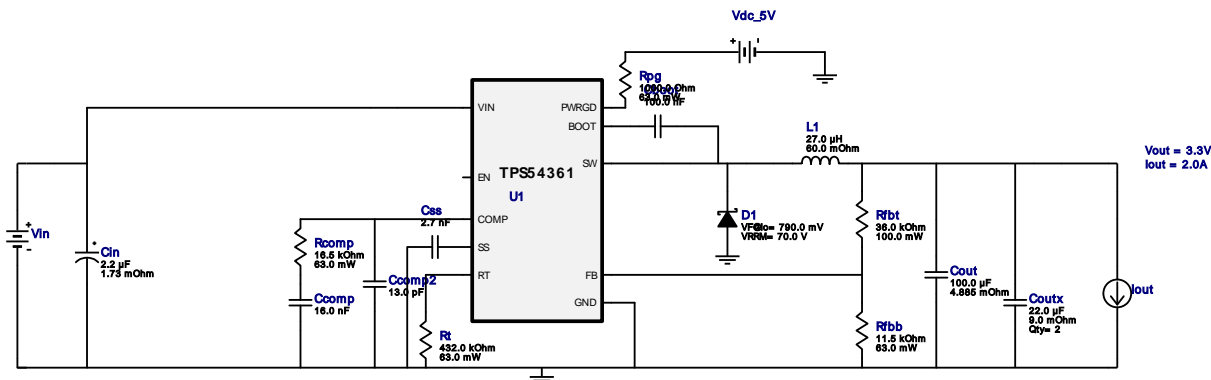







## WEBENCH® Design Report

Design : 4466246/55 TPS54361DPRR  
TPS54361DPRR 48.0V-60.0V to 3.30V @ 2.0A

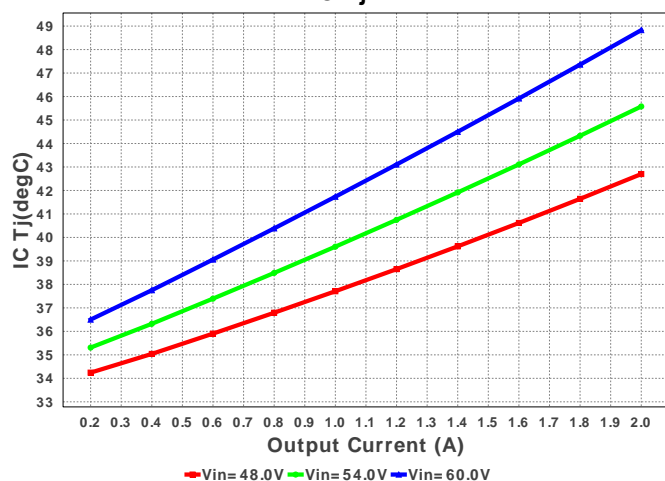


## Electrical BOM

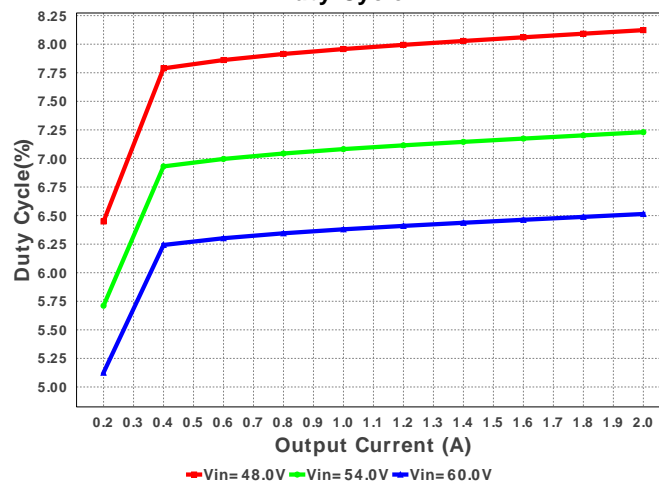
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm <sup>2</sup>
2.	Ccomp	MuRata	GRM55N5C1H163JD01L Series= C0G/NP0	Cap= 16.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$1.26	 2220 54 mm <sup>2</sup>
3.	Ccomp2	Samsung Electro-Mechanics	CL21C130JBANNNC Series= C0G/NP0	Cap= 13.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
4.	Cin	TDK	C3225X7R2A225K230AB Series= X7R	Cap= 2.2 uF ESR= 1.73 mOhm VDC= 100.0 V IRMS= 5.5932 A	1	\$0.19	 1210_250 15 mm <sup>2</sup>
5.	Cout	MuRata	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 A	1	\$0.14	 1206_190 11 mm <sup>2</sup>
6.	Coutx	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	2	\$0.04	 0805 7 mm <sup>2</sup>
7.	Css	Yageo America	CC0805KRX7R9BB272 Series= X7R	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
8.	D1	Diodes Inc.	B370-13-F	VF@Io= 790.0 mV VRRM= 70.0 V	1	\$0.22	 SMC 83 mm <sup>2</sup>
9.	L1	Bourns	SDR1307-270ML	L= 27.0 uH DCR= 60.0 mOhm	1	\$0.35	 SDR1307 227 mm <sup>2</sup>
10.	Rcomp	Vishay-Dale	CRCW040216K5FKED Series= CRCW..e3	Res= 16.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rfbb	Vishay-Dale	CRCW040211K5FKED Series= CRCW..e3	Res= 11.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
12.	Rfbt	Yageo America	RC0603FR-0736KL Series= ?	Res= 36.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm <sup>2</sup>
13.	Rpg	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
14.	Rt	Vishay-Dale	CRCW0402432KFKED Series= CRCW..e3	Res= 432.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
15.	U1	Texas Instruments	TPS54361DPRR	Switcher	1	\$2.60	 DPR0010A 25 mm <sup>2</sup>

