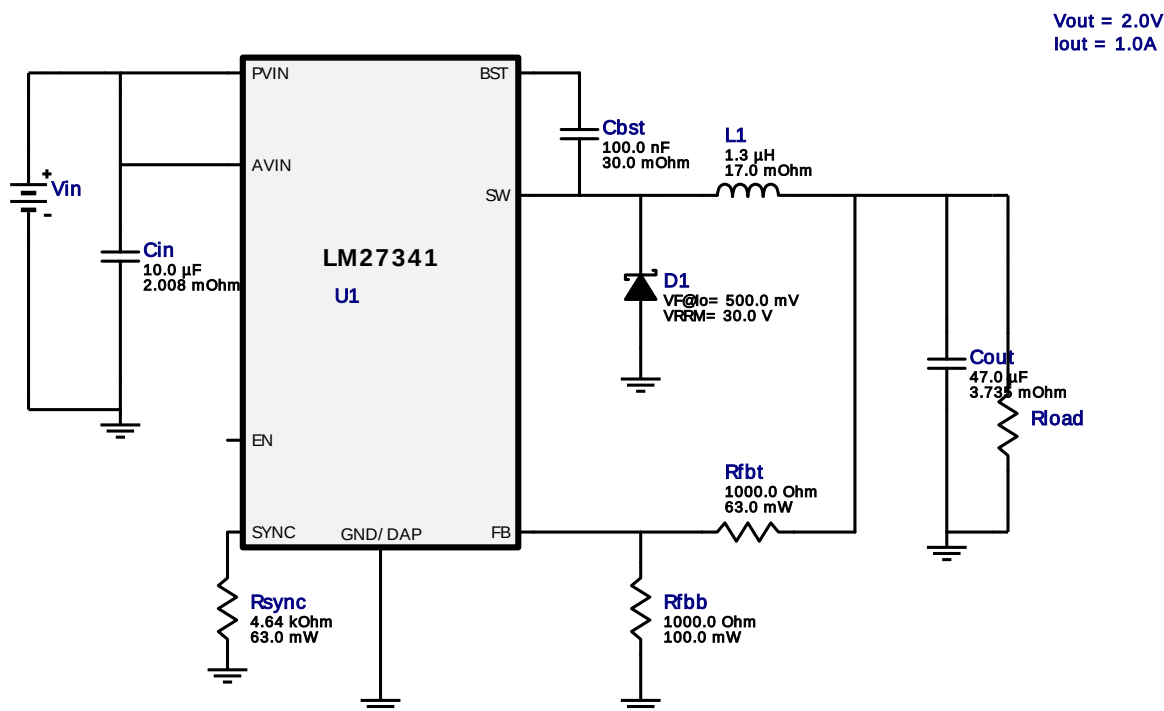


WEBENCH® Design Report

Design : 4728750/3 LM27341MY/NOPB
LM27341MY/NOPB 10.0V-20.0V to 2.00V @ 1.0A

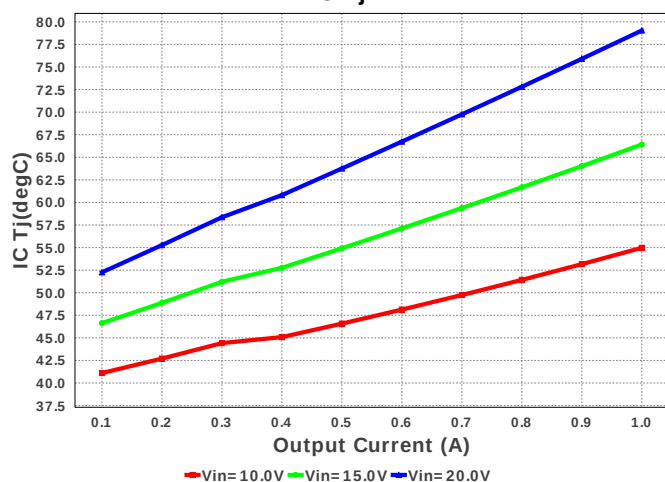


Electrical BOM

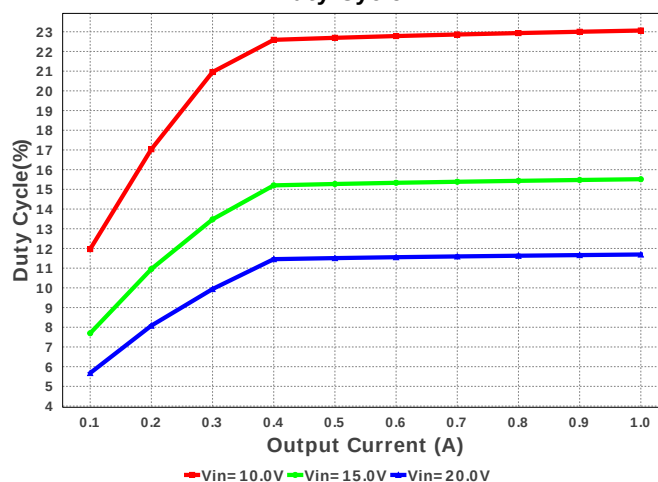
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM188R71C104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 16.0 V IRMS= 1.7 A	1	\$0.01	0603 5 mm ²
2.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	1	\$0.22	1210_280 15 mm ²
3.	Cout	MuRata	GRM31CE70G476ME15L Series= X7U	Cap= 47.0 uF ESR= 3.735 mOhm VDC= 4.0 V IRMS= 4.1841 A	1	\$0.10	1206_190 11 mm ²
4.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	SMA 37 mm ²
5.	L1	Bourns	SRN6045-1R3Y	L= 1.3 uH DCR= 17.0 mOhm	1	\$0.16	SRN6045 64 mm ²
6.	Rfbb	Vishay-Dale	CRCW06031K00FKEA Series= CRCW..e3	Res= 1000.0 Ohm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	0603 5 mm ²
7.	Rfbs	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	Rsync	Vishay-Dale	CRCW04024K64FKED Series= CRCW..e3	Res= 4.64 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
9.	U1	Texas Instruments	LM27341MY/NOPB	Switcher	1	\$1.10	 MUC10A 24 mm²

