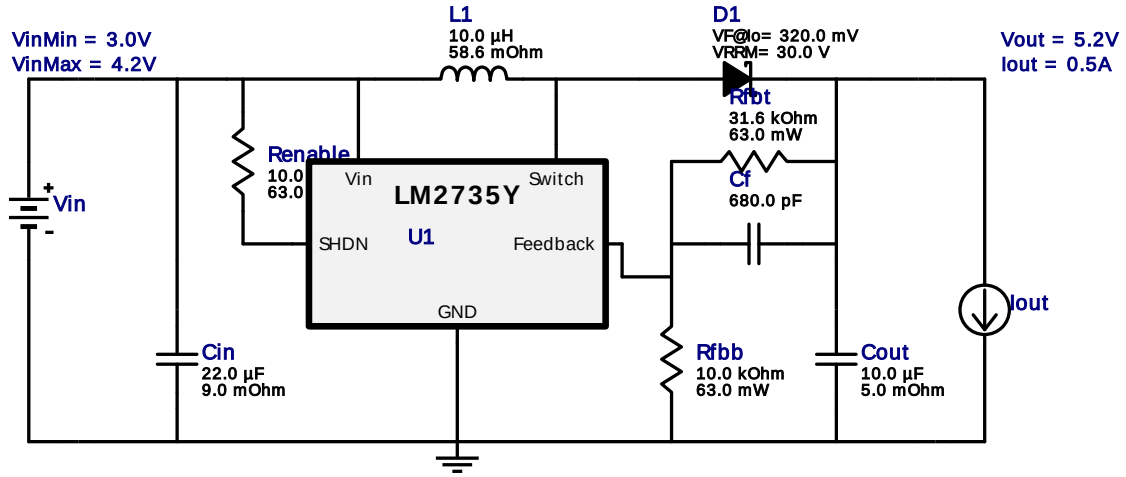
WEBENCH® Design Report

VinMin = 3.0V
VinMax = 4.2V
Vout = 5.2V
Iout = 0.5A

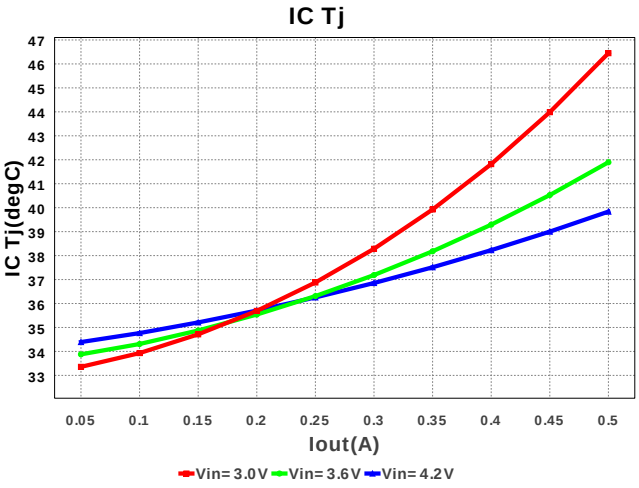
Device = LM2735YMY/NOPB
Topology = Boost
Created = 10/1/13 4:07:06 AM
BOM Cost = $1.74
Total Pd = 0.36W
Footprint = 156.0mm2
BOM Count = 9

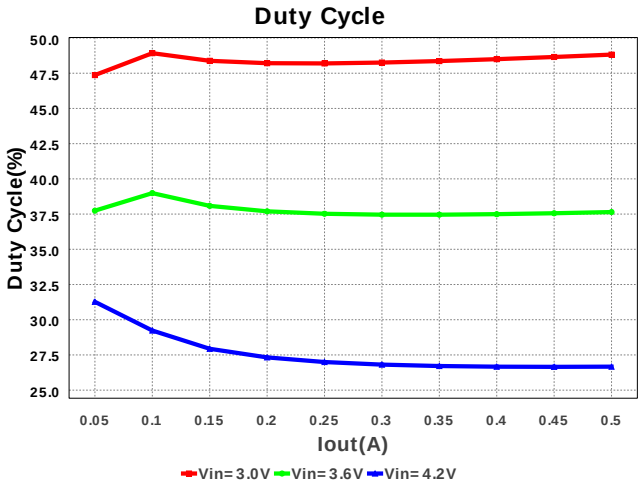
Design : 900574/18 LM2735YMY/NOPB
LM2735YMY/NOPB 3.0V-4.2V to 5.2V @ 0.5A

