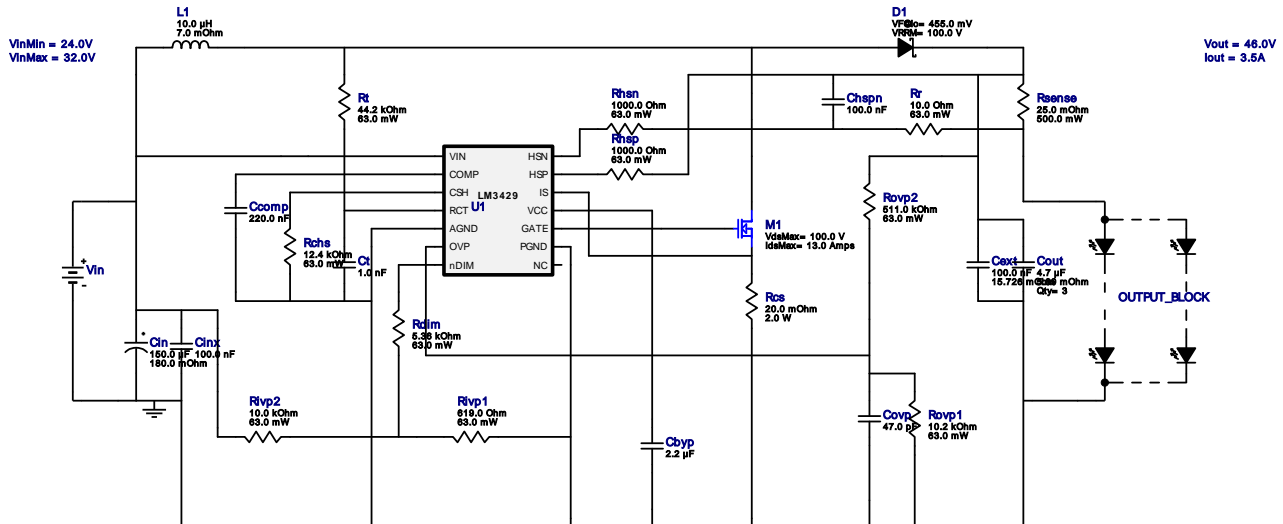





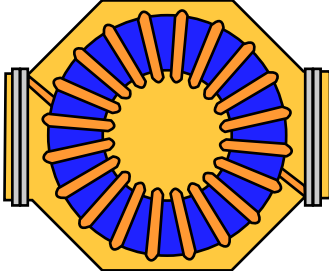












## WEBENCH® Design Report


 Design : 3728462/7 LM3429MH/NOPB  
 LM3429MH/NOPB 24.0V-32.0V to 46.00V @ 3.783860967741935A


