


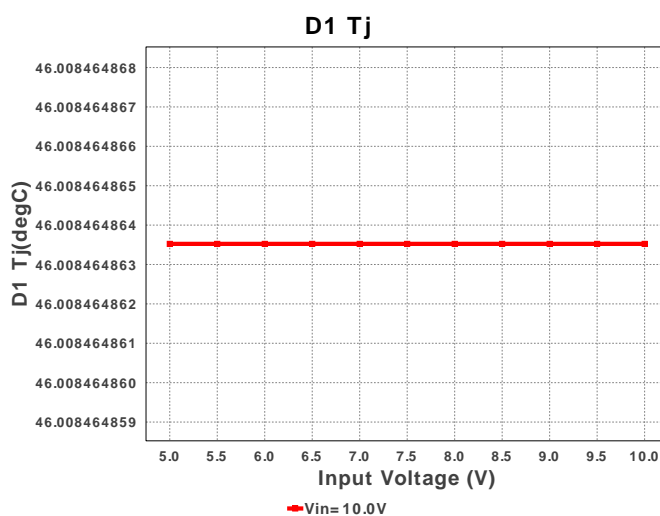
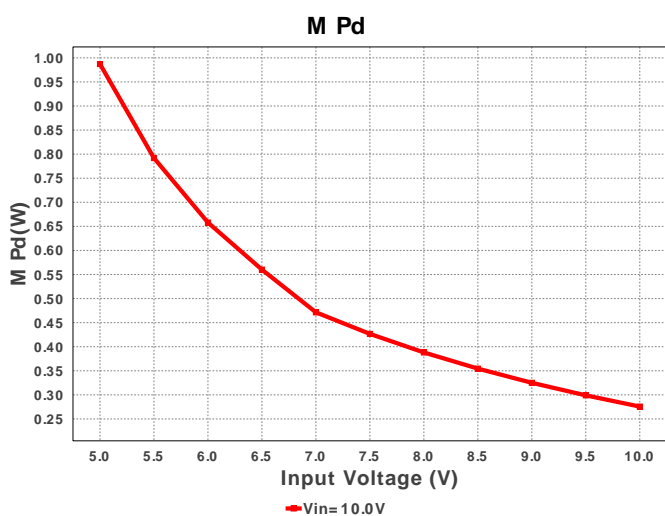
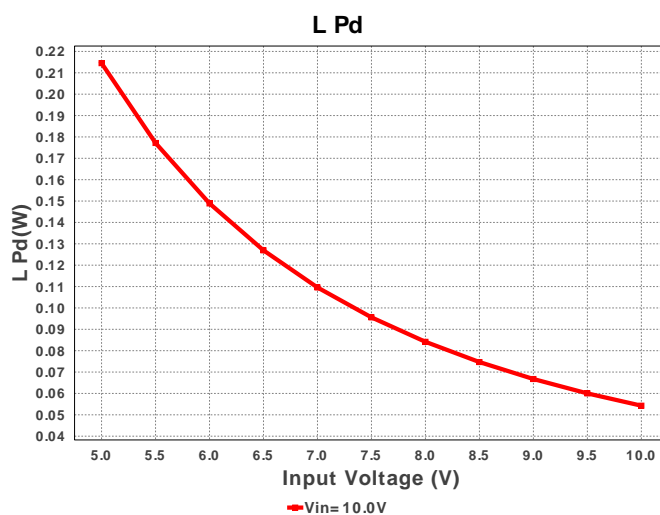
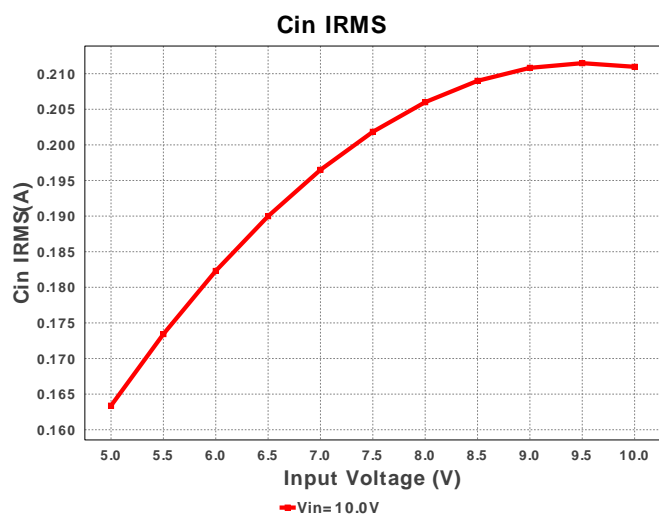
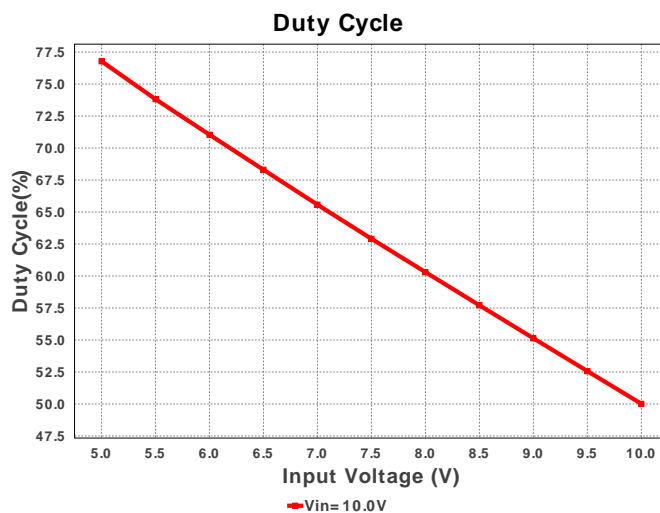
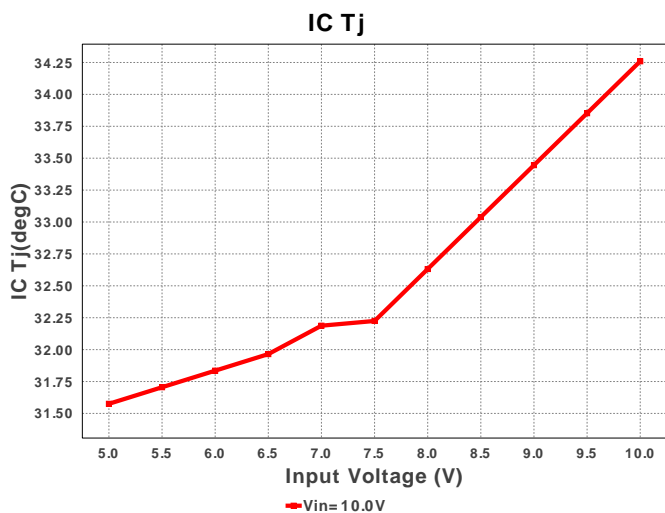
1. This regulator device is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific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