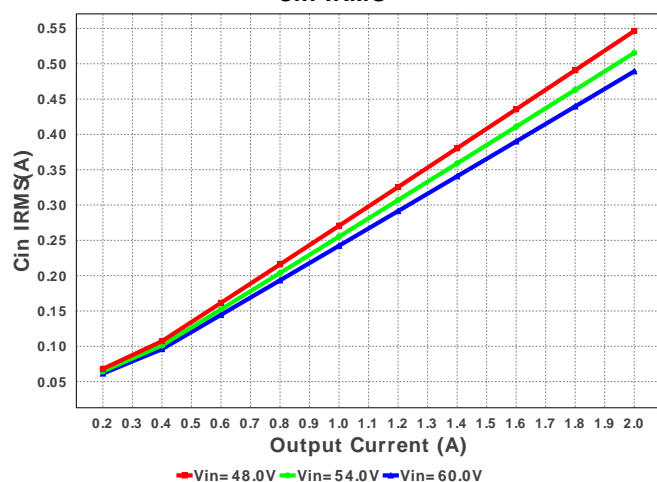
IC Tj



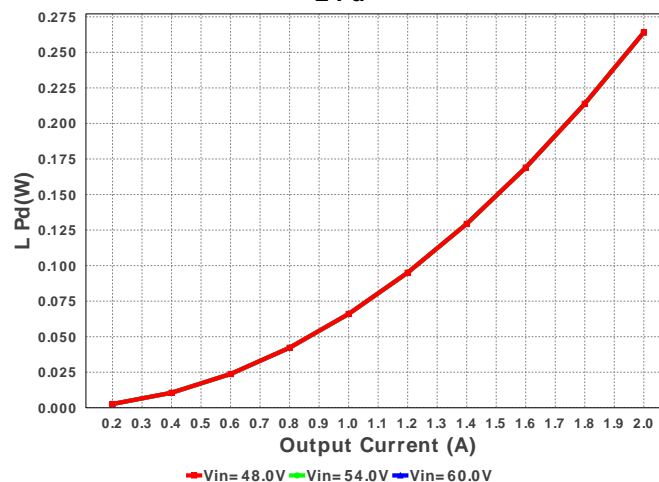
Duty Cycle

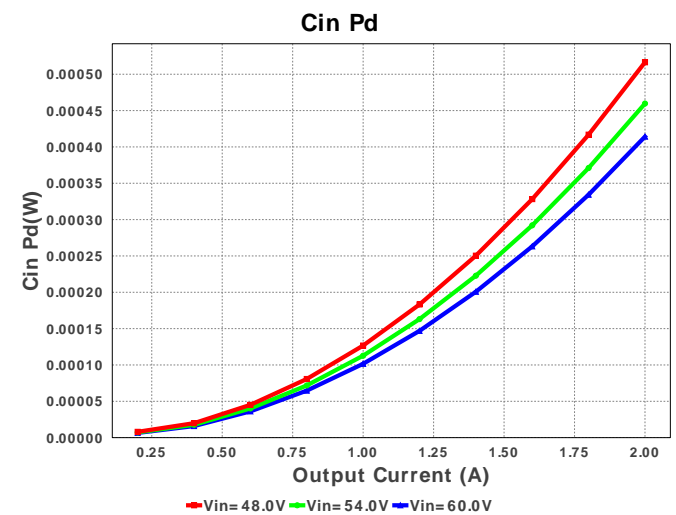
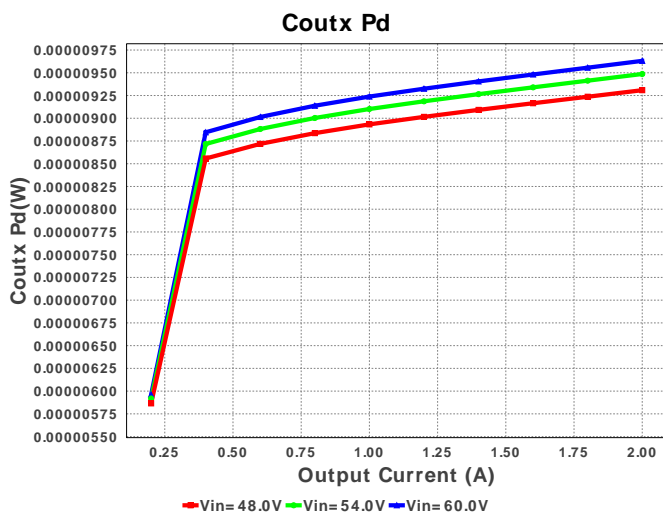
