

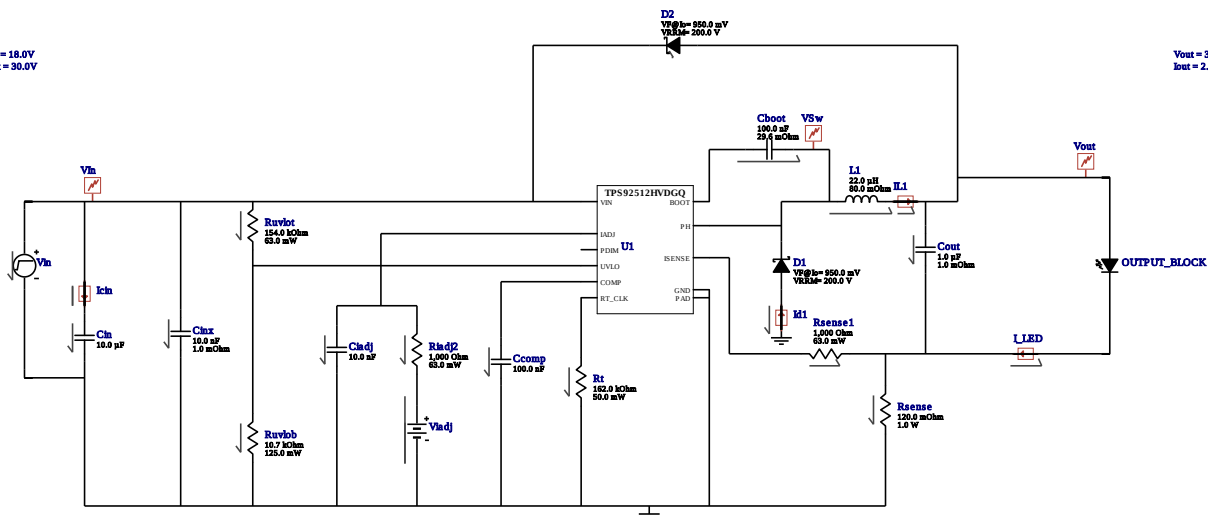
WEBENCH® Electrical Simulation Report

VinMin = 18.0V
VinMax = 30.0V
Vout = 3.2V
Iout = 2.0A

Device = TPS92512HVDGQR
Topology = Buck
Created = 2018-11-19 02:54:28.595
User ID = 11119
Design Id = 57
eSim Id = 19
Simulation Type = Startup