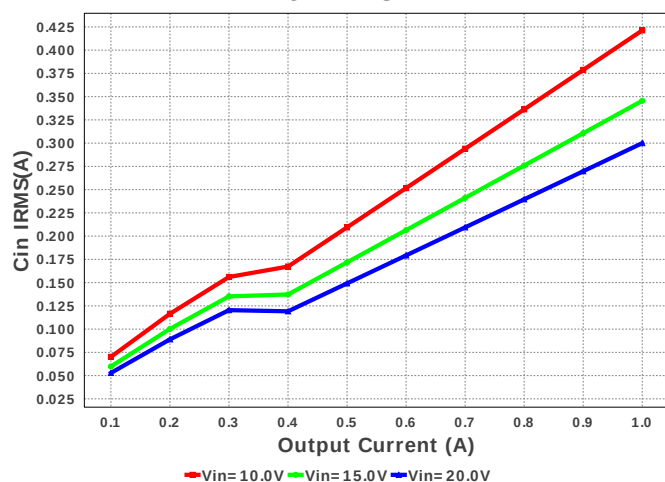
IC Tj



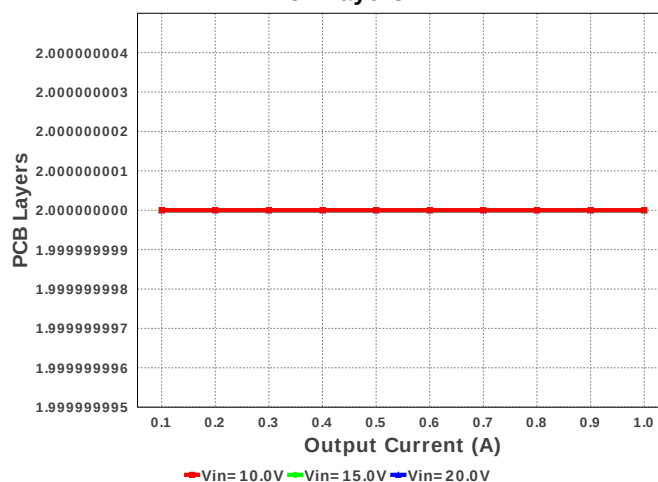
Duty Cycle

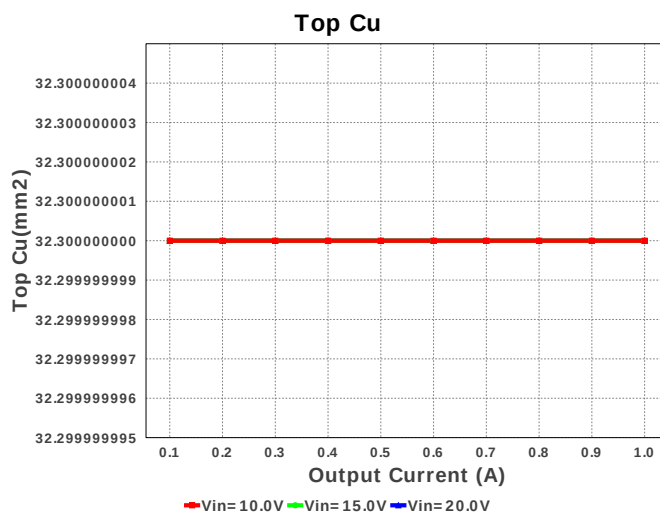
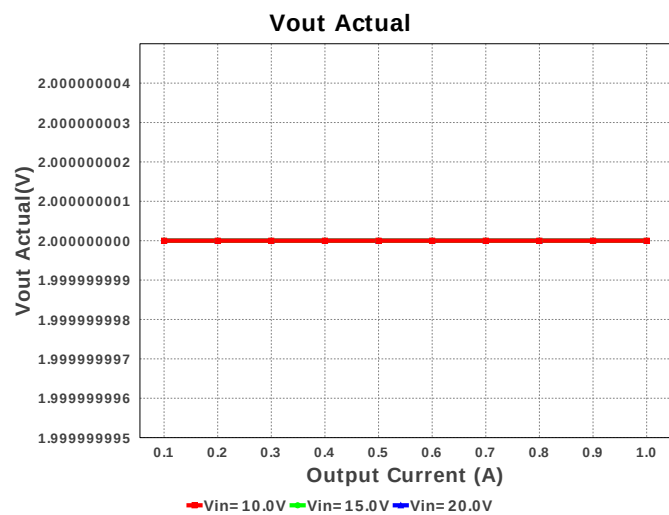
