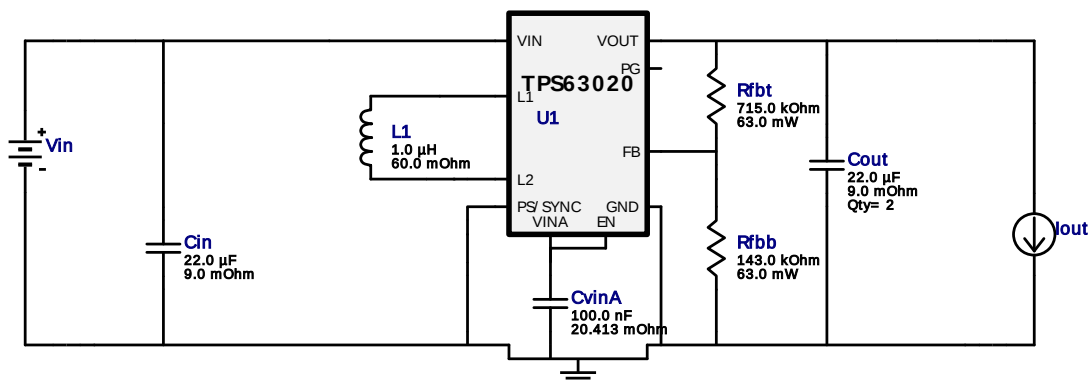


WEBENCH® Design Report

Design : 3779120/647 TPS63020DSJR
TPS63020DSJR 2.8V-4.0V to 3.0V @ 0.5A

VinMin = 2.8V
VinMax = 4.0V

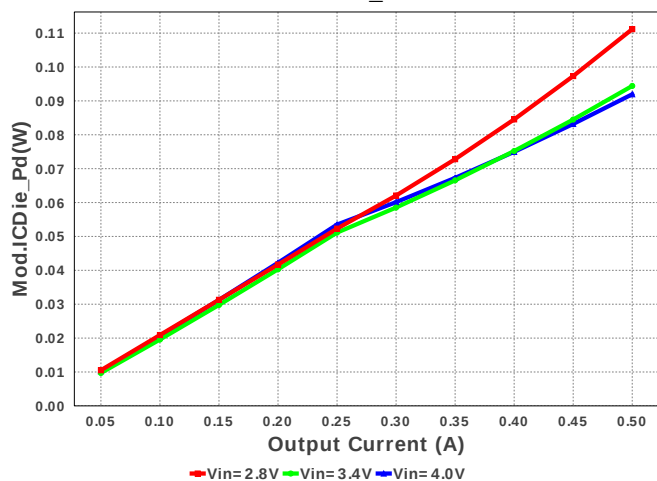
Vout = 3.0V
Iout = 0.5A



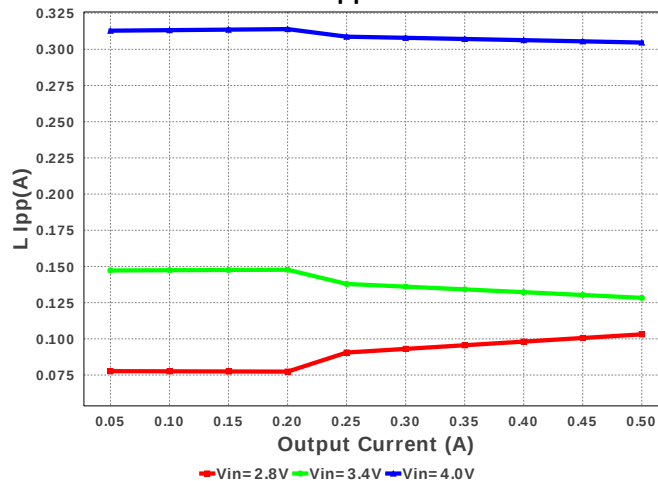
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	\$0.03	 0805 7mm2
2.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	2	\$0.03	 0805 7mm2
3.	CvinA	TDK	C1005X5R0J104K Series= 285	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 1005 3mm2
4.	L1	TDK	MLP2520K1R0MT	L= 1.0 uH DCR= 60.0 mOhm	1	\$0.14	 MLP2520K-M 11mm2
5.	Rfbb	Vishay-Dale	CRCW0402143KFKED Series= CRCW..e3	Res= 143.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
6.	Rfbb	Vishay-Dale	CRCW0402143KFKED Series= CRCW..e3	Res= 143.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
7.	U1	Texas Instruments	TPS63020DSJR	Switcher	1	\$1.90	 R-PVSON-N14 20mm2

