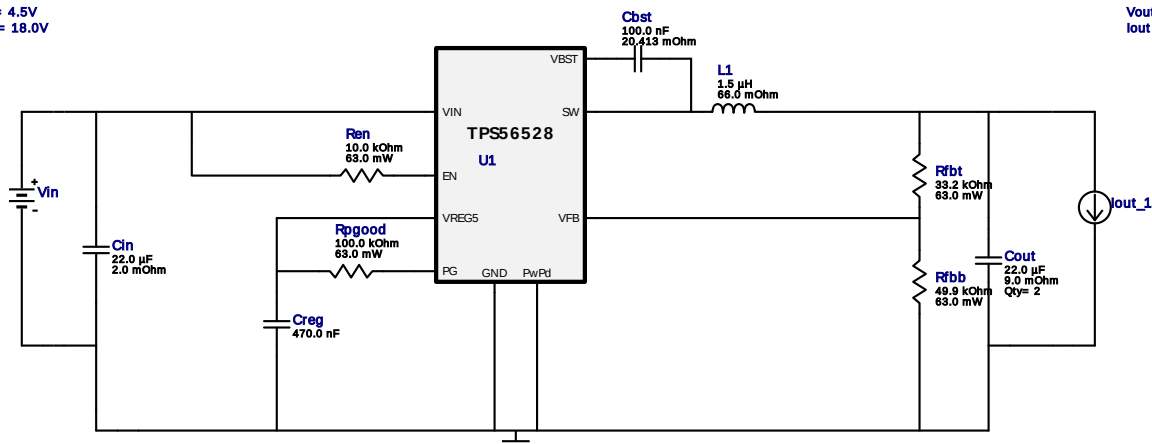


WEBENCH® Design Report

Design : 3820738/488 TPS56528DDAR
TPS56528DDAR 4.5V-18.0V to 1.0V @ 1.0A

VinMin = 4.5V
VinMax = 18.0V

Vout = 1.0V
Iout = 1.0A



Electrical BOM

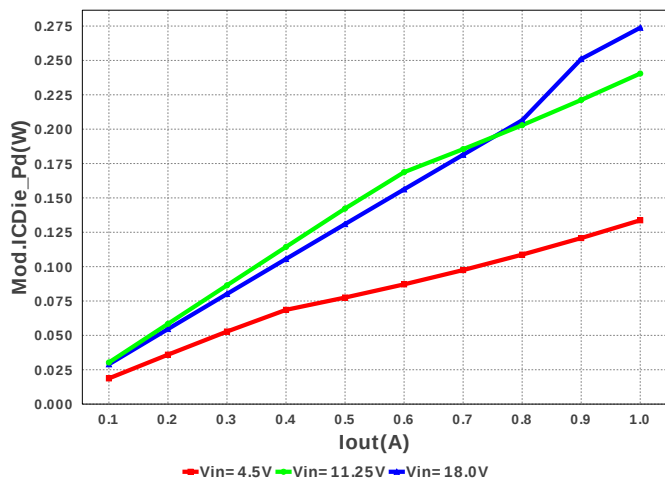
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	TDK	C1005X5R1A104K Series= 285	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3mm2
2.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.28	1210 15mm2
3.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 µF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	2	\$0.03	0805 7mm2
4.	Creg	MuRata	GRM155R61A474KE15D Series= X5R	Cap= 470.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3mm2
5.	L1	Bourns	SRN3015-1R5Y	L= 1.5 µH DCR= 66.0 mOhm	1	\$0.14	SRN3015 16mm2
6.	Ren	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
7.	Rfbb	Vishay-Dale	CRCW040249K9FKED Series= CRCW..e3	Res= 49.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
8.	Rfht	Vishay-Dale	CRCW040233K2FKED Series= CRCW..e3	Res= 33.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
9.	Rpgood	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	TPS56528DDAR	Switcher	1	\$1.20	