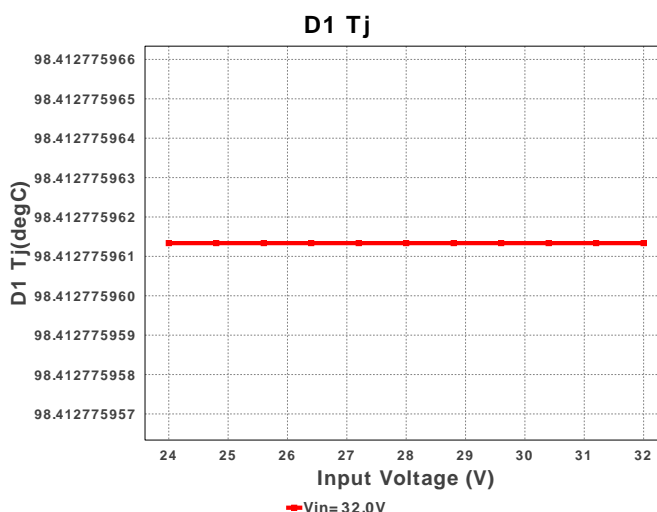
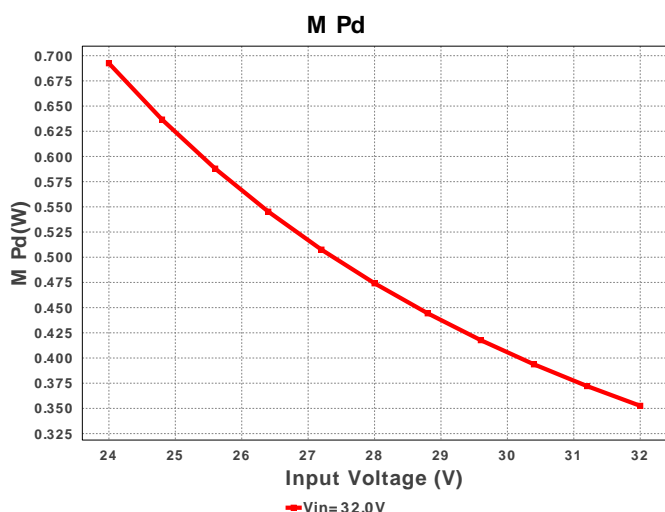
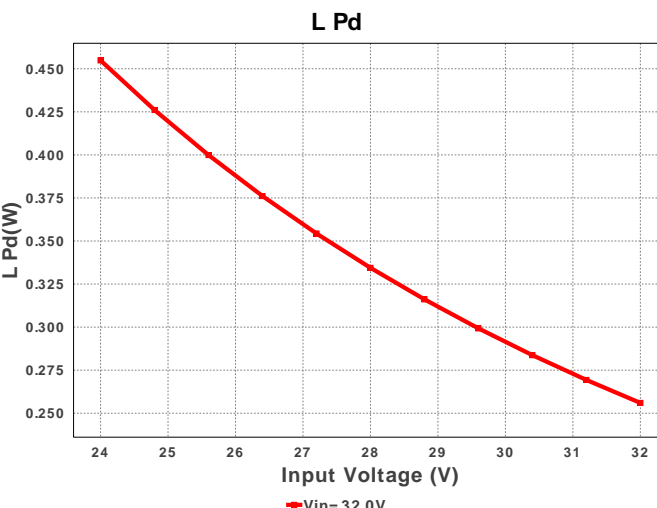
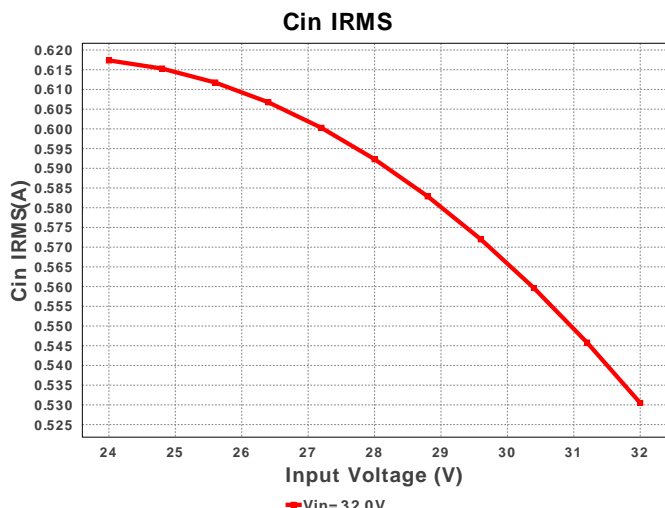
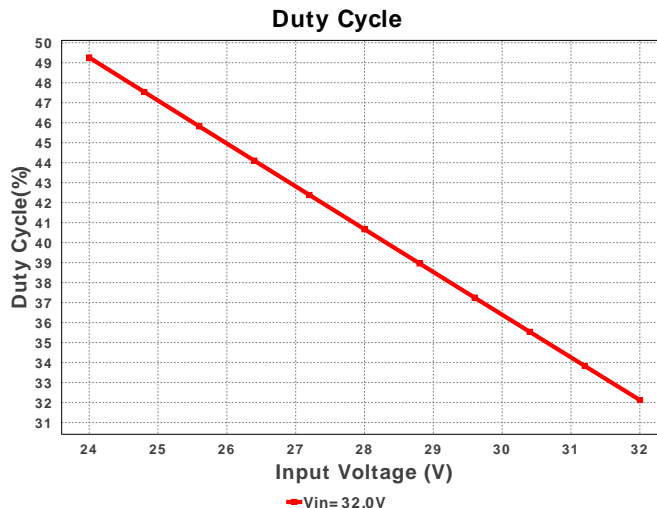
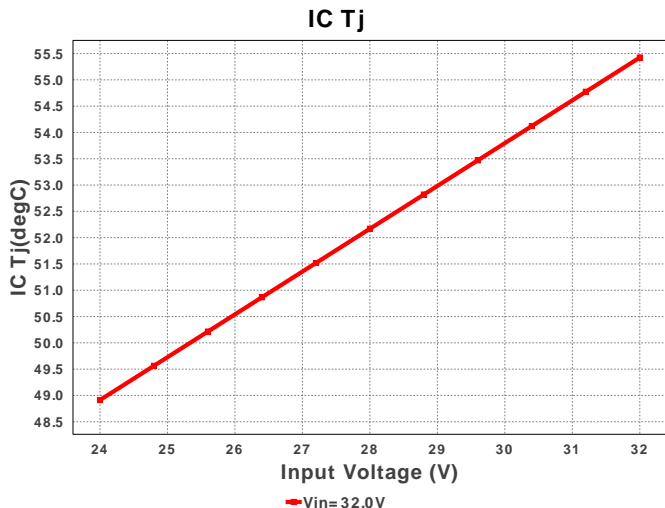
1. This regulator device is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific application. View WEBENCH(R) Disclaimer.

