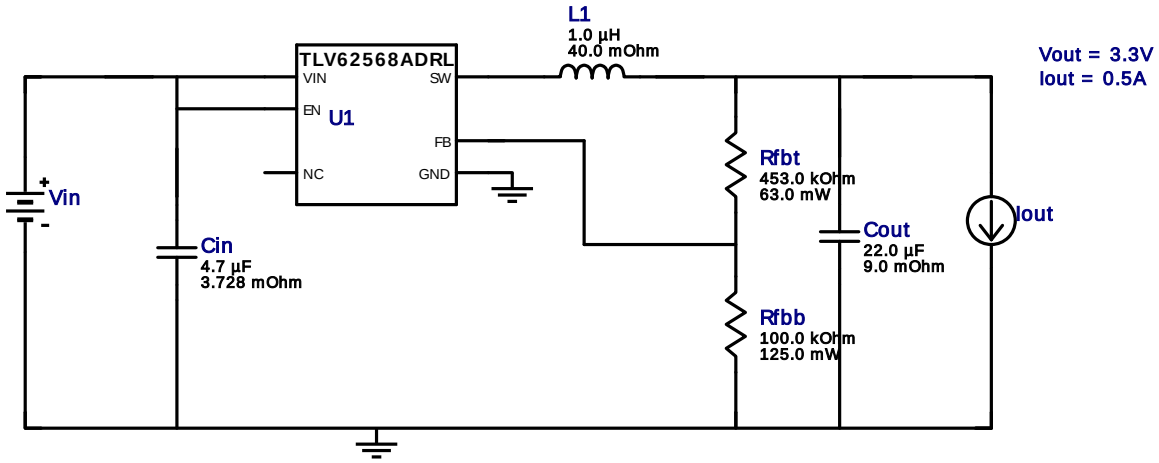
WEBENCH® Design Report

VinMin = 4.0V
VinMax = 4.5V
Vout = 3.3V
Iout = 0.5A

Device = TLV62568ADRLR
Topology = Buck
Created = 2018-08-15 11:26:33.570
BOM Cost = $0.79
BOM Count = 6
Total Pd = 0.08W

Design : TLV62568ADRLR
TLV62568ADRLR 4.0V-4.5V to 3.30V @ 0.5A



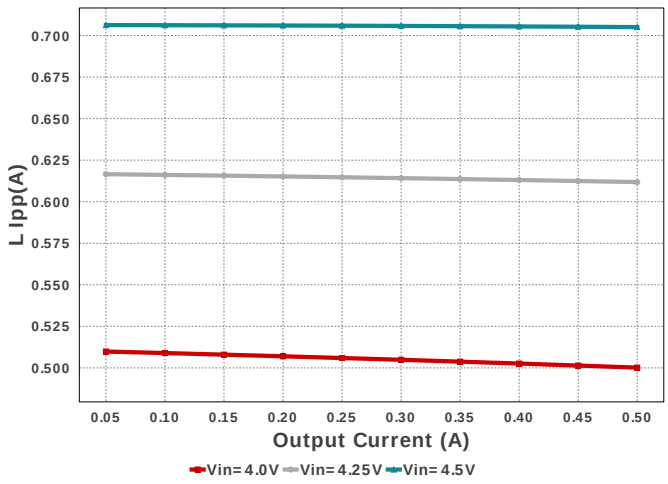
My Comments

No comments

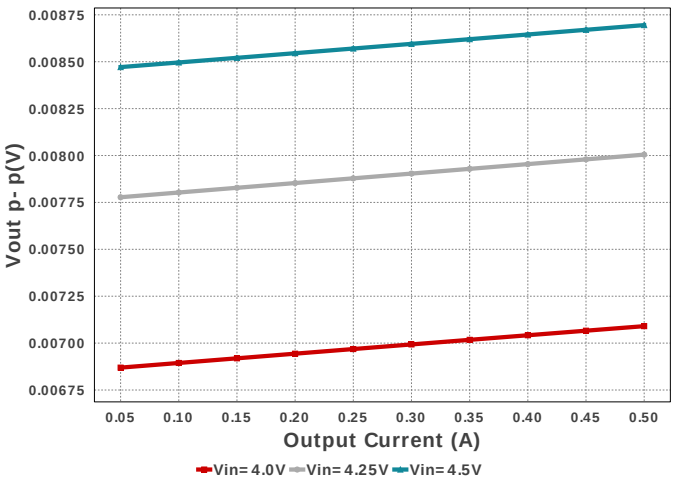
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	TDK	C1608X7S1A475K080AC Series= X7S	Cap= 4.7 uF ESR= 3.728 mOhm VDC= 10.0 V IRMS= 2.69359 A	1	$0.06	0603 5 mm²
2.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	$0.10	0805 7 mm²
3.	L1	MuRata Toko	DFE252012F-1R0M=P2	L= 1.0 µH DCR= 40.0 mOhm	1	$0.23	DFE252012F 10 mm²
4.	Rfbb	Panasonic	ERJ-6ENF1003V Series= ERJ-6E	Res= 100.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
5.	Rfbt	Vishay-Dale	CRCW0402453KFKED Series= CRCW..e3	Res= 453.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
6.	U1	Texas Instruments	TLV62568ADRLR	Switcher	1	$0.38	DRL0006A 7 mm²