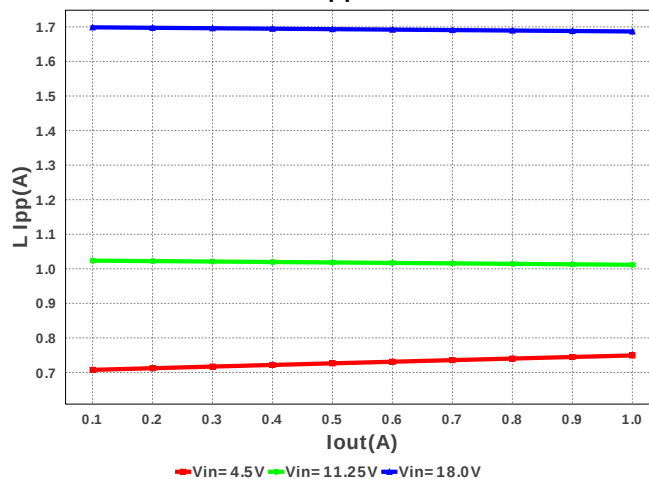


R-PDSO-G8 57mm2

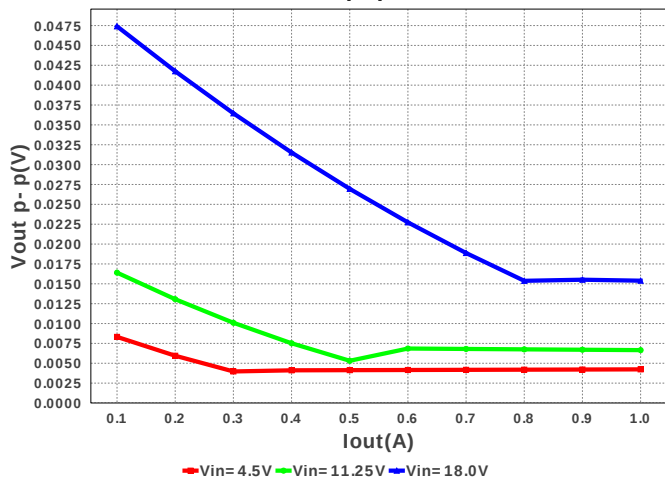
Mod.ICDie_Pd



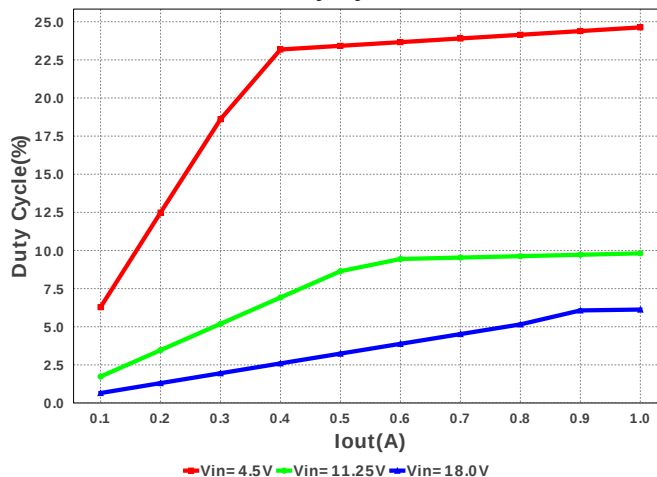
L Ipp