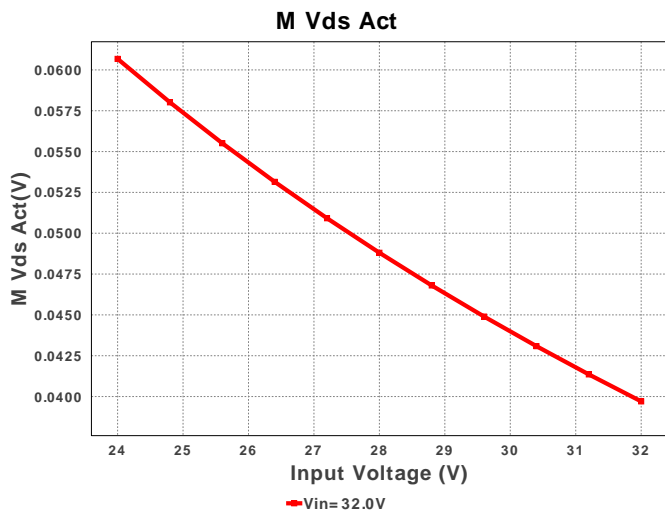
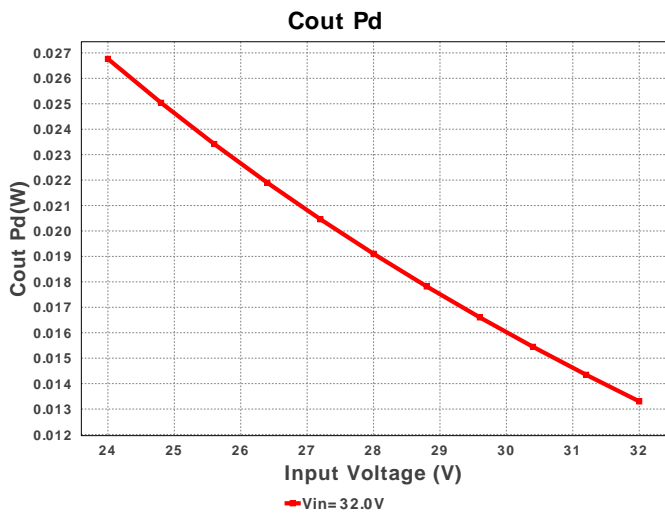
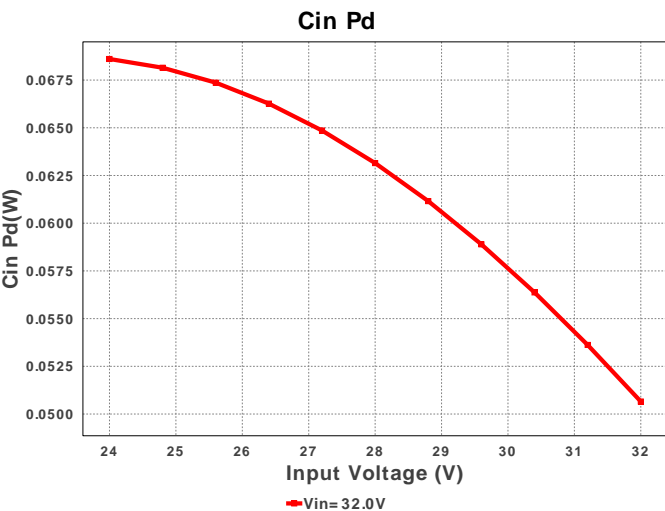
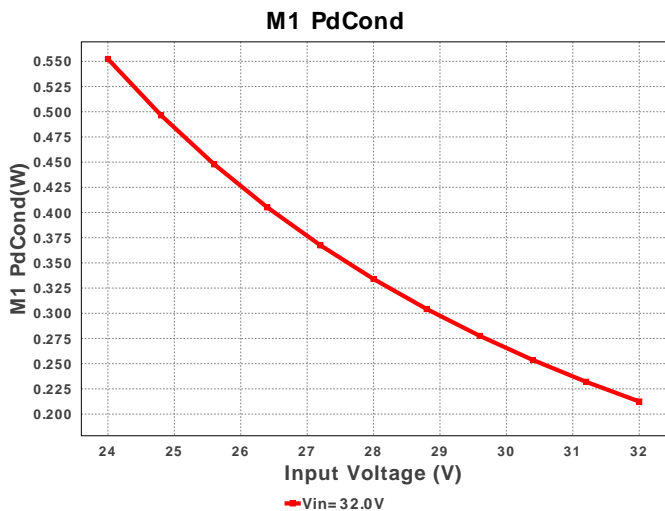
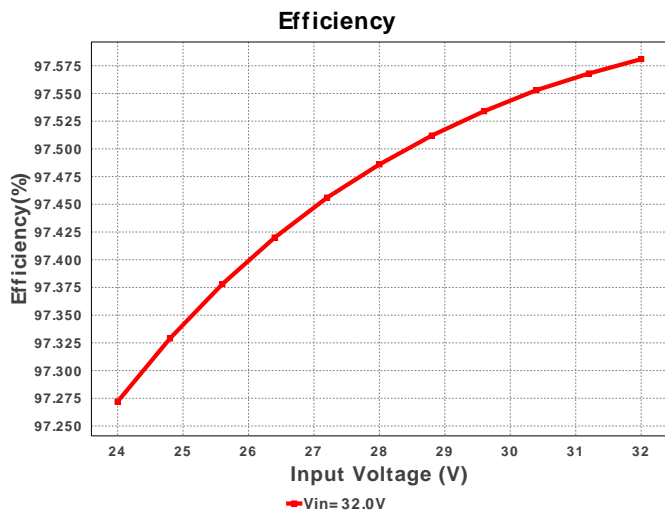
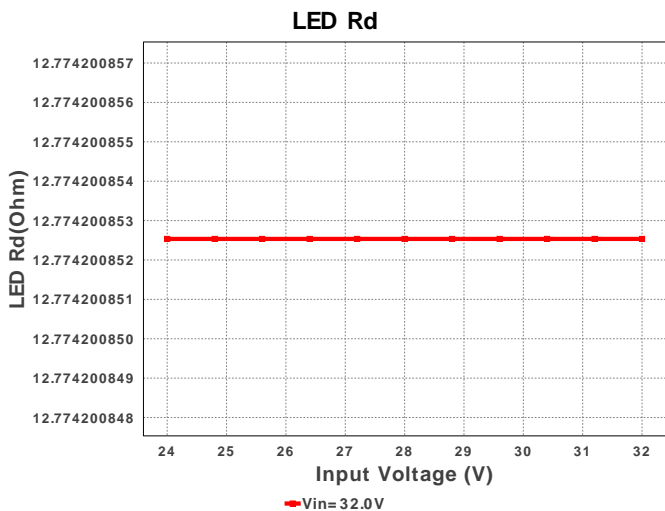
## Electrical BOM

