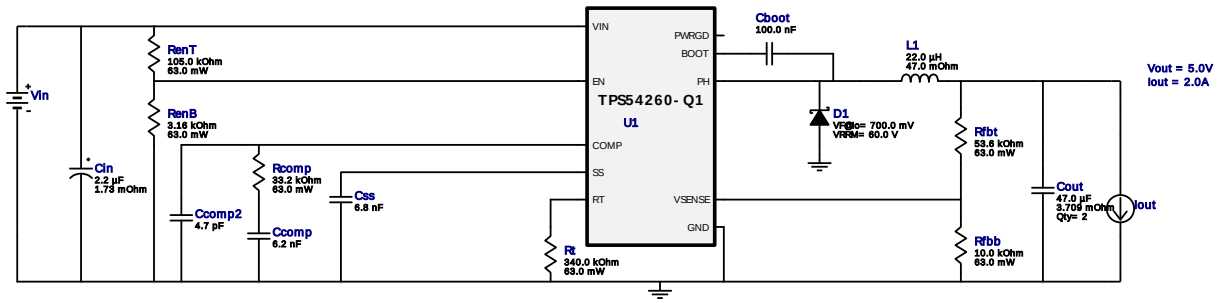
VinMin = 48.0V
VinMax = 48.0V
Vout = 5.0V
Iout = 2.0A

Device = TPS54260QDGQRQ1
Topology = Buck
Created = 7/19/16 8:19:59 PM
BOM Cost = $3.21
BOM Count = 16
Total Pd = 1.9W

WEBENCH® Design Report

Design : 4730153/23 TPS54260QDGQRQ1
TPS54260QDGQRQ1 48.0V-48.0V to 5.00V @ 2.0A

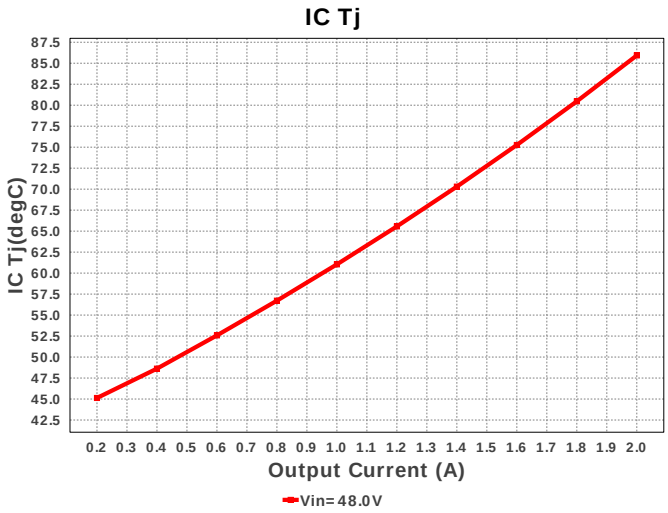


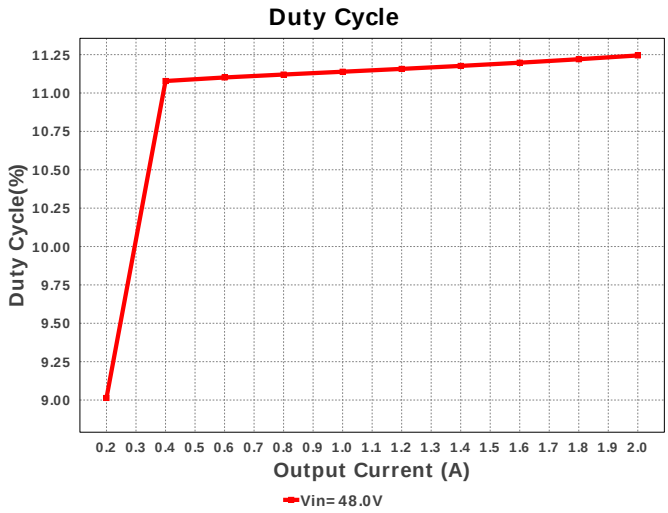
1. This regulator device is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific application.View WEBENCH(R) Disclaimer.

