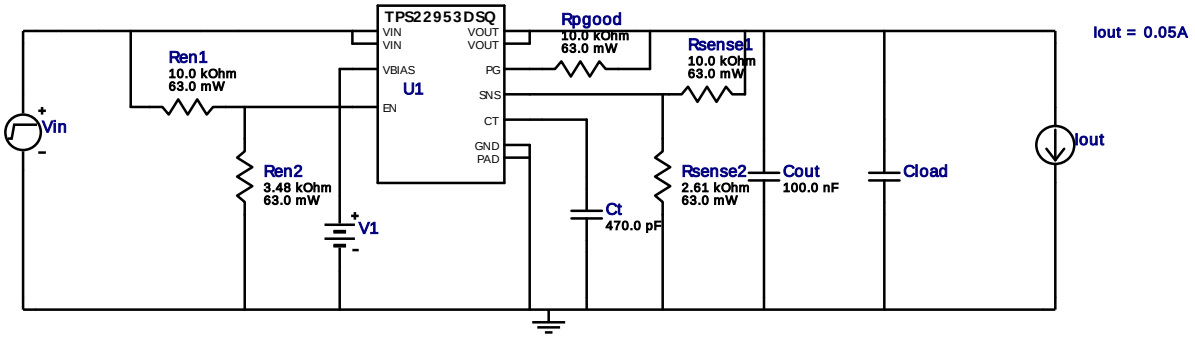
WEBENCH® Design Report

VinMin = 2.7V
VinMax = 4.2V
Vout = 4.2V
Iout = 0.05A

Device = TPS22953DSQR
Topology = Load Switch
Created = 9/11/16 7:50:02 AM
BOM Cost = $0.38
BOM Count = 9
Total Pd = 0.0W

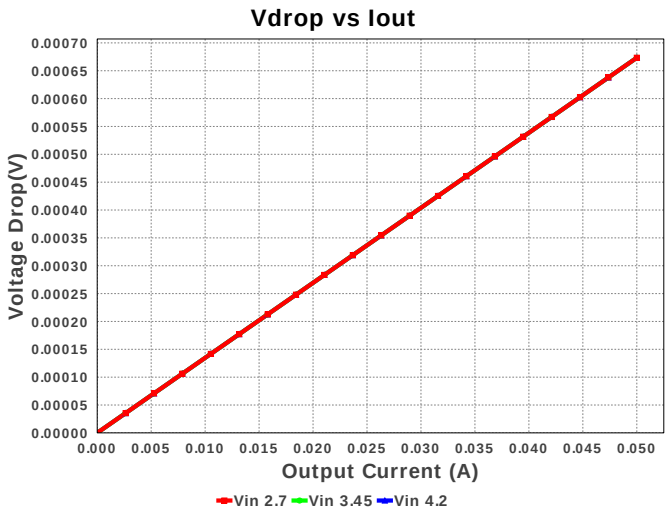
Design : 4790845/8 TPS22953DSQR
Design 8 - TPS22953DSQR