VinMin = 18.0V
VinMax = 30.0V

Vout = 3.2V
Iout = 2.0A



My Comments

No comments

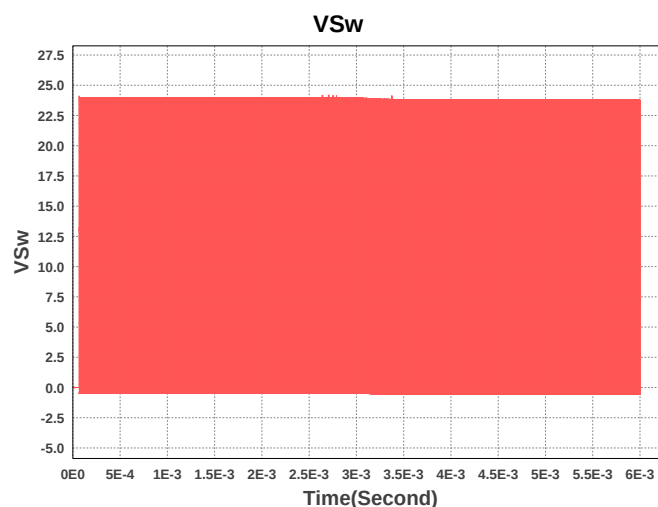
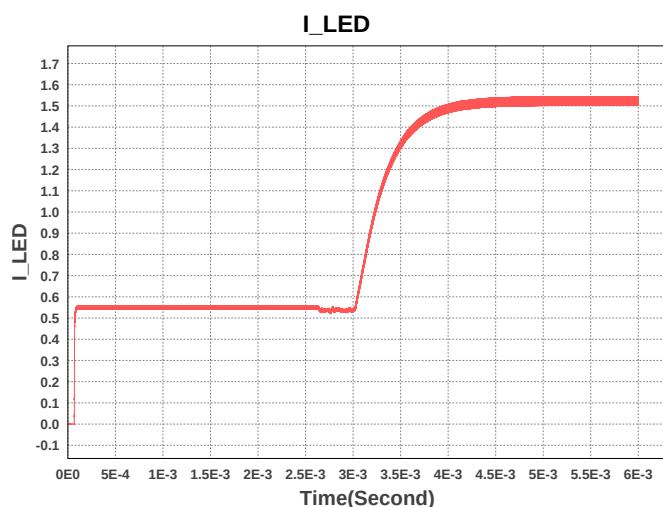
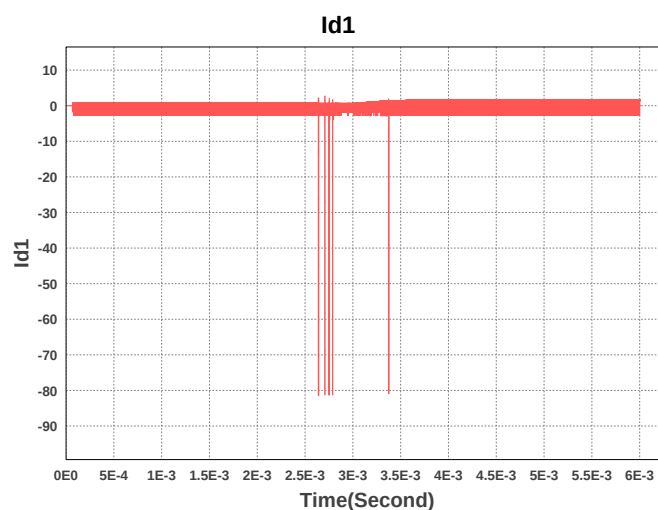
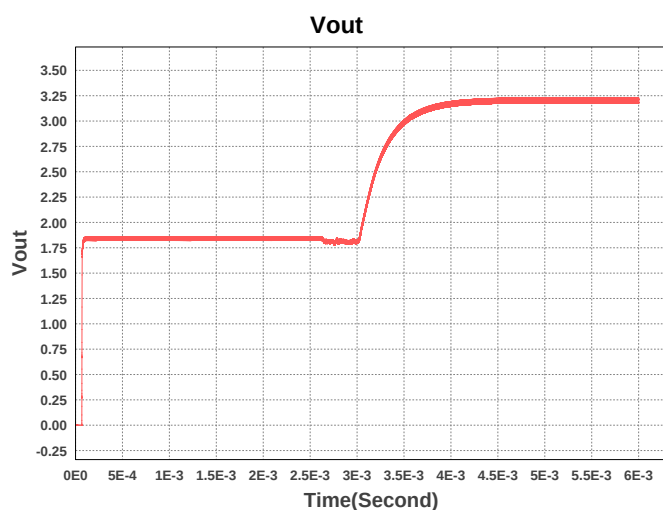
Electrical BOM