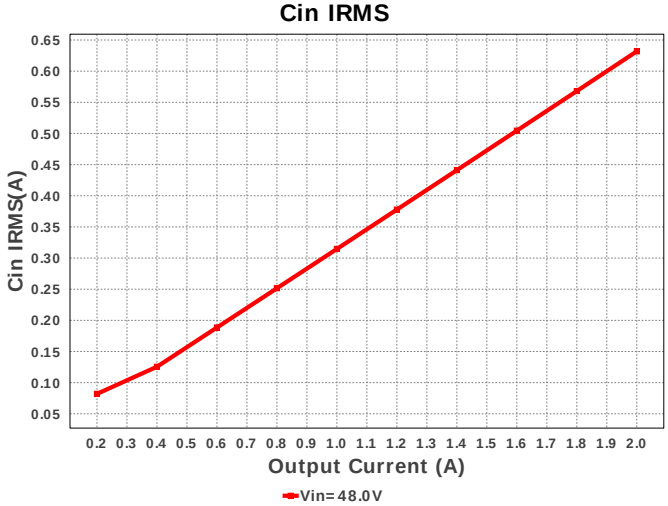
Electrical BOM

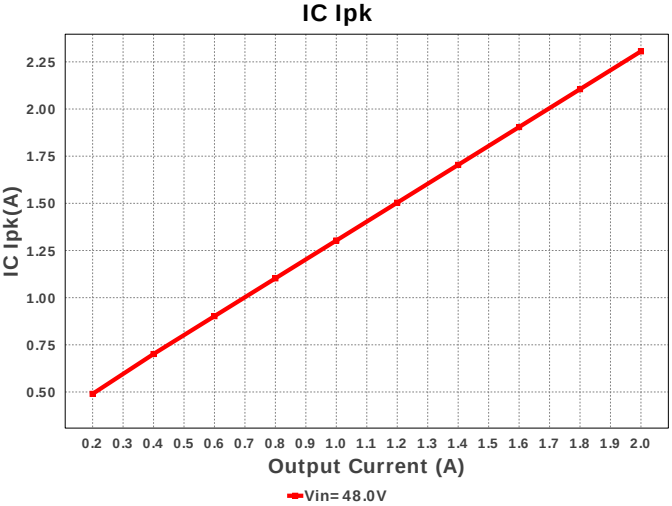
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	$0.01	0402 3 mm²
2.	Ccomp	MuRata	GRM2195C1H622JA01D Series= C0G/NP0	Cap= 6.2 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.04	0805 7 mm²
3.	Ccomp2	MuRata	GRM1555C1H4R7CA01D Series= C0G/NP0	Cap= 4.7 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0402 3 mm²
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 mm²
5.	Cout	MuRata	GRM31CR61A476KE15L Series= X5R	Cap= 47.0 uF ESR= 3.709 mOhm VDC= 10.0 V IRMS= 4.2862 A	2	$0.15	1206_190 11 mm²
6.	Css	Yageo America	CC0805KRX7R9BB682 Series= X7R	Cap= 6.8 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
7.	D1	Diodes Inc.	B360A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	$0.12	SMA 37 mm²
8.	L1	Bourns	SDR1307-220ML	L= 22.0 µH DCR= 47.0 mOhm	1	$0.35	SDR1307 227 mm²
9.	Rcomp	Vishay-Dale	CRCW040233K2FKED Series= CRCW..e3	Res= 33.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
10.	RenB	Vishay-Dale	CRCW04023K16FKED Series= CRCW..e3	Res= 3.16 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