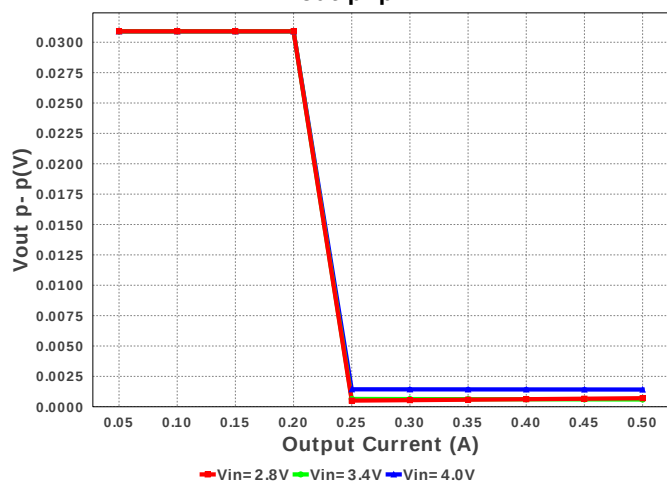
Mod.ICDie_Pd



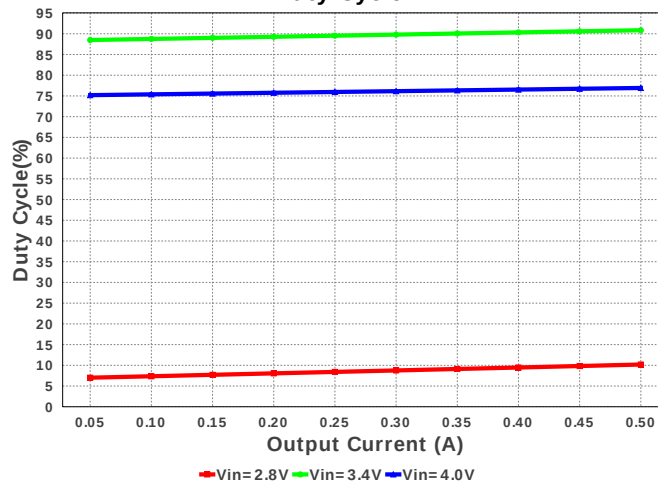
L Ipp



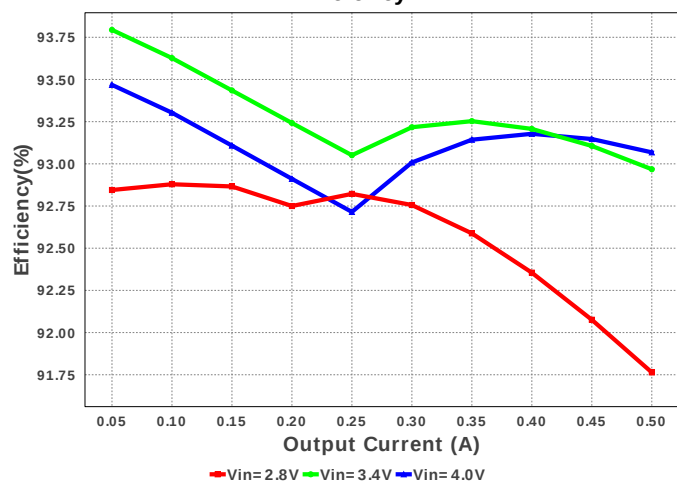
