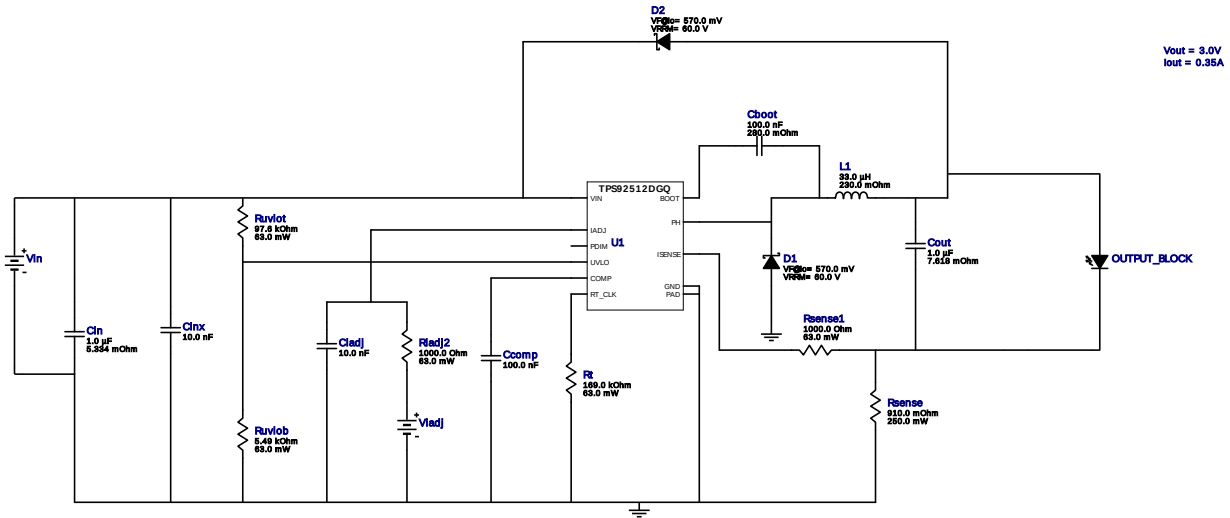


WEBENCH® Design Report

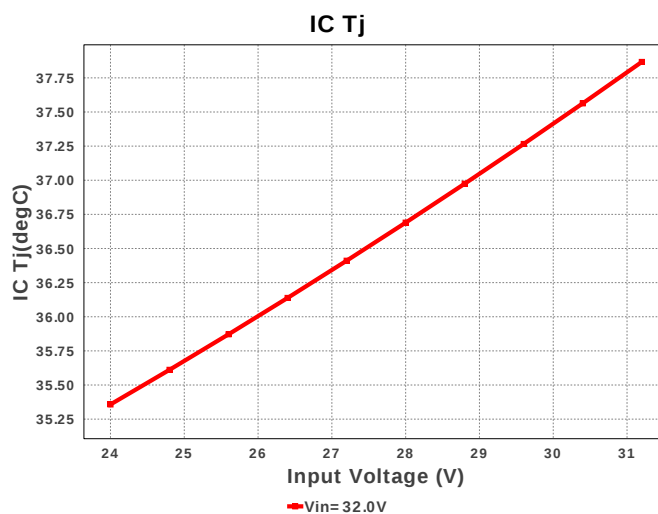
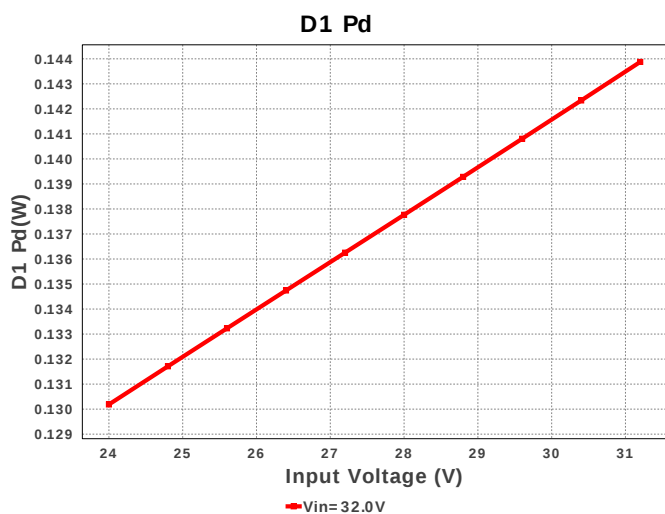
Design : 906020/2231 TPS92512DGQR
TPS92512DGQR 24.0V-32.0V to 3.00V @ 0.35A

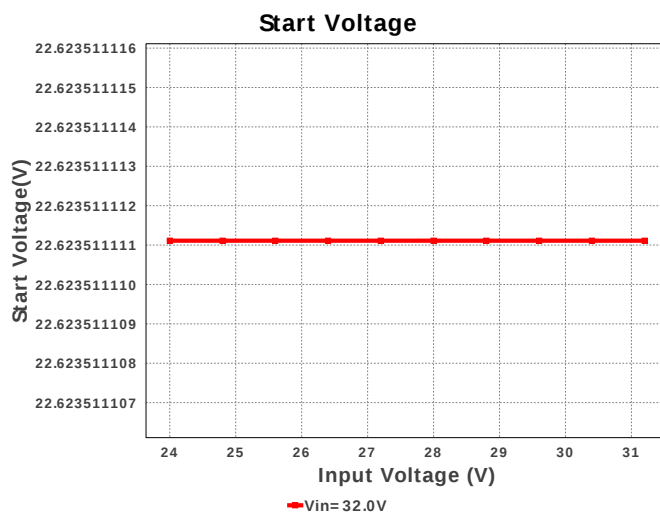
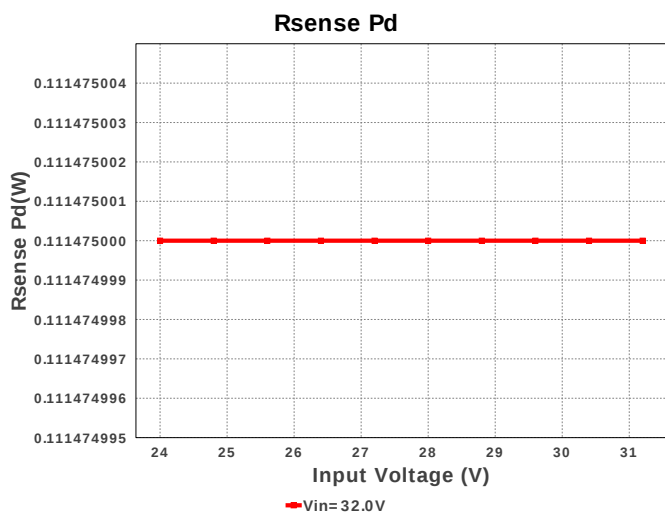
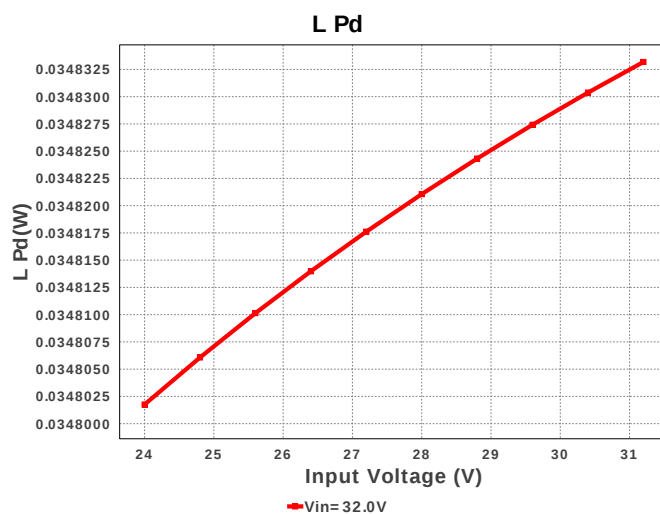
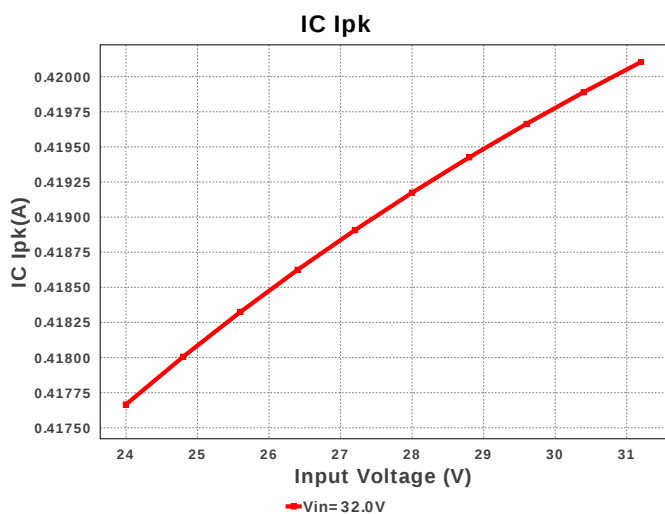
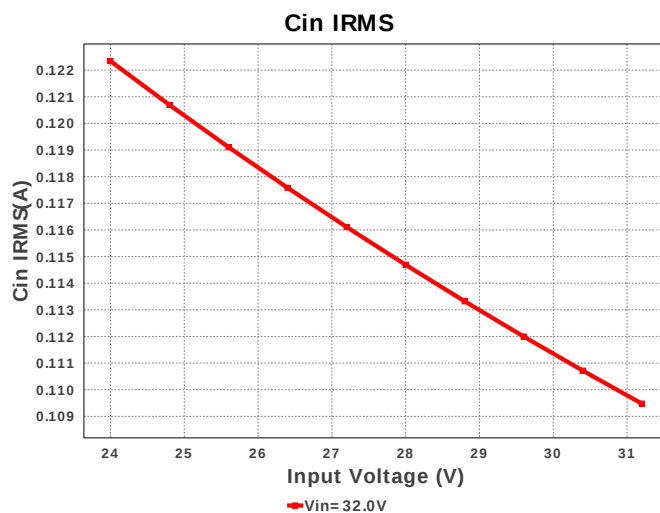
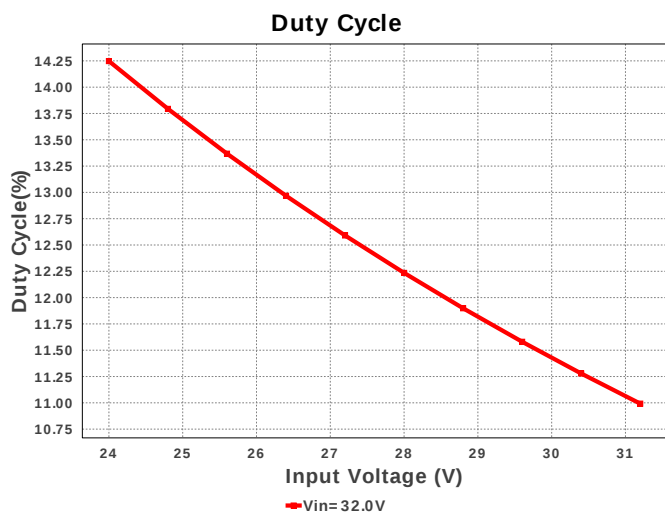


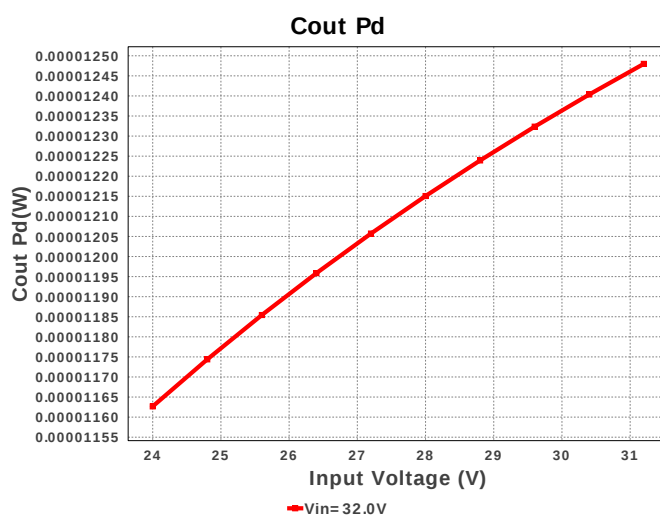
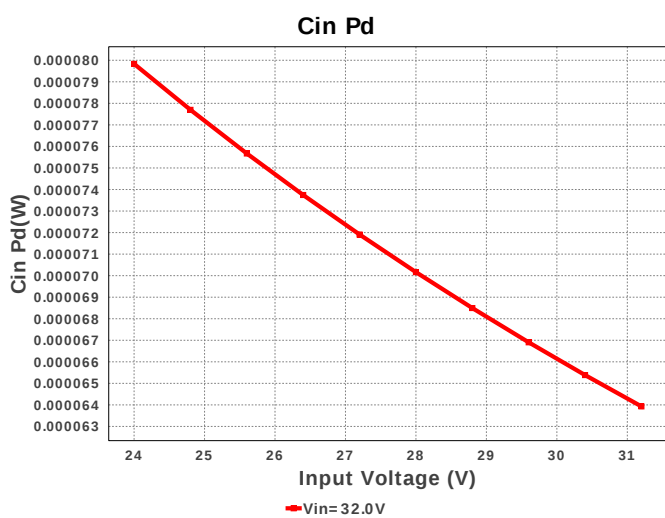
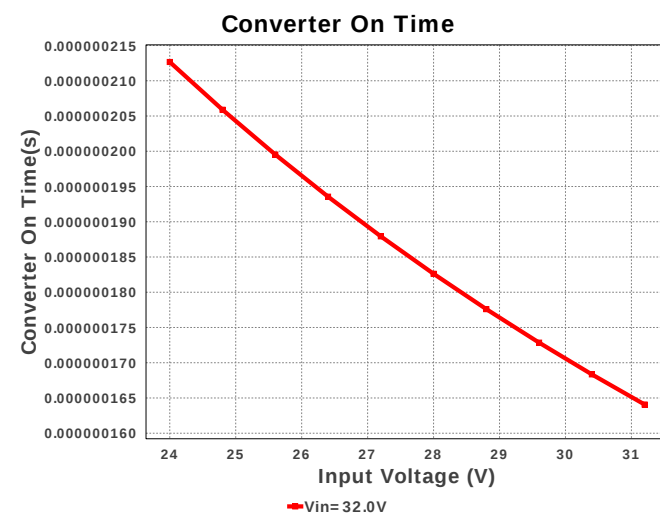
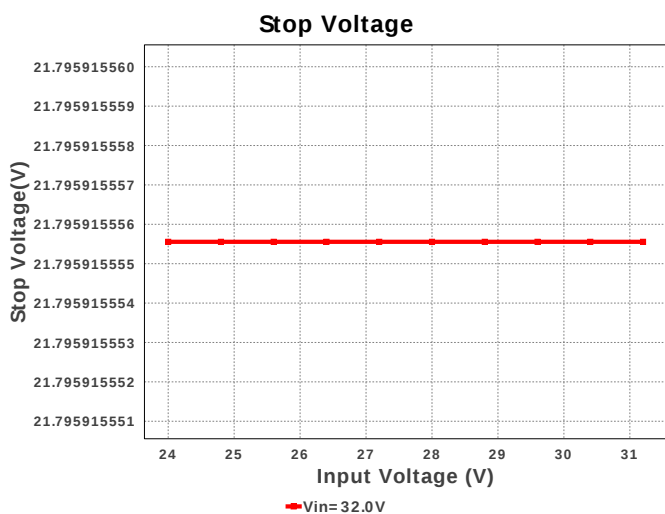