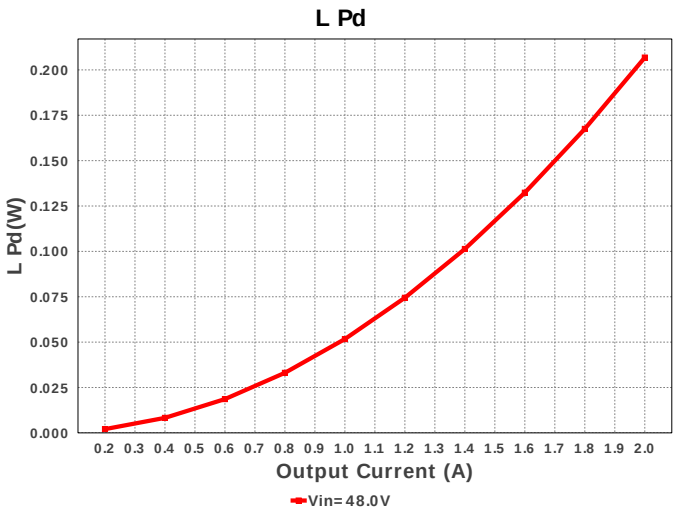
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	RenT	Vishay-Dale	CRCW0402105KFKED Series= CRCW..e3	Res= 105.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
12.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
13.	Rfbt	Vishay-Dale	CRCW040253K6FKED Series= CRCW..e3	Res= 53.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
14.	Rt	Vishay-Dale	CRCW0402340KFKED Series= CRCW..e3	Res= 340.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
15.	U1	Texas Instruments	TPS54260QDGQRQ1	Switcher	1	$2.12	S-PDSO-G10 24 mm²