Electrical BOM

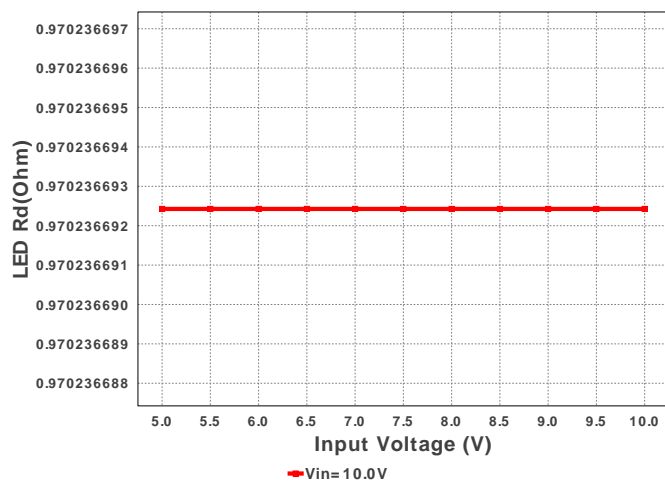
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	Kemet	C0603C225K9PACTU Series= X5R	Cap= 2.2 µF VDC= 6.3 V IRMS= 0.0 A	1	\$0.02	0603 5mm2
2.	Ccomp	Kemet	C0603C225K9PACTU Series= X5R	Cap= 2.2 µF VDC= 6.3 V IRMS= 0.0 A	1	\$0.02	0603 5mm2
3.	Cext	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7mm2
4.	Chspn	MuRata	GRM21BR71H104KA01L Series= X7R	Cap= 100.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7mm2
5.	Cin	Nichicon	UUD1E221MNL1GS Series= uD	Cap= 220.0 µF ESR= 170.0 mOhm VDC= 25.0 V IRMS= 450.0 mA	1	\$0.16	SM_RADIAL_8MM 113mm2
6.	Cinx	Kemet	C0603C104K3RACTU Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0603 5mm2
7.	Cout	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.28	1210 15mm2
8.	Covp	Yageo America	CC0805JRNP09BN470 Series= C0G/NP0	Cap= 47.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7mm2
9.	Ct	Yageo America	CC0805KRX7R9BB102 Series= X7R	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7mm2

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	D1	Vishay-Semiconductor	SL44-E3/57T	VF@Io= 440.0 mV VRRM= 40.0 V	1	\$0.32	 SMC 83mm2
11.	D_LED	Citizen Electronics	CL-L103-C6N-C	LED	2	NA	 CIT_LED_3 486mm2
12.	L1	Bourns	SRR1260-120M	L= 12.0 µH DCR= 23.0 mOhm	1	\$0.41	 SRR1260 210mm2
13.	M1	Texas Instruments	CSD18504Q5A	VdsMax= 40.0 V IdsMax= 50.0 Amps	1	\$0.56	 TRANS_NexFET_Q5A 55mm2
14.	M2	Texas Instruments	CSD18504Q5A	VdsMax= 40.0 V IdsMax= 50.0 Amps	1	\$0.56	 TRANS_NexFET_Q5A 55mm2
15.	Rchs	Vishay-Dale	CRCW040212K4FKED Series= CRCW..e3	Res= 12.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
16.	Rcs	Stackpole Electronics Inc	CSRN2010FK60L0 Series= ?	Res= 60.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.14	 2010 32mm2
17.	Rdim	Vishay-Dale	CRCW040225K5FKED Series= CRCW..e3	Res= 25.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
18.	Rhsn	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
19.	Rhsp	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
20.	Rvp1	Vishay-Dale	CRCW04023K92FKED Series= CRCW..e3	Res= 3.92 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
21.	Rvp2	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
22.	Rovp1	Vishay-Dale	CRCW040228K0FKED Series= CRCW..e3	Res= 28.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
23.	Rovp2	Vishay-Dale	CRCW0402511KFKED Series= CRCW..e3	Res= 511.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
24.	Rr	Vishay-Dale	CRCW040210R0FKED Series= CRCW..e3	Res= 10.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
25.	Rsense	Rohm	MCR25JZHFLR130 Series= 298	Res= 130.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	\$0.04	 1210 15mm2
26.	Rt	Vishay-Dale	CRCW040244K2FKED Series= CRCW..e3	Res= 44.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2