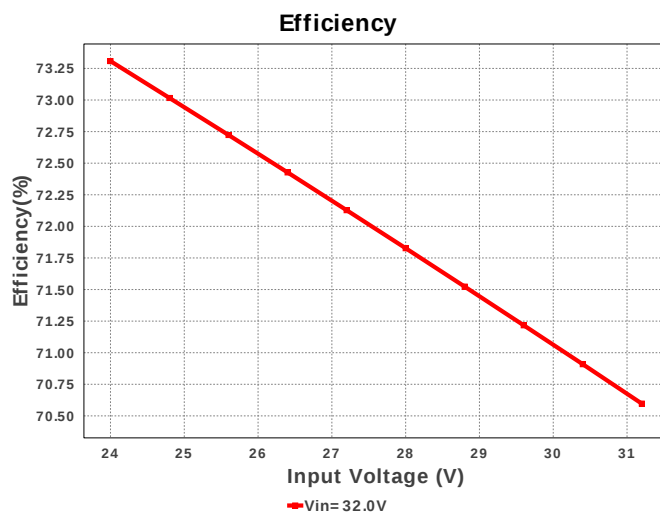
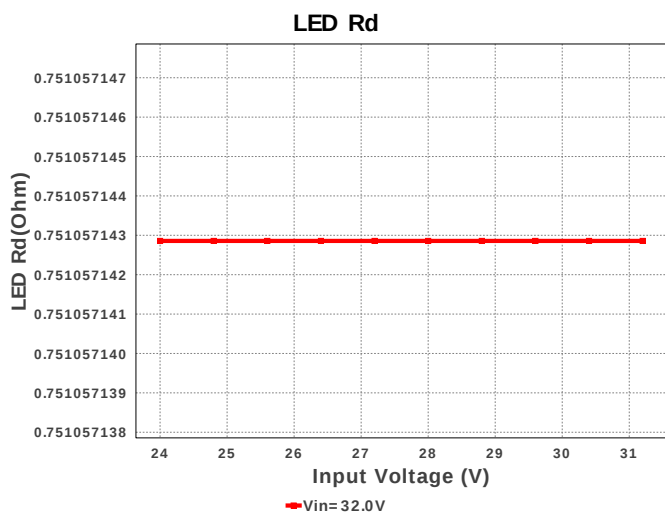
Electrical BOM

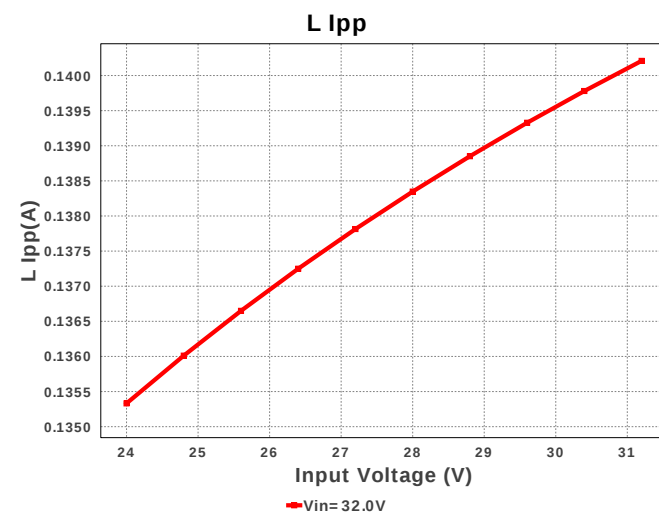
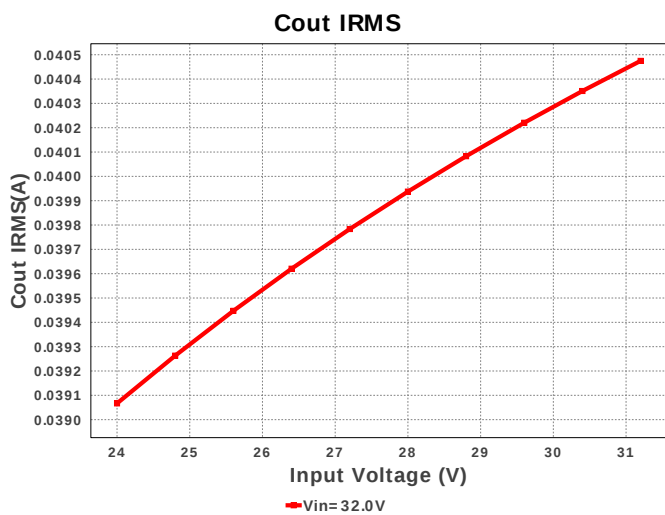
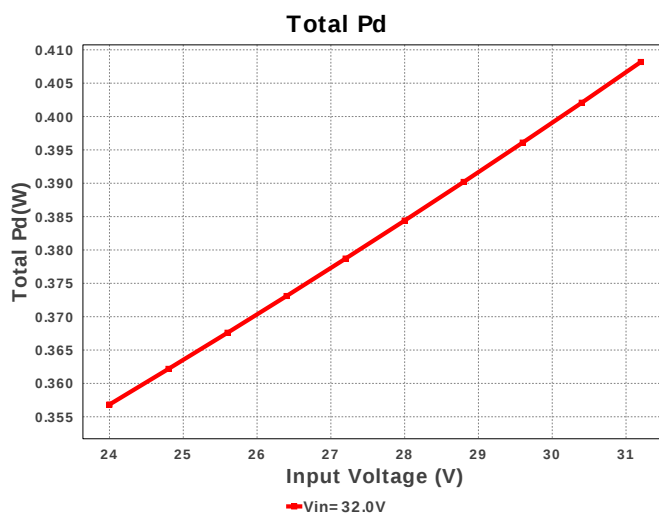
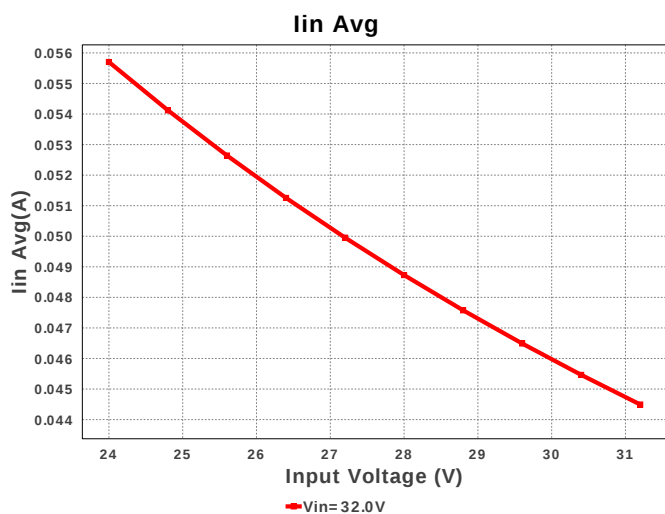
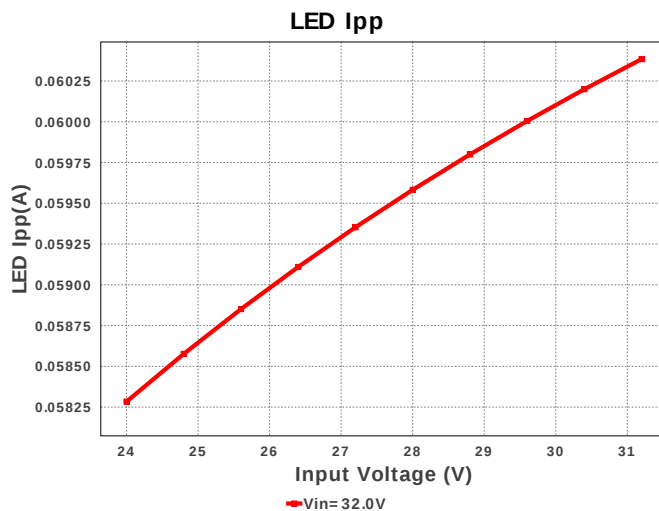
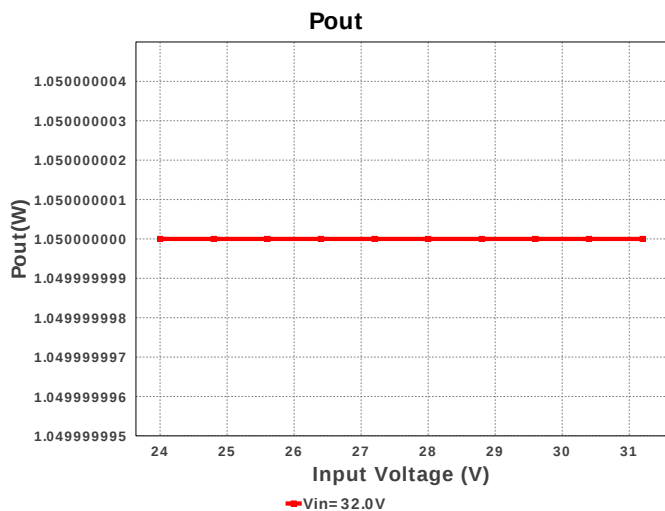
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Ciadj	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	MuRata	GRM31CR72A105KA01L Series= X7R	Cap= 1.0 uF ESR= 5.334 mOhm VDC= 100.0 V IRMS= 1.55432 A	1	\$0.11	1206_190 11 mm ²