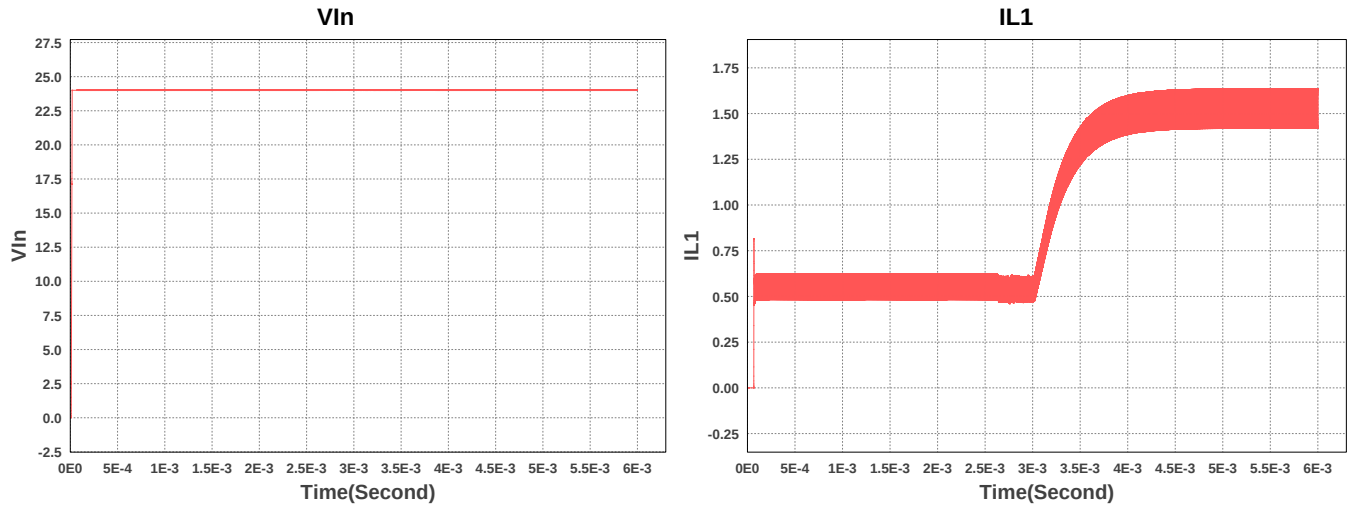
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	TDK	C1608X7R1H104K080AA Series= X7R	Cap= 100.0 nF ESR= 29.6 mOhm VDC= 50.0 V IRMS= 971.99 mA	1	\$0.01	0603 5 mm ²
2.	Ccomp	TDK	CGA5L2C0G1H104J160AA Series= C0G/NP0	Cap= 100.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.15	1206 11 mm ²
3.	Ciadj	TDK	CGA4C2C0G1H103J060AA Series= C0G/NP0	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.07	0805 7 mm ²
4.	Cin	MuRata	KCM55QR71J106KH01K Series= X7R	Cap= 10.0 µF VDC= 63.0 V IRMS= 0.0 A	1	\$1.97	KCM55Q 59 mm ²
5.	Cinx	MuRata	GRM188R72A103KA01D Series= X7R	Cap= 10.0 nF ESR= 1.0 mOhm VDC= 100.0 V IRMS= 0.0 A	1	\$0.02	0603 5 mm ²
6.	Cout	Kemet	C0603C105Z8VACTU Series= Y5V	Cap= 1.0 µF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
7.	D1	SMC Diode Solutions	SBRD10200TR	VF@Io= 950.0 mV VRRM= 200.0 V	1	\$0.12	DPAK 102 mm ²
8.	D2	SMC Diode Solutions	SBRD10200TR	VF@Io= 950.0 mV VRRM= 200.0 V	1	\$0.12	DPAK 102 mm ²
9.	D_LED	CUSTOM	CUSTOM	LED	1	NA	CUSTOM 0 mm ²
10.	L1	Bourns	SDR1105-220ML	L= 22.0 µH DCR= 80.0 mOhm	1	\$0.36	SDR1105 157 mm ²
11.	Riadj2	Vishay-Dale	CRCW04021K00FKED Series= CRCW.e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rsense	CUSTOM	CUSTOM_RESISTOR_MD Series= CUSTOM	Res= 120.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.10	0805 13 mm ²
13.	Rsense1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	Rt	Yageo	RC0201FR-07162KL Series= ?	Res= 162.0 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	0201 2 mm ²
15.	Ruvlob	Panasonic	ERJ-6ENF1072V Series= ERJ-6E	Res= 10.7 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
16.	Ruvlot	Vishay-Dale	CRCW0402154KFKED Series= CRCW..e3	Res= 154.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
17.	U1	Texas Instruments	TPS92512HVDGQR	Switcher	1	\$0.50	DGQ0010D_N 24 mm ²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Viadj	V	Input Voltage	1.1 V