Vout p- p



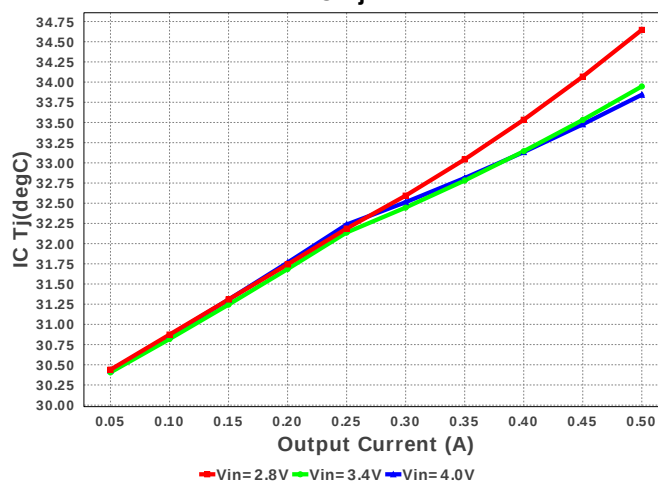
Duty Cycle

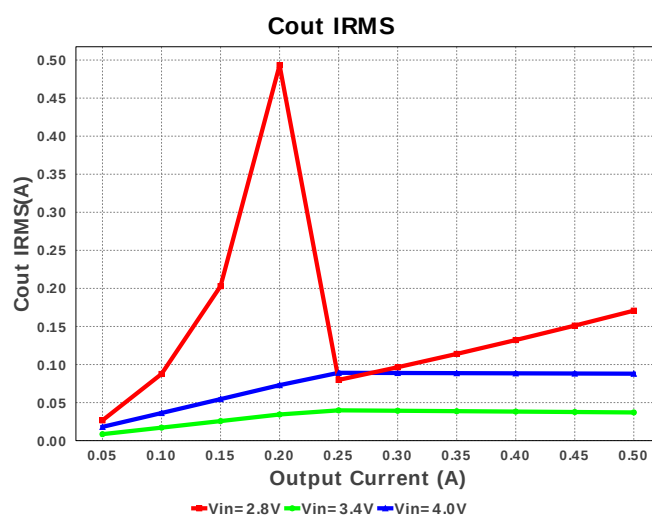
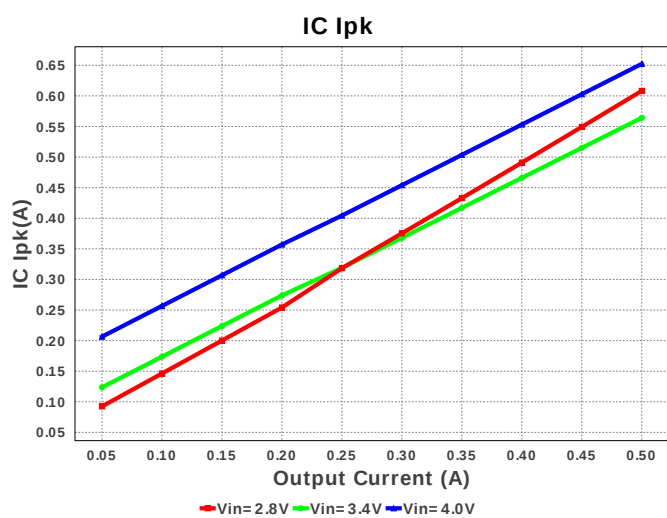
