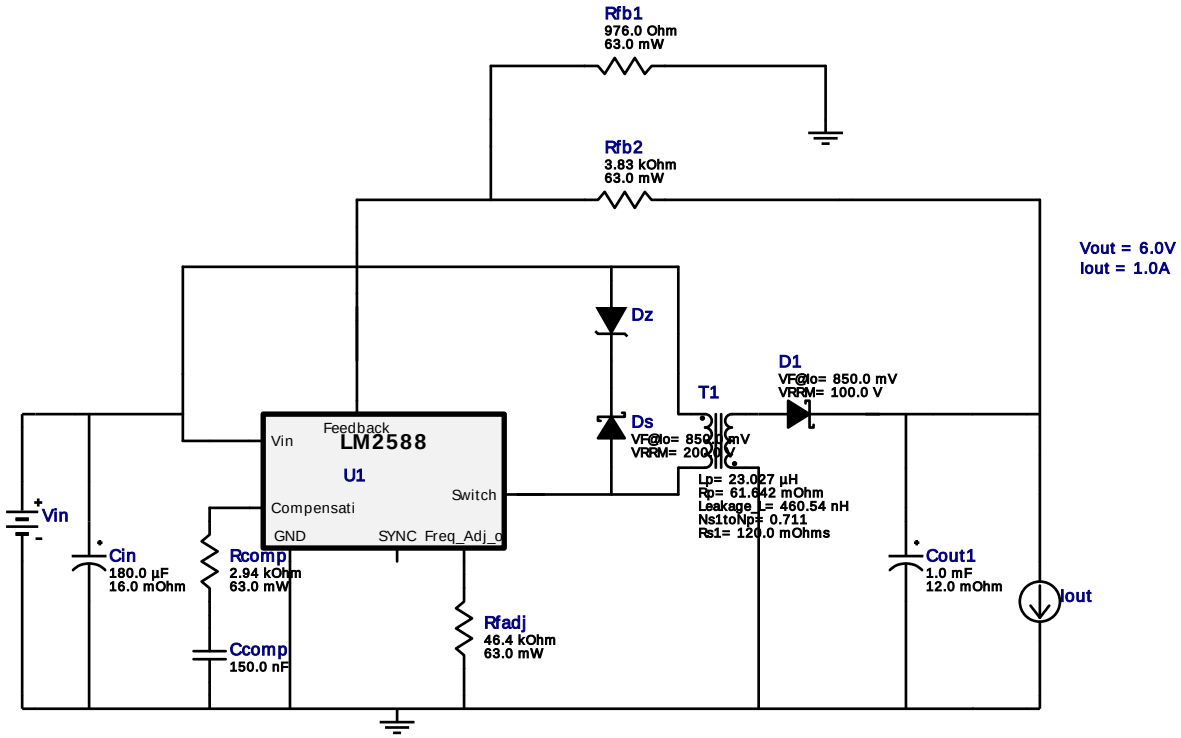
WEBENCH® Design Report

VinMin = 6.0V
VinMax = 16.0V
Vout = 6.0V
Iout = 1.0A

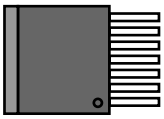
Device = LM2588S-ADJ/NOPB
Topology = Flyback
Created = 9/12/16 6:59:47 PM
BOM Cost = $0.00
BOM Count = 12
Total Pd = 2.56W

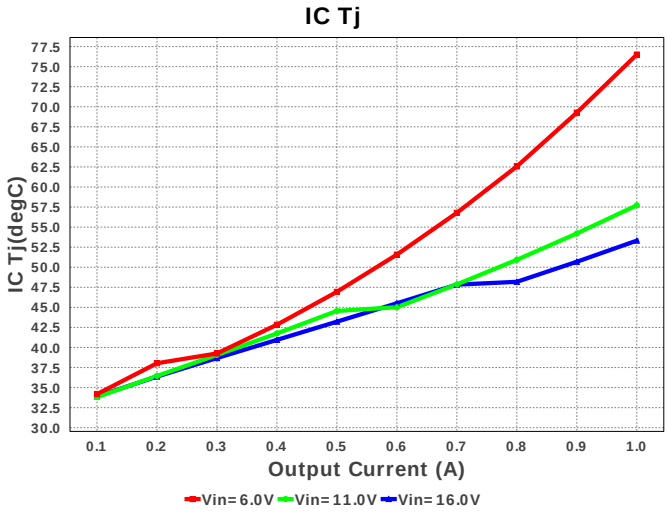
Design : 1542746/891 LM2588S-ADJ/NOPB
LM2588S-ADJ/NOPB 6.0V-16.0V to 6.00V @ 1.0A