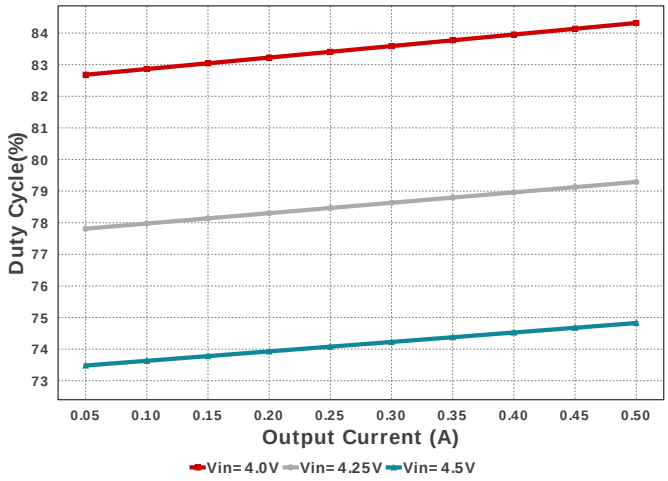
L Ipp



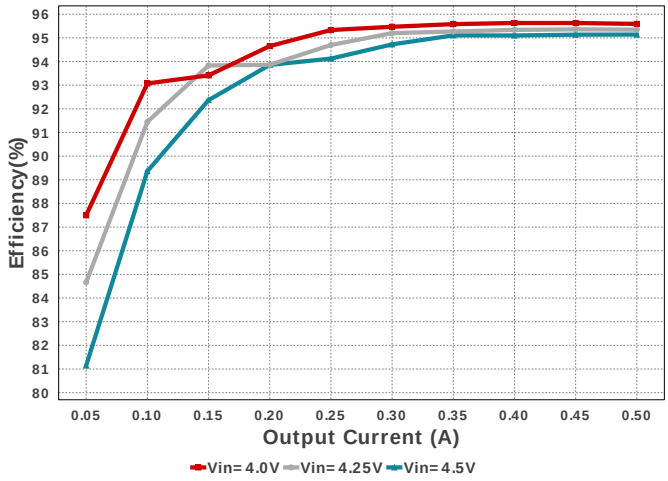
Vout p- p



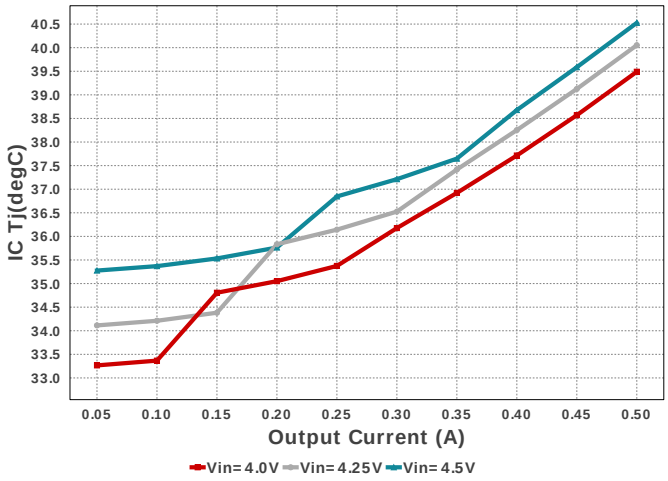
Duty Cycle



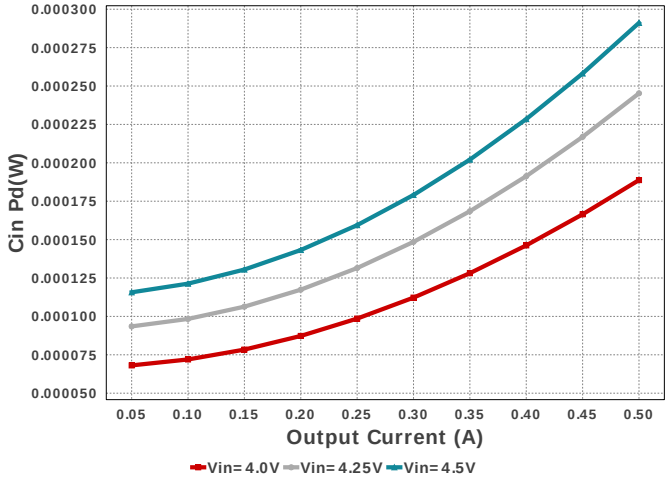
Efficiency

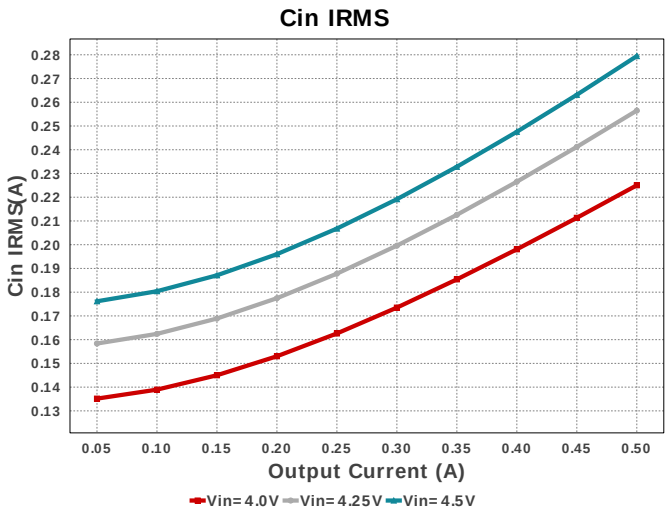


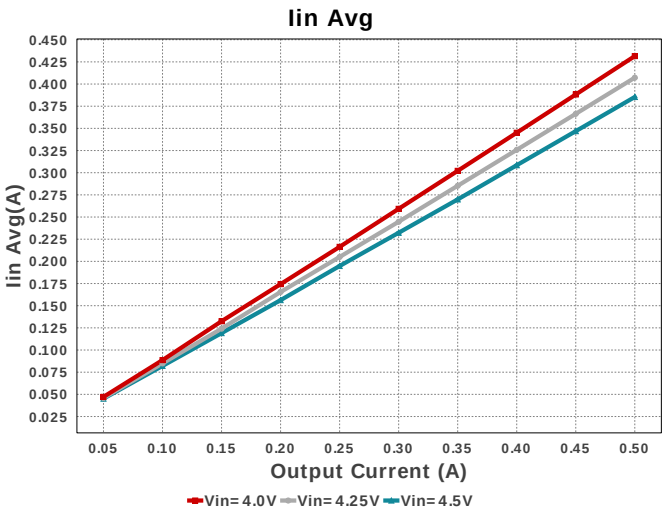
IC Tj

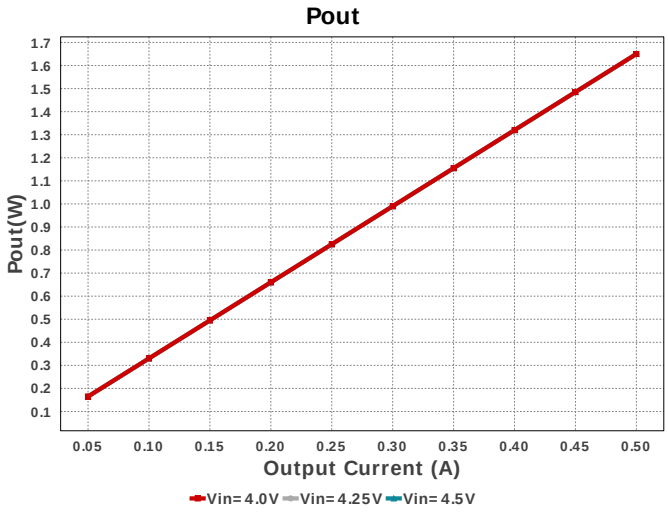


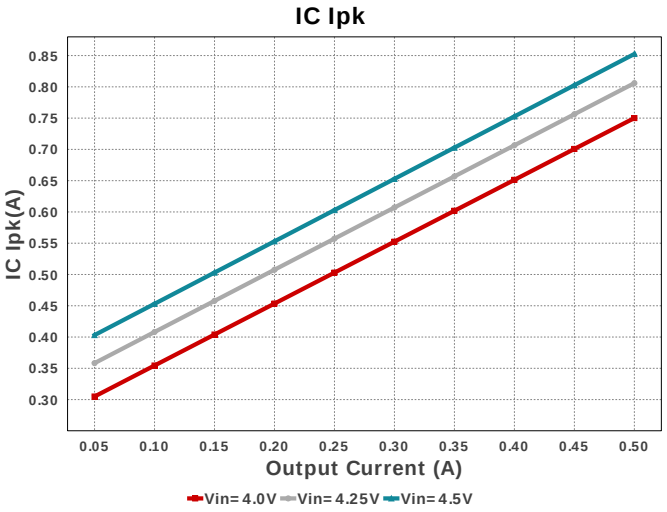
Cin Pd

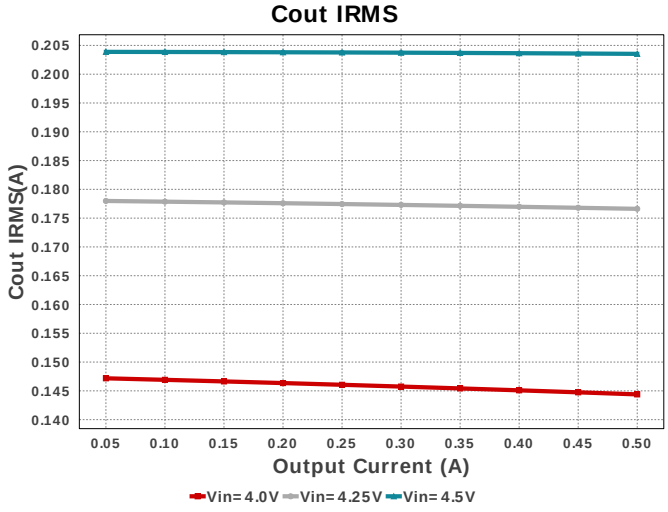


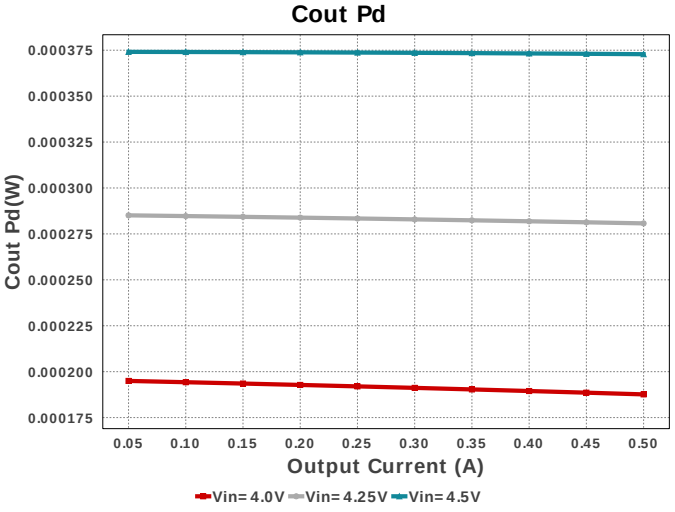


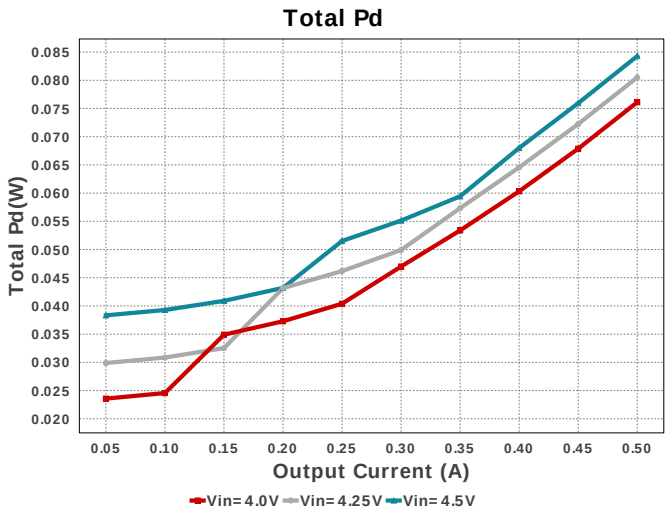


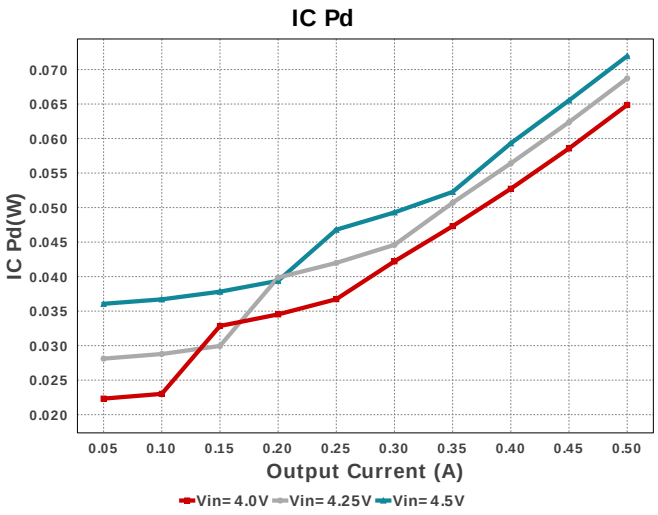


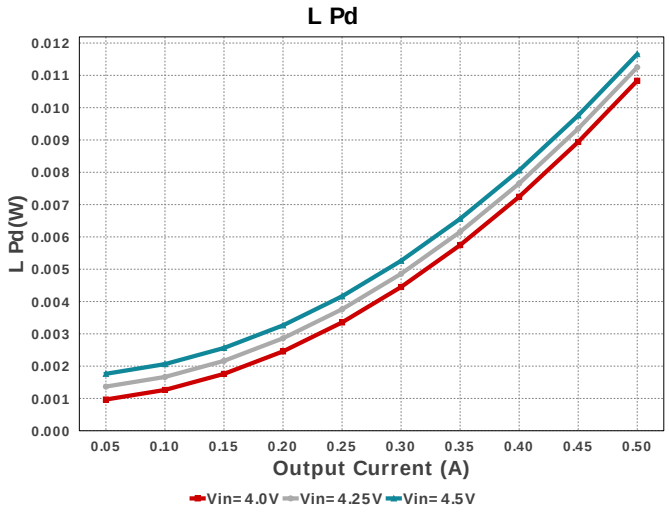


