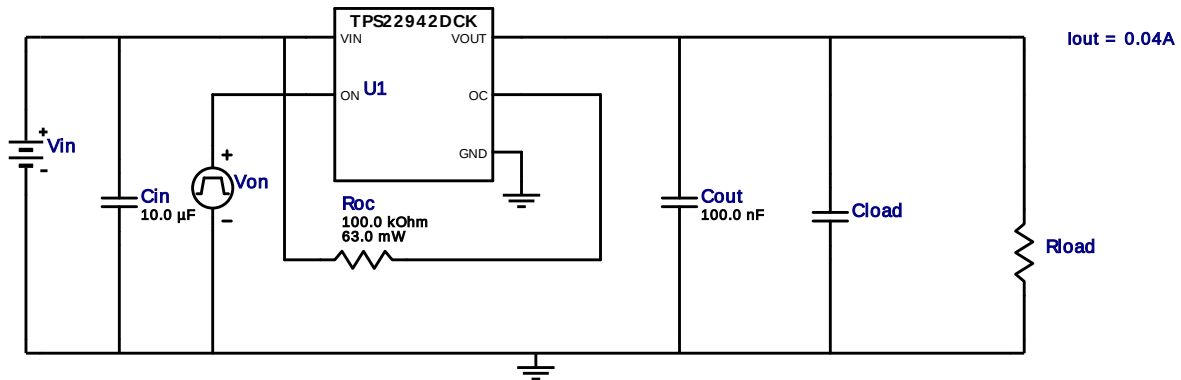


WEBENCH® Design Report

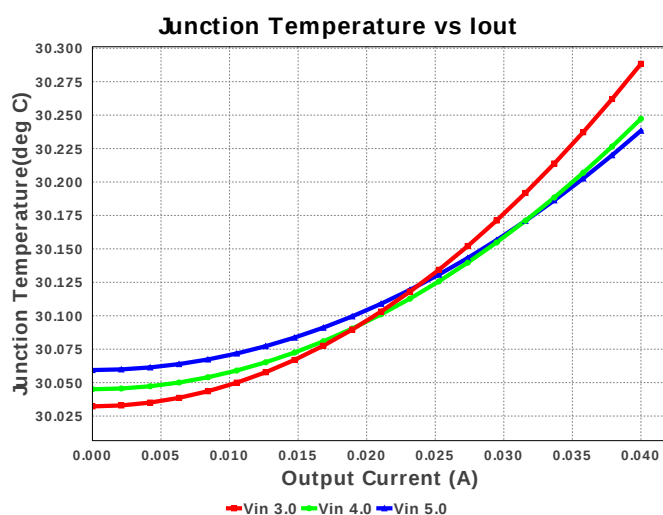
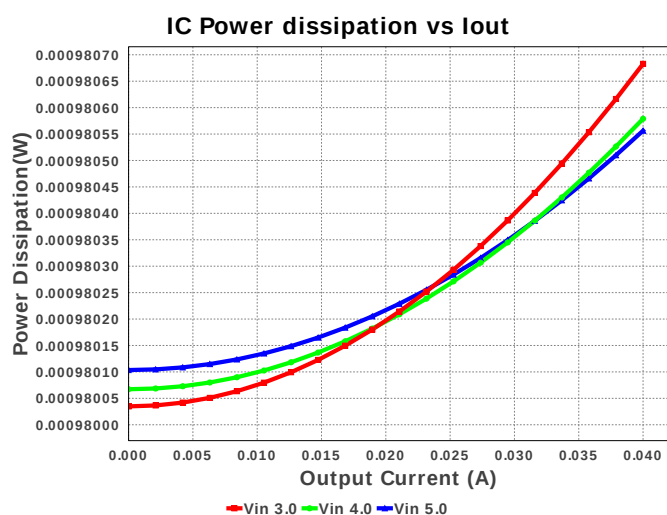
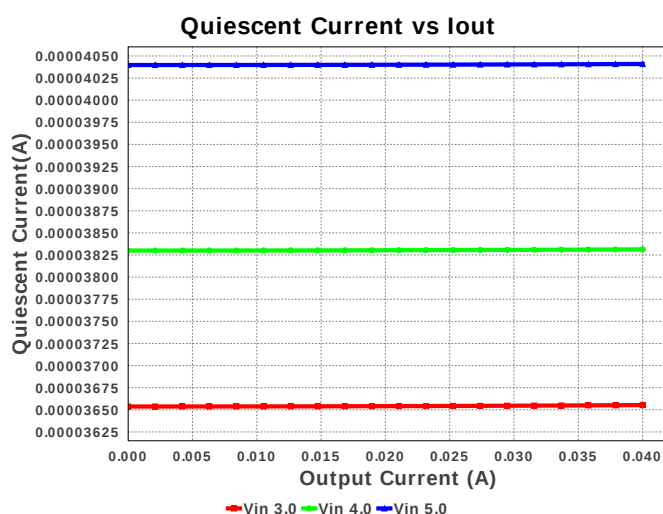
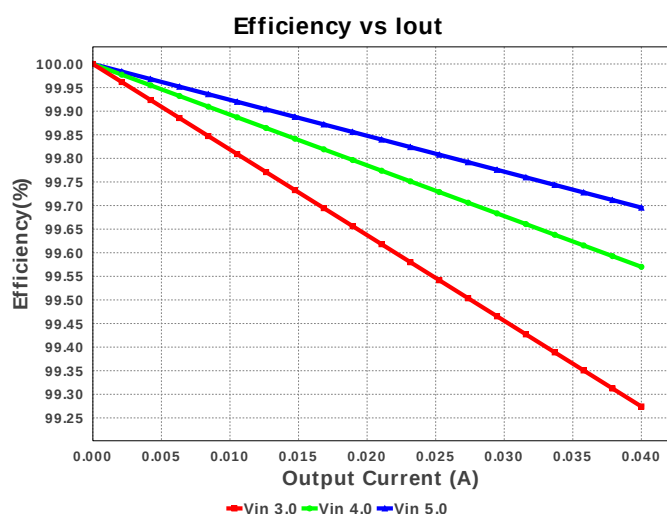
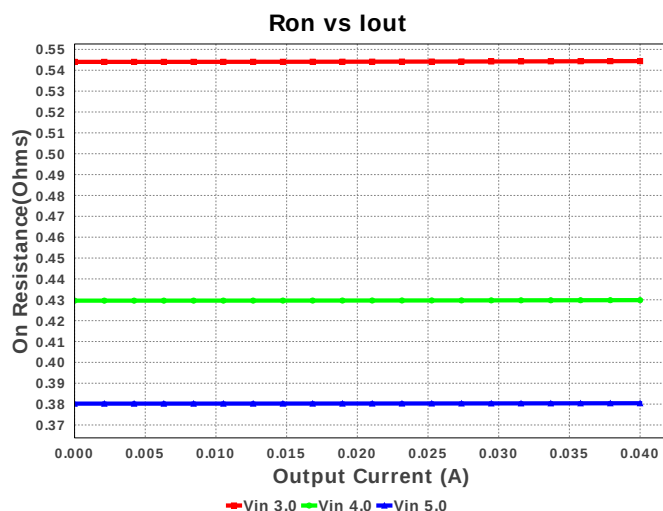
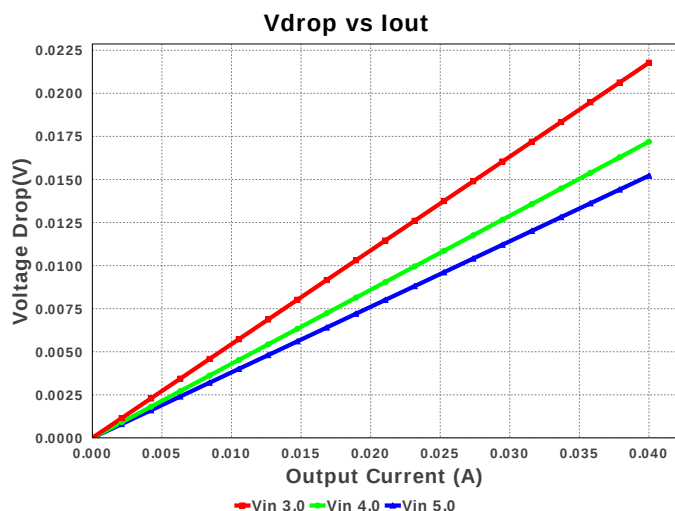
Design : 4799898/3 TPS22942DCKR
Design 3 - TPS22942DCKR



