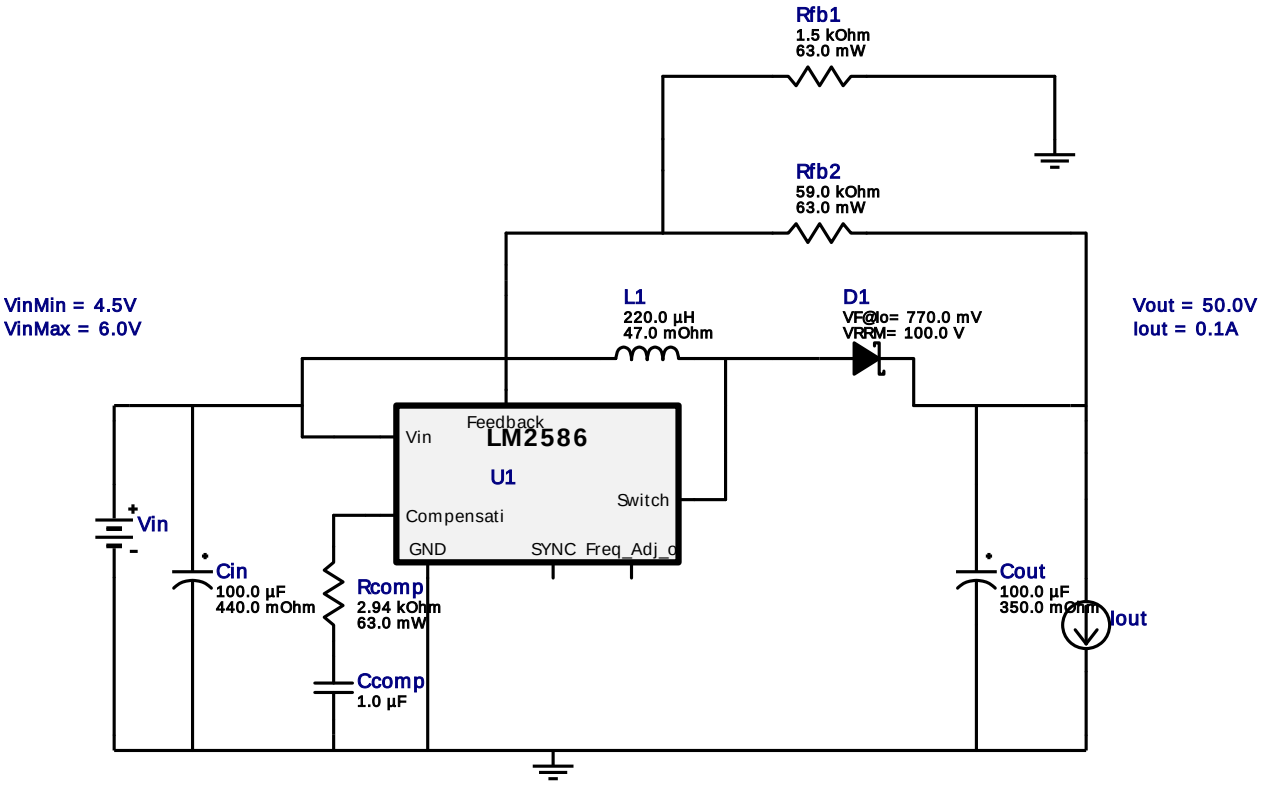
WEBENCH® Design Report

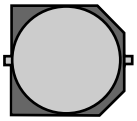
VinMin = 4.5V
VinMax = 6.0V
Vout = 50.0V
Iout = 0.1A

Device = LM2586SX-ADJ/NOPB
Topology = Boost
Created = 6/15/15 1:21:37 AM
BOM Cost = $4.93
Footprint = 1,370.0 mm²
BOM Count = 9
Total Pd = 1.38W

Design : 1977409/5 LM2586SX-ADJ/NOPB
LM2586SX-ADJ/NOPB 4.5V-6.0V to 50.00V @ 0.1A