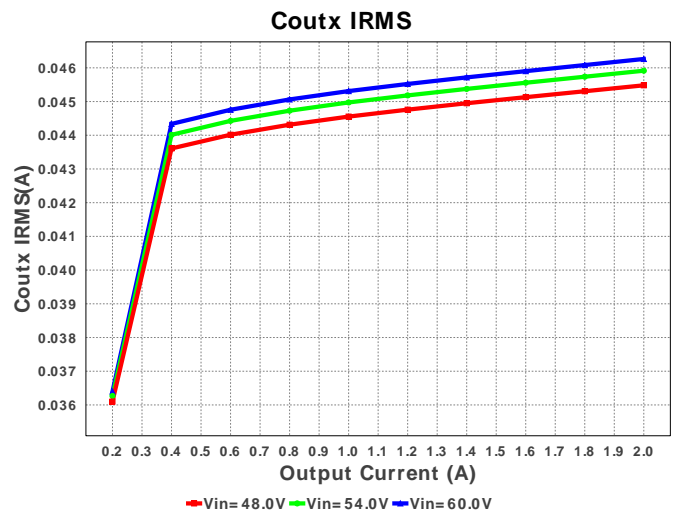
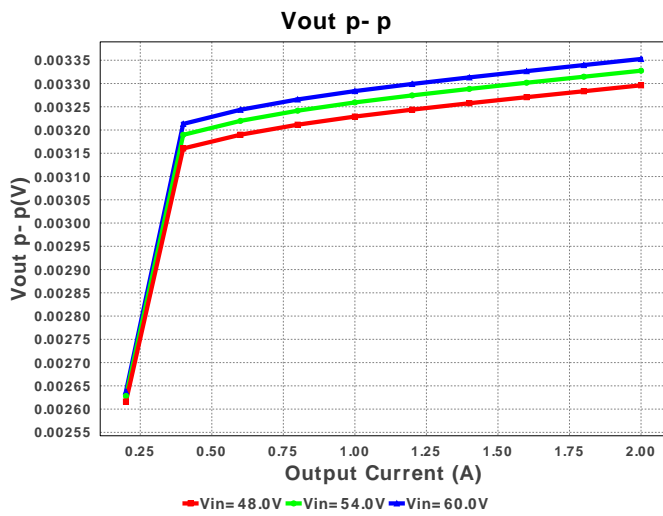
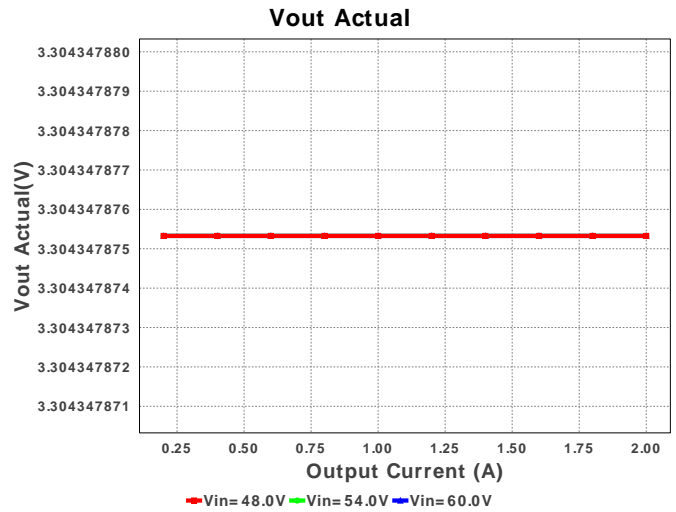
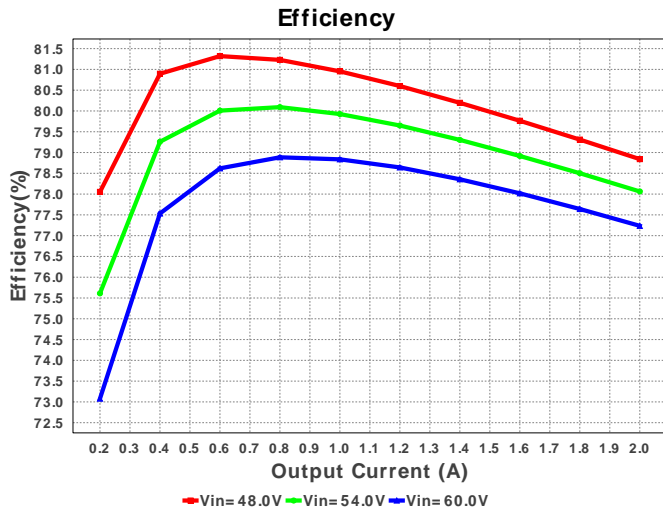