5.	Cinx	MuRata	GRM188R72A103KA01D Series= X7R	Cap= 10.0 nF VDC= 100.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
6.	Cout	TDK	C1005X5R0J105M Series= X5R	Cap= 1.0 uF ESR= 7.618 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
7.	D1	NXP Semiconductor	PMEG6010CEH,115	VF@Io= 570.0 mV VRRM= 60.0 V	1	\$0.04	SOD-123F 12 mm ²
8.	D2	NXP Semiconductor	PMEG6010CEH,115	VF@Io= 570.0 mV VRRM= 60.0 V	1	\$0.04	SOD-123F 12 mm ²
9.	D_LED	Cree	XPGWHT-L1-0000-00H51	LED	1	\$1.60	xlampxpg 20 mm ²
10.	L1	Bourns	SRR4028-330Y	L= 33.0 uH DCR= 230.0 mOhm	1	\$0.26	SRR4028 34 mm ²

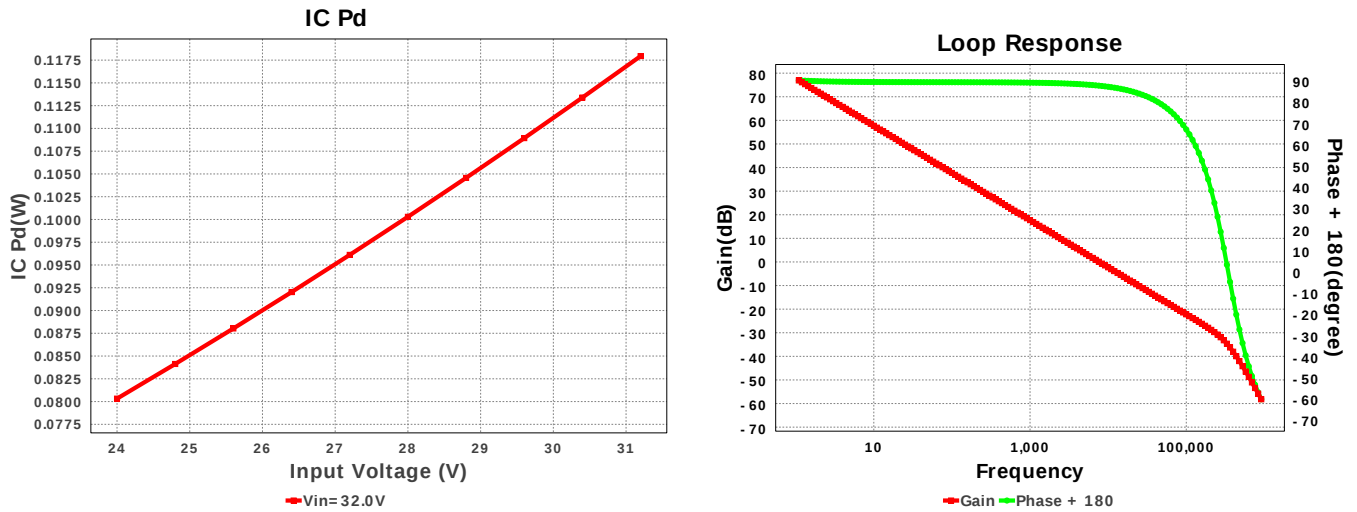