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	Taiyo Yuden	EMK212B7105KG-T Series= X7R	Cap= 1.0 uF VDC= 16.0 V IRMS= 0.0 A	1	$0.02	 0805 7 mm²
2.	Cin	Nichicon	UUD1A101MCL1GS Series= uD	Cap= 100.0 uF ESR= 440.0 mOhm VDC= 10.0 V IRMS= 230.0 mA	1	$0.10	 SM_RADIAL_6.3AMM 80 mm²
3.	Cout	Panasonic	EEE-FK1J101P Series= FK	Cap= 100.0 uF ESR= 350.0 mOhm VDC= 63.0 V IRMS= 400.0 mA	1	$0.28	 SM_RADIAL_G 172 mm²
4.	D1	Diodes Inc.	DFLS1100-7	VF@Io= 770.0 mV VRRM= 100.0 V	1	$0.19	 PowerDI123 13 mm²

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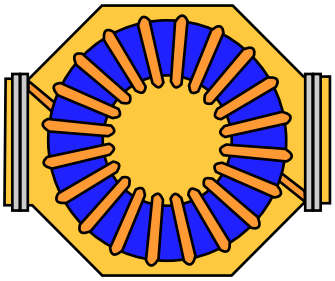
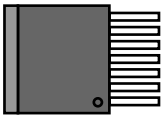
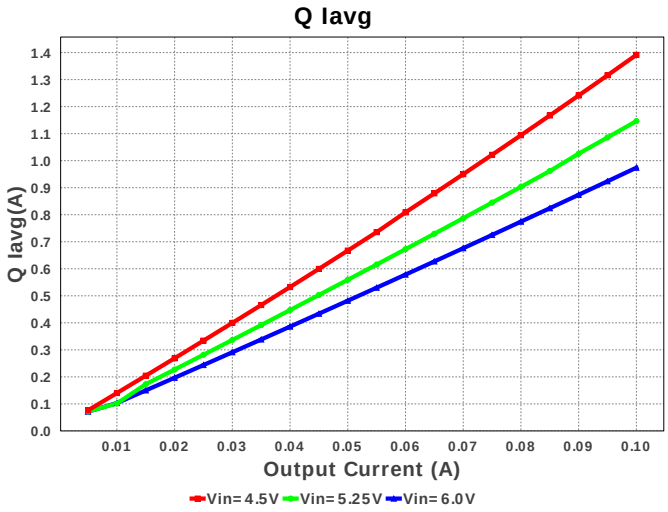
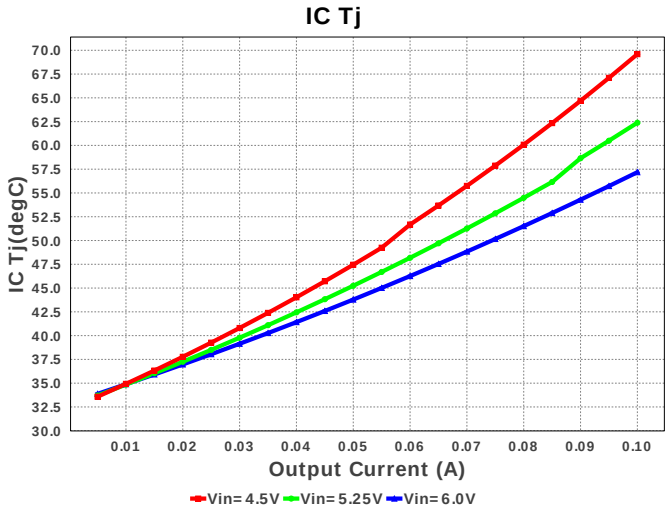
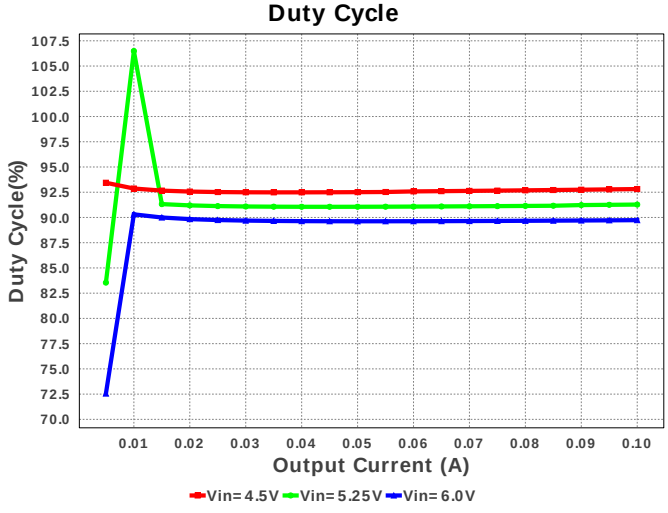
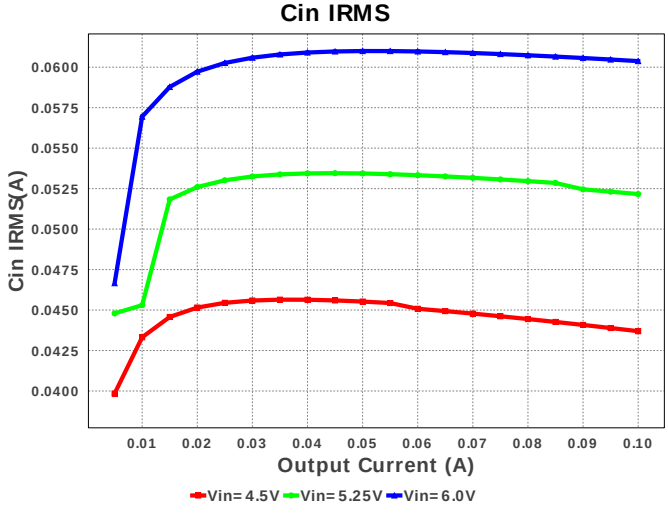
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
5.	L1	Bourns	PM2110-221K-RC	L= 220.0 µH DCR= 47.0 mOhm	1	$1.21	 PM2110 890 mm²
6.	Rcomp	Vishay-Dale	CRCW04022K94FKED Series= CRCW..e3	Res= 2.94 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rfb1	Vishay-Dale	CRCW04021K50FKED Series= CRCW..e3	Res= 1.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
8.	Rfb2	Vishay-Dale	CRCW040259K0FKED Series= CRCW..e3	Res= 59.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
9.	U1	Texas Instruments	LM2586SX-ADJ/NOPB	Switcher	1	$3.10	 TS7B 199 mm²









