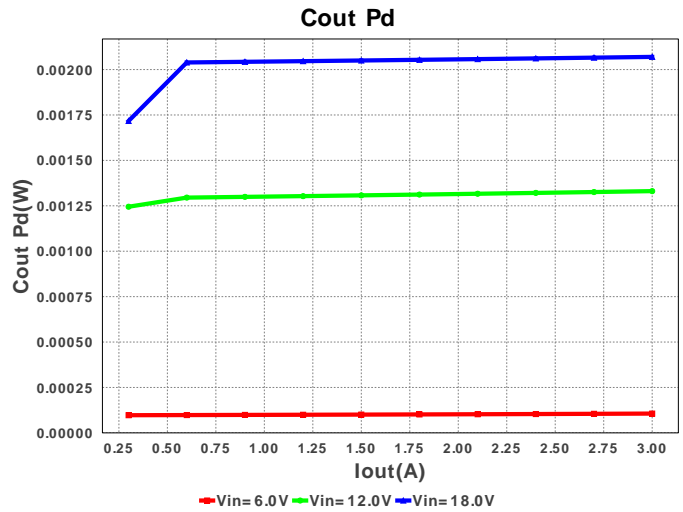
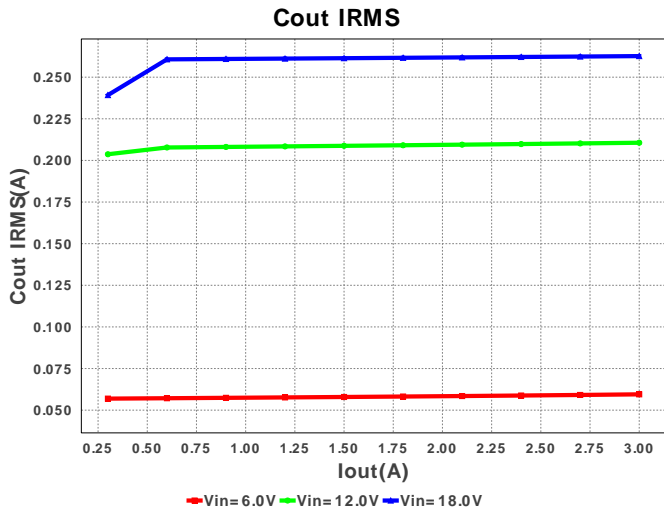
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	U1	Texas Instruments	TPS54560DDAR	Switcher	1	\$2.30	



R-PDSO-G8 57mm2







### Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	596.108 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	259.029 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	3.449 A	Current	Peak switch current in IC
4.	Iin Avg	932.64 mA	Current	Average input current
5.	L Ipp	897.302 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	12	General	Total Design BOM count
7.	FootPrint	285.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	918.056 kHz	General	Switching frequency
9.	Pout	15.0 W	General	Total output power
10.	Total BOM	\$3.6	General	Total BOM Cost
11.	Vout OP	5.0 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Cross Freq	45.498 kHz	Op_point	Bode plot crossover frequency
13.	Duty Cycle	29.783 %	Op_point	Duty cycle
14.	Efficiency	89.352 %	Op_point	Steady state efficiency
15.	IC Tj	42.9 degC	Op_point	IC junction temperature
16.	ICThetaJA	26.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	3.0 A	Op_point	Iout operating point
18.	Phase Marg	64.372 deg	Op_point	Bode Plot Phase Margin
19.	VIN_OP	18.0 V	Op_point	Vin operating point
20.	Vout p-p	27.007 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	710.69 µW	Power	Input capacitor power dissipation
22.	Cout Pd	2.013 mW	Power	Output capacitor power dissipation
23.	Diode Pd	932.296 mW	Power	Diode power dissipation
24.	IC Pd	496.145 mW	Power	IC power dissipation
25.	L Pd	356.4 mW	Power	Inductor power dissipation
26.	Total Pd	1.788 W	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	3.0 A	Maximum Output Current
2.	Iout1	3.0 Amps	Output Current #1
3.	VinMax	18.0 V	Maximum input voltage
4.	VinMin	6.0 V	Minimum input voltage
5.	Vout	5.0 V	Output Voltage
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	TPS54560	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature

## Design Assistance

1. **TPS54560** Product Folder : <http://www.ti.com/product/TPS54560> : contains the data sheet and other resources.

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**You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.**

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