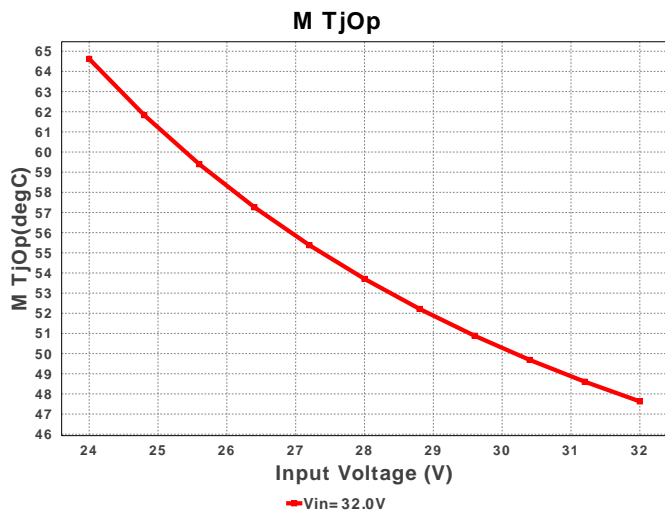
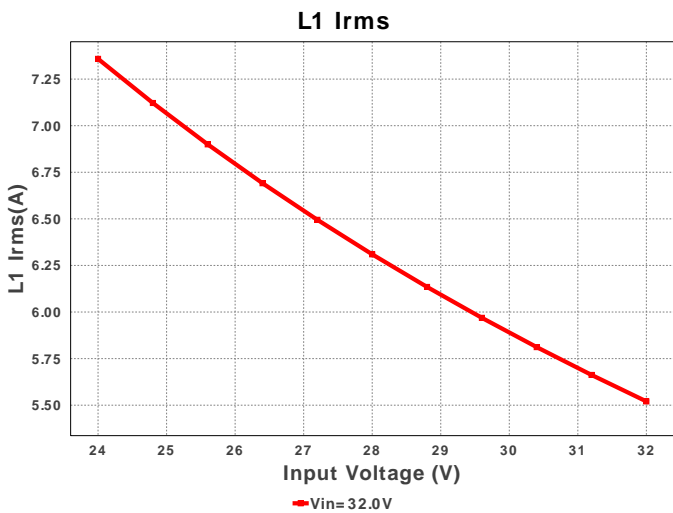
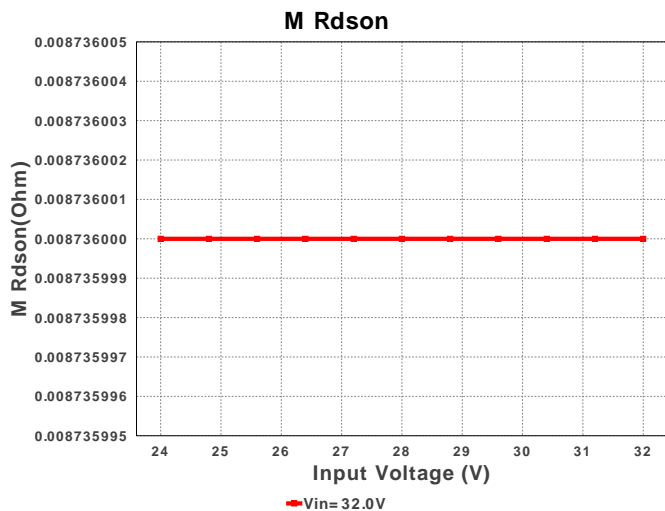
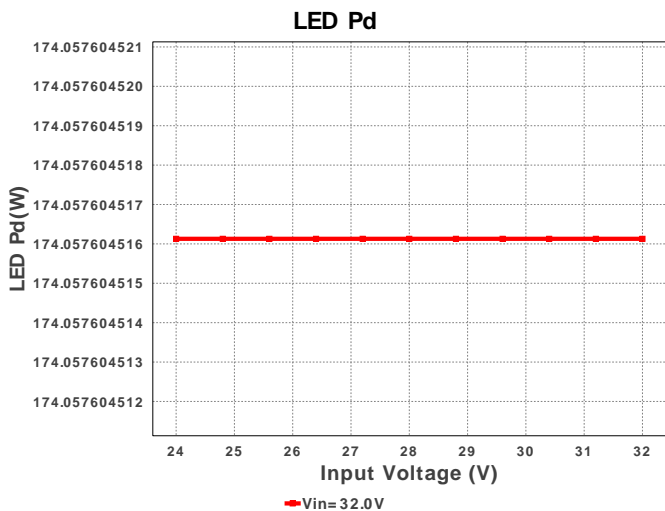
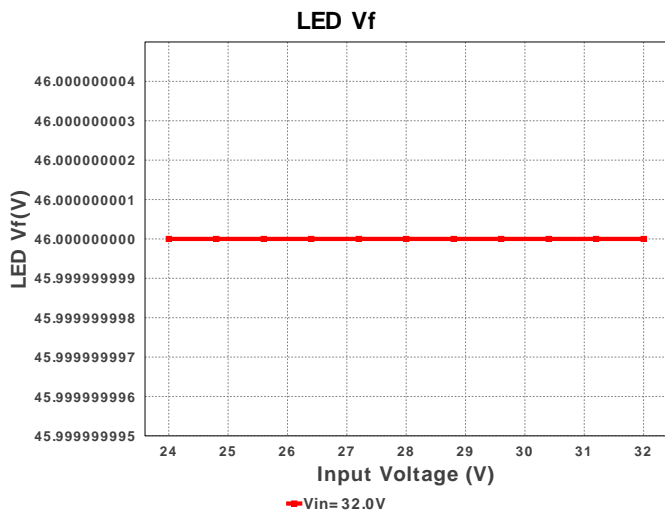
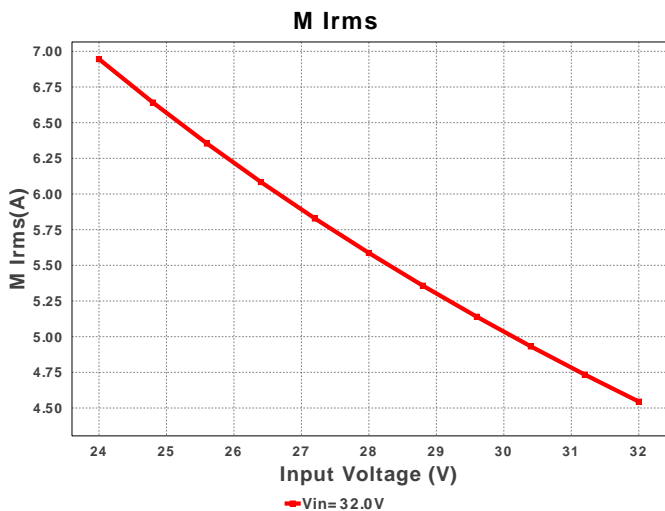
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1.	Cbyp	Taiyo Yuden	EMK212B7225KG-T Series= X7R	Cap= 2.2 uF VDC= 16.0 V IRMS= 0.0 A	1	\$0.03	 0805 7 mm <sup>2</sup>
2.	Ccomp	MuRata	GRM155C80G224KE01D Series= 379	Cap= 220.0 nF VDC= 4.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm <sup>2</sup>
3.	Cext	TDK	C2012X7R2A104K Series= X7R	Cap= 100.0 nF ESR= 15.726 mOhm VDC= 100.0 V IRMS= 0.0 A	1	\$0.03	 0805 7 mm <sup>2</sup>
4.	Chspn	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
5.	Cin	Nichicon	UUD1H151MNL1GS Series= uD	Cap= 150.0 uF ESR= 180.0 mOhm VDC= 50.0 V IRMS= 670.0 mA	1	\$0.26	 SM_RADIAL_10BMM 160 mm <sup>2</sup>
6.	Cinx	MuRata	GRM188R72A104KA35D Series= X7R	Cap= 100.0 nF VDC= 100.0 V IRMS= 0.0 A	1	\$0.03	 0603 5 mm <sup>2</sup>
7.	Cout	TDK	C3225X7S2A475M200AB Series= 479	Cap= 4.7 uF ESR= 5.89 mOhm VDC= 100.0 V IRMS= 6.7739 A	3	\$0.42	 1210 15 mm <sup>2</sup>
8.	Covp	Kemet	C0805C470K5GACTU Series= C0G/NP0	Cap= 47.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>