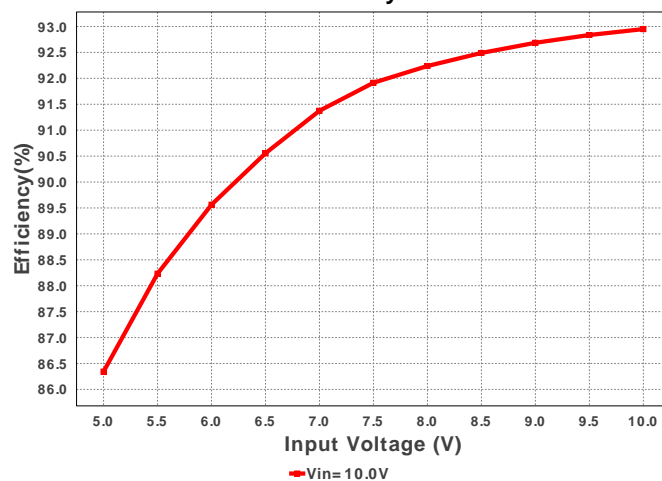
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
27.	U1	Texas Instruments	LM3421MH/NOPB	Switcher	1	\$1.15	 MXA16A 59mm2



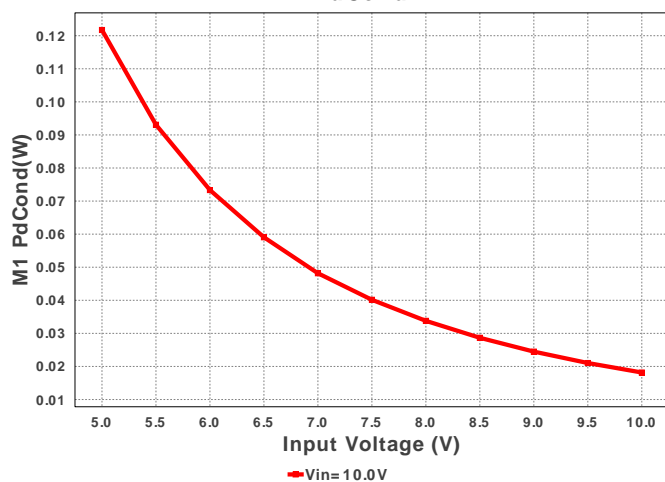