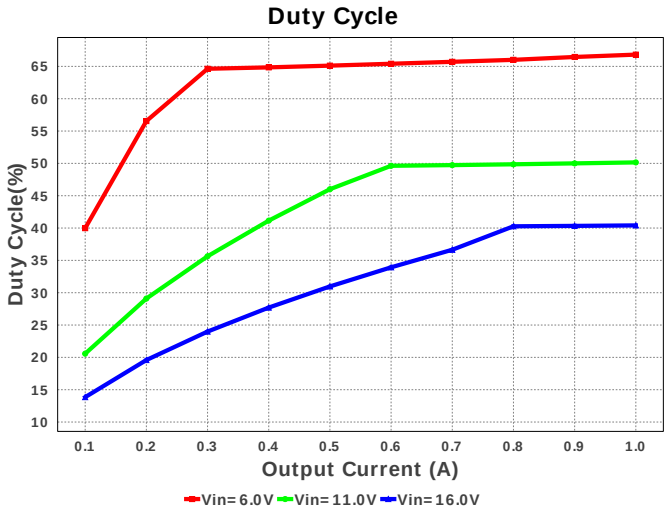


Electrical BOM

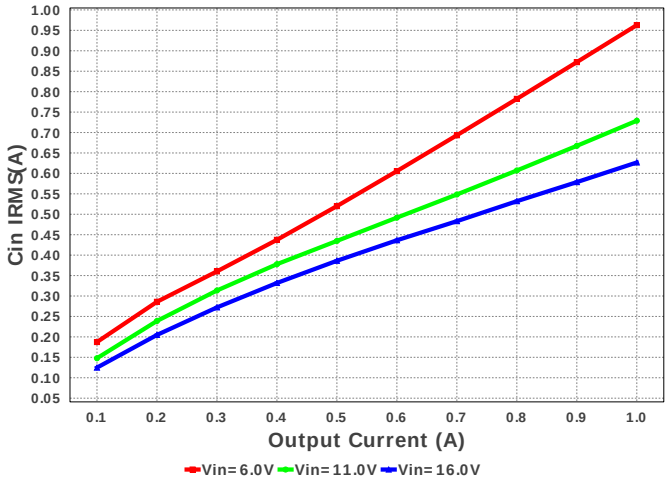
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	MuRata	GRM155R60J154KE01D Series= X5R	Cap= 150.0 nF VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm²
2.	Cin	Panasonic	25SVPF180M Series= ?	Cap= 180.0 uF ESR= 16.0 mOhm VDC= 25.0 V IRMS= 4.65 A	1	$0.61	CAPSMT_62_E12 106 mm²
3.	Cout1	Panasonic	16SVPF1000M Series= ?	Cap= 1.0 mF ESR= 12.0 mOhm VDC= 16.0 V IRMS= 5.4 A	1	$0.74	CAPSMT_62_F12 151 mm²
4.	D1	Micro Commercial Components	SK310A-TP	VF@Io= 850.0 mV VRRM= 100.0 V	1	$0.10	SMA 37 mm²
5.	Ds	Diodes Inc.	DFLS1200-7	VF@Io= 850.0 mV VRRM= 200.0 V	1	$0.21	PowerDI123 13 mm²
6.	Dz	Micro Commercial Components	3SMAJ5937B-TP	Zener	1	$0.12	SMA 37 mm²
7.	Rcomp	Vishay-Dale	CRCW04022K94FKED Series= CRCW..e3	Res= 2.94 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	Rfadj	Vishay-Dale	CRCW040246K4FKED Series= CRCW..e3	Res= 46.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
9.	Rfb1	Vishay-Dale	CRCW0402976RFKED Series= CRCW..e3	Res= 976.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
10.	Rfb2	Vishay-Dale	CRCW04023K83FKED Series= CRCW..e3	Res= 3.83 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
11.	T1	CUSTOM	CUSTOM	Lp= 23.027 µH Rp= 61.642 mOhm Leakage_L= 460.54 nH Ns1toNp= 0.711 Rs1= 120.0 mOhms	1	NA	CUSTOM 0 mm²
12.	U1	Texas Instruments	LM2588S-ADJ/NOPB	Switcher	1	$5.10	 TS7B 199 mm²