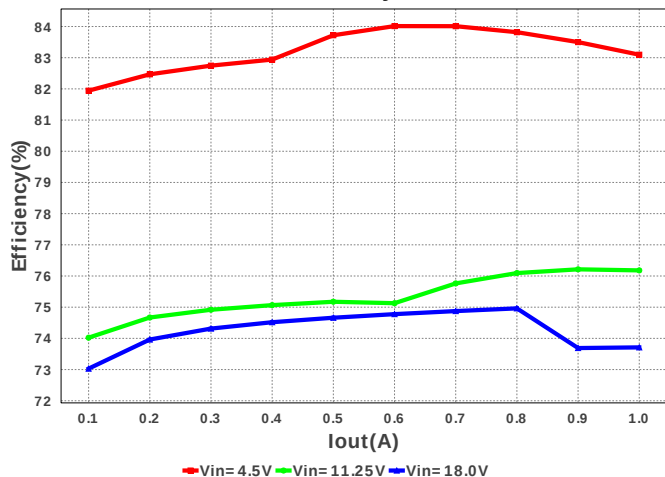
Vout p- p



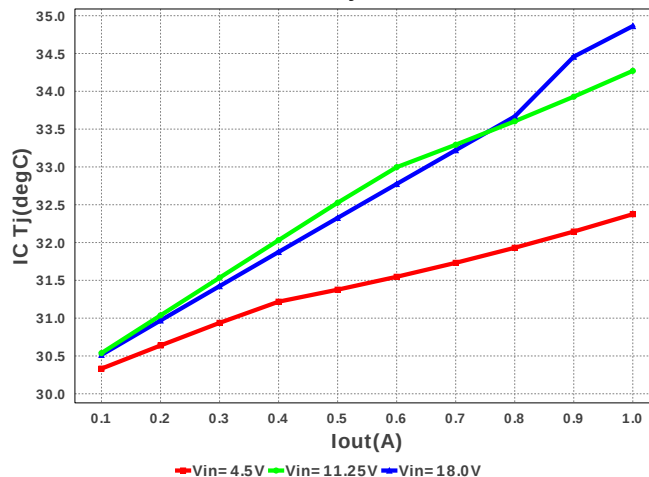
Duty Cycle

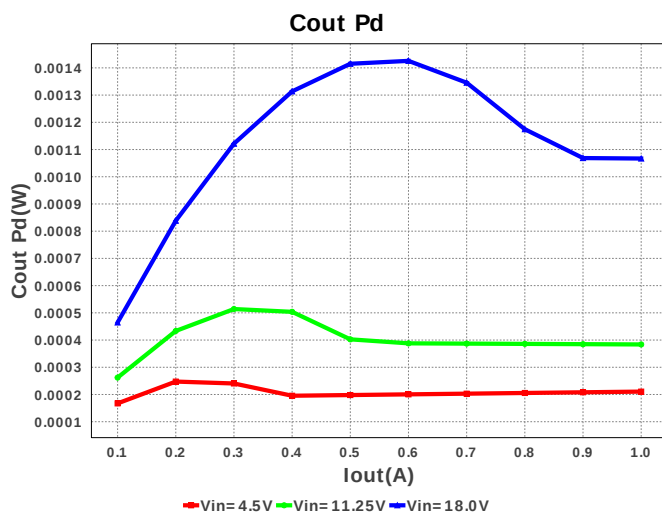
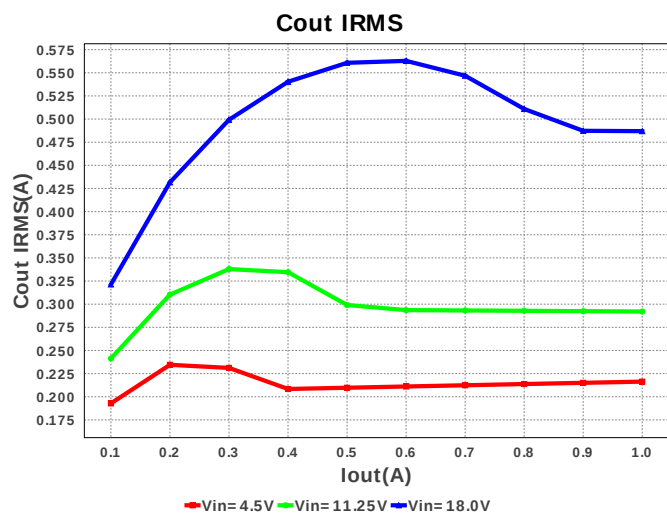