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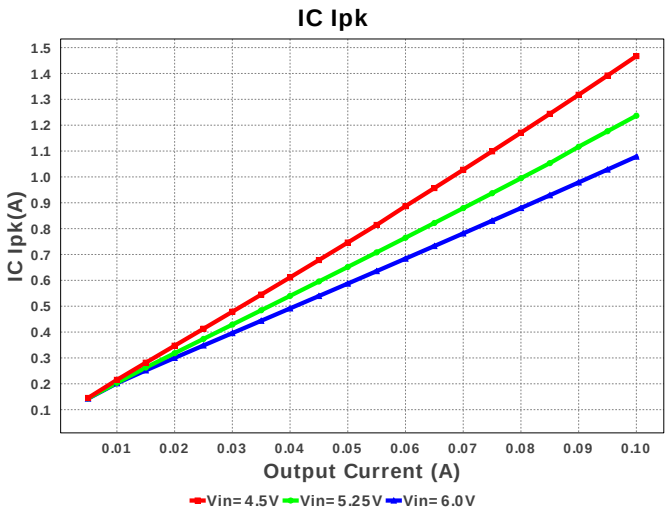

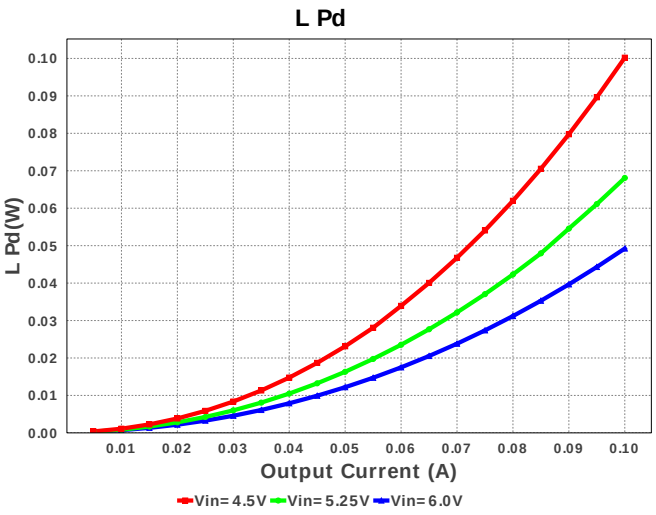

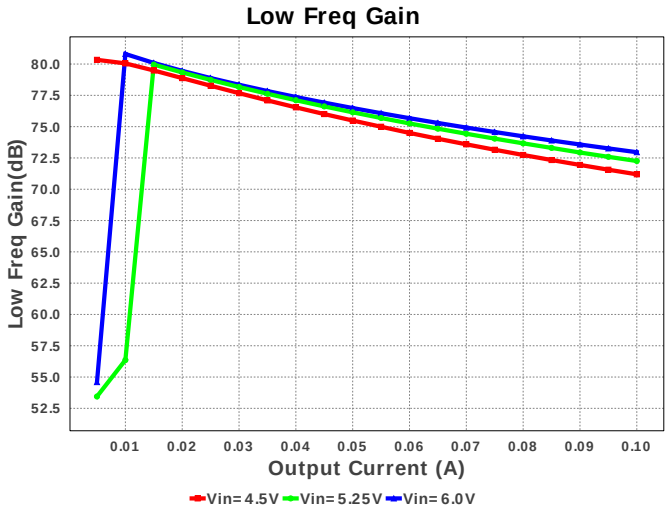