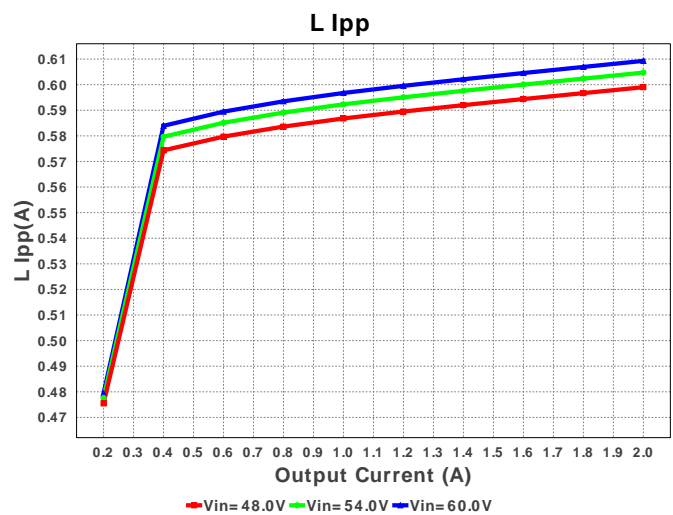
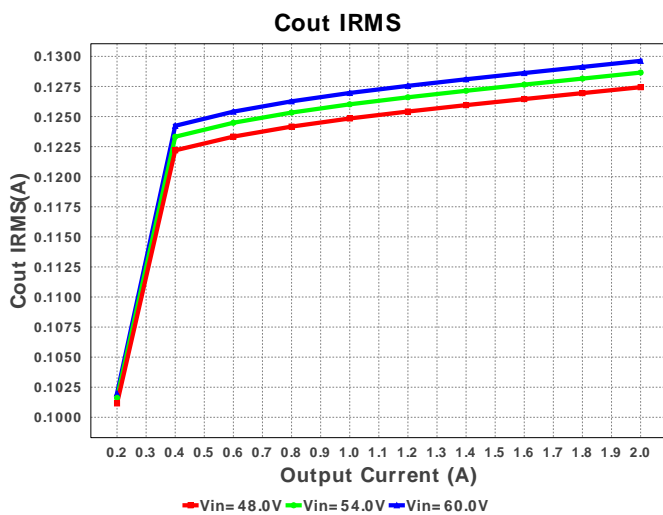
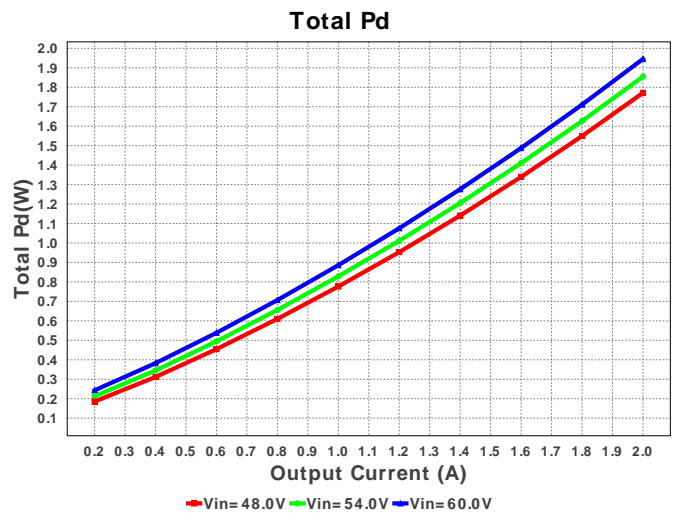