LED Rd



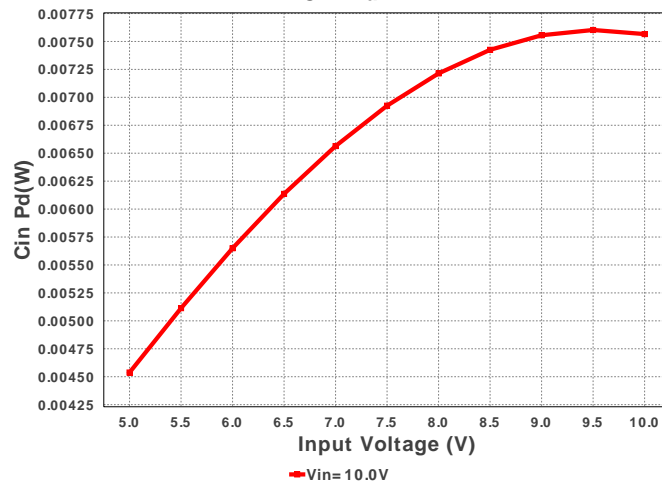
Efficiency



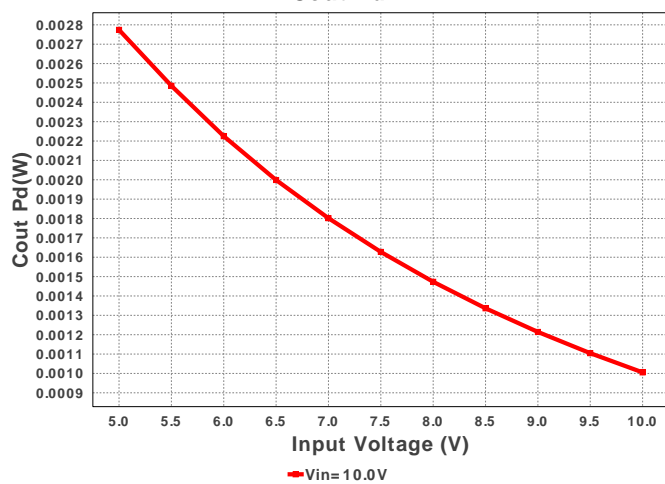
M1 PdCond



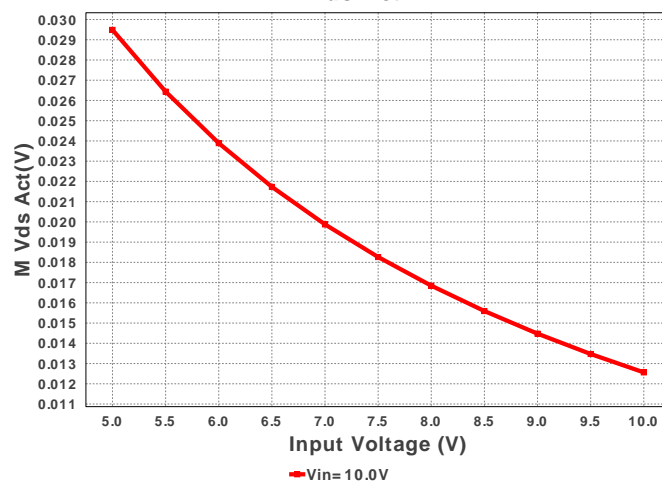
Cin Pd

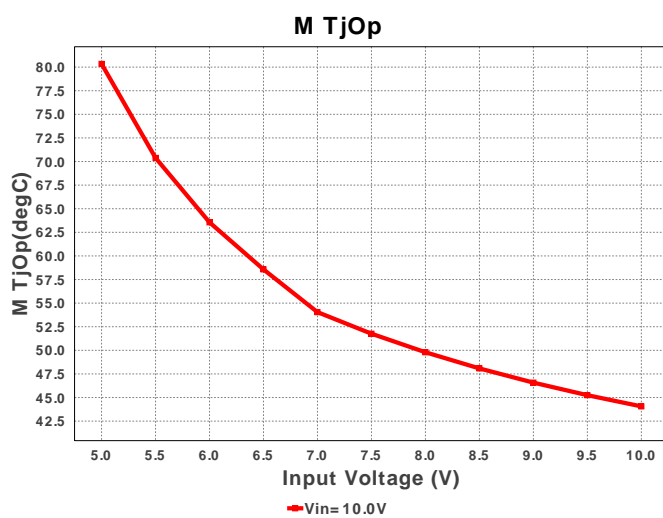
