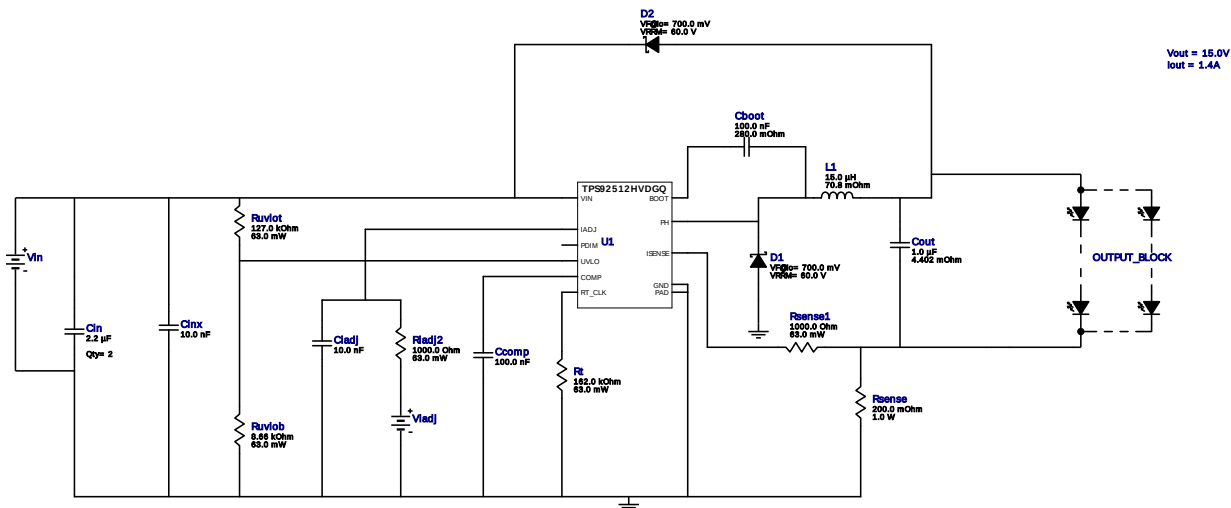


WEBENCH® Design Report

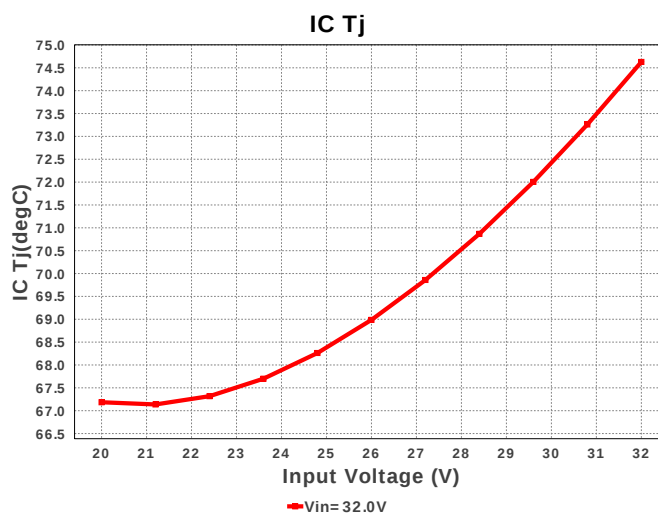
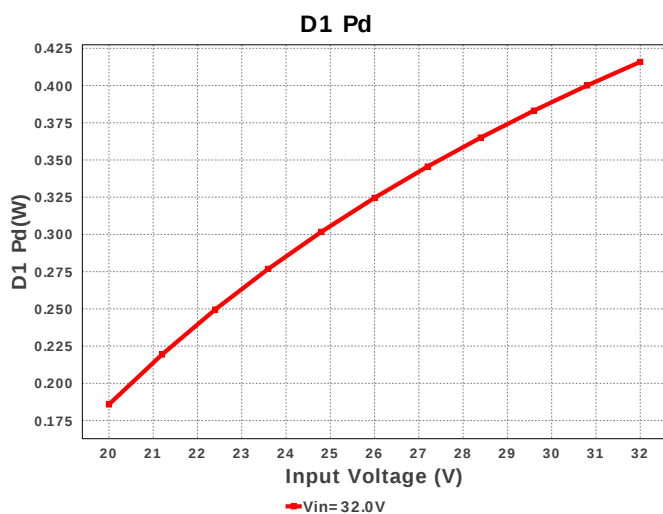
Design : 906020/2235 TPS92512HVDGQR
TPS92512HVDGQR 20.0V-32.0V to 15.00V @ 1.4A

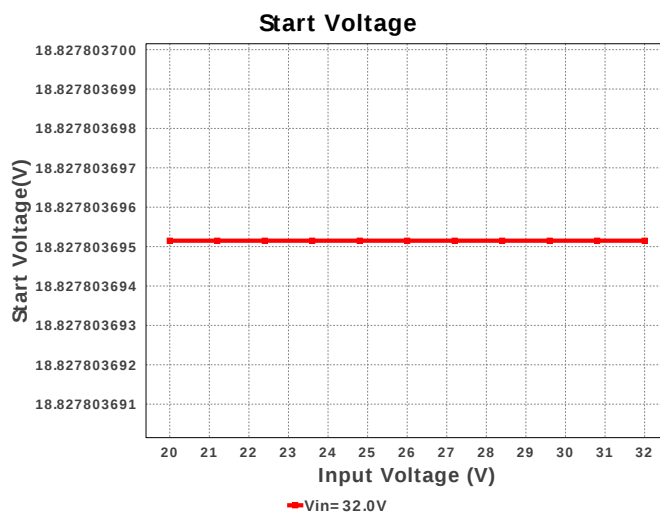
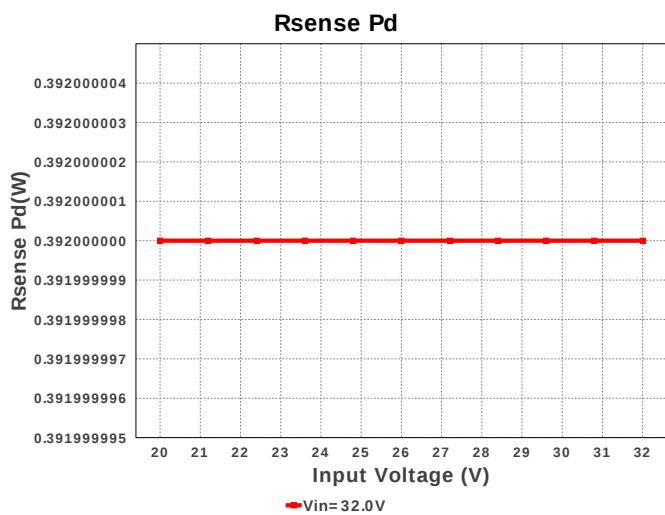
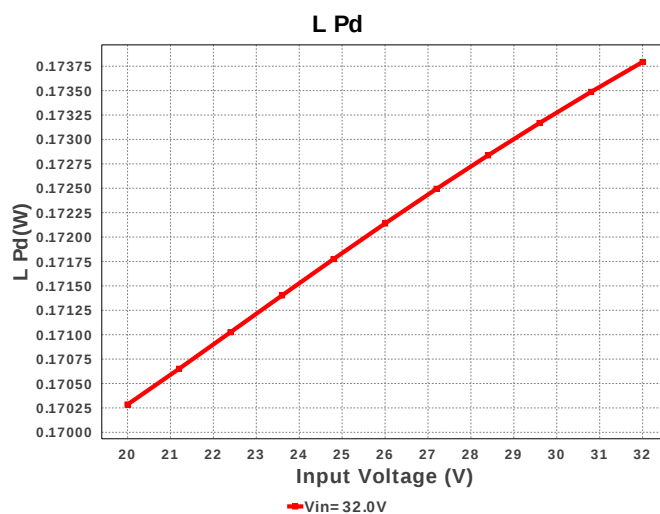
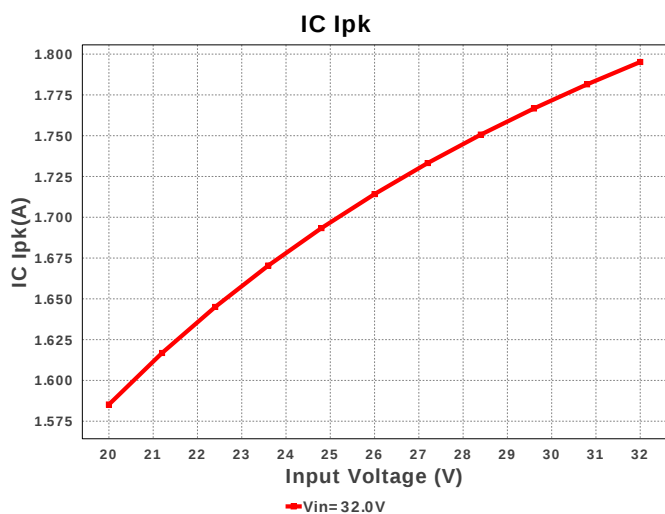
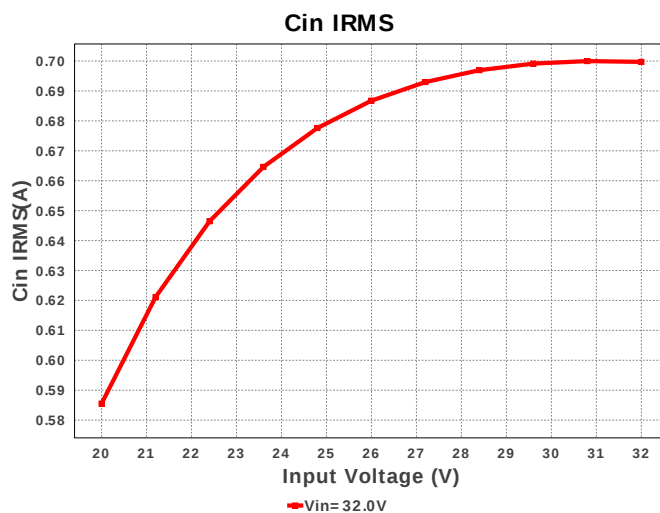
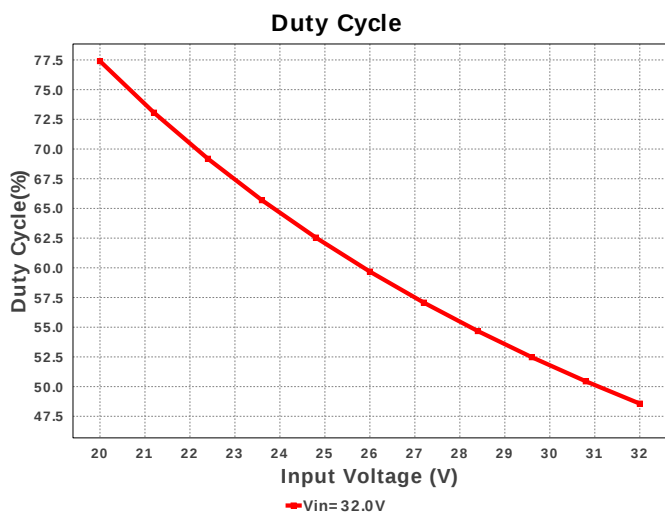


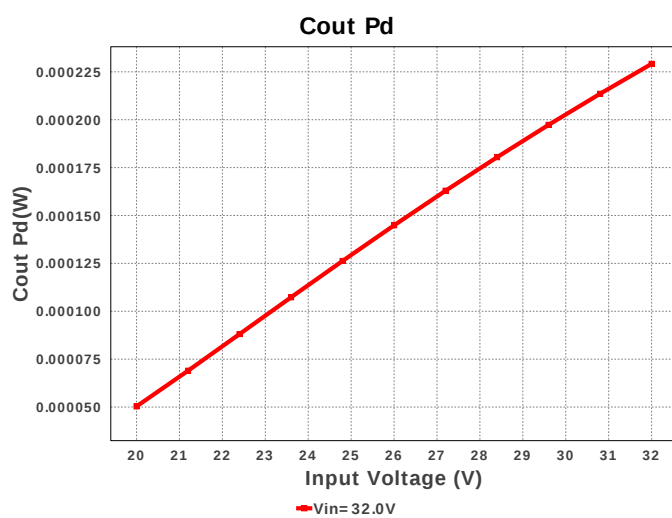
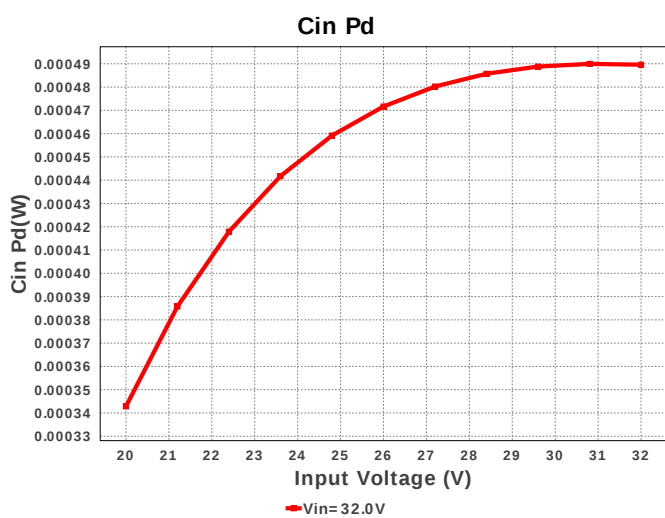
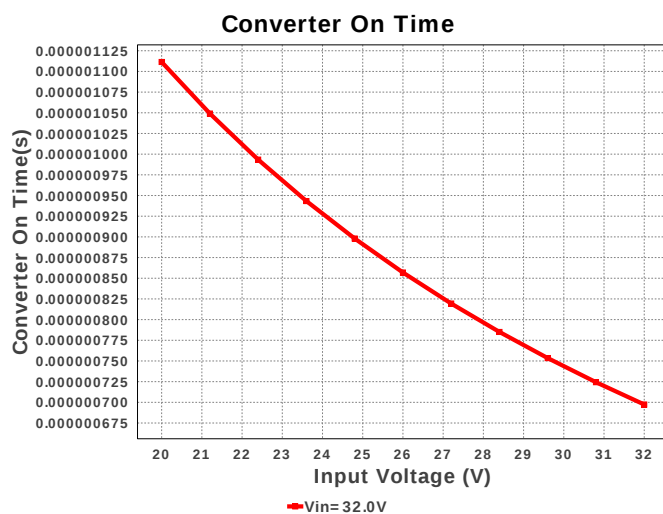
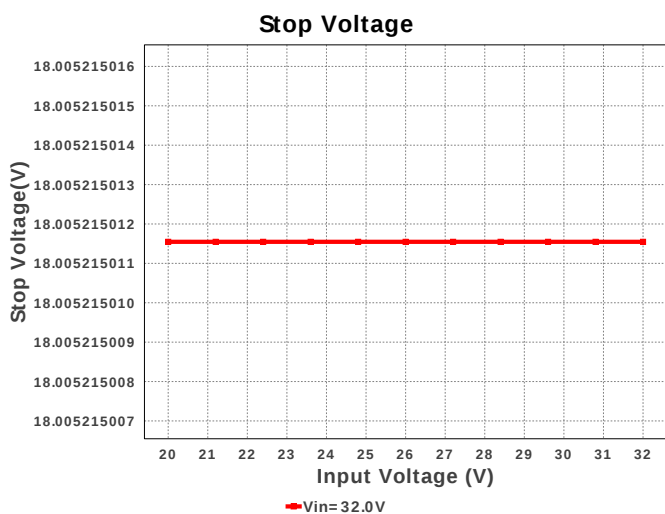