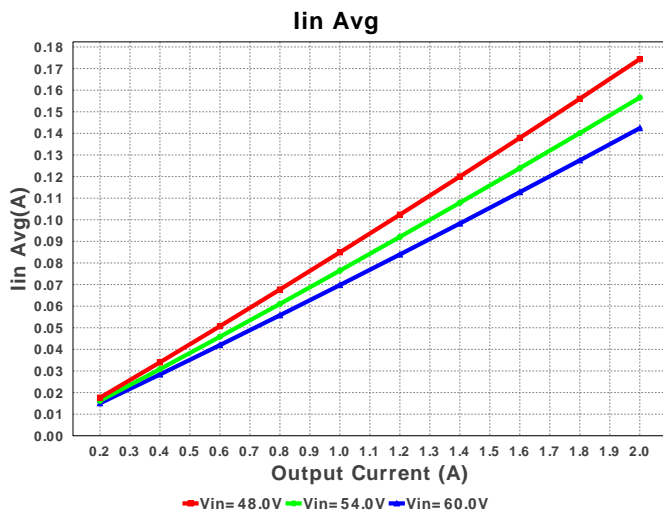
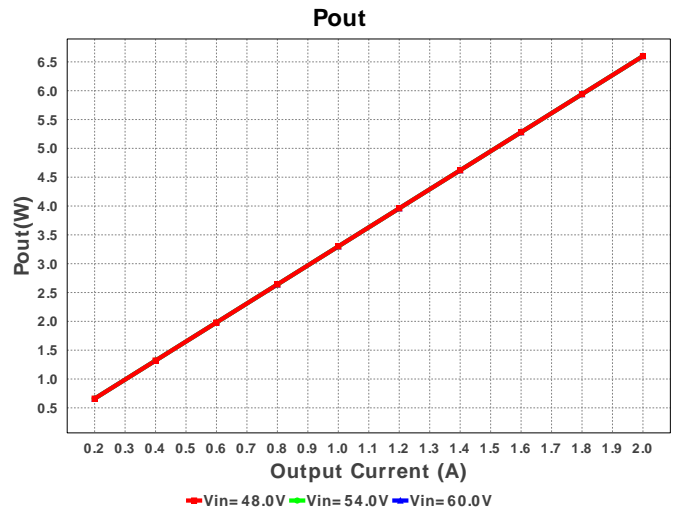
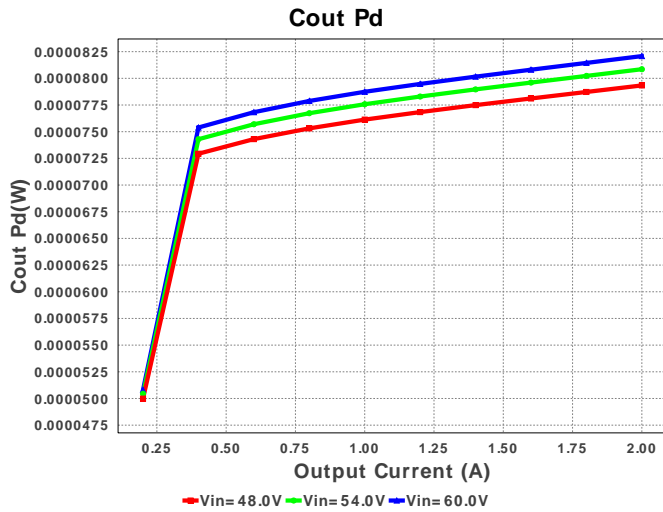
Cin IRMS