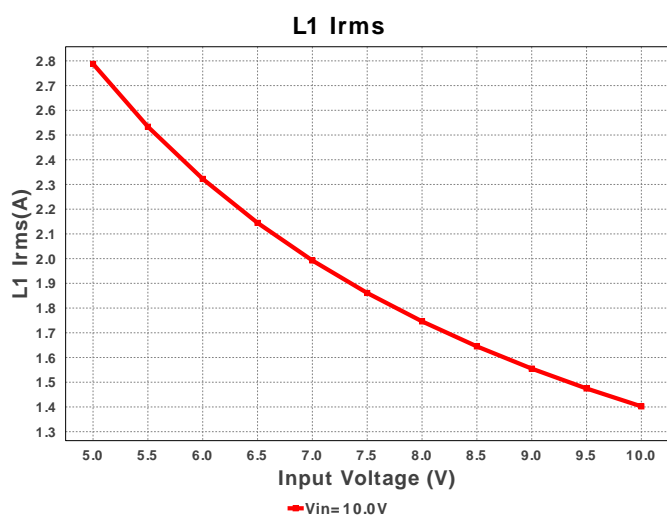
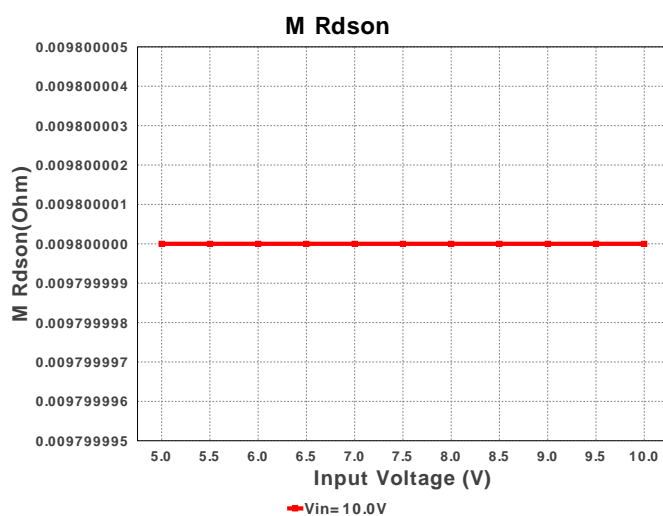
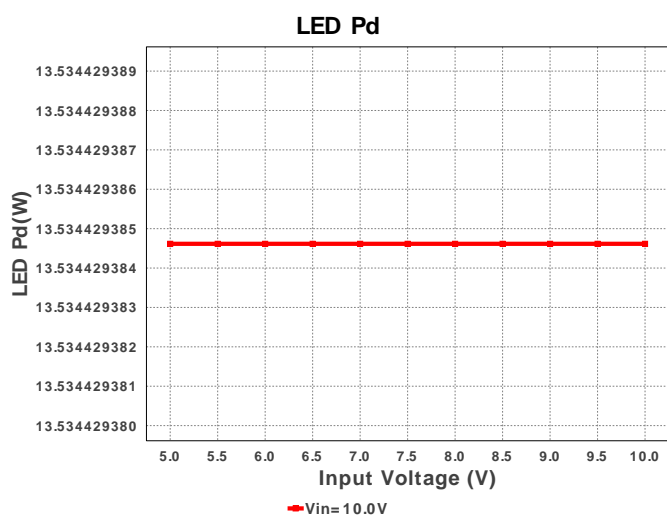
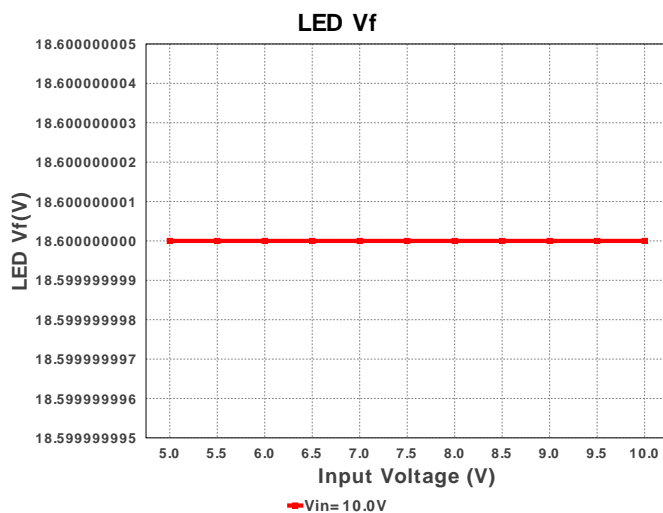
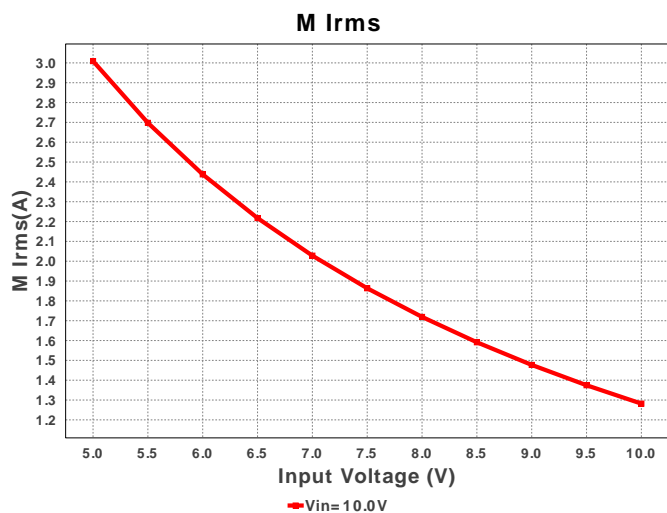