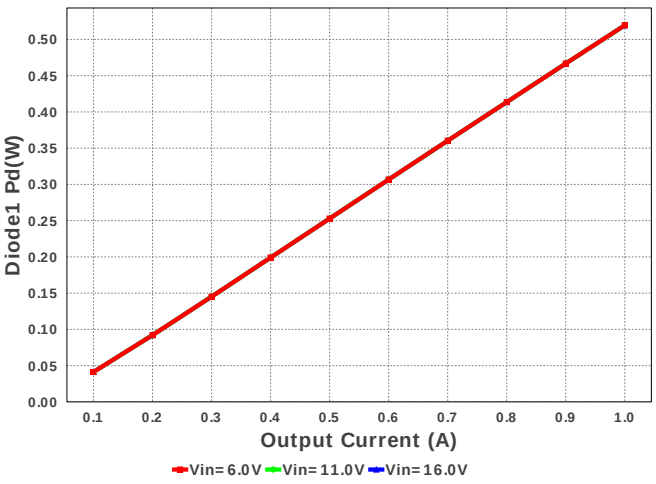




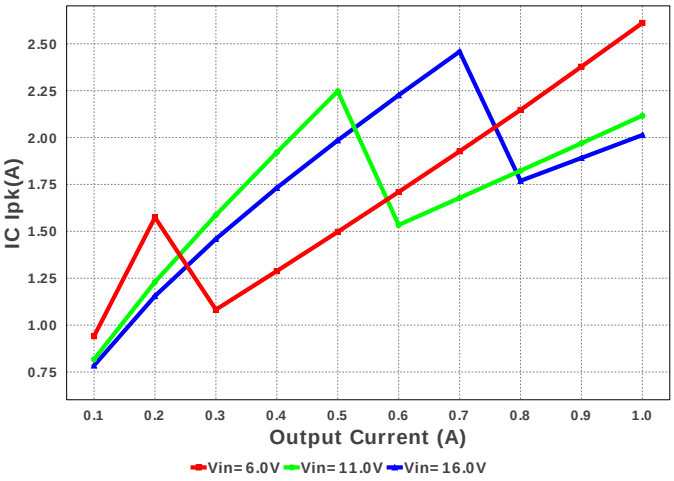
Cin IRMS



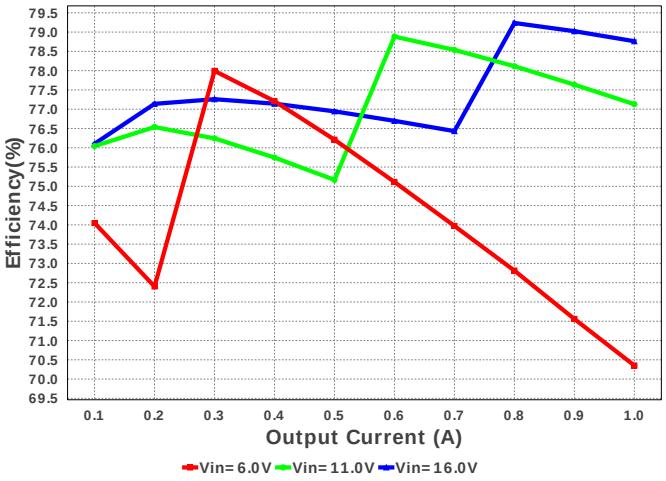
Diode1 Pd



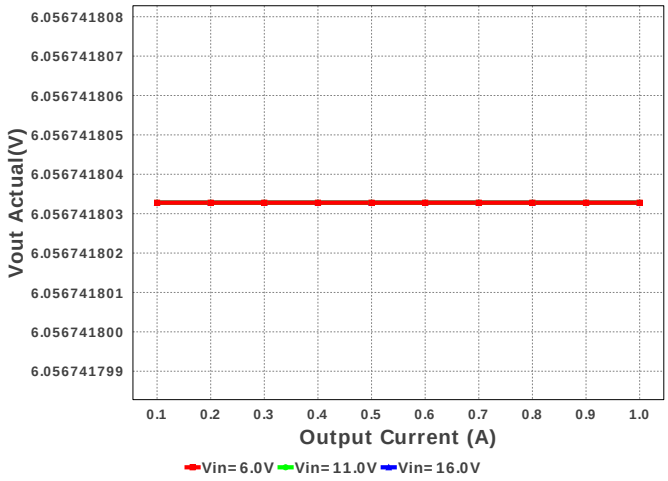
IC Ipk



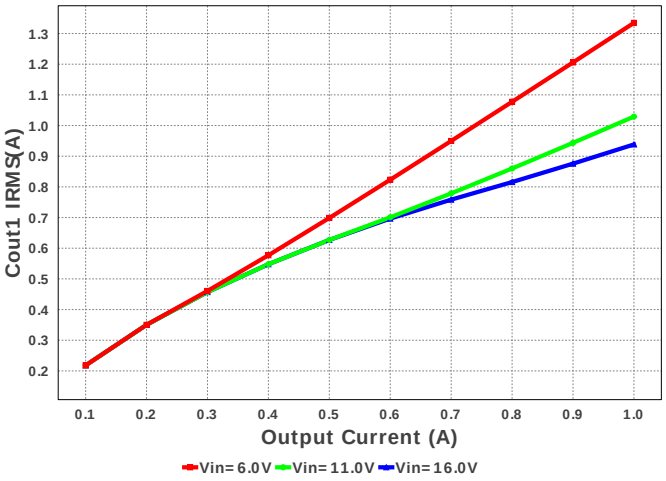
Efficiency

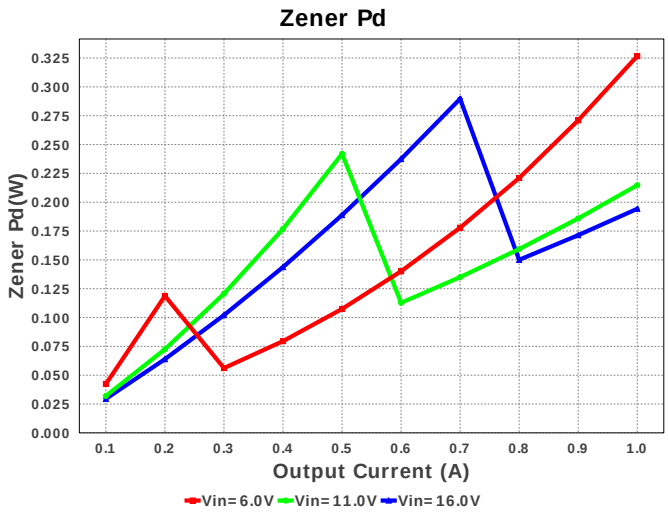


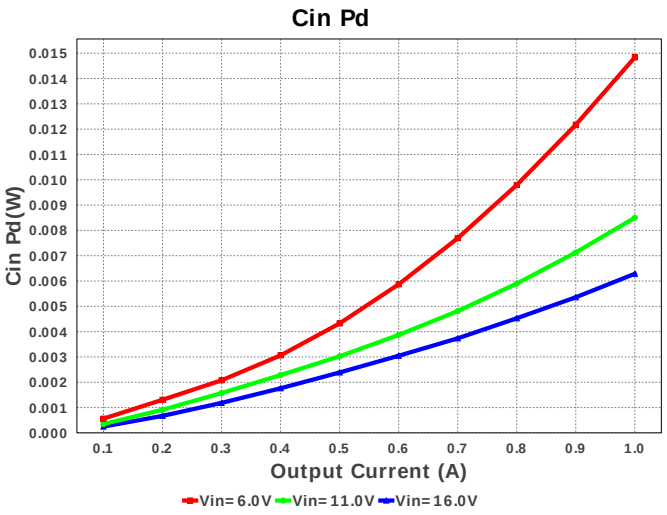
Vout Actual

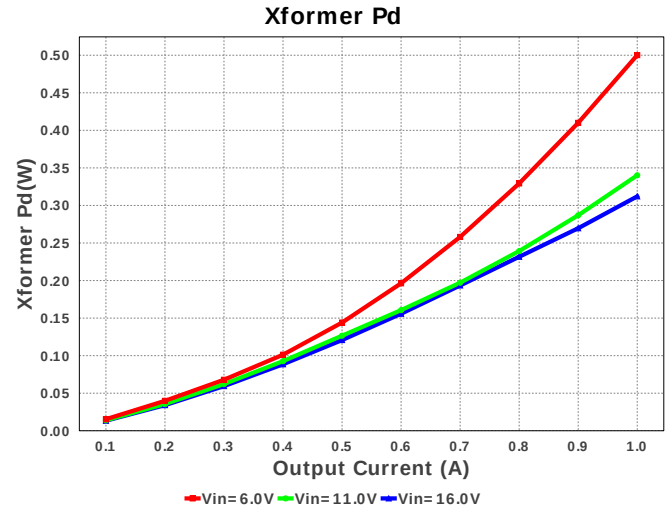


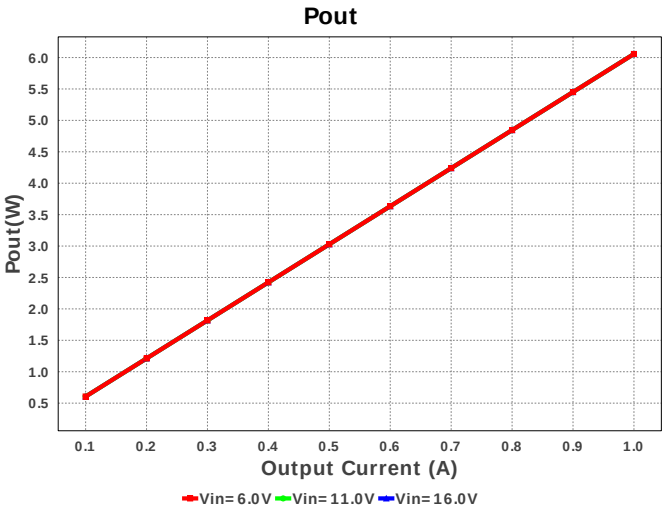
Cout1 IRMS

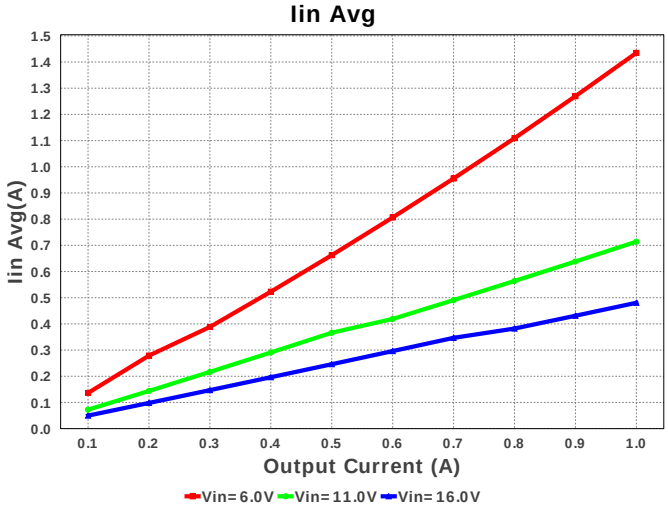


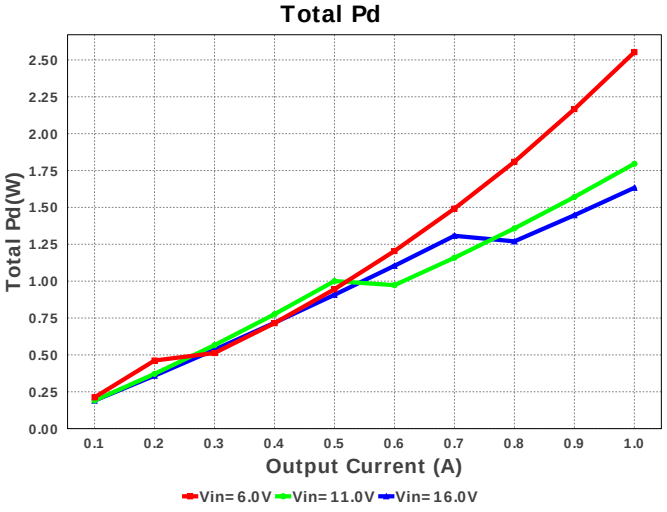