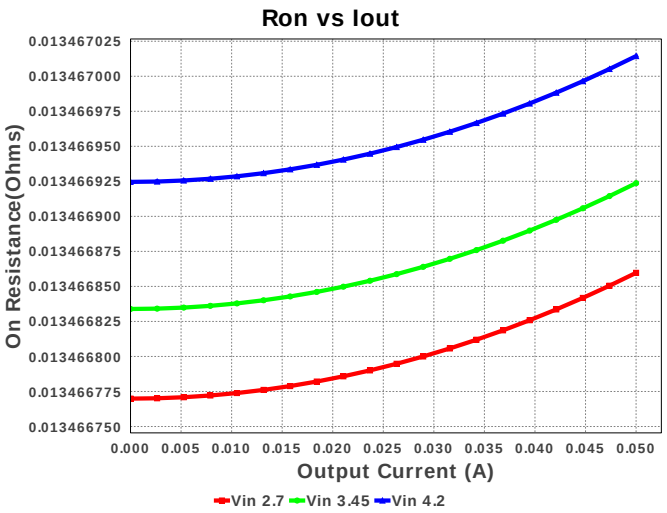


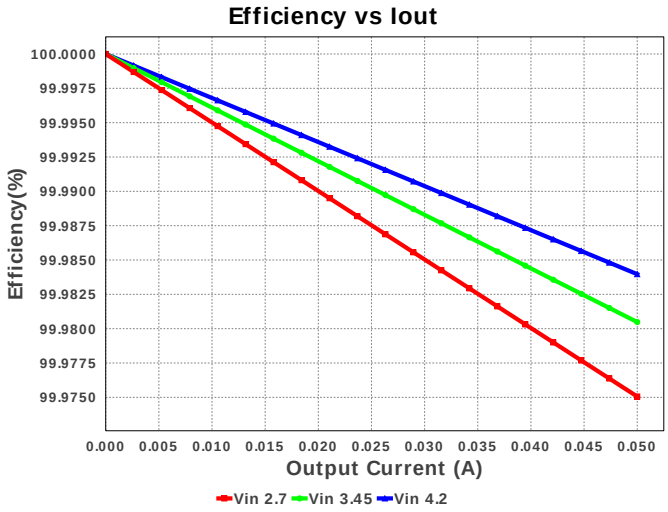
1. To limit the voltage drop on the input supply caused by transient in-rush currents when the switch turns on into a discharged load capacitor or a short circuit, it is generally recomended to have a capacitor of at least Cload*10 between VIN and GND.

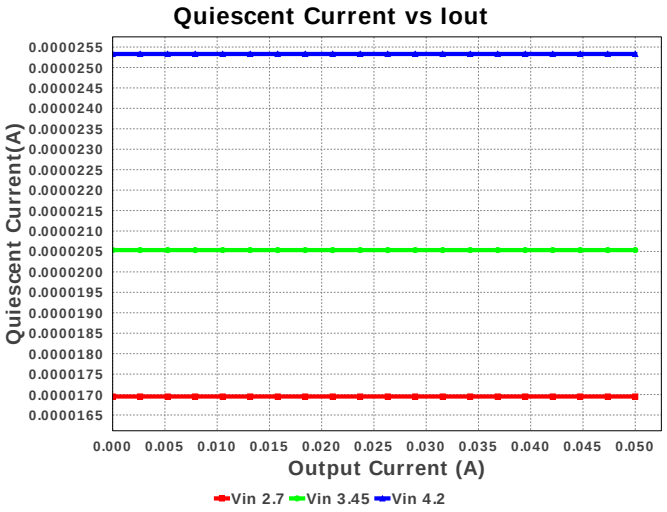
Electrical BOM

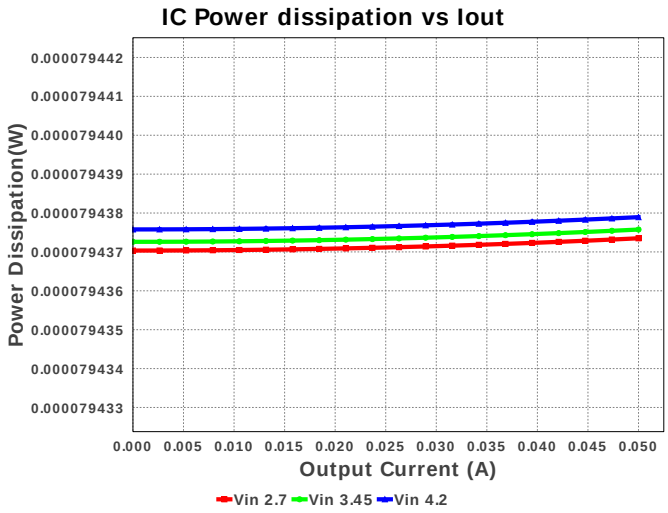
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R60J106KE19D Series= X5R	Cap= 10.0 uF ESR= 4.324 mOhm VDC= 6.3 V IRMS= 2.8728 A	1	$0.02	0805 7 mm^2
2.	Cout	MuRata	GRM155R60J104KA01D Series= X5R	Cap= 100.0 nF VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm^2
3.	Ct	Yageo America	CC0805KRX7R9BB471 Series= X7R	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
4.	Ren1	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
5.	Ren2	Vishay-Dale	CRCW04023K48FKED Series= CRCW..e3	Res= 3.48 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
6.	Rpgood	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
7.	Rsense1	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
8.	Rsense2	Vishay-Dale	CRCW04022K61FKED Series= CRCW..e3	Res= 2.61 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
9.	U1	Texas Instruments	TPS22953DSQR	Switcher	1	$0.29	R-PWSON-N10 12 mm^2