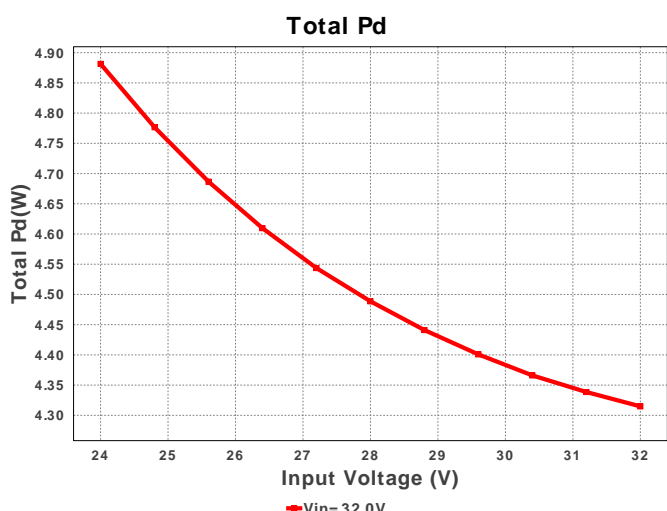
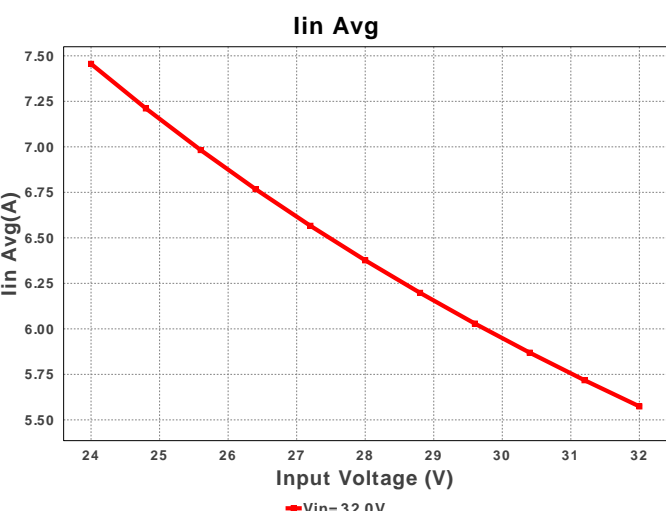
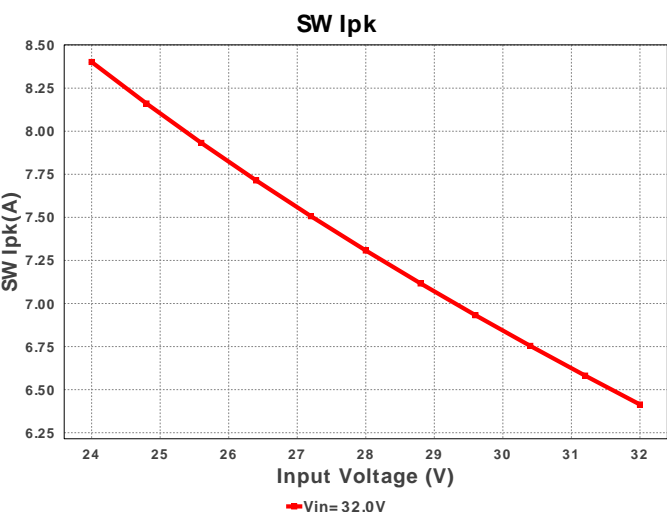
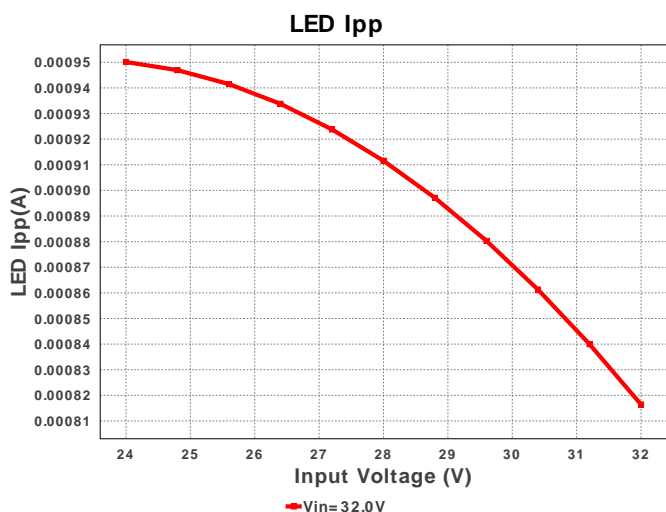
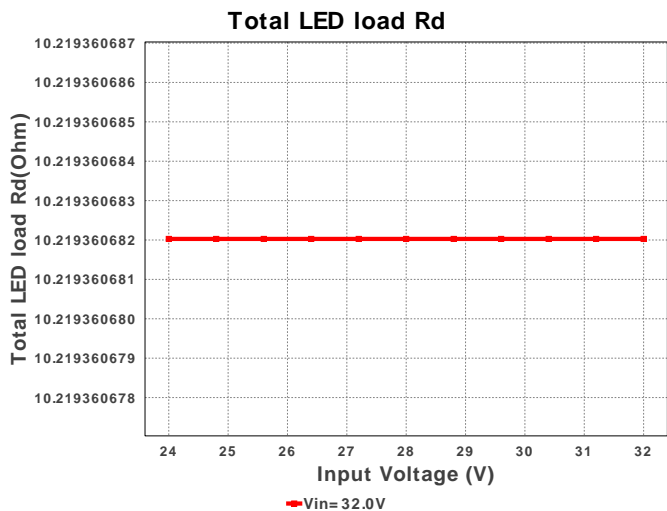
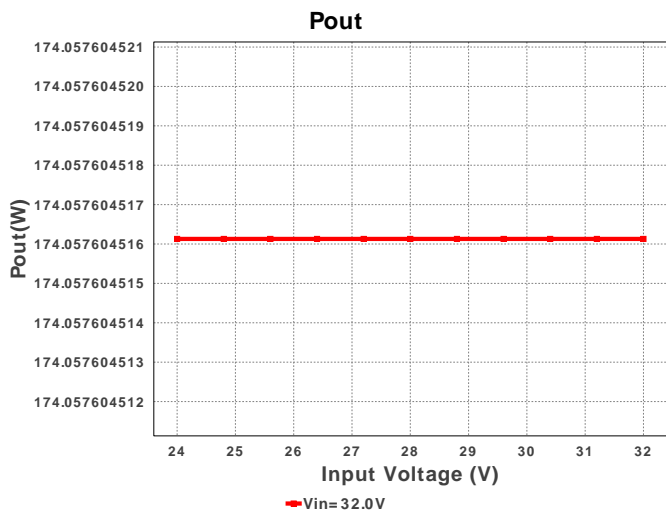
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	Ct	Yageo America	CC0805JRNPO9BN102 Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
10.	D1	STMicroelectronics	STPS20M100SG-TR	VF@Io= 455.0 mV VRRM= 100.0 V	1	\$1.33	 DDPAK 210 mm <sup>2</sup>
11.	D_LED	Cree	XHP50A-00-0000-0D0BJ40DTED		20	\$6.35	 xlampxhp 0 mm <sup>2</sup>
12.	L1	Bourns	PM2110-100K-RC	L= 10.0 µH DCR= 7.0 mOhm	1	\$1.21	 PM2110 890 mm <sup>2</sup>
13.	M1	Texas Instruments	CSD19533Q5A	VdsMax= 100.0 V IdsMax= 13.0 Amps	1	\$0.83	 TRANS_NexFET_Q5A 55 mm <sup>2</sup>
14.	Rchs	Vishay-Dale	CRCW040212K4FKED Series= CRCW..e3	Res= 12.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
15.	Rcs	Stackpole Electronics Inc	CSRN2512FK20L0 Series= ?	Res= 20.0 mOhm Power= 2.0 W Tolerance= 1.0%	1	\$0.15	 2512 43 mm <sup>2</sup>
16.	Rdim	Vishay-Dale	CRCW04025K36FKED Series= CRCW..e3	Res= 5.36 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
17.	Rhsn	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
18.	Rhsp	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
19.	Rivp1	Vishay-Dale	CRCW0402619RFKED Series= CRCW..e3	Res= 619.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
20.	Rivp2	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
21.	Rovp1	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
22.	Rovp2	Vishay-Dale	CRCW0402511KFKED Series= CRCW..e3	Res= 511.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
23.	Rr	Vishay-Dale	CRCW040210R0FKED Series= CRCW..e3	Res= 10.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
24.	Rsense	Stackpole Electronics Inc	CSR1206FK25L0 Series= ?	Res= 25.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	\$0.10	 1206 11 mm <sup>2</sup>