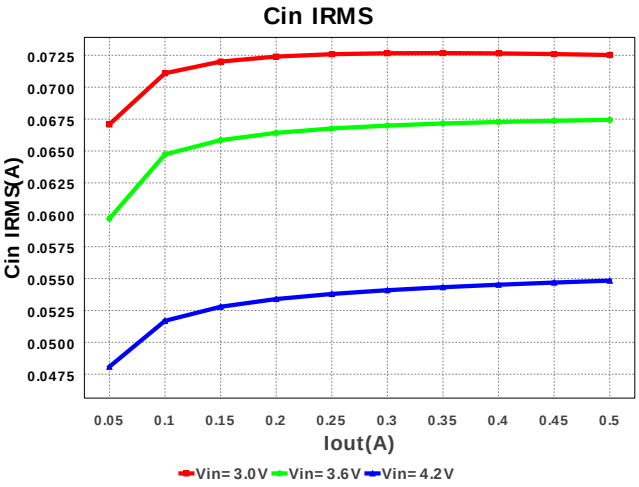


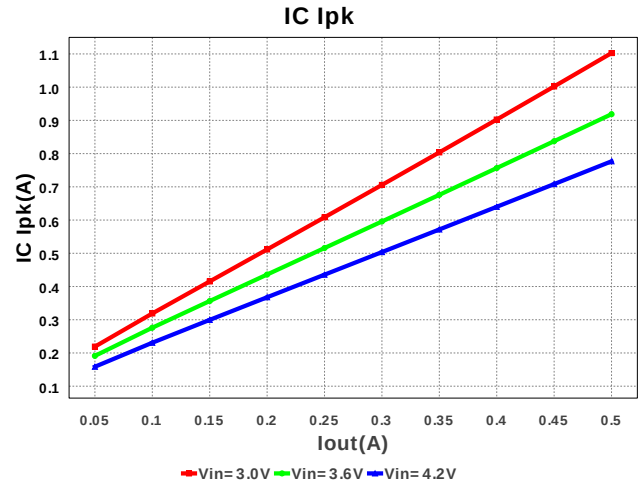
Electrical BOM

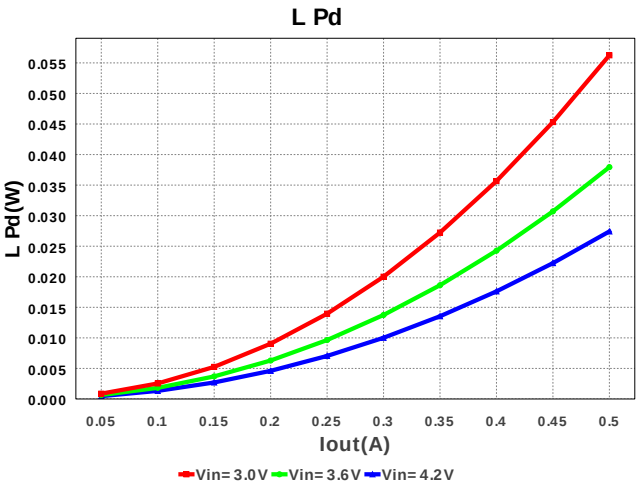
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	MuRata	GRM033R71E681KA01D Series= X7R	Cap= 680.0 pF VDC= 25.0 V IRMS= 0.0 A	1	$0.10	0201 2mm2
2.	Cin	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 µF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	$0.05	0805 7mm2
3.	Cout	TDK	C1608X5R0J106M Series= X5R	Cap= 10.0 µF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 1.9 A	1	$0.06	0603 5mm2
4.	D1	Toshiba	CMS06	VF@Io= 320.0 mV VRRM= 30.0 V	1	$0.19	M-FLAT 19mm2
5.	L1	Bourns	SRN6045-100M	L= 10.0 µH DCR= 58.6 mOhm	1	$0.16	SRN6045 64mm2
6.	Renable	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3mm2
7.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3mm2
8.	Rfbt	Vishay-Dale	CRCW040231K6FKED Series= CRCW..e3	Res= 31.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3mm2
9.	U1	Texas Instruments	LM2735YMY/NOPB	Switcher	1	$1.15	MUY08A 24mm2