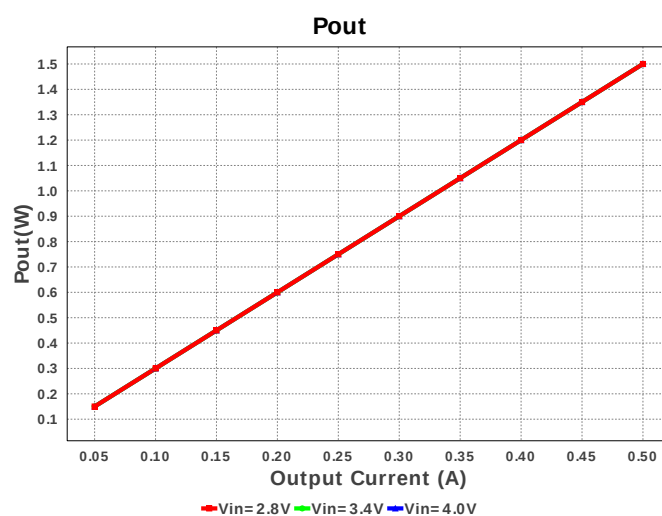
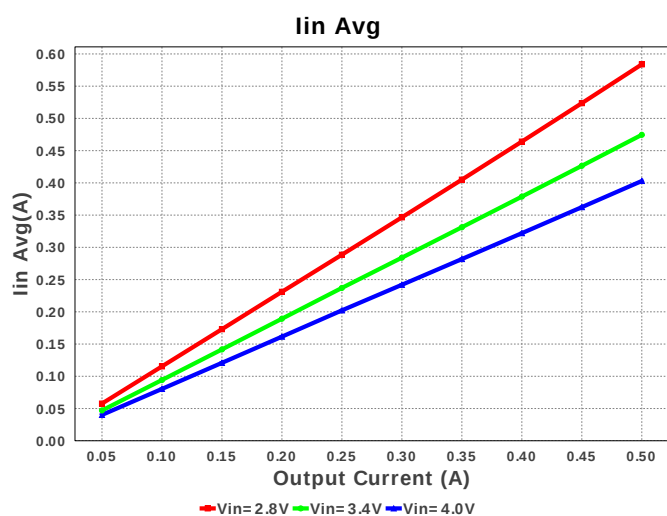
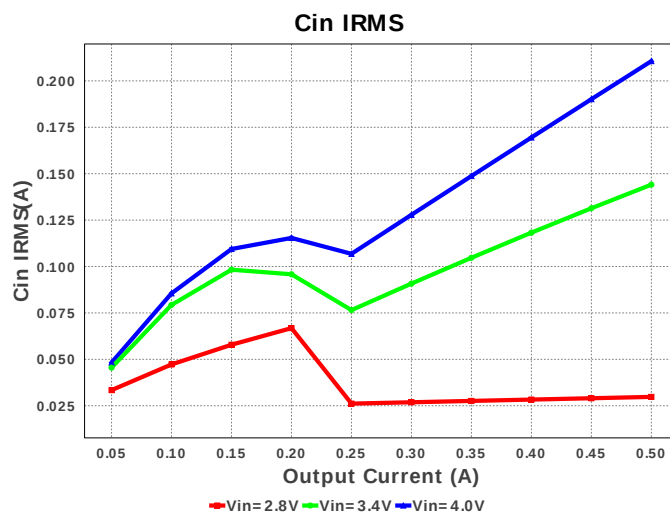
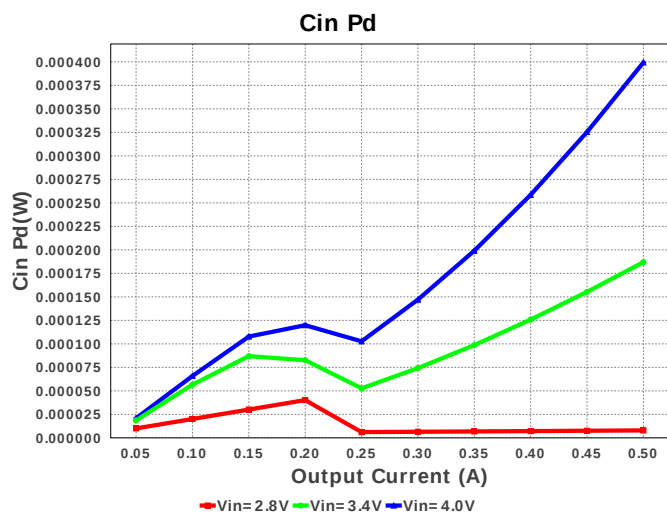