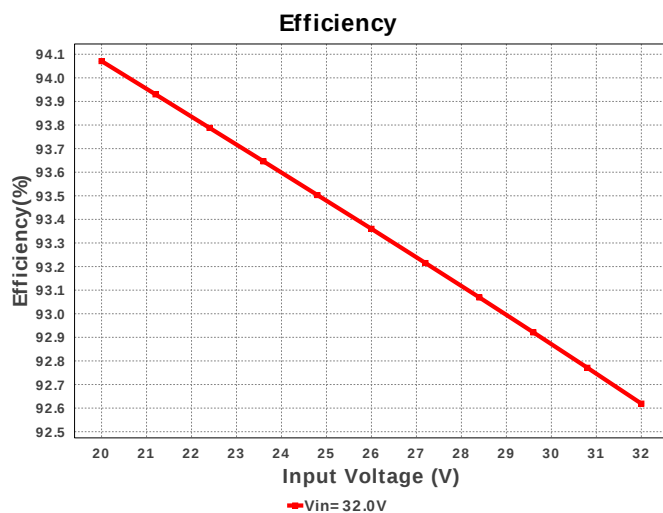
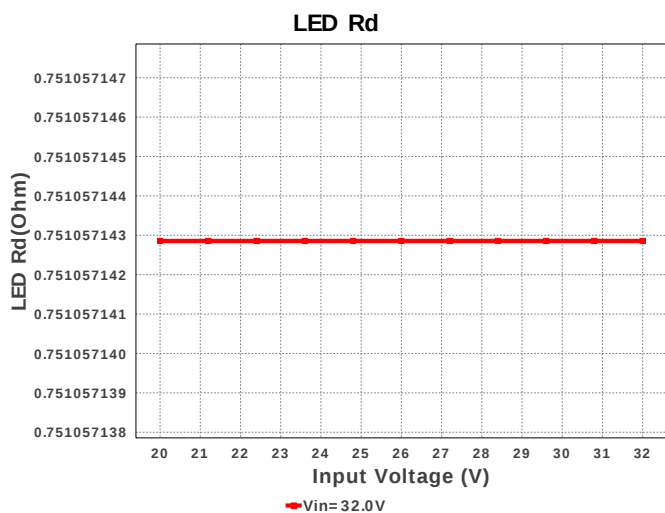
Electrical BOM

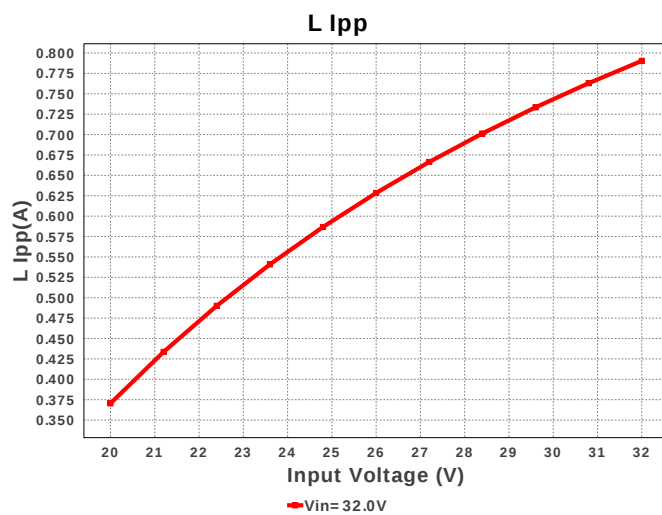
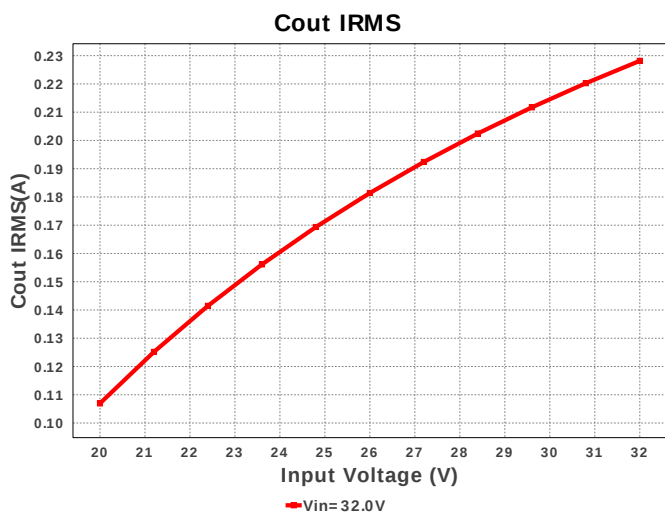
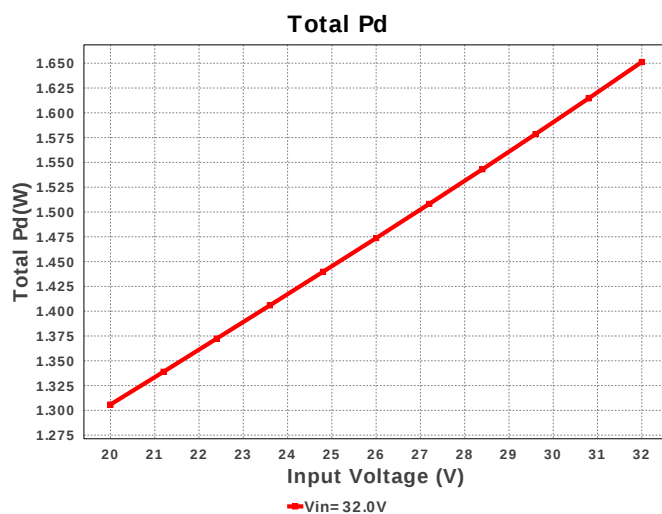
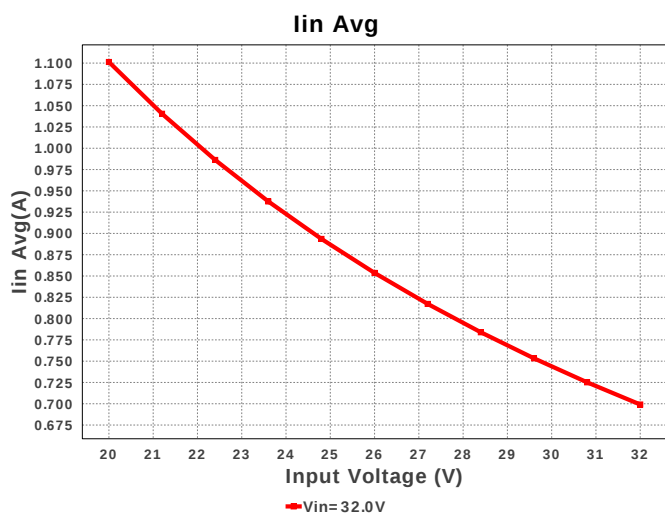
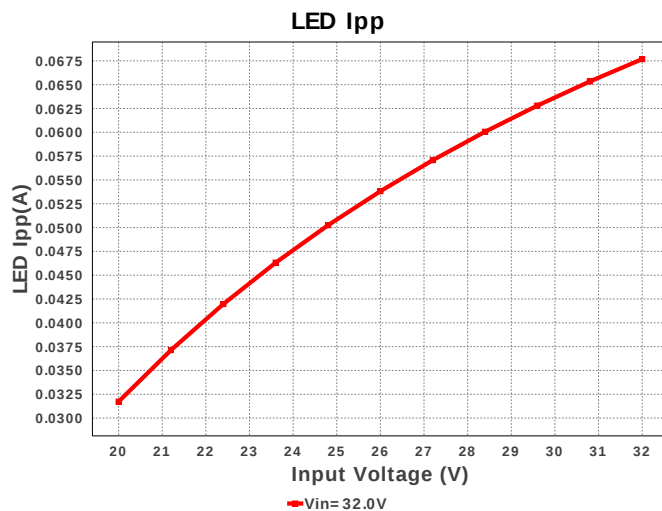
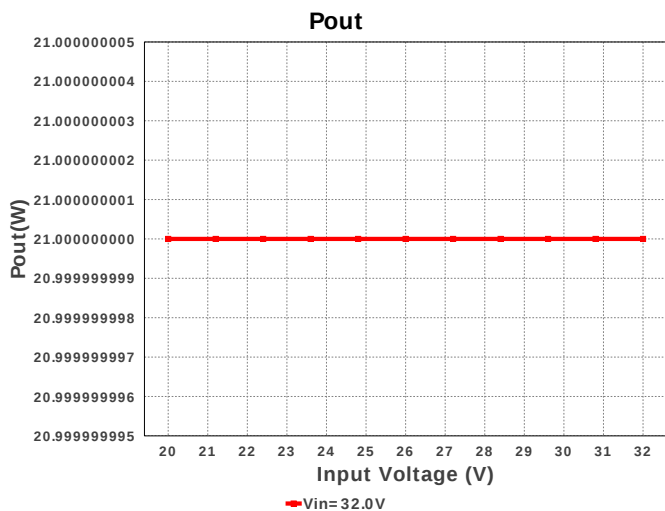
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm²
2.	Ccomp	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm²
3.	Ciadj	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm²
4.	Cin	Taiyo Yuden	HMK325B7225KN-T Series= X7R	Cap= 2.2 uF VDC= 100.0 V IRMS= 0.0 A	2	\$0.13	 1210 15 mm²