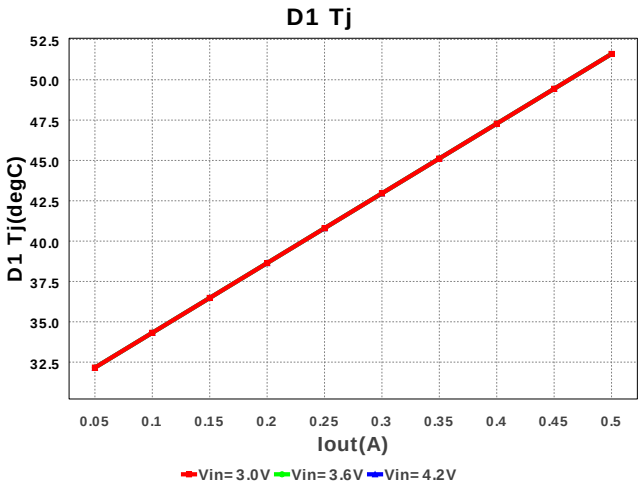




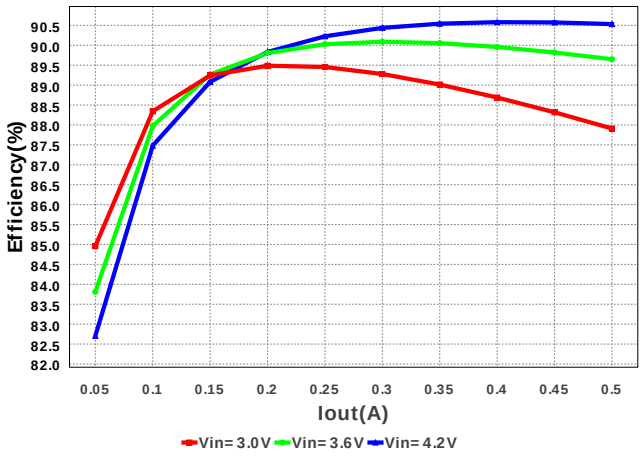




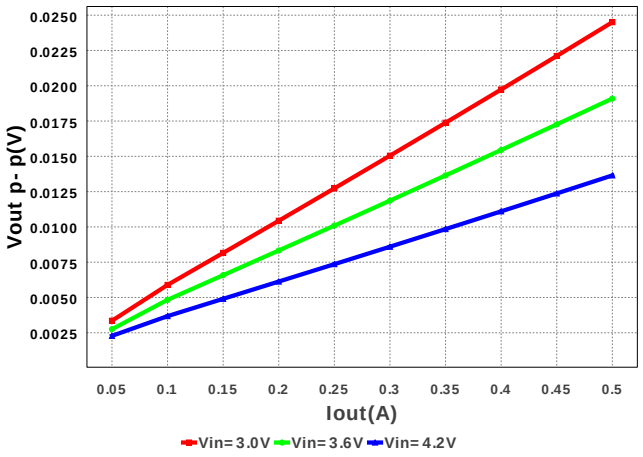




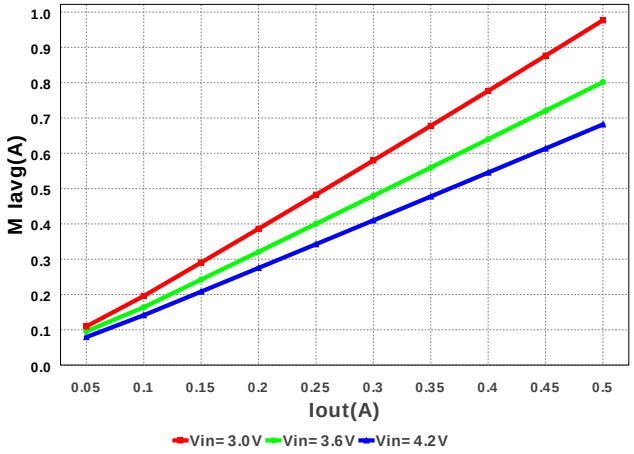
Efficiency



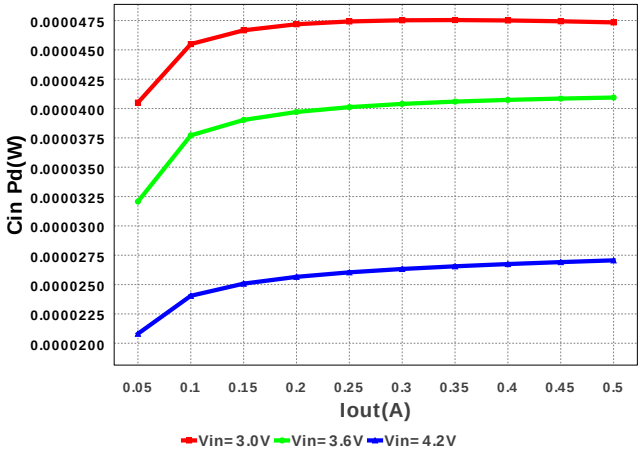
Vout p- p



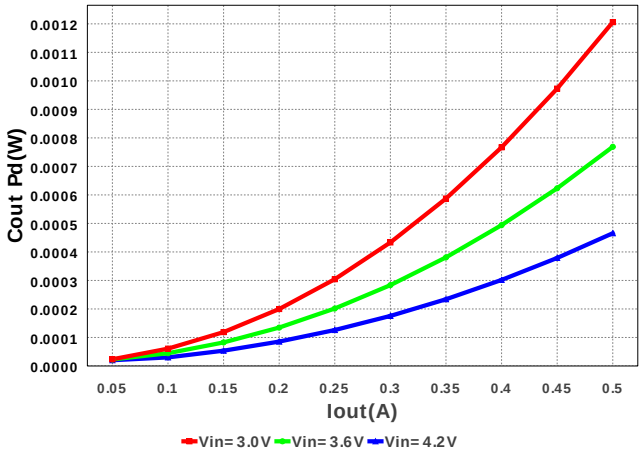
M Iavg



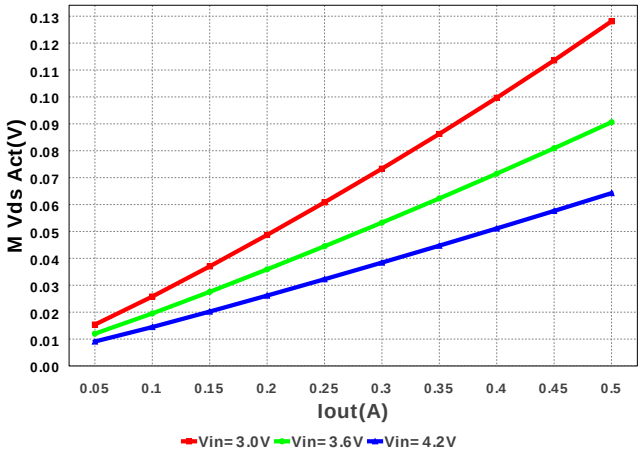
Cin Pd



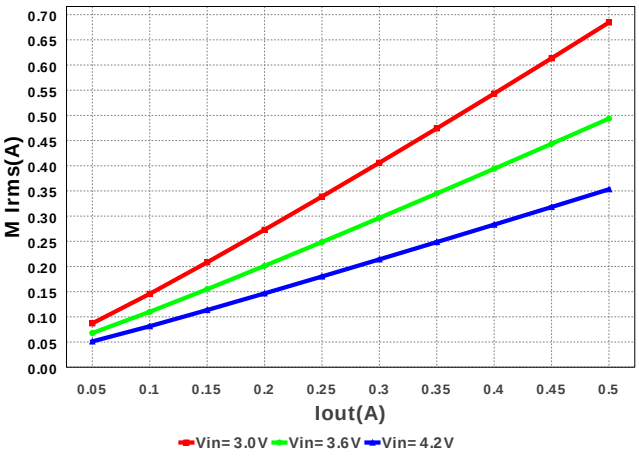
Cout Pd



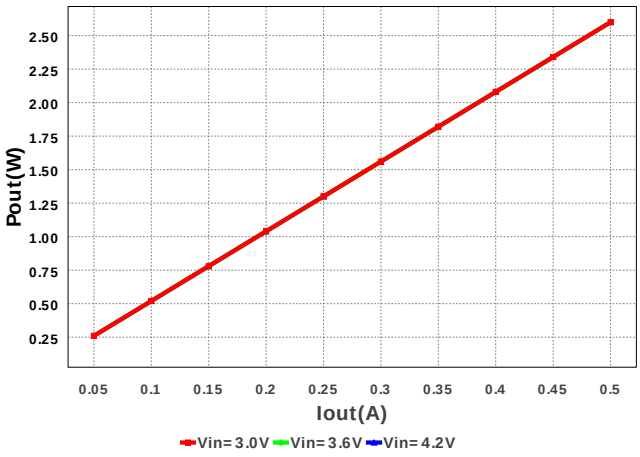
M Vds Act



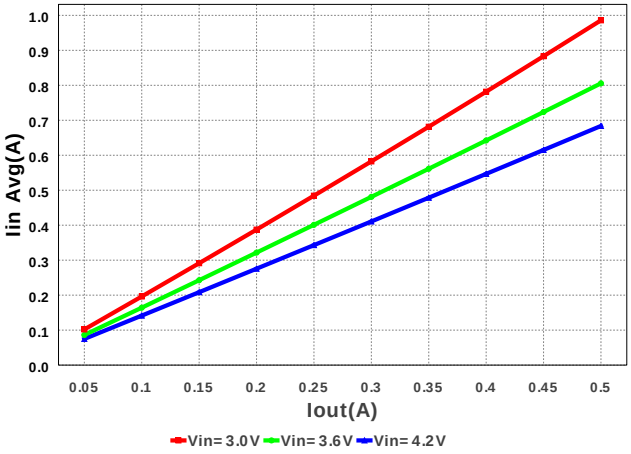
M Irms



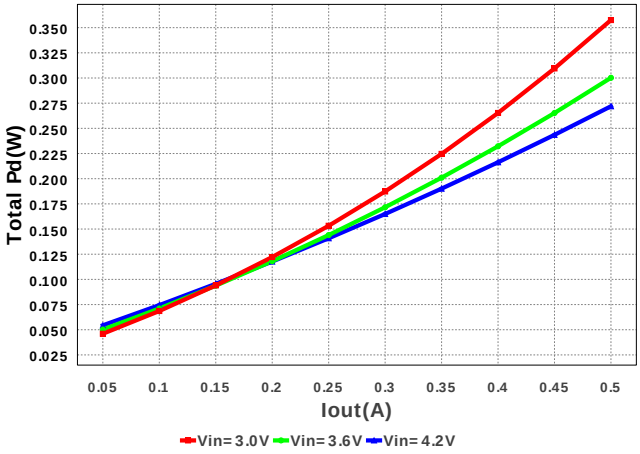
Pout



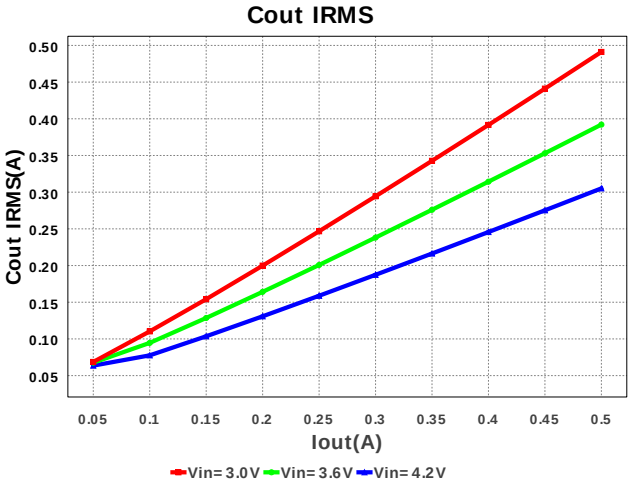
Iin Avg



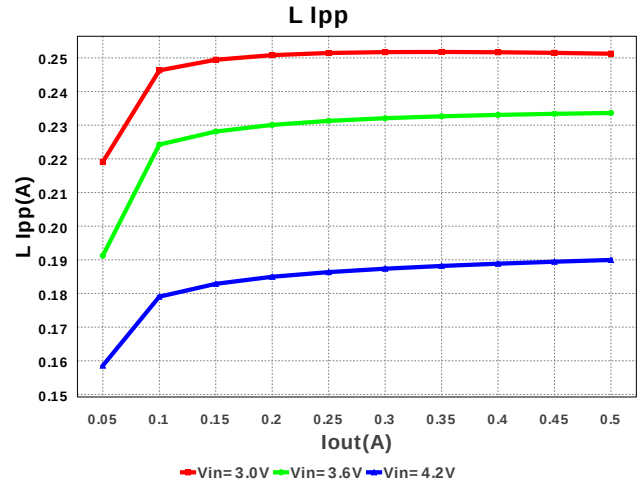
Total Pd

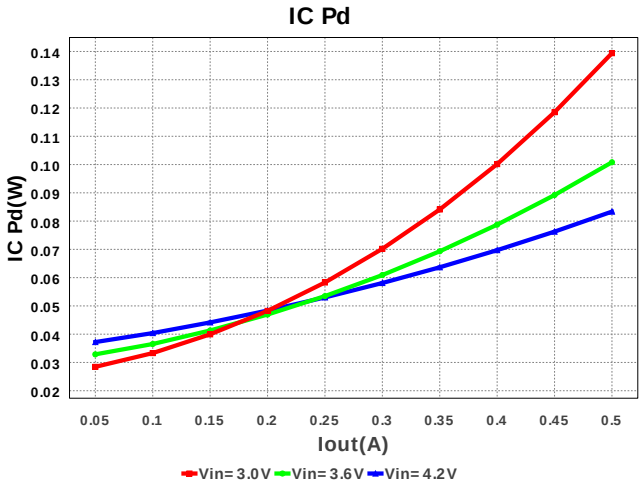