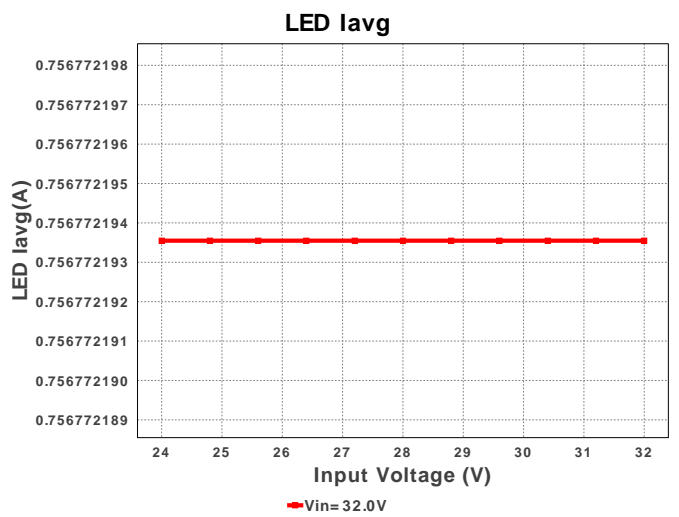
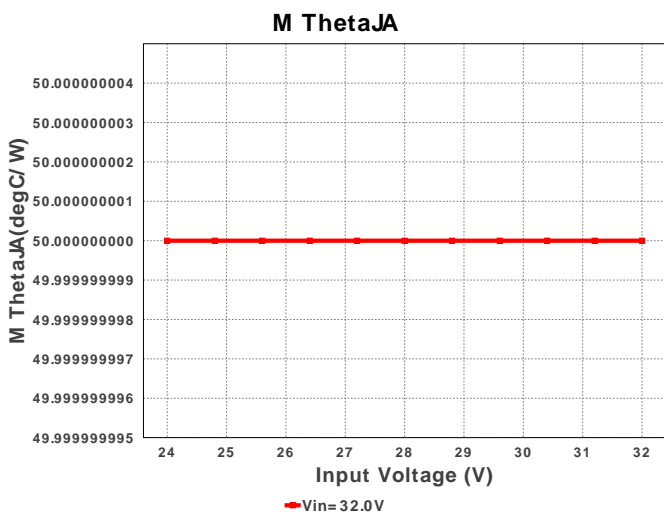
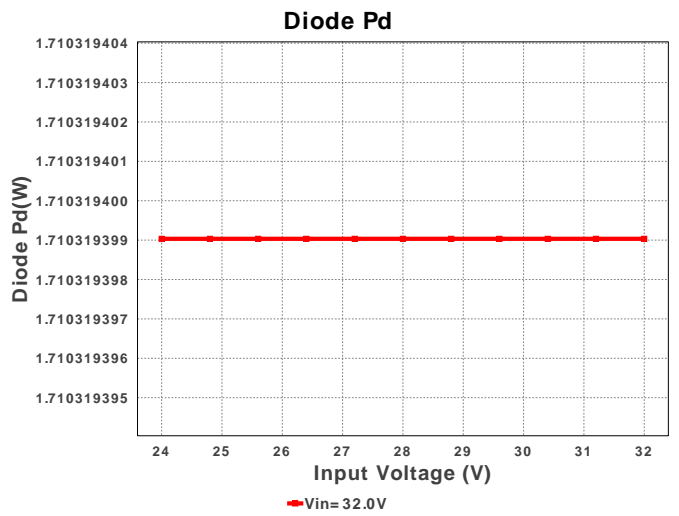
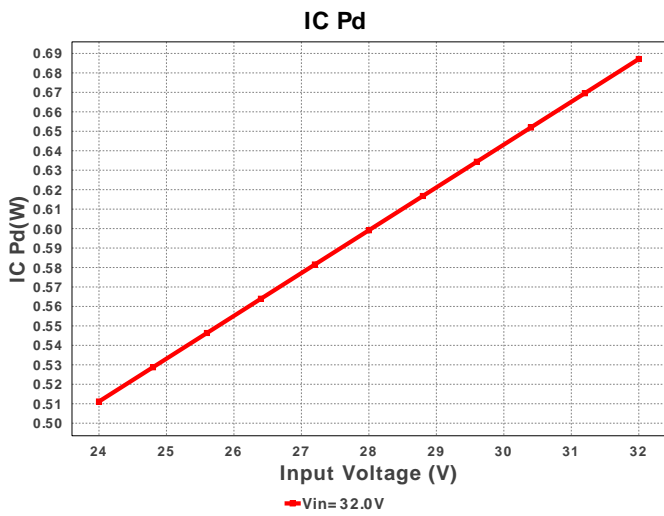
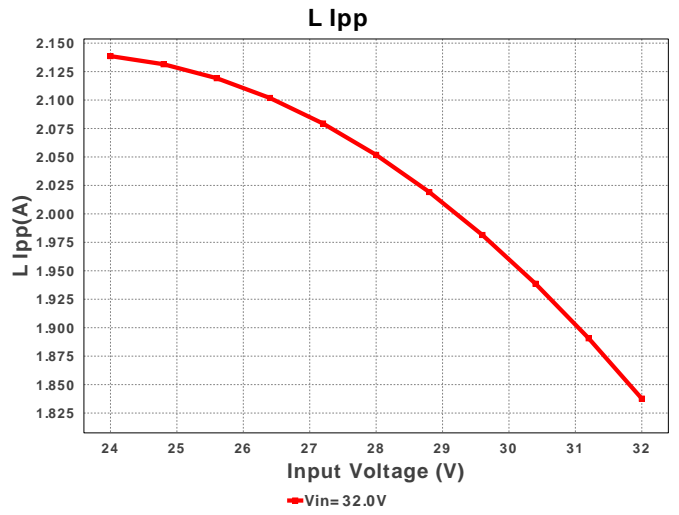
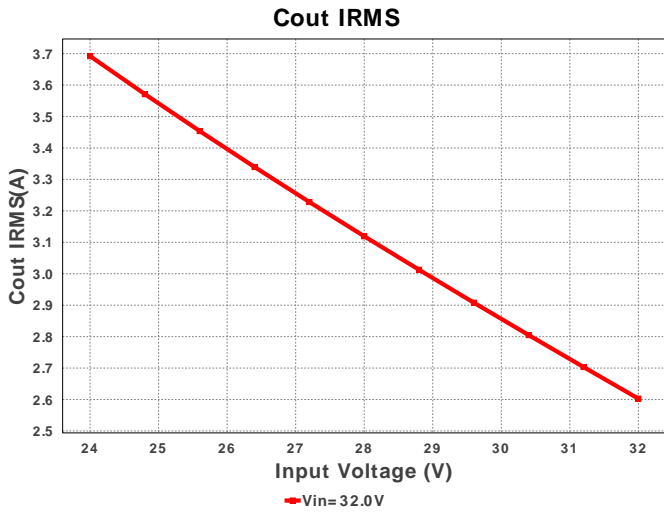
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
25.	Rt	Vishay-Dale	CRCW040244K2FKED Series= CRCW..e3	Res= 44.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
26.	U1	Texas Instruments	LM3429MH/NOPB	Switcher	1	\$1.20	 MXA14A 59 mm <sup>2</sup>