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Riadj2	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rsense	Bourns	CRM0805-FX-R910ELF Series= ?	Res= 910.0 mOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.03	 0805 7 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	CRCW0402169KFKED Series= CRCW..e3	Res= 169.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	Ruvlob	Vishay-Dale	CRCW04025K49FKED Series= CRCW..e3	Res= 5.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
16.	Ruvlot	Vishay-Dale	CRCW040297K6FKED Series= CRCW..e3	Res= 97.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
17.	U1	Texas Instruments	TPS92512DGQR	Switcher	1	\$0.55	 DGQ0010D_N 24 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	108.28 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	41.228 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	421.409 mA	Current	Peak switch current in IC
4.	Iin Avg	43.575 mA	Current	Average input current
5.	L Ipp	142.82 mA	Current	Peak-to-peak inductor ripple current
6.	LED Ipp	61.508 mA	Current	LED Ripple Current
7.	BOM Count	17	General	Total Design BOM count
8.	FootPrint	161.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	669.967 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	1.05 W	General	Total output power
12.	Total BOM	\$2.73	General	Total BOM Cost
13.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
14.	Cross Freq	7.697 kHz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	10.72 %	Op_point	Duty cycle
16.	Efficiency	70.283 %	Op_point	Steady state efficiency
17.	IC Tj	38.176 degC	Op_point	IC junction temperature
18.	ICThetaJA	66.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	350.0 mA	Op_point	Iout operating point
20.	LED Rd	751.057 mOhm	Op_point	LED DynamicResistance
21.	Phase Marg	88.371 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	32.0 V	Op_point	Vin operating point