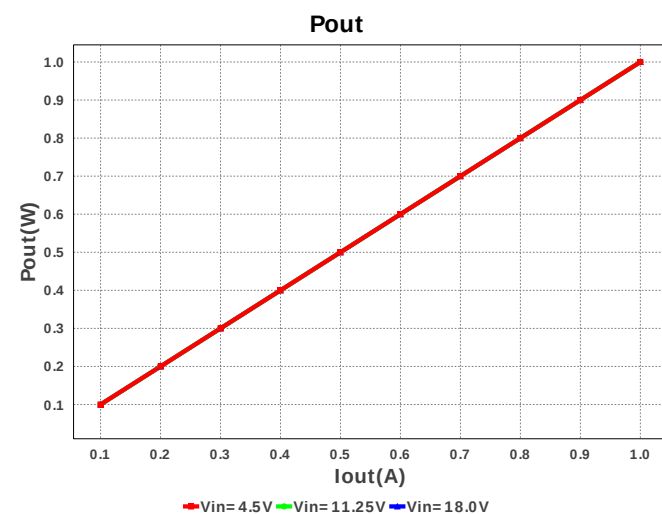
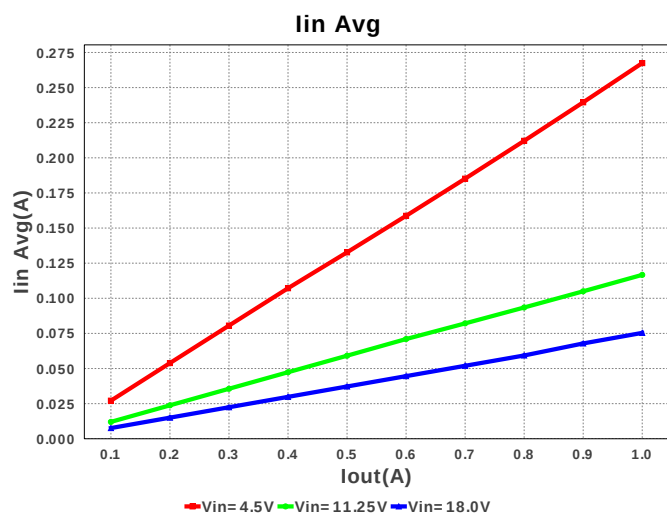
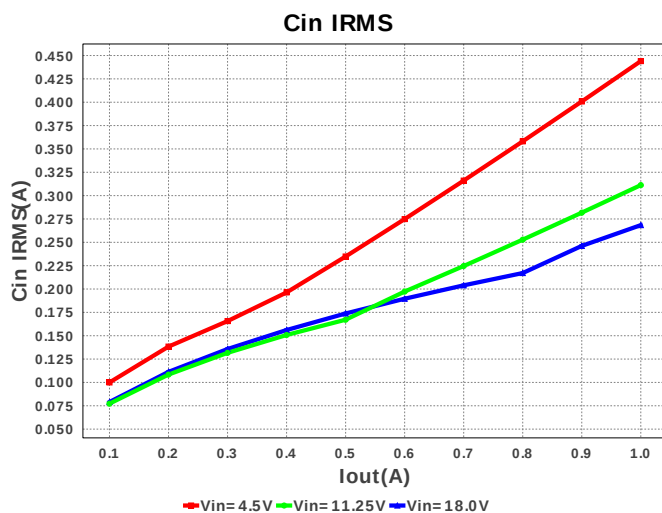
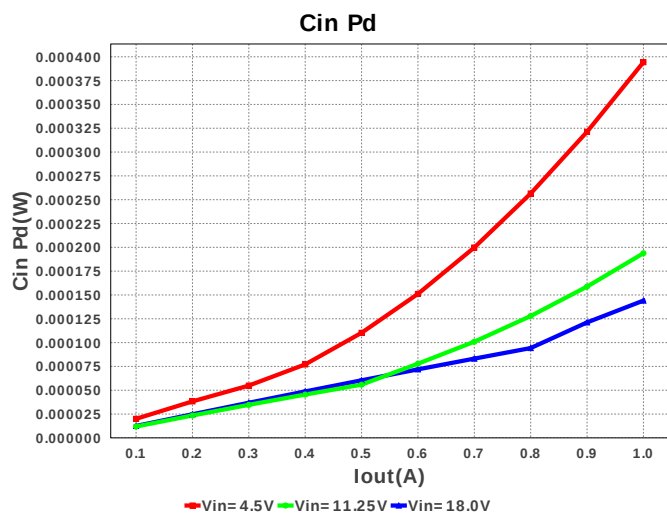