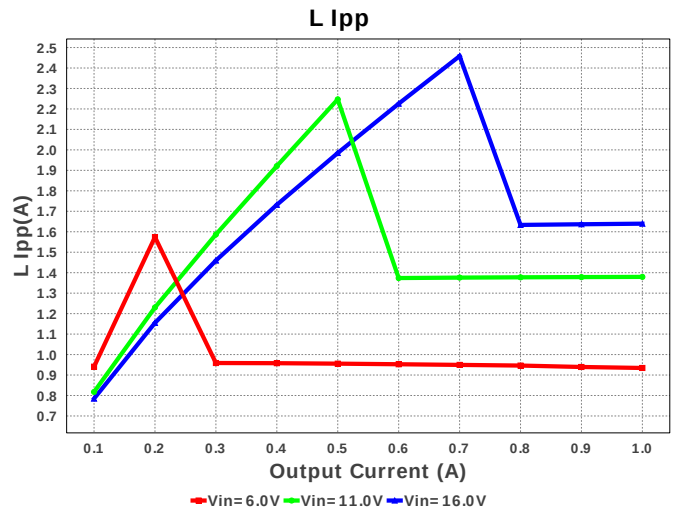


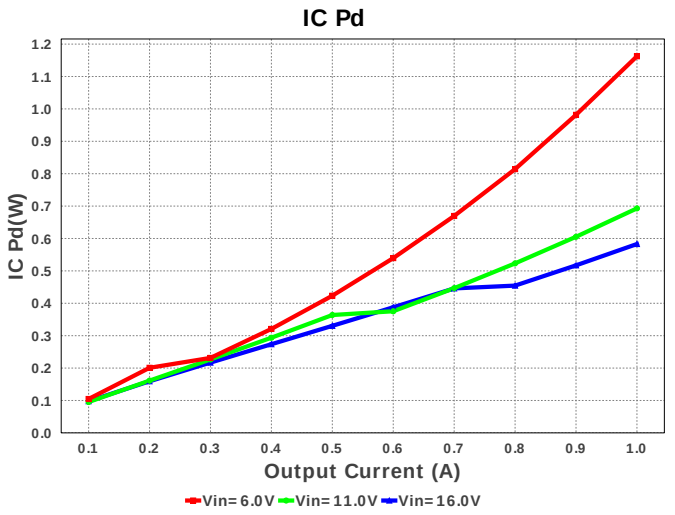


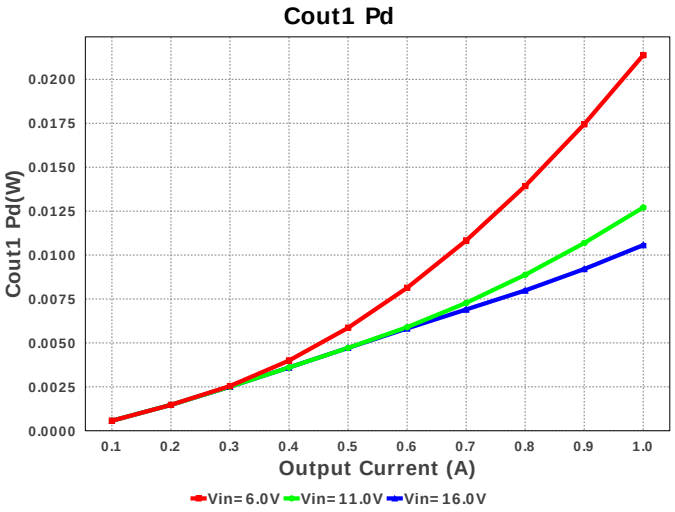


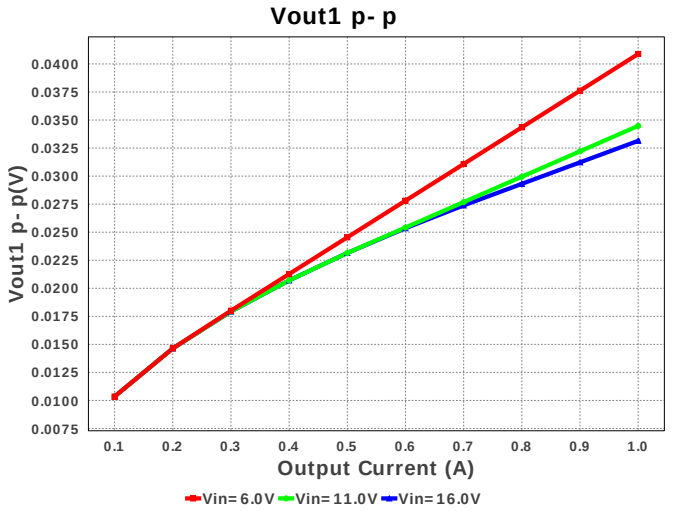












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	998.87 mA	Current	Input capacitor RMS ripple current
2.	Cout1 IRMS	1.383 A	Current	Output capacitor1 RMS ripple current
3.	IC Ipk	2.649 A	Current	Peak switch current
4.	Iin Avg	1.437 A	Current	Average input current
5.	L Ipp	990.59 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	12	General	Total Design BOM count