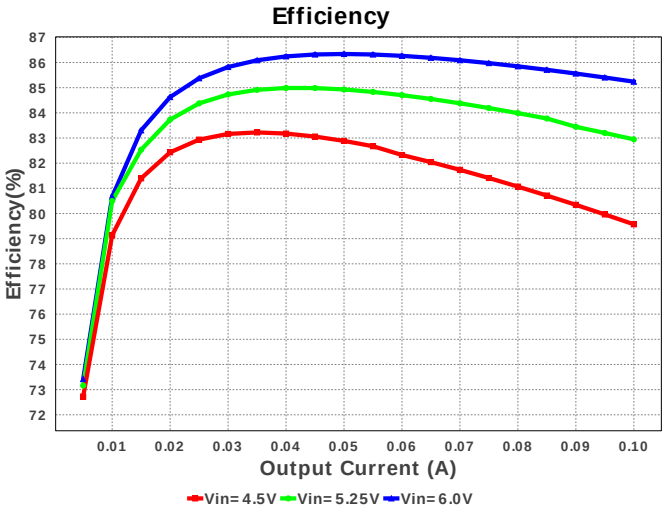

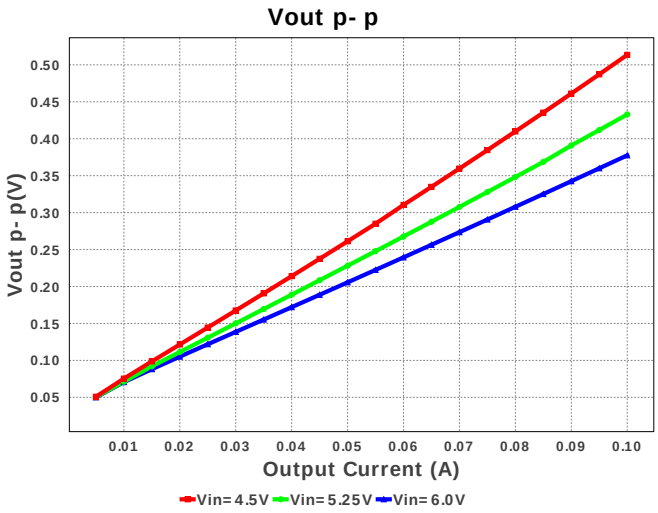

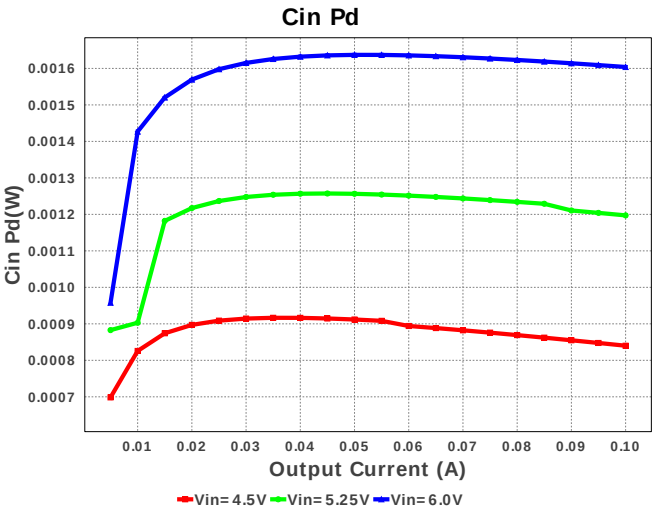

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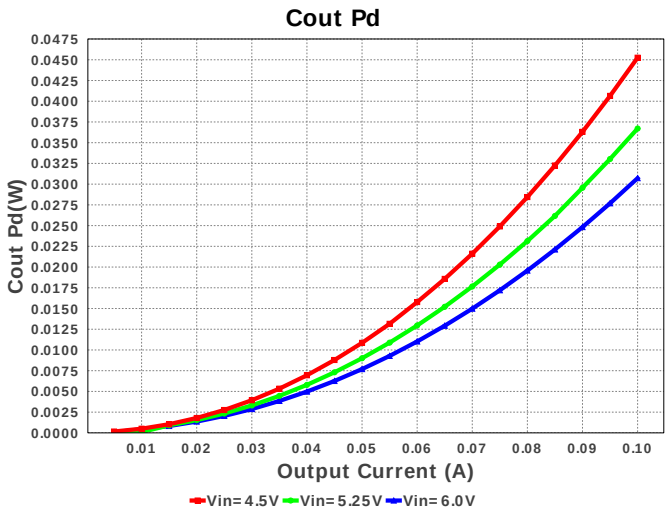