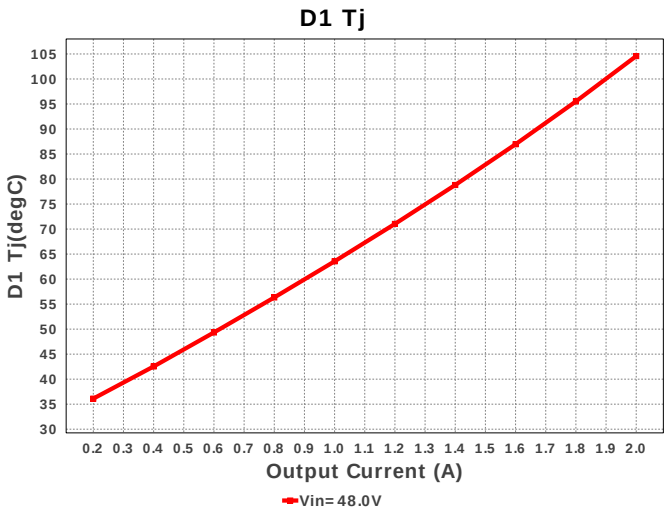


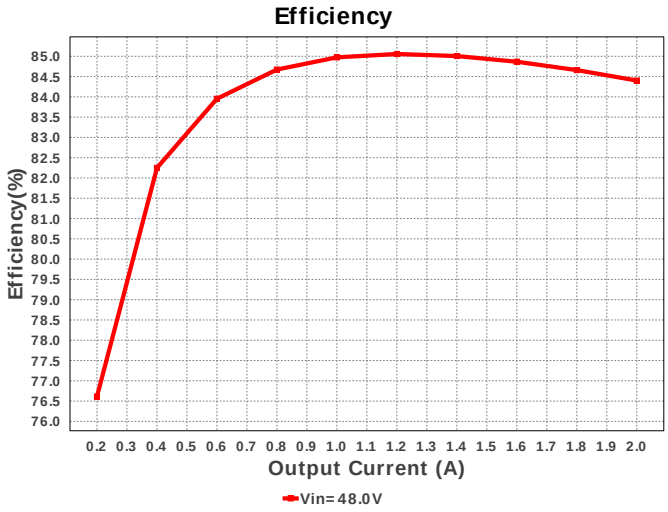


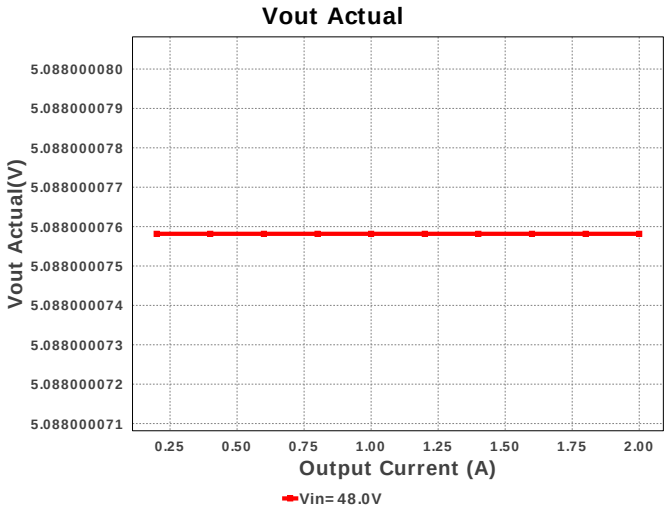


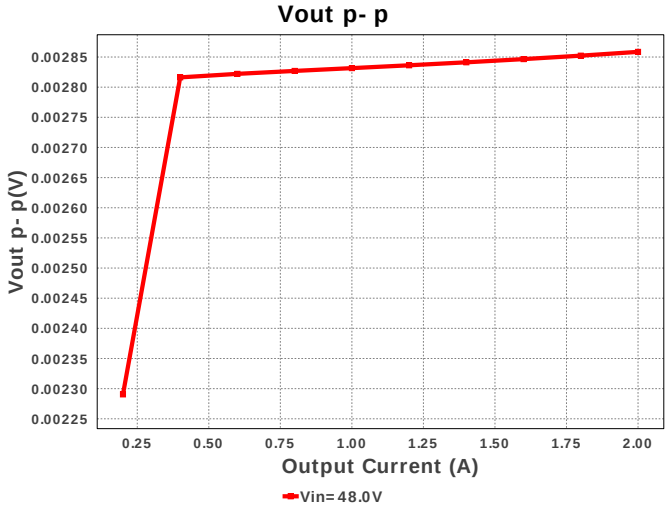


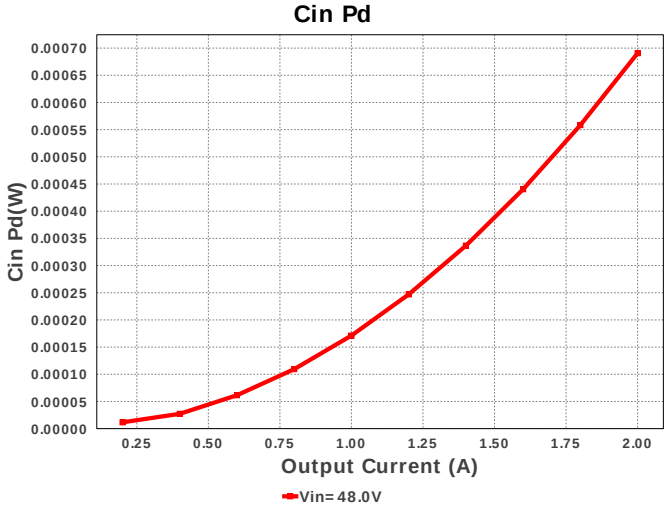


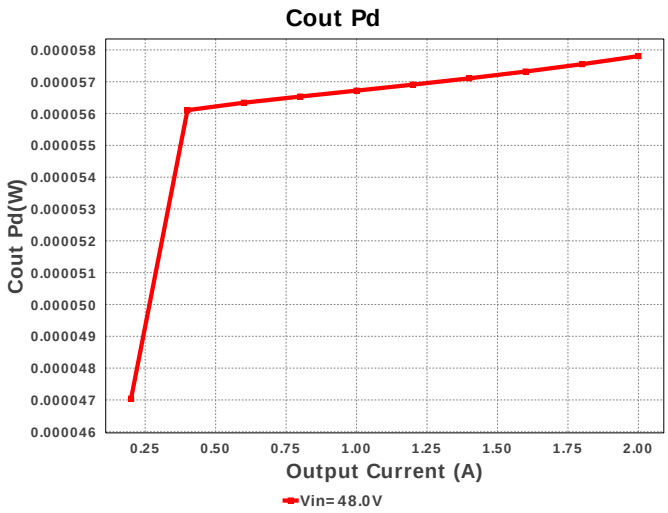


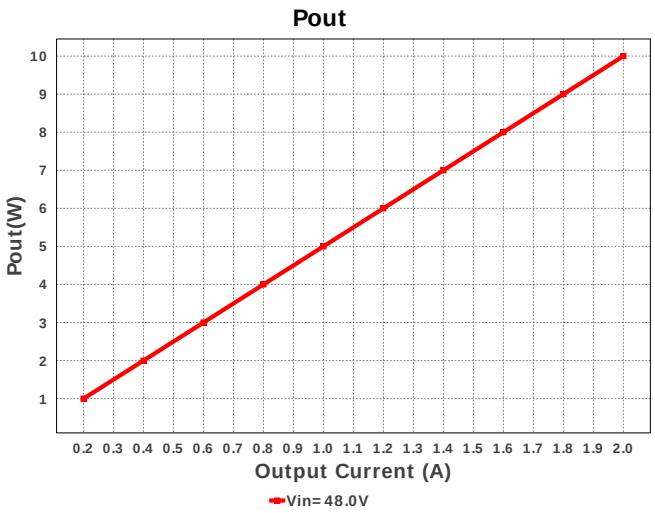


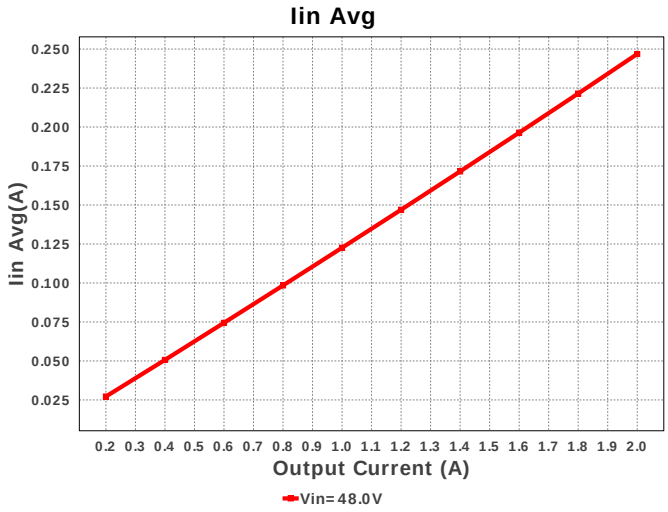


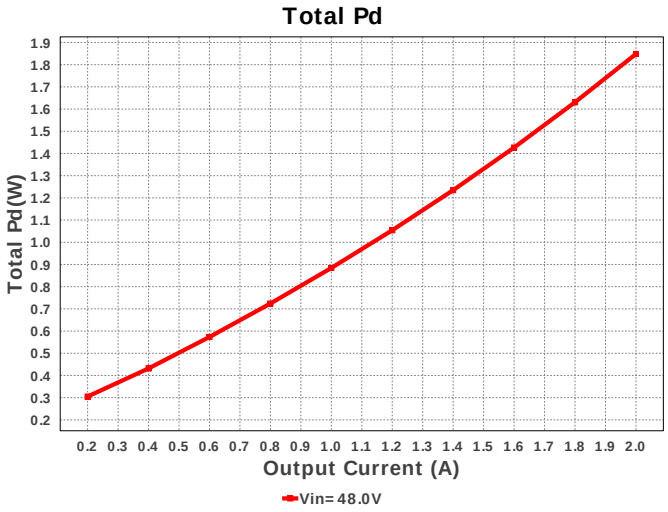


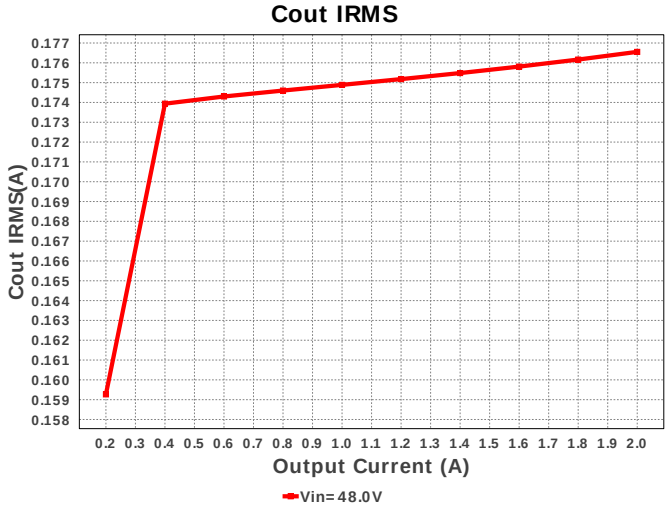


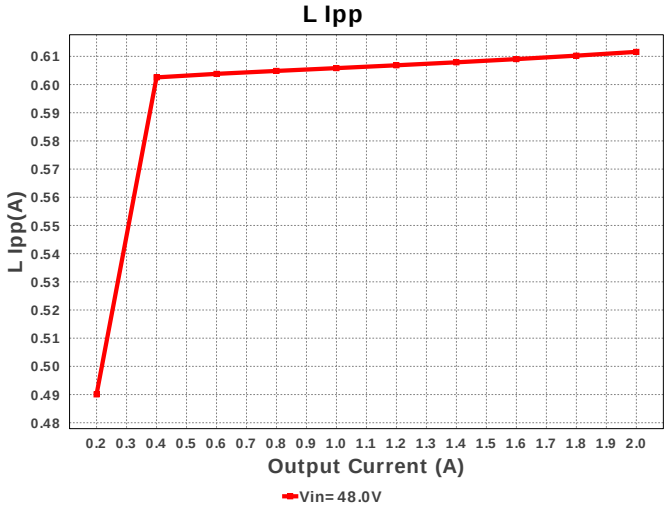


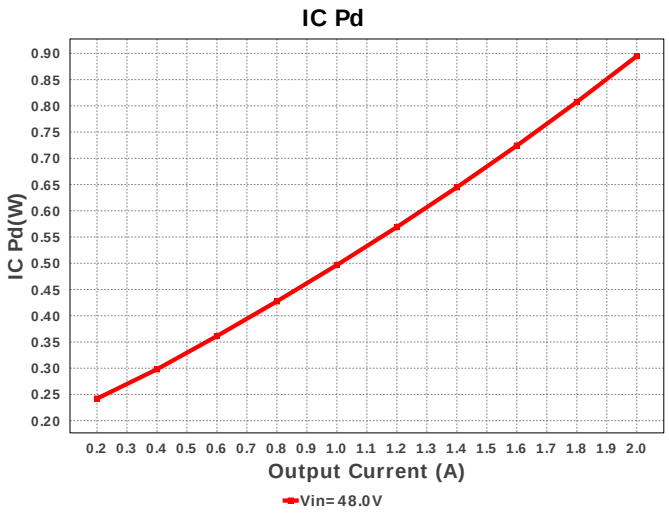


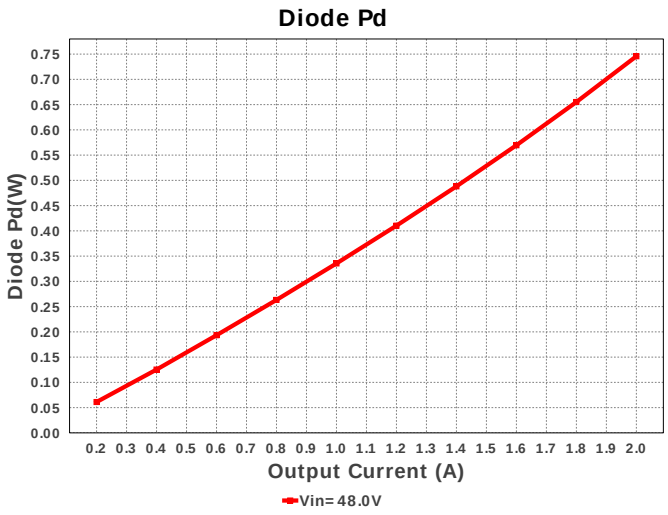


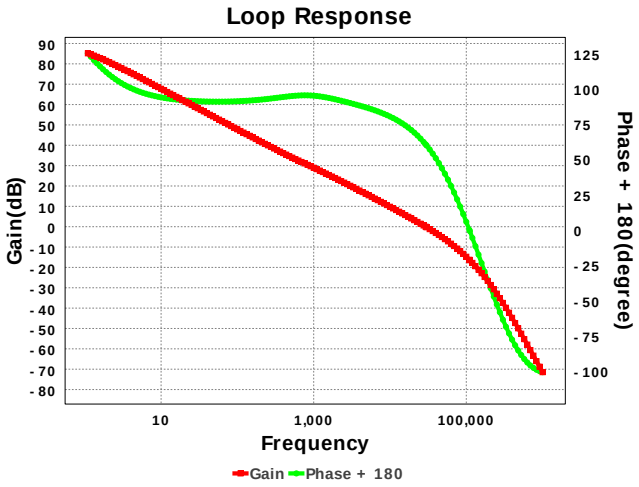