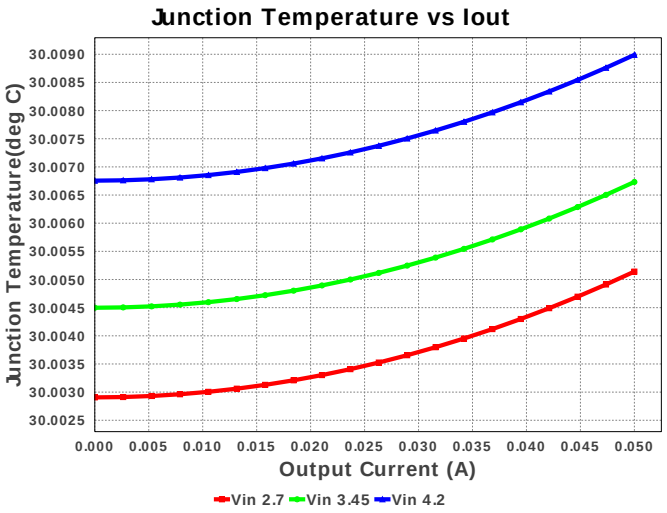












Operating Values

#	Name	Value	Category	Description
1.	BOM Count	9	General	Total Design BOM count
2.	FootPrint	44.0 mm^2	General	Total Foot Print Area of BOM components
3.	Inrush Current	100.0 mA	General	User entered Inrush Current
4.	Pout	209.965 mW	General	Total output power
5.	Total BOM	$0.38	General	Total BOM Cost
6.	Cload Act	200.0 nF	Op_Point	Cload (Actual)
7.	Ron Act	14.073 mOhm	Op_Point	Ron (Actual)
8.	SlewRate Act	5.1 mV/us	Op_Point	Change in volt per unit time
9.	Trise Act	658.665 µs	Op_Point	Rise time
10.	Vdrop Act	703.626 µV	Op_Point	Voltage drop

#	Name	Value	Category	Description
11.	DC Load Fall Time	36.907 µs	Op_point	Fall time calculated with the DC load attached. Considering only CLoad + Cout and RLoad
12.	DC Load Inrush Current	41.02 mA	Op_point	Inrush current calculated with the DC load connected
13.	Efficiency	99.983 %	Op_point	Steady state efficiency
14.	IC Tj	30.009 degC	Op_point	IC junction temperature
15.	IOUT_OP	50.0 mA	Op_point	Iout operating point
16.	No Load Fall Time	NaN s	Op_point	
17.	No Load Inrush Current	41.02 mA	Op_point	Inrush current calculated with the DC load not connected
18.	VIN_OP	4.2 V	Op_point	Vin operating point
19.	Total Pd	141.567 µW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	50.0 m	Maximum Output Current
2.	Iout	50.0 m	Maximum Output Current
3.	VinMax	4.2	Maximum input voltage
4.	VinMin	2.7	Minimum input voltage
5.	base_pn	TPS22953	Texas Instruments Base Part Number
6.	cload	100.0 n	Minimum load capacitance user requirement
7.	inrush_Current	100.0 m	Inrush current
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature
10.	vdrop_max	200.0 m	Maximum voltage drop user requirement

Design Assistance

1. TPS22953 Product Folder : http://www.ti.com/product/tps22953 : contains the data sheet and other resources.