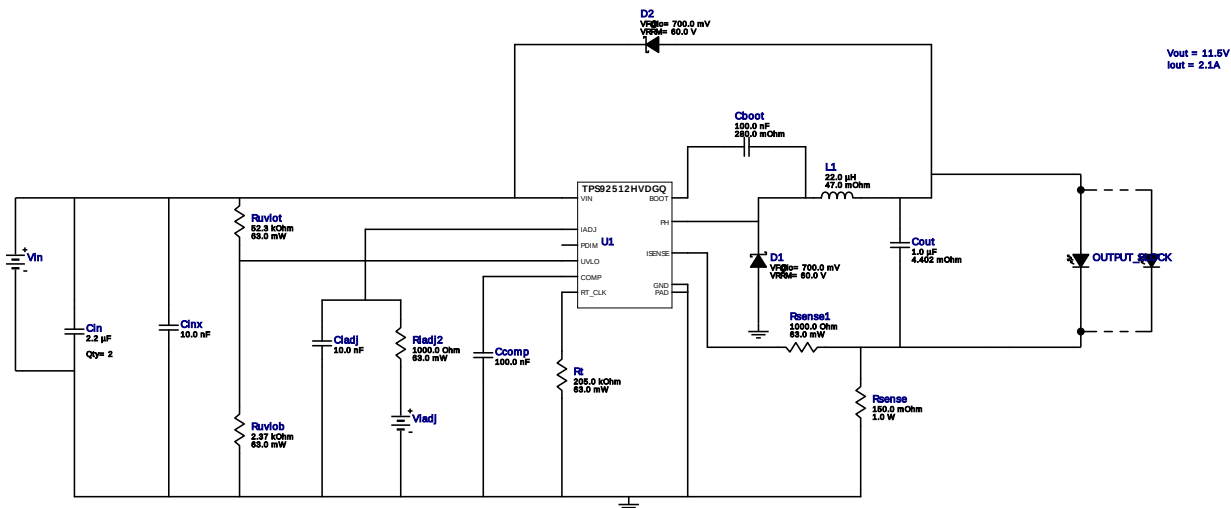


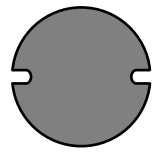
WEBENCH® Design Report

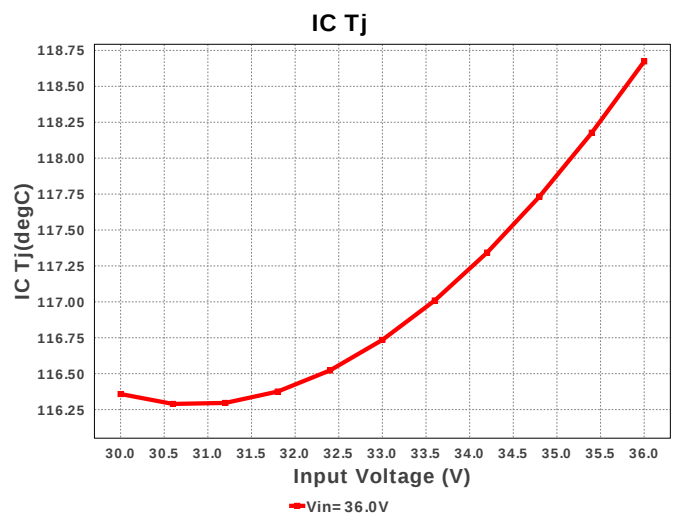
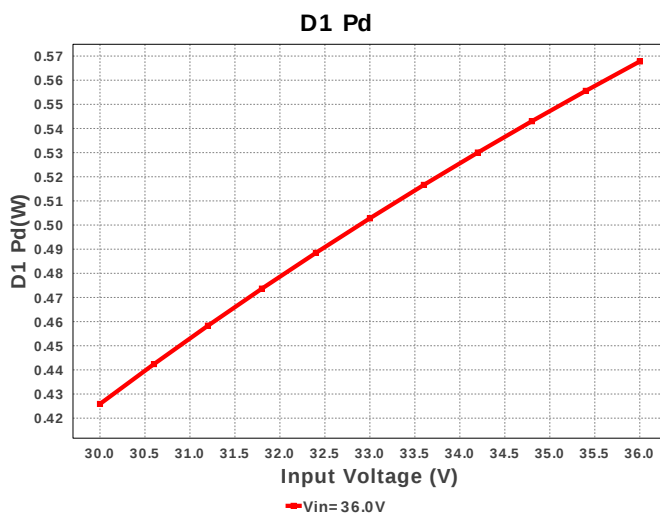
Design : 906020/2247 TPS92512HVDGQR
TPS92512HVDGQR 30.0V-36.0V to 19.37V @ 2.1A

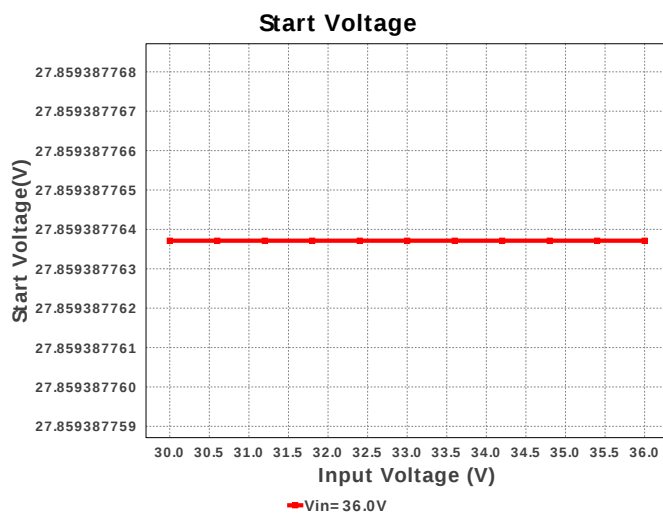
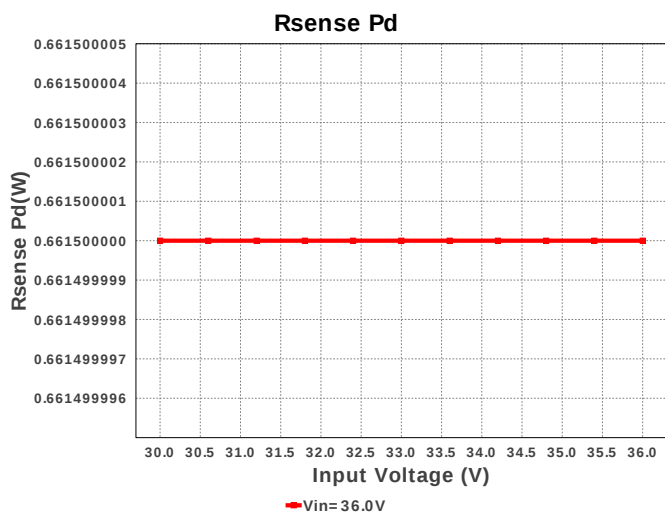
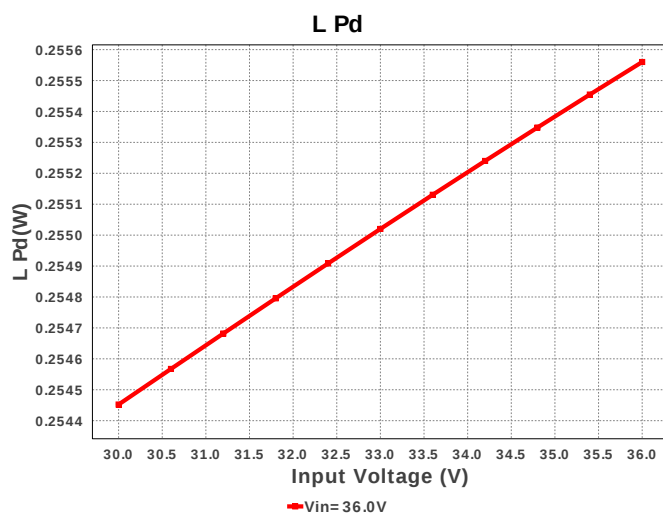
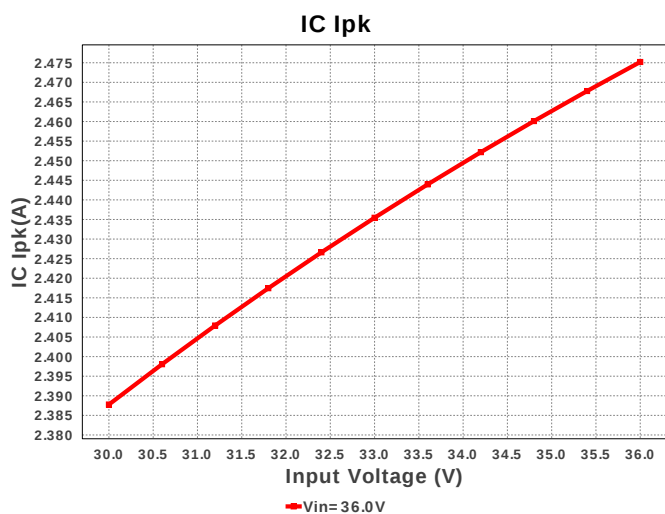
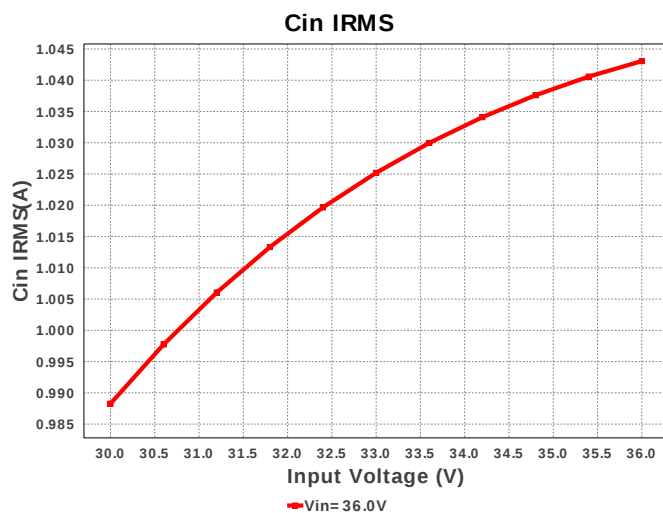
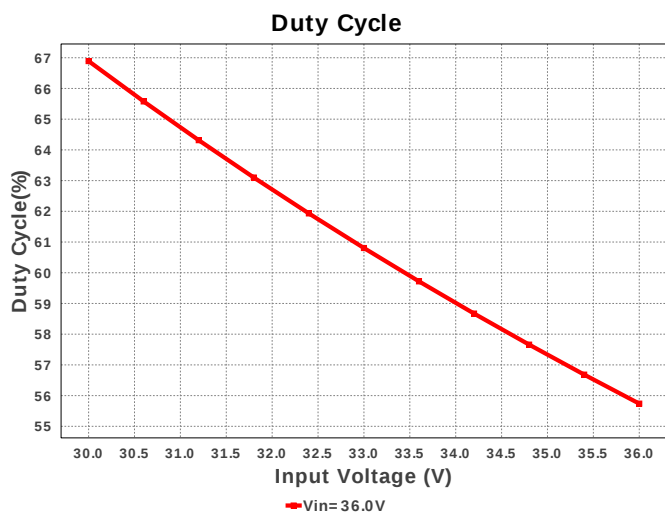


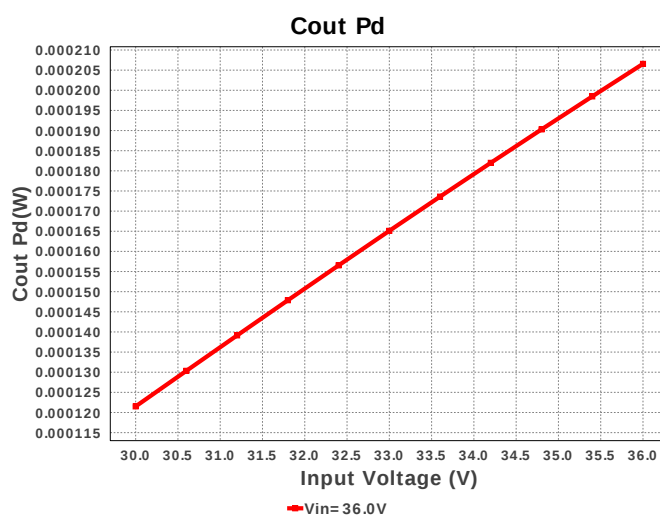