5.	Cinx	MuRata	GRM188R72A103KA01D Series= X7R	Cap= 10.0 nF VDC= 100.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm²
6.	Cout	MuRata	GRM21BR71H105KA12L Series= X7R	Cap= 1.0 uF ESR= 4.402 mOhm VDC= 50.0 V IRMS= 1.677 A	1	\$0.05	 0805 7 mm²
7.	D1	Diodes Inc.	B160-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.06	 SMA 37 mm²
8.	D2	Diodes Inc.	B160-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.06	 SMA 37 mm²
9.	D_LED	Cree	XPGWHT-L1-0000-00F51	LED	20	\$1.32	 xlampxpg 20 mm²
10.	L1	TDK	SLF6045T-150M1R3-3PF	L= 15.0 uH DCR= 70.8 mOhm	1	\$0.43	 SLF6045 64 mm²

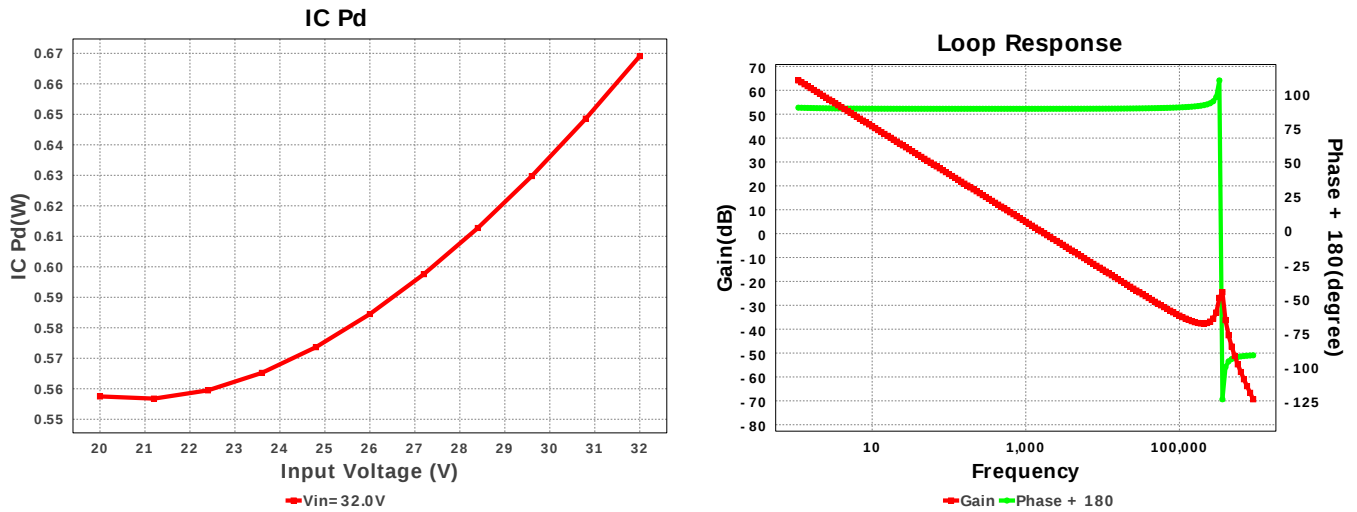