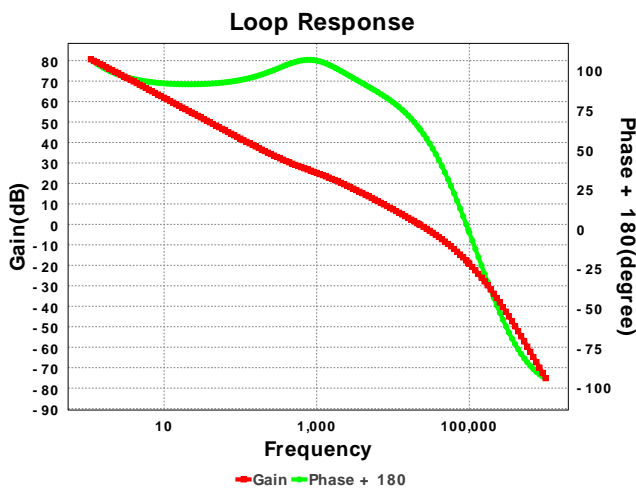
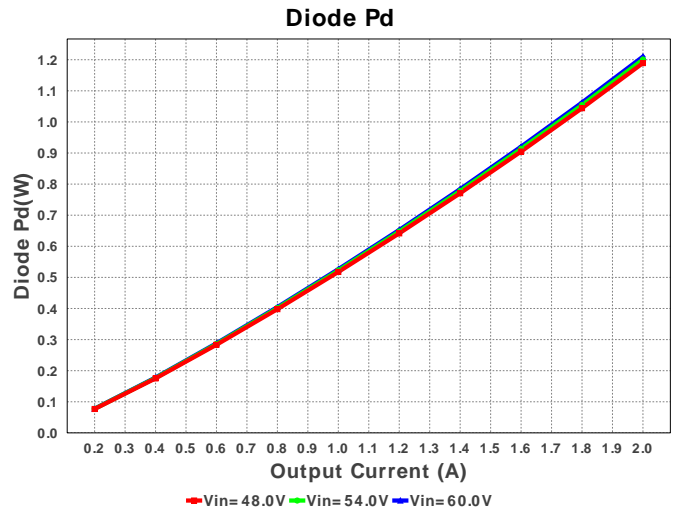
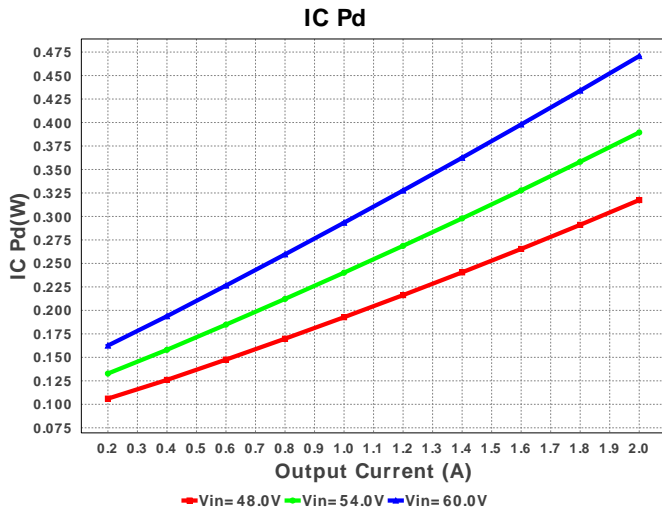