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	633.227 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	177.448 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.0 A	Current	Peak switch current in IC
4.	Iin Avg	247.98 mA	Current	Average input current
5.	L Ipp	614.7 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	16	General	Total Design BOM count
7.	FootPrint	361.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	359.358 kHz	General	Switching frequency
9.	Pout	10.0 W	General	Total output power
10.	Total BOM	$3.21	General	Total BOM Cost
11.	D1 Tj	110.011 degC	Op_Point	D1 junction temperature
12.	Low Freq Gain	85.142 dB	Op_Point	Gain at 10Hz
13.	Vout Actual	5.088 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
15.	Cross Freq	29.266 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	11.302 %	Op_point	Duty cycle
17.	Efficiency	84.011 %	Op_point	Steady state efficiency
18.	Gain Marg	-16.512 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	85.975 degC	Op_point	IC junction temperature
20.	ICThetaJA	62.5 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	2.0 A	Op_point	Iout operating point
22.	Phase Marg	61.144 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	48.0 V	Op_point	Vin operating point
24.	Vout p-p	2.873 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	693.689 µW	Power	Input capacitor power dissipation
26.	Cout Pd	58.394 µW	Power	Output capacitor power dissipation
27.	Diode Pd	800.109 mW	Power	Diode power dissipation
28.	IC Pd	895.603 mW	Power	IC power dissipation
29.	L Pd	206.8 mW	Power	Inductor power dissipation
30.	Total Pd	1.903 W	Power	Total Power Dissipation

#	Name	Value	Category	Description
31.	Vout Tolerance	2.72 %		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	48.0	Maximum input voltage
3.	VinMin	48.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS54260-Q1	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. The TPS54260-Q1 is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific application

2. **TPS54260-Q1** Product Folder : http://www.ti.com/product/TPS54260%2DQ1 : contains the data sheet and other resources.