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Riadj2	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rsense	Stackpole Electronics Inc	CSRN2010FKR200 Series= ?	Res= 200.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.11	 2010 32 mm ²
13.	Rsense1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
14.	Rt	Vishay-Dale	CRCW0402162KFKED Series= CRCW..e3	Res= 162.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	Ruvlob	Vishay-Dale	CRCW04028K66FKED Series= CRCW..e3	Res= 8.66 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
16.	Ruvlot	Vishay-Dale	CRCW0402127KFKED Series= CRCW..e3	Res= 127.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
17.	U1	Texas Instruments	TPS92512HVDGQR	Switcher	1	\$0.80	 DGQ0010D_N 24 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	699.713 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	226.993 mA	Current	Output capacitor RMS ripple current
3.	IC lpk	1.793 A	Current	Peak switch current in IC
4.	Iin Avg	699.11 mA	Current	Average input current
5.	L lpp	786.33 mA	Current	Peak-to-peak inductor ripple current
6.	LED lpp	67.34 mA	Current	LED Ripple Current
7.	BOM Count	37	General	Total Design BOM count
8.	FootPrint	666.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	696.429 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	21.0 W	General	Total output power
12.	Total BOM	\$28.26	General	Total BOM Cost
13.	Vout OP	15.0 V	Op_Point	Operational Output Voltage
14.	Cross Freq	1.765 kHz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	48.567 %	Op_point	Duty cycle
16.	Efficiency	92.619 %	Op_point	Steady state efficiency
17.	IC Tj	74.629 degC	Op_point	IC junction temperature
18.	ICThetaJA	66.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	1.4 A	Op_point	Iout operating point
20.	LED Rd	751.057 mOhm	Op_point	LED DynamicResistance
21.	Phase Marg	90.013 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	32.0 V	Op_point	Vin operating point