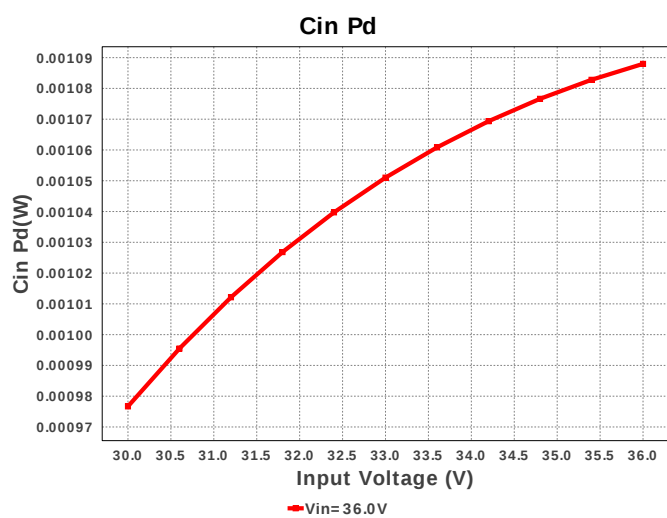
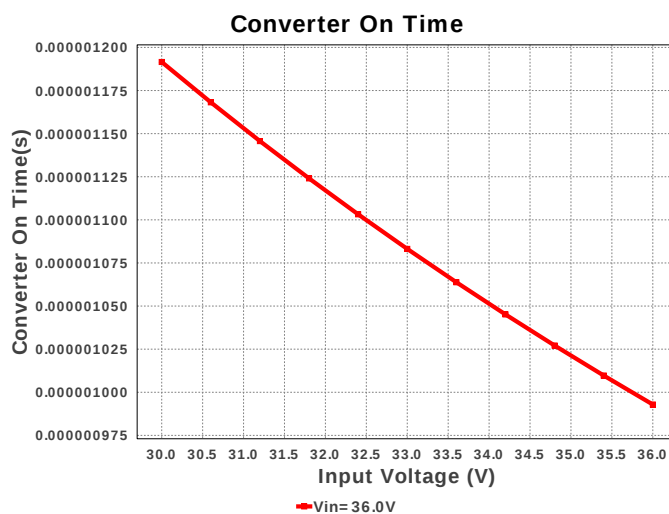
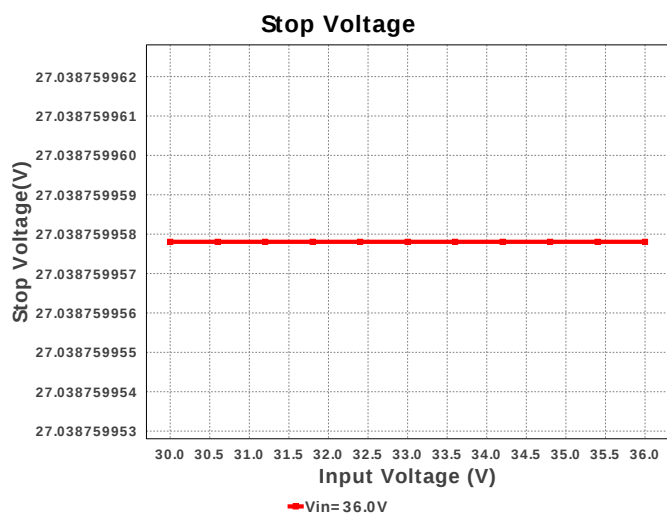
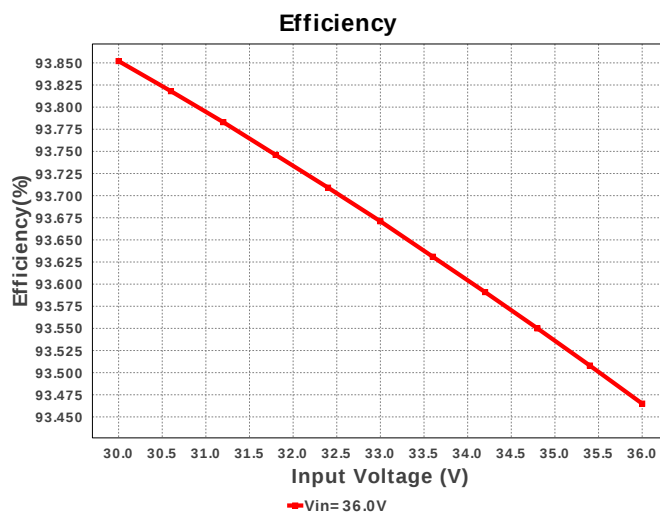
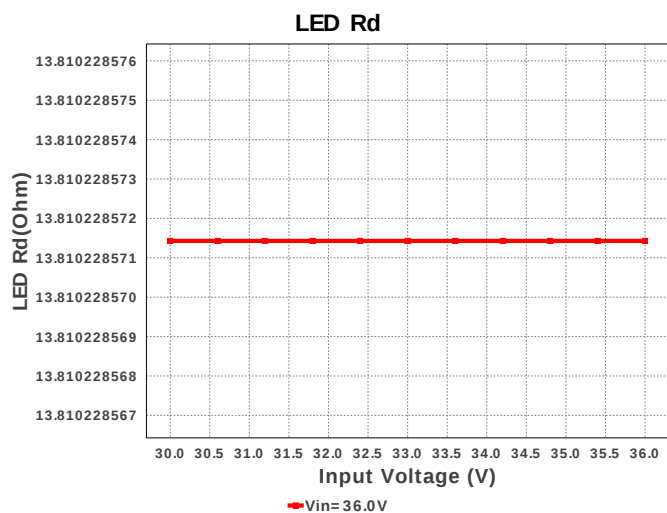
Electrical BOM

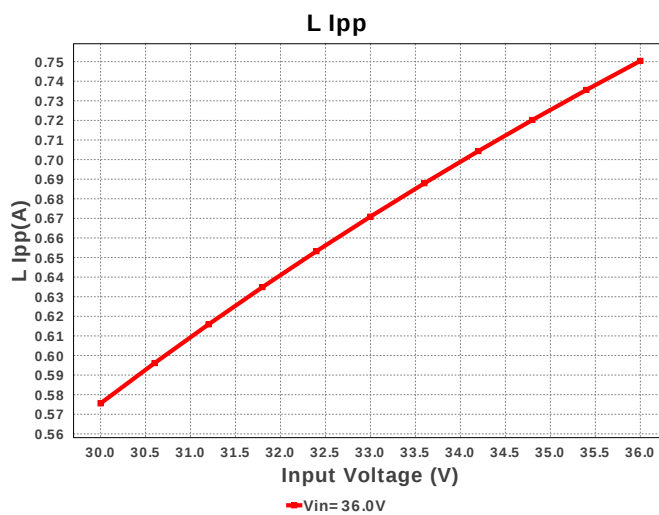
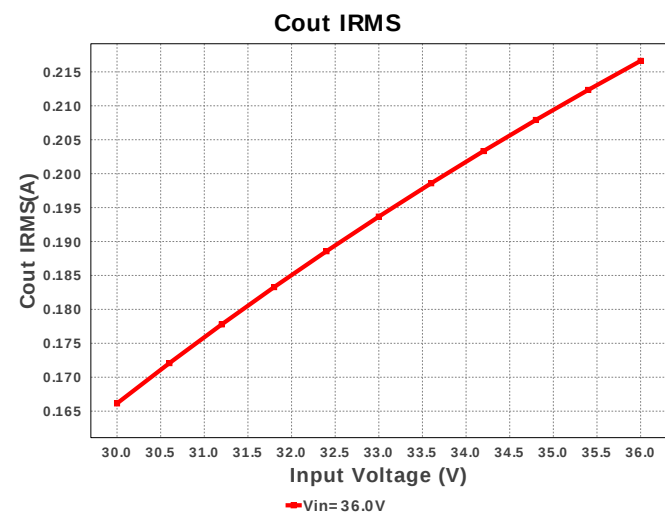
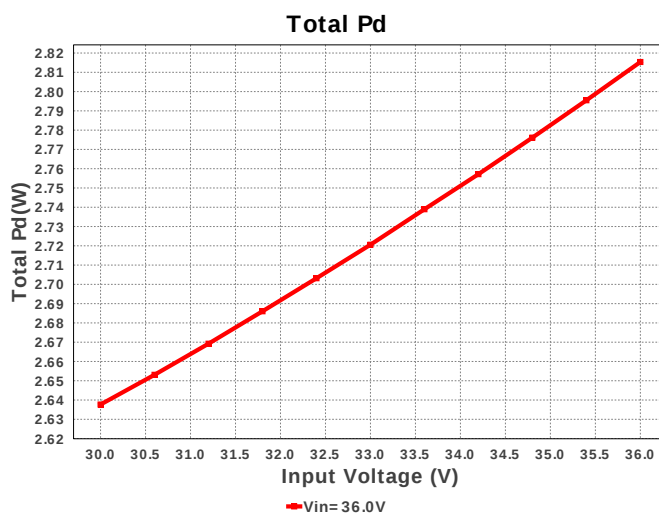
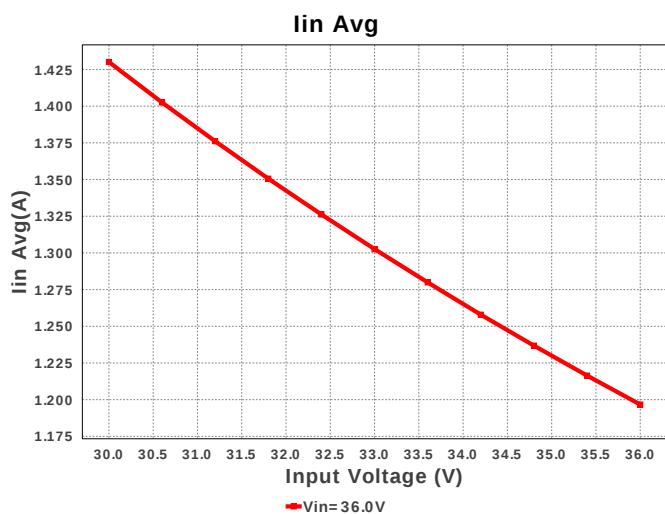
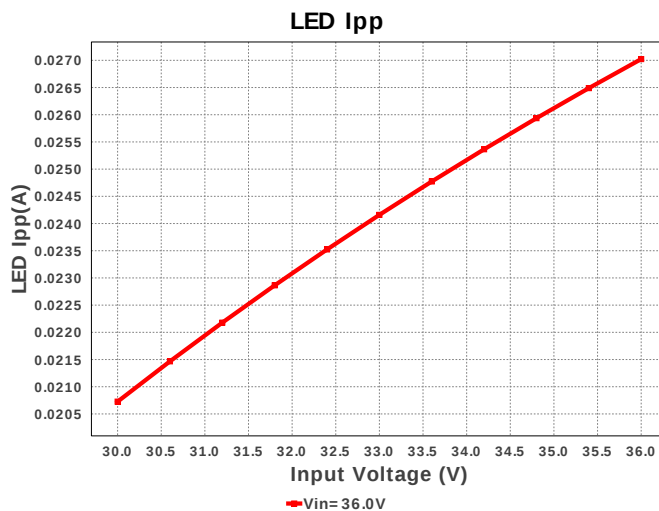
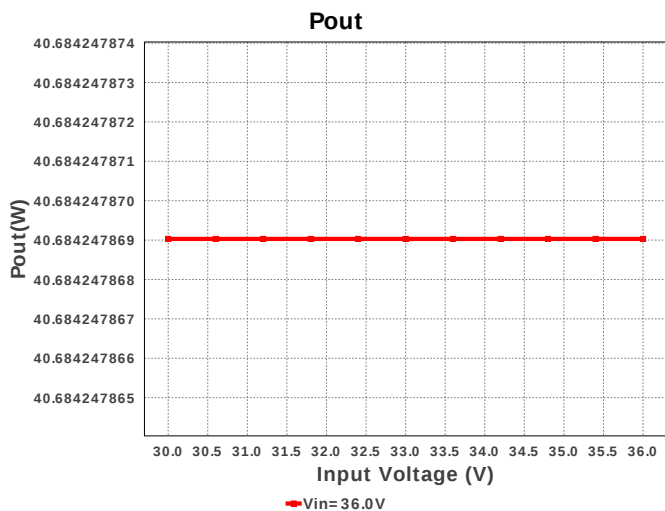
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm²