Design Inputs

#	Name	Value	Description
1.	Iout	2.0 A	Maximum Output Current
2.	VinMax	30.0 V	Maximum input voltage
3.	VinMin	18.0 V	Minimum input voltage
4.	Vout	3.2 V	Output Voltage
5.	acFrequency	60.0 Hz	AC Frequency
6.	application	LED_DRIVER	LED Application
7.	base_pn	TPS92512HV	Base Product Number
8.	LED_Architect	N	LED Architect Project
9.	ledparallel	1.0	Number of LED in parallel
10.	ledpartnumber	Custom	LED Part number
11.	ledseries	1.0	Number of LED in series
12.	line_fsw	60.0	AC Line Frequency
13.	source	DC	Input Source Type
14.	Ta	30.0 degC	Ambient temperature
15.	UserFsw	696.429 kHz	Customer Selected Frequency

Operating Values

#	Name	Value	Category	Description
1.	BOM Count	17		Total Design BOM count
2.	Total BOM	\$0.0		Total BOM Cost
3.	Cin IRMS	761.635 mA	Capacitor	Input capacitor RMS ripple current
4.	Cin Pd	580.09 μ W	Capacitor	Input capacitor power dissipation
5.	Cout IRMS	68.973 mA	Capacitor	Output capacitor RMS ripple current
6.	Cout Pd	4.757 μ W	Capacitor	Output capacitor power dissipation
7.	D1 Pd	1.582 W	Diode	Output Diode Power Dissipation
8.	IC Ipk	0.0 A	IC	Peak switch current in IC
9.	IC Pd	395.99 mW	IC	IC power dissipation
10.	IC Tj	56.412 degC	IC	IC junction temperature
11.	IC Tolerance	0.0 V	IC	IC Feedback Tolerance
12.	ICThetaJA	66.7 degC/W	IC	IC junction-to-ambient thermal resistance
13.	Iin Avg	368.72 mA	IC	Average input current
14.	L Ipp	238.929 mA	Inductor	Peak-to-peak inductor ripple current
15.	L Pd	390.86 mW	Inductor	Inductor power dissipation
16.	LED Ipp	78.979 mA	LED	LED Ripple Current
17.	LED Rd	800.0 mOhm	LED	LED DynamicResistance
18.	Cin Pd	580.09 μ W	Power	Input capacitor power dissipation
19.	Cout Pd	4.757 μ W	Power	Output capacitor power dissipation
20.	D1 Pd	1.582 W	Power	Output Diode Power Dissipation
21.	IC Pd	395.99 mW	Power	IC power dissipation
22.	L Pd	390.86 mW	Power	Inductor power dissipation
23.	Rsense Pd	480.0 mW	Power	LED Current Rsns Power Dissipation
24.	Total Pd	2.849 W	Power	Total Power Dissipation
25.	Rsense Pd	480.0 mW	Resistor	LED Current Rsns Power Dissipation
26.	Converter On Time	252.713 ns	System	Approximate Converter On Time
27.	Cross Freq	1.037 kHz	System Information	Bode plot crossover frequency
28.	Duty Cycle	17.6 %	System Information	Duty cycle
29.	Efficiency	67.805 %	System Information	Steady state efficiency

#	Name	Value	Category	Description
30.	FootPrint	524.0 mm ²	System Information	Total Foot Print Area of BOM components
31.	Frequency	696.429 kHz	System Information	Switching frequency
32.	Iout	2.0 A	System Information	Iout operating point
33.	Mode	CCM	System Information	Conduction Mode
34.	Phase Marg	89.819 deg	System Information	Bode Plot Phase Margin
35.	Pout	6.4 W	System Information	Total output power
36.	Start Voltage	18.471 V	System Information	Start Voltage with External UVLO Resistors
37.	Stop Voltage	17.578 V	System Information	Stop Voltage with External UVLO Resistors
38.	Vin	24.0 V	System Information	Vin operating point
39.	Vout	3.2 V	System Information	Operational Output Voltage

Design Assistance

1. **TPS92512HV** Product Folder : <http://www.ti.com/product/TPS92512HV> : contains the data sheet and other resources.

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