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 recommended to have a capacitor of at least $C_{load} \times 10$ between VIN and GND.

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Samsung Electro-Mechanics	CL10A106MQ8NNNC Series= X5R	Cap= 10.0 uF VDC= 6.3 V IRMS= 0.0 A	1	\$0.03	0603 5 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.	Roc	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
4.	U1	Texas Instruments	TPS22942DCKR	Switcher	1	\$0.30	R-PDSO-G5 16 mm ²



Operating Values

#	Name	Value	Category	Description
1.	BOM Count	4	General	Total Design BOM count
2.	FootPrint	27.0 mm ²	General	Total Foot Print Area of BOM components
3.	Inrush Current	80.0 mA	General	User entered Inrush Current
4.	Pout	199.391 mW	General	Total output power
5.	Total BOM	\$0.35	General	Total BOM Cost
6.	Cloud Act	200.0 nF	Op_Point	Cloud (Actual)
7.	Ron Act	380.42 mOhm	Op_Point	Ron (Actual)
8.	SlewRate Act	398.783 mV/us	Op_Point	Change in volt per unit time
9.	Trise Act	10.0 μs	Op_Point	Rise time
10.	Vdrop Act	15.217 mV	Op_Point	Voltage drop

#	Name	Value	Category	Description
11.	DC Load Fall Time	54.763 μ s	Op_point	Fall time calculated with the DC load attached. Considering only CLoad + Cout and RLoad
12.	DC Load Inrush Current	79.757 mA	Op_point	Inrush current calculated with the DC load connected
13.	Efficiency	99.696 %	Op_point	Steady state efficiency
14.	IC Tj	30.238 degC	Op_point	IC junction temperature
15.	IOUT_OP	40.0 mA	Op_point	Iout operating point
16.	No Load Fall Time	NaN s	Op_point	
17.	No Load Inrush Current	79.757 mA	Op_point	Inrush current calculated with the DC load not connected
18.	VIN_OP	5.0 V	Op_point	Vin operating point
19.	Total Pd	810.718 μ W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	40.0 m	Maximum Output Current
2.	Iout	40.0 m	Maximum Output Current
3.	VinMax	5.0	Maximum input voltage
4.	VinMin	3.0	Minimum input voltage
5.	base_pn	TPS22942	Base Product Number
6.	cload	100.0 n	Minimum load capacitance user requirement
7.	inrush_Current	80.0 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. **TPS22942** Product Folder : <http://www.ti.com/product/tps22942> : contains the data sheet and other resources.

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).