2.	Ccomp	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm²
3.	Ciadj	MuRata	GRM216R71H103KA01D 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.	B260A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.09	 SMA 37 mm²
8.	D2	Bourns	CD214A-B160LF	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.08	 SMA 37 mm²
9.	D_LED	Cree	XHP50A-00-0000-0D00J20DT	LED	3	\$3.51	 xlampxhp 0 mm²

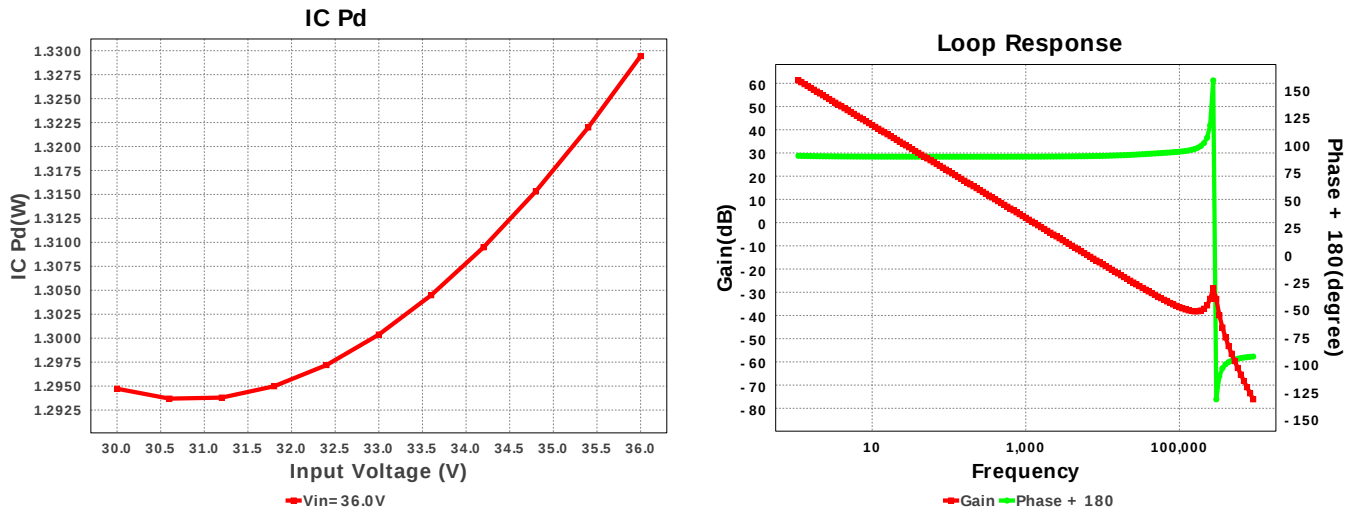
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	L1	Bourns	SDR1307-220ML	L= 22.0 μ H DCR= 47.0 mOhm	1	\$0.35	 SDR1307 227 mm ²