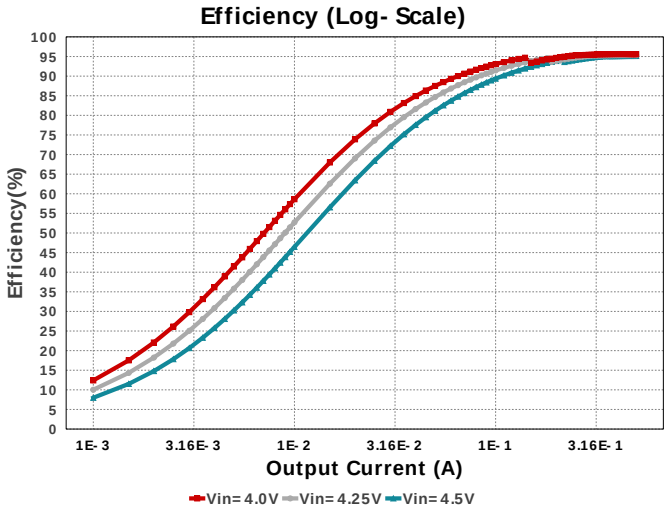












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	279.445 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	203.533 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	852.529 mA	Current	Peak switch current in IC
4.	Iin Avg	385.39 mA	Current	Average input current
5.	L Ipp	705.06 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	6	General	Total Design BOM count
7.	FootPrint	38.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.196 MHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	Mode	CCM	General	Conduction Mode
11.	Pout	1.65 W	General	Total output power
12.	Total BOM	$0.79	General	Total BOM Cost
13.	Duty Cycle	74.825 %	Op Point	Duty cycle
14.	Efficiency	95.141 %	Op Point	Steady state efficiency
15.	IC Tj	40.526 degC	Op Point	IC junction temperature
16.	ICThetaJA	146.3 degC/W	Op Point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	500.0 mA	Op Point	Iout operating point
18.	VIN_OP	4.5 V	Op Point	Vin operating point
19.	Vout Actual	3.318 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
20.	Vout OP	3.3 V	Op Point	Operational Output Voltage
21.	Vout Tolerance	5.043 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
22.	Vout p-p	8.496 mV	Op Point	Peak-to-peak output ripple voltage
23.	Cin Pd	291.118 µW	Power	Input capacitor power dissipation
24.	Cout Pd	372.831 µW	Power	Output capacitor power dissipation
25.	IC Pd	71.946 mW	Power	IC power dissipation
26.	L Pd	11.657 mW	Power	Inductor power dissipation
27.	Total Pd	84.267 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	4.5	Maximum input voltage
3.	VinMin	4.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TLV62568A-DRL	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TLV62568A-DRL** Product Folder : http://www.ti.com/product/TLV62568A : contains the data sheet and other resources.