23.	Cin Pd	62.539 μW	Power	Input capacitor power dissipation
24.	Cout Pd	12.949 μW	Power	Output capacitor power dissipation
25.	D1 Pd	145.427 mW	Power	Output Diode Power Dissipation
26.	IC Pd	122.584 mW	Power	IC power dissipation
27.	L Pd	34.85 mW	Power	Inductor power dissipation
28.	Rsense Pd	111.475 mW	Power	Rsense Power Dissipation
29.	Total Pd	414.374 mW	Power	Total Power Dissipation
30.	Start Voltage	22.624 V	UVLO	Start Voltage with External UVLO Resistors
31.	Stop Voltage	21.796 V	UVLO	Stop Voltage with External UVLO Resistors
32.	Converter On Time	162.516 ns		Approximate Converter On Time

Design Inputs

#	Name	Value	Description
1.	Iout	350.0 m	Maximum Output Current
2.	VinMax	32.0	Maximum input voltage
3.	VinMin	24.0	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	application	LED_DRIVER	LED Application
6.	base_pn	TPS92512	Texas Instruments Base Part Number
7.	isLEDArchitect	N	LED Architect Project
8.	ledparallel	1.0	Number of LED in parallel
9.	ledpartnumber	XPGWHT-L1-0000-00H51	LED Part number
10.	ledseries	1.0	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. TPS92512 Product Folder : <http://www.ti.com/product/TPS92512> : contains the data sheet and other resources.

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