11.	Riadj2	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rsense	Stackpole Electronics Inc	CSRN2010FKR150 Series= ?	Res= 150.0 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	CRCW0402205KFKED Series= CRCW..e3	Res= 205.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	Ruvlob	Vishay-Dale	CRCW04022K37FKED Series= CRCW..e3	Res= 2.37 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
16.	Ruvlot	Vishay-Dale	CRCW040252K3FKED Series= CRCW..e3	Res= 52.3 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	1.043 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	215.634 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.473 A	Current	Peak switch current in IC
4.	Iin Avg	1.197 A	Current	Average input current
5.	L Ipp	746.98 mA	Current	Peak-to-peak inductor ripple current
6.	LED Ipp	26.9 mA	Current	LED Ripple Current
7.	BOM Count	20	General	Total Design BOM count
8.	FootPrint	432.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	561.373 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	40.684 W	General	Total output power
12.	Total BOM	\$12.36	General	Total BOM Cost
13.	Vout OP	19.373 V	Op_Point	Operational Output Voltage
14.	Cross Freq	1.267 kHz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	55.739 %	Op_point	Duty cycle
16.	Efficiency	93.465 %	Op_point	Steady state efficiency
17.	IC Tj	118.673 degC	Op_point	IC junction temperature
18.	ICThetaJA	66.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	2.1 A	Op_point	Iout operating point
20.	LED Rd	13.81 Ohm	Op_point	LED DynamicResistance
21.	Phase Marg	90.055 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	36.0 V	Op_point	Vin operating point
23.	Cin Pd	1.088 mW	Power	Input capacitor power dissipation
24.	Cout Pd	204.684 μW	Power	Output capacitor power dissipation
25.	D1 Pd	567.783 mW	Power	Output Diode Power Dissipation
26.	IC Pd	1.329 W	Power	IC power dissipation
27.	L Pd	255.536 mW	Power	Inductor power dissipation
28.	Rsense Pd	661.5 mW	Power	Rsense Power Dissipation
29.	Total Pd	2.815 W	Power	Total Power Dissipation
30.	Start Voltage	27.859 V	UVLO	Start Voltage with External UVLO Resistors
31.	Stop Voltage	27.039 V	UVLO	Stop Voltage with External UVLO Resistors
32.	Converter On Time	988.39 ns		Approximate Converter On Time

Design Inputs

#	Name	Value	Description
1.	Iout	2.1	Maximum Output Current
2.	VinMax	36.0	Maximum input voltage
3.	VinMin	30.0	Minimum input voltage
4.	Vout	11.5	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	3.0	Number of LED in parallel
9.	ledpartnumber	XHP50A-00-0000-0D0012D	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. TPS92512HV Product Folder : <http://www.ti.com/product/TPS92512HV> : contains the data sheet and other resources.

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