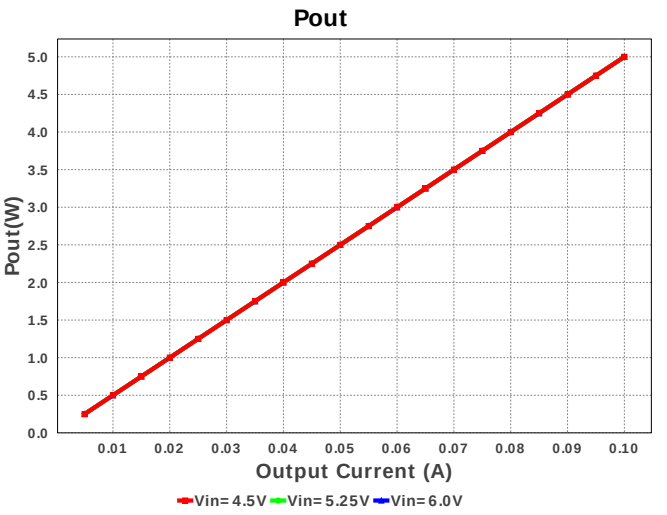

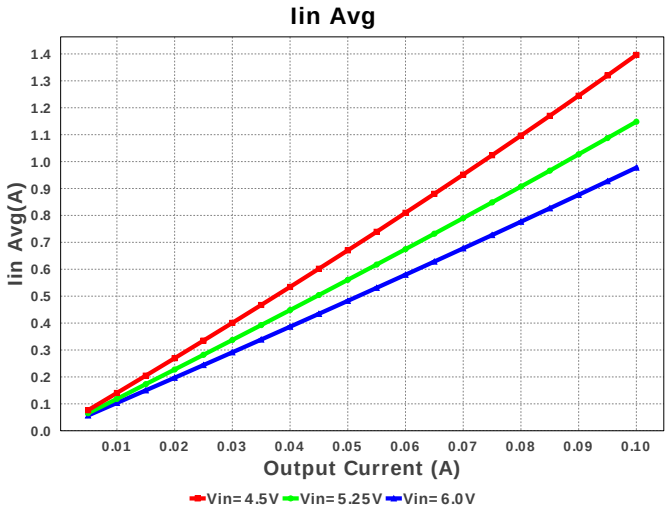

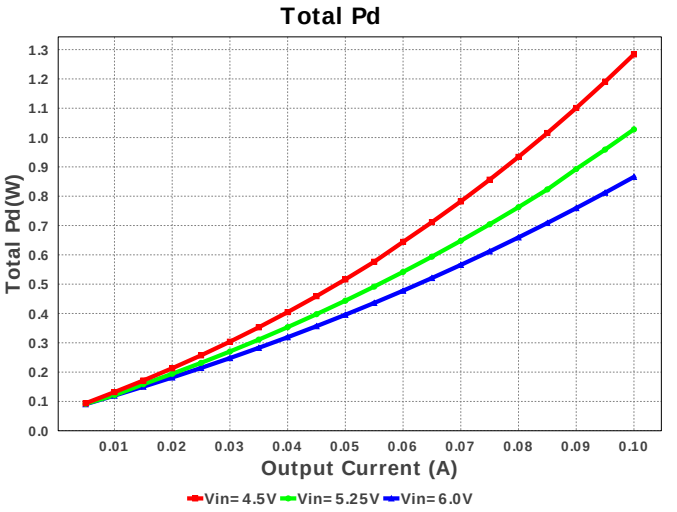

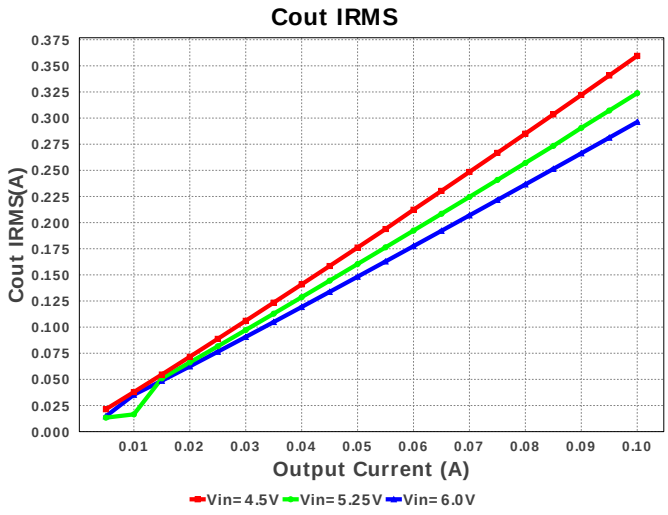