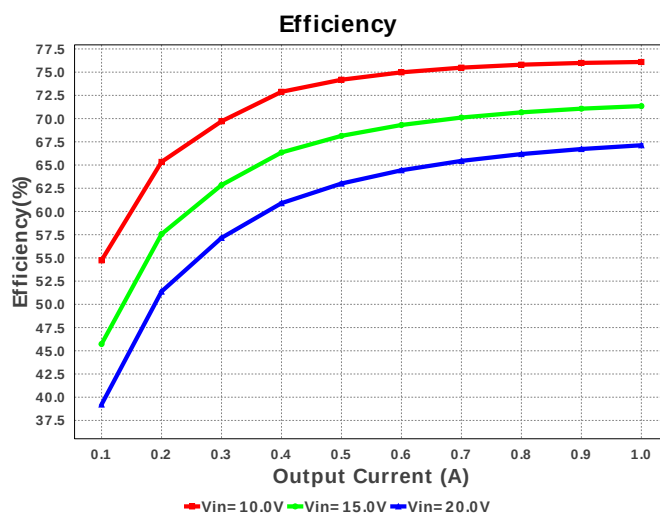
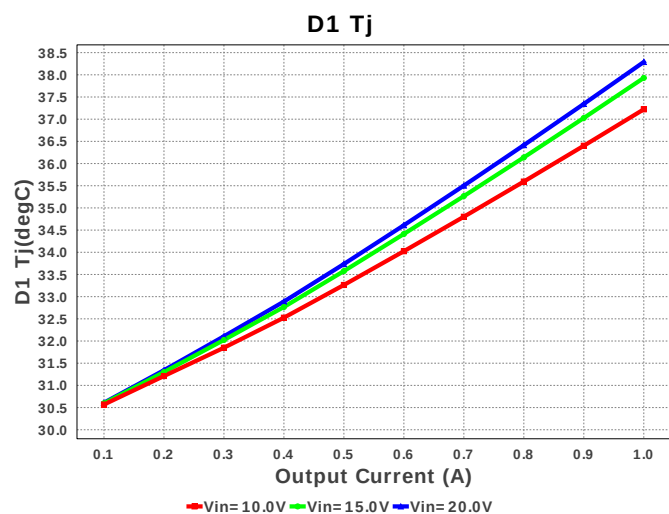
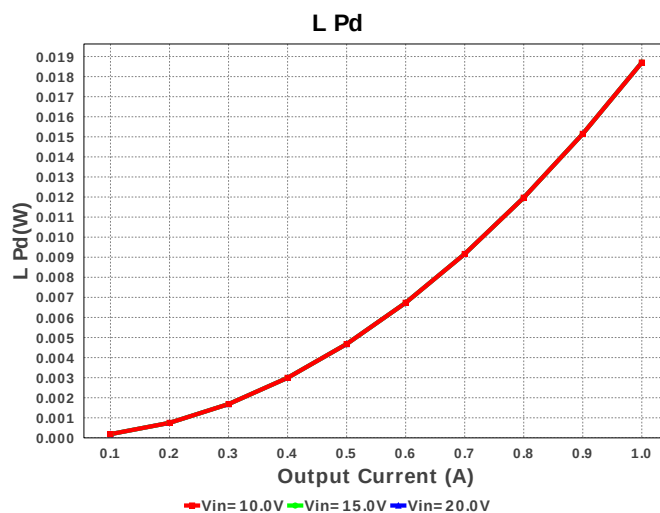
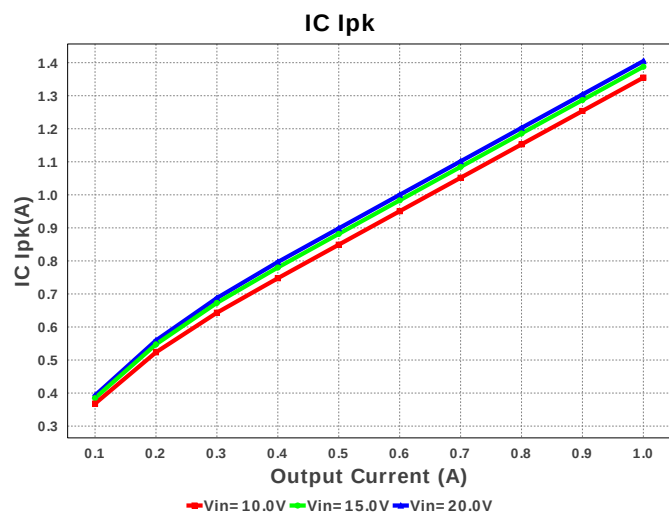