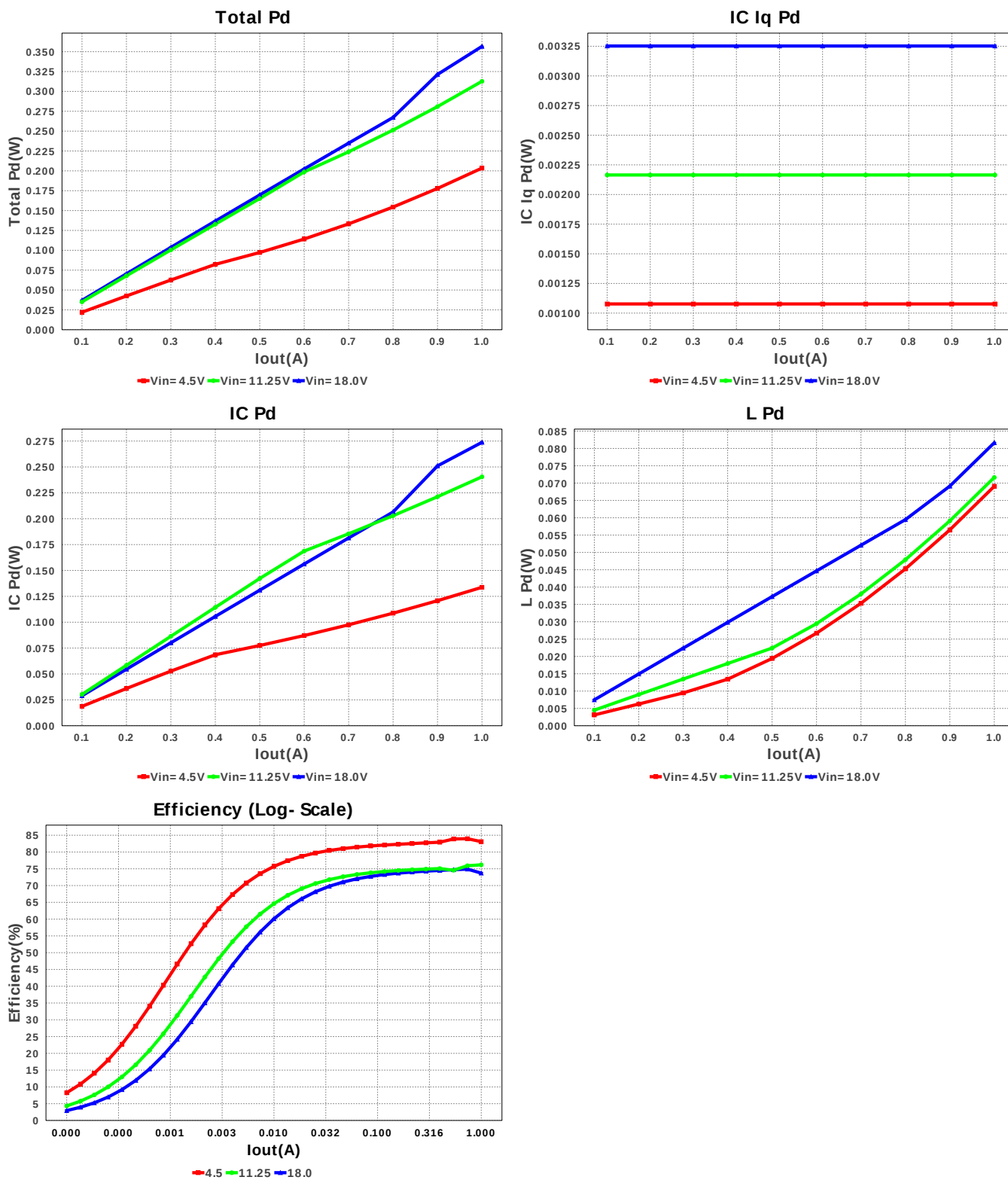
Efficiency



IC Tj







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	268.411 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	486.923 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	75.369 mA	Current	Average input current
4.	L Ipp	1.687 A	Current	Peak-to-peak inductor ripple current
5.	BOM Count	11	General	Total Design BOM count
6.	FootPrint	120.0 mm2	General	Total Foot Print Area of BOM components
7.	Frequency	408.478 kHz	General	Switching frequency
8.	Pout	1.0 W	General	Total output power
9.	Total BOM	\$1.73	General	Total BOM Cost
10.	Vout OP	1.0 V	Op_Point	Operational Output Voltage
11.	Duty Cycle	6.127 %	Op_point	Duty cycle

#	Name	Value	Category	Description
12.	Efficiency	73.711 %	Op_point	Steady state efficiency
13.	IC Tj	34.862 degC	Op_point	IC junction temperature
14.	ICThetaJA	17.76 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	1.0 A	Op_point	Iout operating point
16.	VIN_OP	18.0 V	Op_point	Vin operating point
17.	Vout p-p	15.391 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	144.089 μ W	Power	Input capacitor power dissipation
19.	Cout Pd	1.067 mW	Power	Output capacitor power dissipation
20.	IC Iq Pd	3.252 mW	Power	IC Iq Pd
21.	IC Pd	273.778 mW	Power	IC power dissipation
22.	L Pd	81.648 mW	Power	Inductor power dissipation
23.	Total Pd	356.648 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0 A	Maximum Output Current
2.	Iout1	1.0 Amps	Output Current #1
3.	VinMax	18.0 V	Maximum input voltage
4.	VinMin	4.5 V	Minimum input voltage
5.	Vout	1.0 V	Output Voltage
6.	Vout1	1.0 Volt	Output Voltage #1
7.	base_pn	TPS56528	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

Design Assistance

1. TPS56528 Product Folder : <http://www.ti.com/product/tps56528> : contains the data sheet and other resources.

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