7.	FootPrint	564.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	151.071 kHz	General	Switching frequency
9.	IC Tolerance	22.0 mV	General	IC Feedback Tolerance
10.	Mode	CCM	General	Conduction Mode
11.	Pout	6.057 W	General	Total output power
12.	Total BOM	$0.0	General	Total BOM Cost
13.	Vout Actual	6.057 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Duty Cycle	66.972 %	Op_point	Duty cycle
15.	Efficiency	70.262 %	Op_point	Steady state efficiency
16.	IC Tj	74.501 degC	Op_point	IC junction temperature
17.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	1.0 A	Op_point	Iout operating point
19.	VIN_OP	6.0 V	Op_point	Vin operating point
20.	Vout1 OP	6.057 V	Op_point	Operational Voltage 1
21.	Vout1 p-p	42.641 mV	Op_point	Peak-to-peak output1 ripple voltage
22.	Cin Pd	15.964 mW	Power	Input capacitor power dissipation
23.	Cout1 Pd	22.964 mW	Power	Output capacitor1 power dissipation
24.	Cout1 Pd	22.964 mW	Power	Output capacitor1 power dissipation
25.	Diode1 Pd	519.479 mW	Power	Diode1 power dissipation
26.	IC Pd	1.113 W	Power	IC power dissipation
27.	Total Pd	2.563 W	Power	Total Power Dissipation
28.	Xformer Pd	536.057 mW	Power	Transformer power dissipation
29.	Zener Pd	348.951 mW	Power	Zener power dissipation
30.	Vout Tolerance	3.427 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	16.0	Maximum input voltage
3.	VinMin	6.0	Minimum input voltage
4.	Vout	6.0	Output Voltage
5.	base_pn	LM2588	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM2588** Product Folder : http://www.ti.com/product/LM2588 : contains the data sheet and other resources.