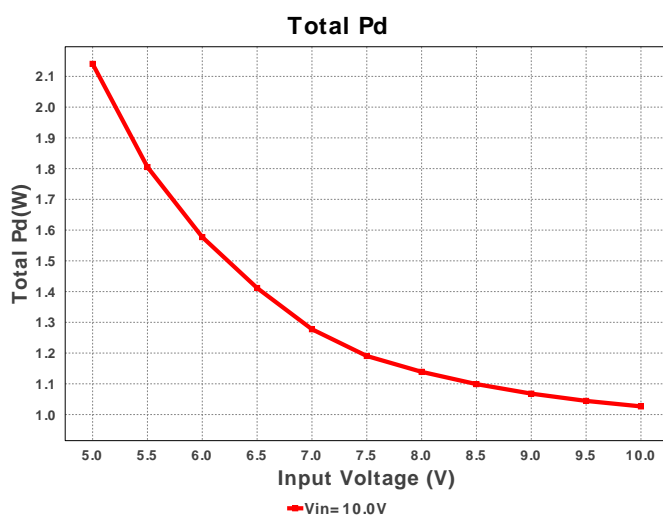
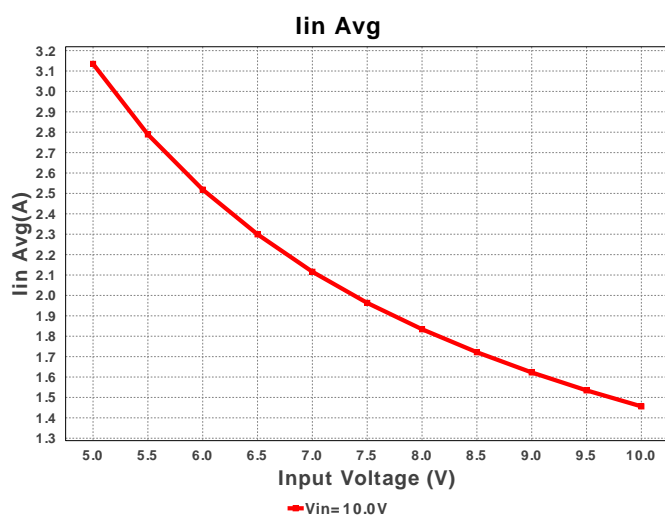
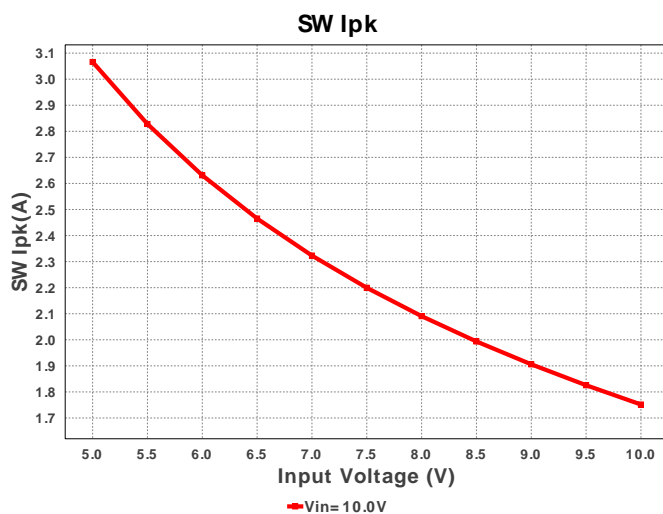
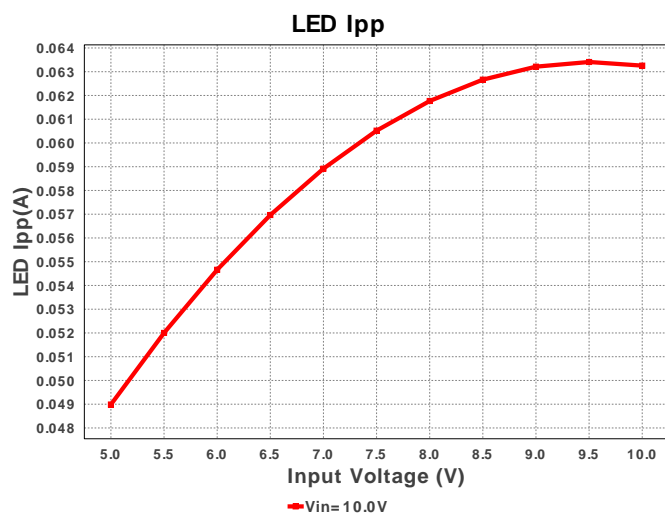
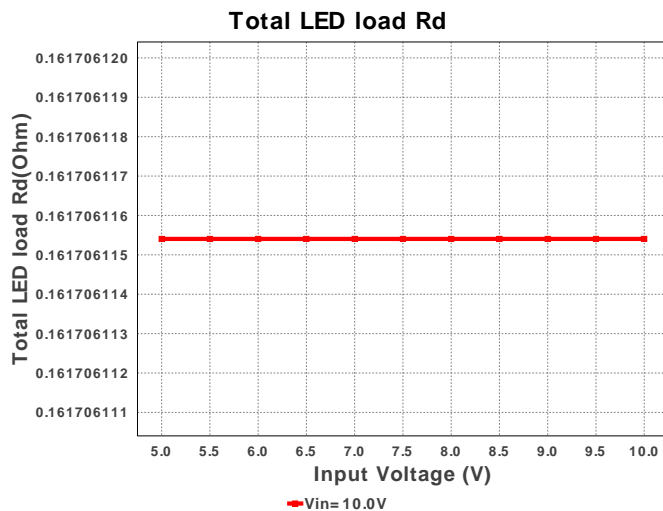
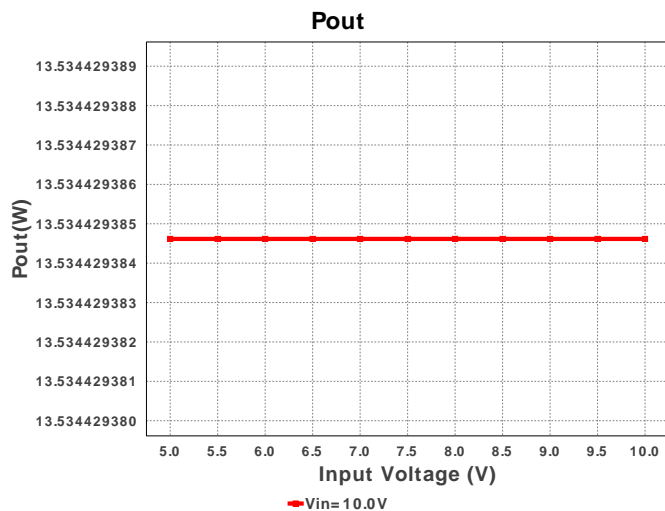
Cout Pd