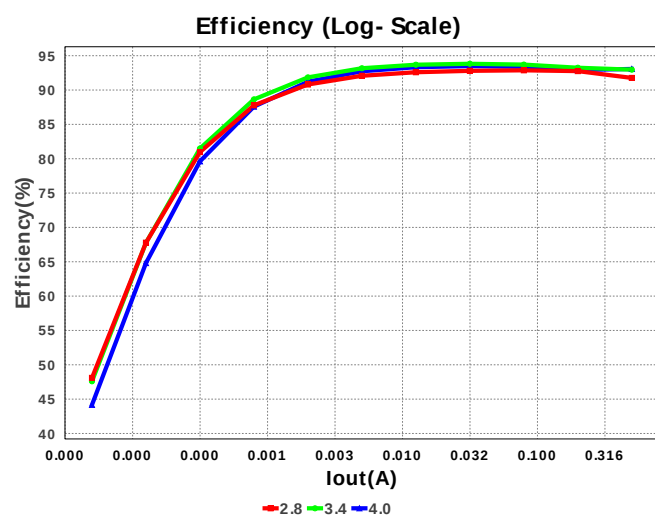
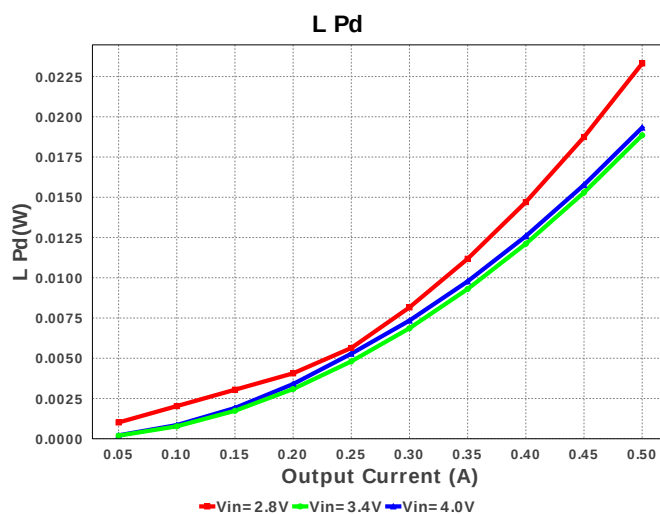
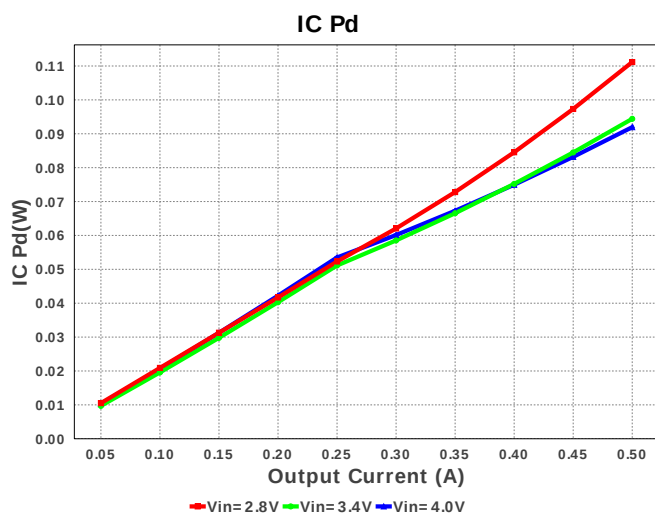
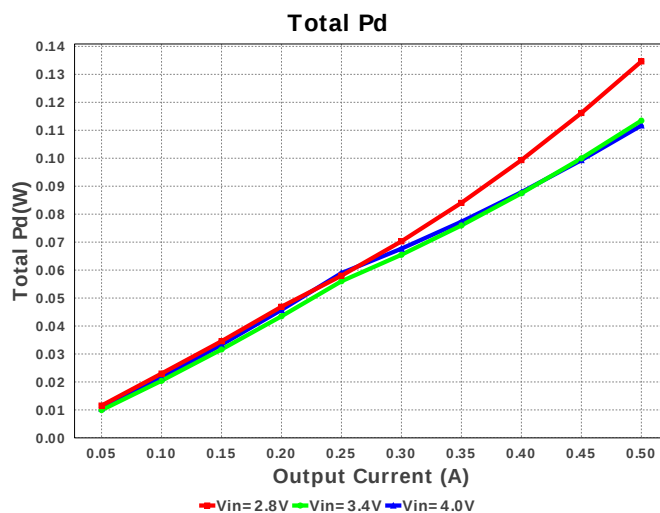
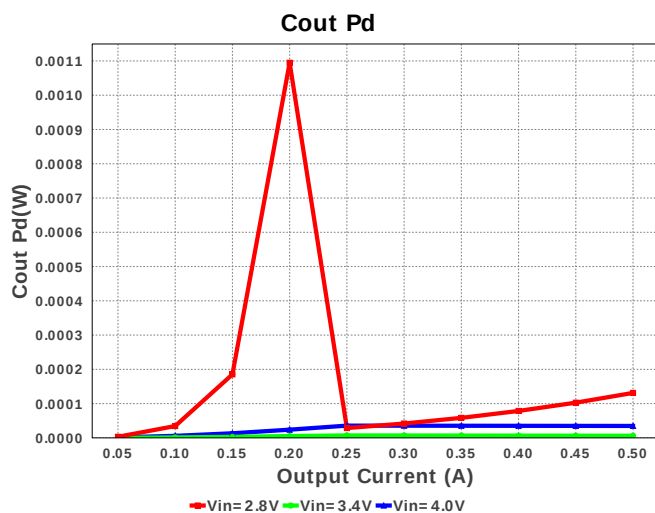
Efficiency