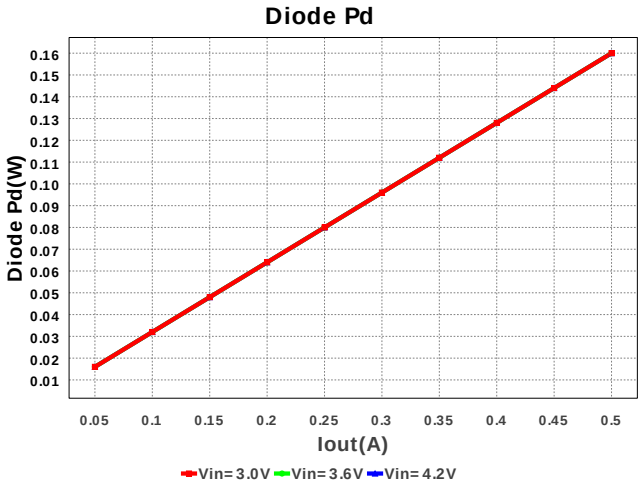
Cout IRMS



L Ipp







Operating Values

#	Name	Value	Category	Description
1.	BOM Count	9		Total Design BOM count
2.	Total BOM	$1.741		Total BOM Cost
3.	Cin IRMS	72.525 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	491.104 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	1.103 A	Current	Peak switch current in IC
6.	Iin Avg	985.85 mA	Current	Average input current
7.	L Ipp	251.235 mA	Current	Peak-to-peak inductor ripple current
8.	M Iavg	976.983 mA	Current	MOSFET Average current
9.	M1 Irms	684.523 mA	Current	Q Iavg
10.	FootPrint	156.0 mm2	General	Total Foot Print Area of BOM components
11.	Frequency	525.0 kHz	General	Switching frequency