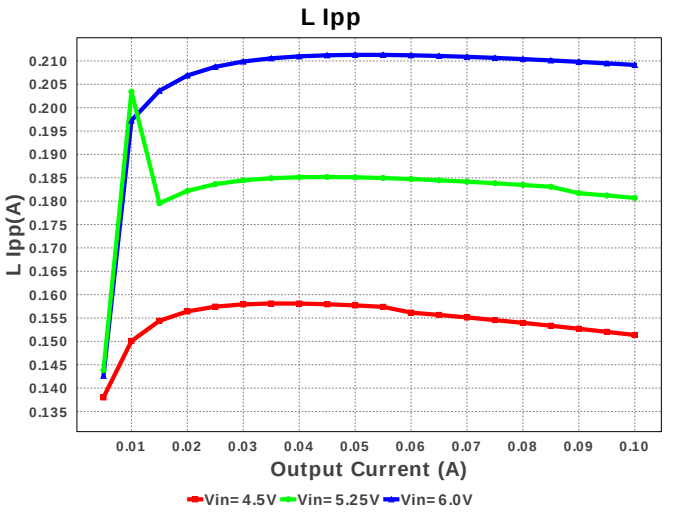

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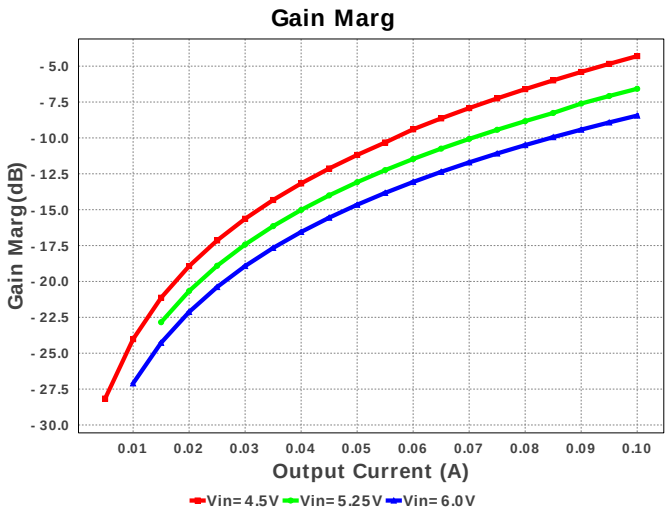