L Pd









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	491.963 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	131.189 mA	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	46.82 mA	Current	Output capacitor_x RMS ripple current
4.	Iin Avg	144.0 mA	Current	Average input current
5.	L Ipp	616.64 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	16	General	Total Design BOM count
7.	FootPrint	461.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	224.511 kHz	General	Switching frequency
9.	Pout	6.6 W	General	Total output power
10.	Total BOM	\$4.92	General	Total BOM Cost
11.	ICThetaJA Effective	40.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
12.	Low Freq Gain	80.636 dB	Op_Point	Gain at 10Hz
13.	Vout Actual	3.304 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
15.	Cross Freq	22.205 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	6.592 %	Op_point	Duty cycle
17.	Efficiency	76.392 %	Op_point	Steady state efficiency
18.	Gain Marg	-18.667 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	48.841 degC	Op_point	IC junction temperature
20.	IOUT_OP	2.0 A	Op_point	Iout operating point
21.	Phase Marg	63.923 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	60.0 V	Op_point	Vin operating point
23.	Vout p-p	3.393 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	418.707 $\mu$ W	Power	Input capacitor power dissipation
25.	Cout Pd	84.074 $\mu$ W	Power	Output capacitor power dissipation
26.	Coutx Pd	9.864 $\mu$ W	Power	Output capacitor_x power loss
27.	Diode Pd	1.304 W	Power	Diode power dissipation
28.	IC Pd	471.025 mW	Power	IC power dissipation
29.	L Pd	264.0 mW	Power	Inductor power dissipation
30.	Total Pd	2.04 W	Power	Total Power Dissipation

#	Name	Value	Category	Description
31.	Vout Tolerance	2.546 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

## Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	60.0	Maximum input voltage
3.	VinMin	48.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS54361	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

## Design Assistance

1. **TPS54361** Product Folder : <http://www.ti.com/product/TPS54361> : contains the data sheet and other resources.

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