23.	Cin Pd	489.598 μW	Power	Input capacitor power dissipation
24.	Cout Pd	226.816 μW	Power	Output capacitor power dissipation
25.	D1 Pd	415.852 mW	Power	Output Diode Power Dissipation
26.	IC Pd	669.096 mW	Power	IC power dissipation
27.	L Pd	173.748 mW	Power	Inductor power dissipation
28.	Rsense Pd	392.0 mW	Power	Rsense Power Dissipation
29.	Total Pd	1.651 W	Power	Total Power Dissipation
30.	Start Voltage	18.828 V	UVLO	Start Voltage with External UVLO Resistors
31.	Stop Voltage	18.005 V	UVLO	Stop Voltage with External UVLO Resistors
32.	Converter On Time	693.817 ns		Approximate Converter On Time

Design Inputs

#	Name	Value	Description
1.	Iout	1.4	Maximum Output Current
2.	VinMax	32.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	15.0	Output Voltage
5.	application	LED_DRIVER	LED Application
6.	base_pn	TPS92512HV	Texas Instruments Base Part Number
7.	isLEDArchitect	N	LED Architect Project
8.	ledparallel	4.0	Number of LED in parallel
9.	ledpartnumber	XPGWHT-L1-0000-00F51	LED Part number
10.	ledseries	5.0	Number of LED in series
11.	line_fsw	60.0	AC Line Frequency
12.	source	DC	Input Source Type
13.	ta	30.0	Ambient temperature

Design Assistance

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

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