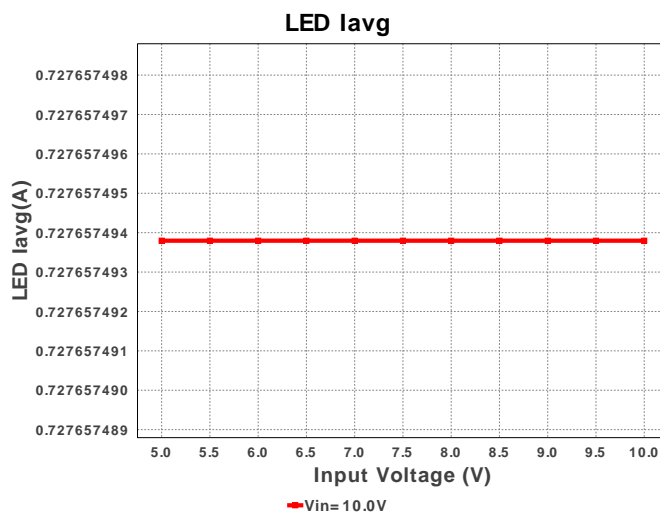
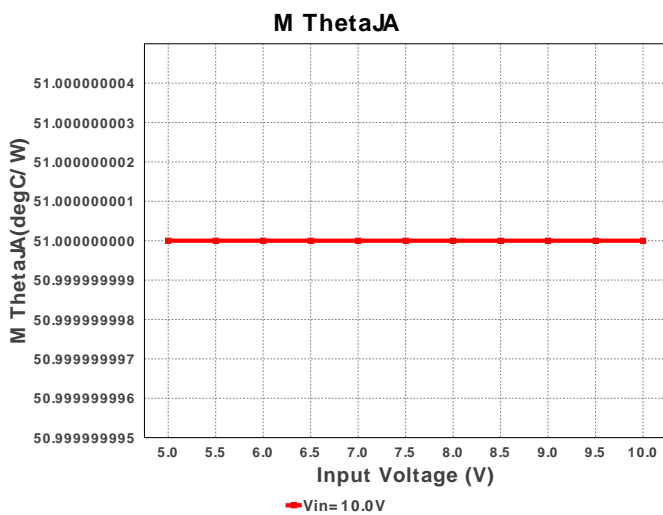
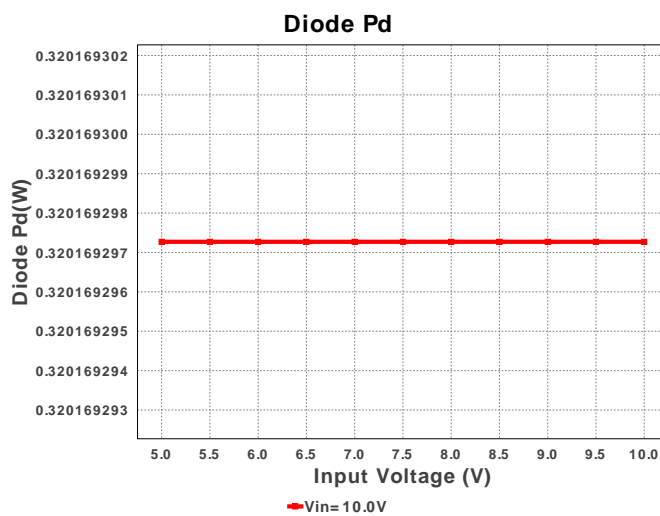
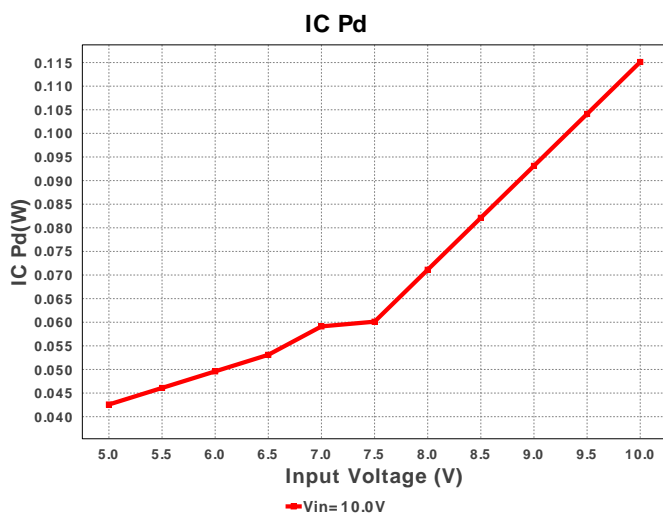
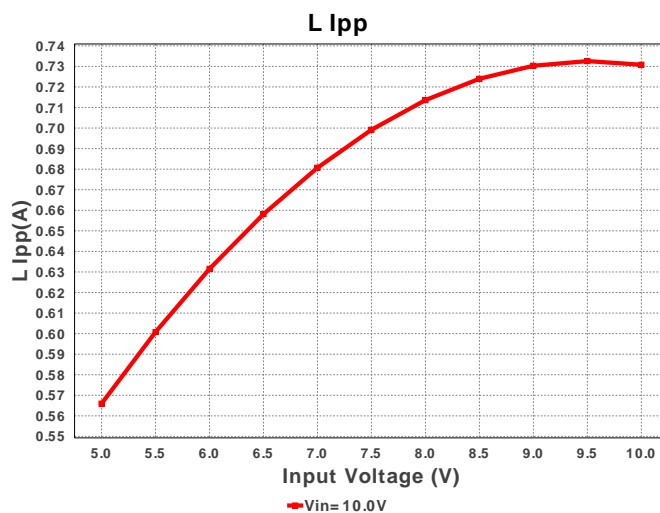
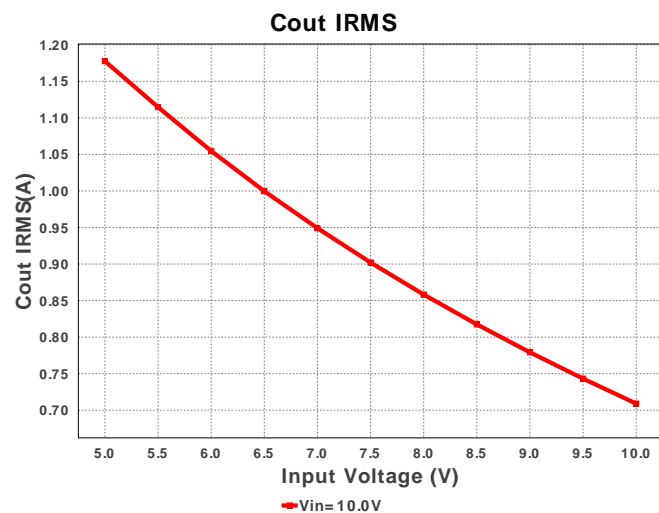