IC Tj







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	29.76 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	170.758 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	608.271 mA	Current	Peak switch current in IC
4.	Iin Avg	583.8 mA	Current	Average input current
5.	L Ipp	103.091 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	8	General	Total Design BOM count
7.	FootPrint	61.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	2.4 MHz	General	Switching frequency
9.	IC Tolerance	5.0 mV	General	IC Feedback Tolerance
10.	Pout	1.5 W	General	Total output power
11.	Total BOM	\$2.15	General	Total BOM Cost

#	Name	Value	Category	Description
12.	Duty Cycle	10.189 %	Op_point	Duty cycle
13.	Efficiency	91.764 %	Op_point	Steady state efficiency
14.	IC Tj	34.647 degC	Op_point	IC junction temperature
15.	ICThetaJA	41.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	500.0 mA	Op_point	Iout operating point
17.	VIN_OP	2.8 V	Op_point	Vin operating point
18.	Vout p-p	705.13 μ V	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	7.971 μ W	Power	Input capacitor power dissipation
20.	Cout Pd	131.212 μ W	Power	Output capacitor power dissipation
21.	IC Pd	111.165 mW	Power	IC power dissipation
22.	L Pd	23.312 mW	Power	Inductor power dissipation
23.	Total Pd	134.629 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 mA	Maximum Output Current
2.	Iout1	500.0 mAmps	Output Current #1
3.	VinMax	4.0 V	Maximum input voltage
4.	VinMin	2.8 V	Minimum input voltage
5.	Vout	3.0 V	Output Voltage
6.	Vout1	3.0 Volt	Output Voltage #1
7.	base_pn	TPS63020	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **TPS63020** Product Folder : <http://www.ti.com/product/tps63020> : contains the data sheet and other resources.

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