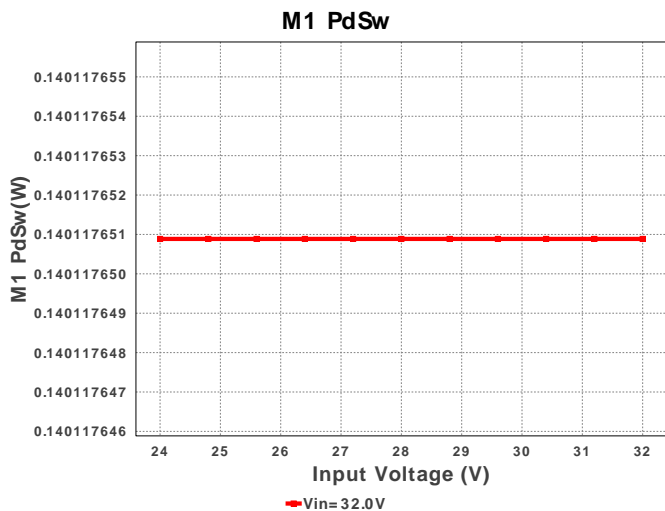












### Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	617.36 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	3.419 A	Current	Output capacitor RMS ripple current
3.	Iin Avg	6.9 A	Current	Average input current
4.	L Ipp	2.139 A	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	6.81 A	Current	Inductor ripple current
6.	LED Iavg	700.0 mA	Current	LED Average Current
7.	LED Ipp	878.985 µA	Current	LED Ripple Current
8.	M Irms	6.411 A	Current	MOSFET RMS ripple current
9.	SW Ipk	7.852 A	Current	Peak switch current
10.	BOM Count	47	General	Total Design BOM count
11.	FootPrint	1.544 k mm <sup>2</sup>	General	Total Foot Print Area of BOM components
12.	Frequency	542.986 kHz	General	Switching frequency
13.	IC Tolerance	25.0 mV	General	IC Feedback Tolerance
14.	M Rdson	8.736 mOhm	General	Drain-Source On-resistance
15.	M Vds Act	56.008 mV	General	M Vds
16.	Pout	161.0 W	General	Total output power
17.	Total BOM	\$133.57	General	Total BOM Cost
18.	D1 Tj	93.7 degC	Op_Point	D1 junction temperature
19.	Vout OP	46.0 V	Op_Point	Operational Output Voltage
20.	Duty Cycle	49.286 %	Op_point	Duty cycle
21.	Efficiency	97.221 %	Op_point	Steady state efficiency
22.	IC Tj	48.913 degC	Op_point	IC junction temperature
23.	ICThetaJA	37.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	3.5 A	Op_point	Iout operating point
25.	LED Rd	13.81 Ohm	Op_point	LED DynamicResistance
26.	LED Vf	46.0 V	Op_point	Total LED Forward Calculated Voltage
27.	M ThetaJA	50.0 degC/W	Op_point	MOSFET junction-to-ambient thermal resistance
28.	M TjOp	66.49 degC	Op_point	MOSFET junction temperature
29.	VIN_OP	24.0 V	Op_point	Vin operating point
30.	Cin Pd	68.604 mW	Power	Input capacitor power dissipation
31.	Cout Pd	22.953 mW	Power	Output capacitor power dissipation
32.	Diode Pd	1.592 W	Power	Diode power dissipation
33.	IC Pd	511.149 mW	Power	IC power dissipation
34.	L Pd	389.604 mW	Power	Inductor power dissipation
35.	LED Pd	161.0 W	Power	LED Power Dissipation
36.	M Pd	729.792 mW	Power	MOSFET power dissipation
37.	M1 PdCond	475.873 mW	Power	M1 MOSFET conduction losses
38.	M1 PdSw	253.918 mW	Power	M1 MOSFET switching losses
39.	Total Pd	4.602 W	Power	Total Power Dissipation
40.	Total LED load Rd	11.048 Ohm	Unknown	Total LED Load DynamicResistance

### Design Inputs

#	Name	Value	Description
1.	Iout	3.5	Maximum Output Current
2.	Iout1	3.5	Output Current #1
3.	VinMax	32.0	Maximum input voltage
4.	VinMin	24.0	Minimum input voltage
5.	Vout	46.0	Output Voltage
6.	Vout1	46.0	Output Voltage #1
7.	application	LED_DRIVER	LED Application
8.	base_pn	LM3429	Texas Instruments Base Part Number



#	Name	Value	Description
9.	isLEDArchitect	N	LED Architect Project
10.	ledparallel	5.0	Number of LED in parallel
11.	ledpartnumber	XHP50A-00-0000-0D0B140D	LED Part number
12.	ledseries	4.0	Number of LED in series
13.	line_fsw	60.0	AC Line Frequency
14.	source	DC	Input Source Type
15.	ta	30.0	Ambient temperature

## Design Assistance

1. LM3429 Product Folder : <http://www.ti.com/product/LM3429> : contains the data sheet and other resources.

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