12.	IC Tolerance	25.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	128.114 mV	General	Voltage drop across the MosFET
14.	Pout	2.6 W	General	Total output power
15.	D1 Tj	51.6 degC	Op_Point	D1 junction temperature
16.	Vout OP	5.2 V	Op_Point	Operational Output Voltage
17.	Cross Freq	8.892 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	48.822 %	Op_point	Duty cycle
19.	Efficiency	87.911 %	Op_point	Steady state efficiency
20.	IC Tj	46.448 degC	Op_point	IC junction temperature
21.	ICThetaJA	118.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	500.0 mA	Op_point	Iout operating point
23.	Phase Marg	44.644 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	3.0 V	Op_point	Vin operating point
25.	Vout p-p	24.505 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	47.339 µW	Power	Input capacitor power dissipation
27.	Cout Pd	1.206 mW	Power	Output capacitor power dissipation
28.	Diode Pd	160.0 mW	Power	Diode power dissipation
29.	IC Pd	139.395 mW	Power	IC power dissipation
30.	L Pd	56.242 mW	Power	Inductor power dissipation
31.	Total Pd	357.538 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	4.2 V	Maximum input voltage
4.	VinMin	3.0 V	Minimum input voltage
5.	Vout	5.2 V	Output Voltage
6.	Vout1	5.2 Volt	Output Voltage #1
7.	base_pn	LM2735Y	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LM2735Y** Product Folder : http://www.ti.com/product/lm2735 : contains the data sheet and other resources.