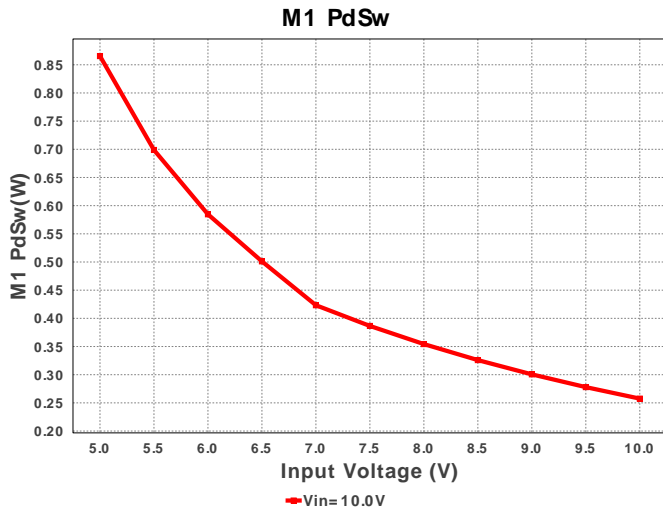
M Vds Act











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	163.377 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.121 A	Current	Output capacitor RMS ripple current
3.	Iin Avg	3.228 A	Current	Average input current
4.	L Ipp	565.953 mA	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	2.682 A	Current	Inductor ripple current
6.	LED Iavg	727.657 mA	Current	LED Average Current
7.	LED Ipp	48.987 mA	Current	LED Ripple Current
8.	M Irms	2.889 A	Current	MOSFET RMS ripple current
9.	SW Ipk	2.96 A	Current	Peak switch current
10.	BOM Count	28	General	Total Design BOM count
11.	FootPrint	1.681 kmm2	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	9.8 mOhm	General	Drain-Source On-resistance
15.	M Vds Act	28.309 mV	General	M Vds
16.	Pout	13.534 W	General	Total output power
17.	Total BOM	\$0.0	General	Total BOM Cost
18.	D1 Tj	46.008 degC	Op_Point	D1 junction temperature
19.	Vout OP	18.6 V	Op_Point	Operational Output Voltage
20.	Duty Cycle	77.447 %	Op_point	Duty cycle
21.	Efficiency	83.857 %	Op_point	Steady state efficiency
22.	IC Tj	31.575 degC	Op_point	IC junction temperature
23.	ICThetaJA	37.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	727.657 mA	Op_point	Iout operating point
25.	LED Rd	970.237 mOhm	Op_point	LED DynamicResistance
26.	LED Vf	18.6 V	Op_point	Total LED Forward Calculated Voltage
27.	M ThetaJA	51.0 degC/W	Op_point	MOSFET junction-to-ambient thermal resistance
28.	M TjOp	103.281 degC	Op_point	MOSFET junction temperature
29.	VIN_OP	5.0 V	Op_point	Vin operating point
30.	Cin Pd	4.538 mW	Power	Input capacitor power dissipation
31.	Cout Pd	2.515 mW	Power	Output capacitor power dissipation
32.	Diode Pd	320.169 mW	Power	Diode power dissipation
33.	IC Pd	42.577 mW	Power	IC power dissipation
34.	L Pd	198.497 mW	Power	Inductor power dissipation
35.	LED Pd	13.534 W	Power	LED Power Dissipation
36.	M Pd	1.437 W	Power	MOSFET power dissipation
37.	M1 PdCond	124.79 mW	Power	M1 MOSFET conduction losses
38.	M1 PdSw	1.312 W	Power	M1 MOSFET switching losses
39.	Total Pd	2.605 W	Power	Total Power Dissipation
40.	Total LED load Rd	161.706 mOhm	Unknown	Total LED Load DynamicResistance

Design Inputs

#	Name	Value	Description
1.	Iout	700.0 mA	Maximum Output Current
2.	Iout1	700.0 mAmps	Output Current #1
3.	VinMax	10.0 V	Maximum input voltage
4.	VinMin	5.0 V	Minimum input voltage
5.	Vout	18.6 V	Output Voltage
6.	Vout1	18.6 Volt	Output Voltage #1
7.	application	LED_DRIVER	LED Application
8.	base_pn	LM3421	Texas Instruments Base Part Number

#	Name	Value	Description
9.	isLEDArchitect	N	LED Architect Project
10.	ledparallel	1.0	Number of LED in parallel
11.	ledpartnumber	CL-L103-C6N-C	LED Part number
12.	ledseries	2.0	Number of LED in series
13.	line_fsw	60.0	AC Line Frequency
14.	source	DC	Input Source Type
15.	ta	30.0 degC	Ambient temperature

Design Assistance

1. LM3421 Product Folder : <http://www.ti.com/product/lm3421> : contains the data sheet and other resources.

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