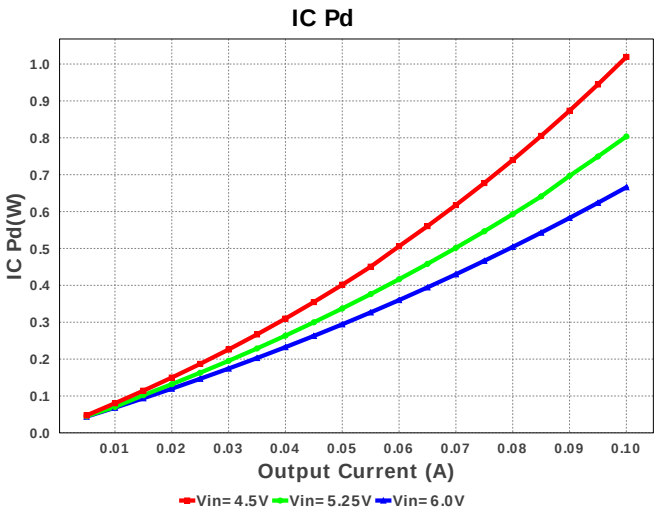

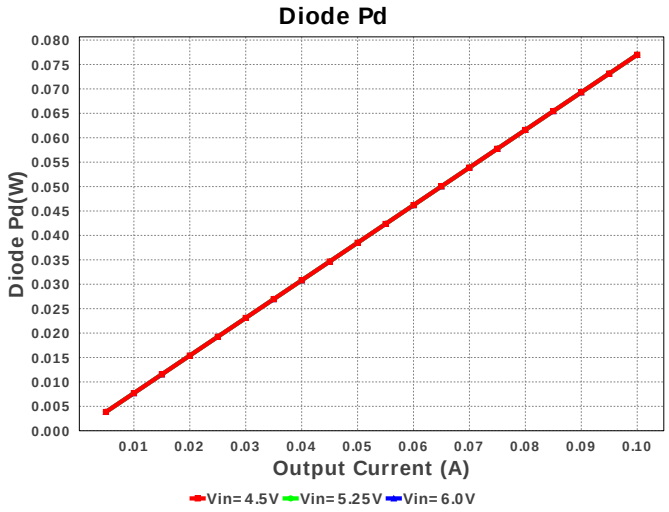

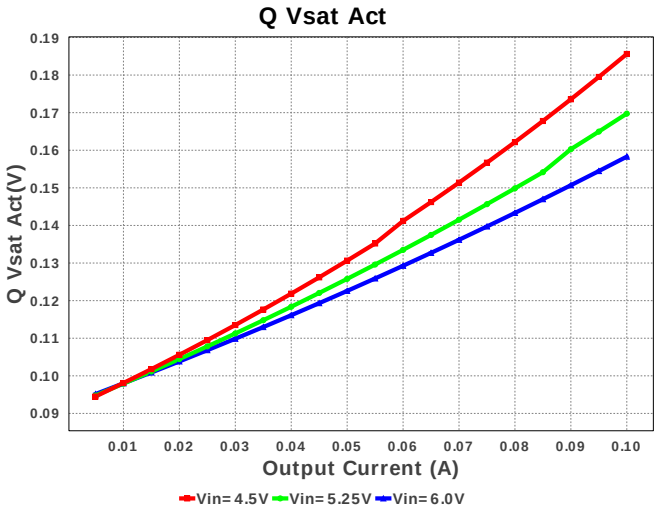

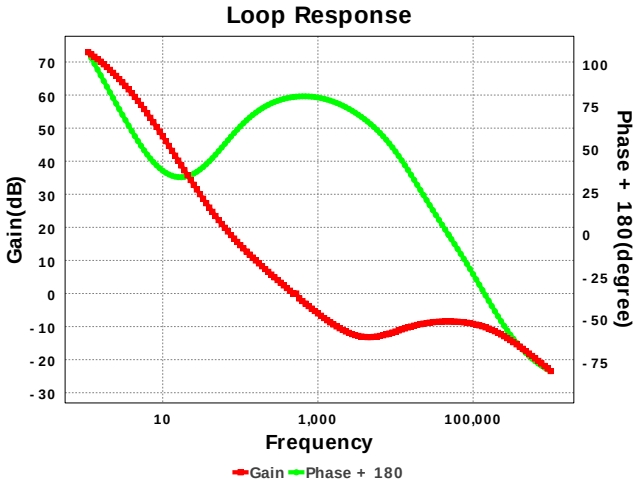

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	42.758 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	363.768 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.496 A	Current	Peak switch current in IC
4.	Iin Avg	1.418 A	Current	Average input current
5.	L Ipp	148.12 mA	Current	Peak-to-peak inductor ripple current
6.	Q Iavg	1.422 A	Current	Q Iavg
7.	BOM Count	9	General	Total Design BOM count
8.	FootPrint	1.37 k mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	100.0 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	5.0 W	General	Total output power

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#	Name	Value	Category	Description
12.	Q Vsat Act	233.513 mV	General	Q Vsat
13.	Total BOM	$4.93	General	Total BOM Cost
14.	Cross Freq	334.675 Hz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	92.968 %	Op_point	Duty cycle
16.	Efficiency	78.36 %	Op_point	Steady state efficiency
17.	Gain Marg	-3.831 dB	Op_point	Bode Plot Gain Margin
18.	IC Tj	91.369 degC	Op_point	IC junction temperature
19.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	100.0 mA	Op_point	Iout operating point
21.	Phase Marg	73.976 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	4.5 V	Op_point	Vin operating point
23.	Vout p-p	523.617 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	804.427 µW	Power	Input capacitor power dissipation
25.	Cout Pd	46.315 mW	Power	Output capacitor power dissipation
26.	Diode Pd	77.0 mW	Power	Diode power dissipation
27.	IC Pd	1.111 W	Power	IC power dissipation
28.	L Pd	104.635 mW	Power	Inductor power dissipation
29.	Total Pd	1.381 W	Power	Total Power Dissipation
30.	Low Freq Gain	71.079 dB	Unknown	Gain at 10Hz

Design Inputs

#	Name	Value	Description
1.	Iout	100.0 m	Maximum Output Current
2.	Iout1	100.0 m	Output Current #1
3.	VinMax	6.0	Maximum input voltage
4.	VinMin	4.5	Minimum input voltage
5.	Vout	50.0	Output Voltage
6.	Vout1	50.0	Output Voltage #1
7.	base_pn	LM2586	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM2586** Product Folder : http://www.ti.com/product/LM2586 : contains the data sheet and other resources.

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