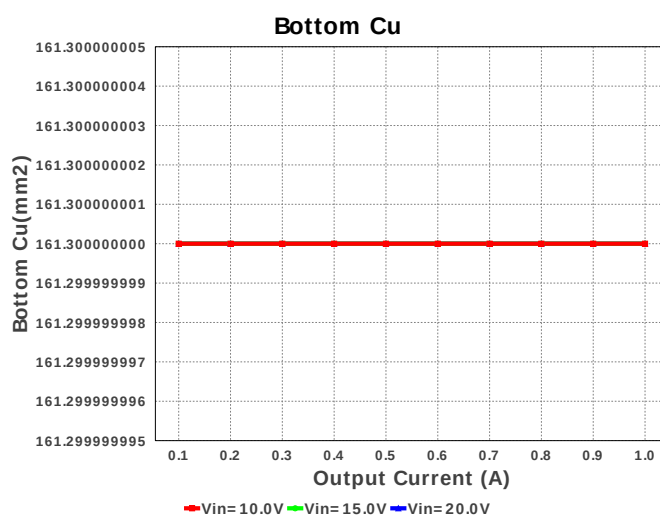
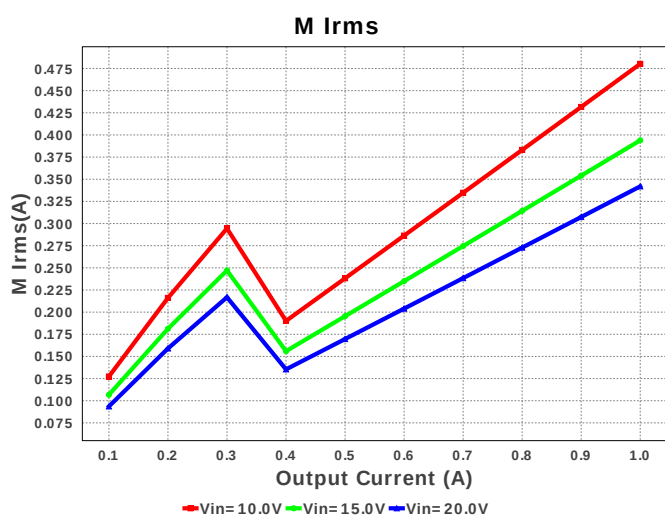
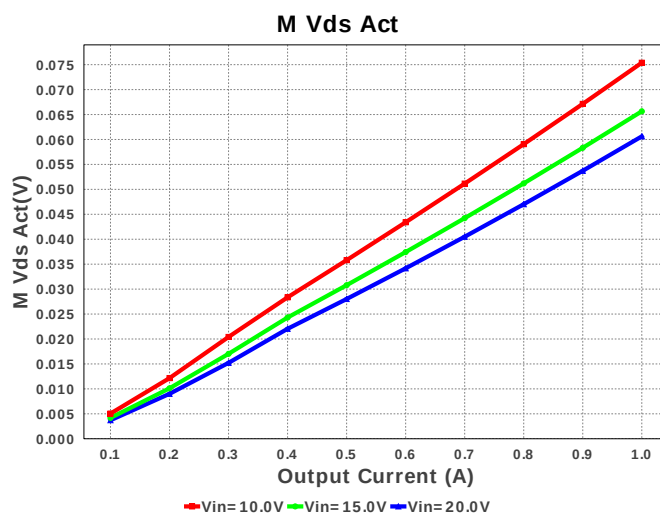
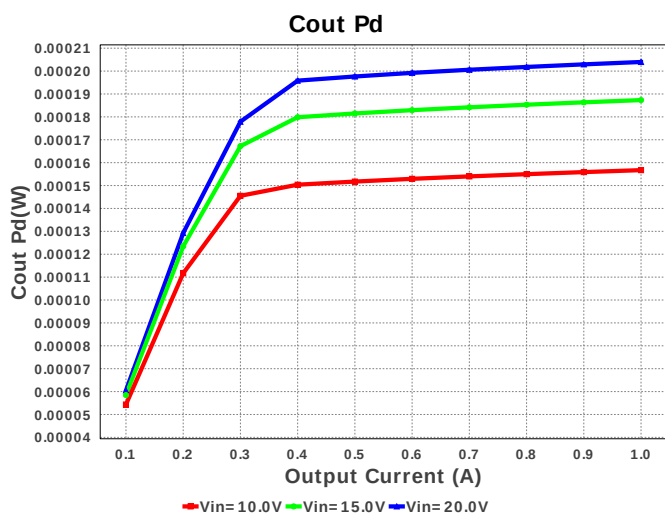
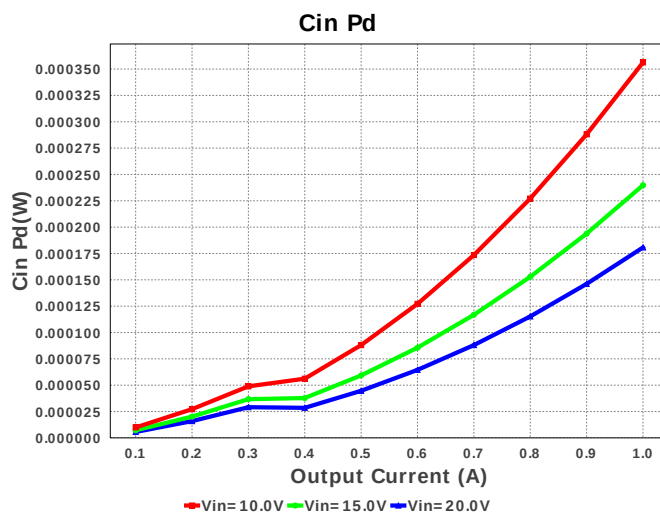
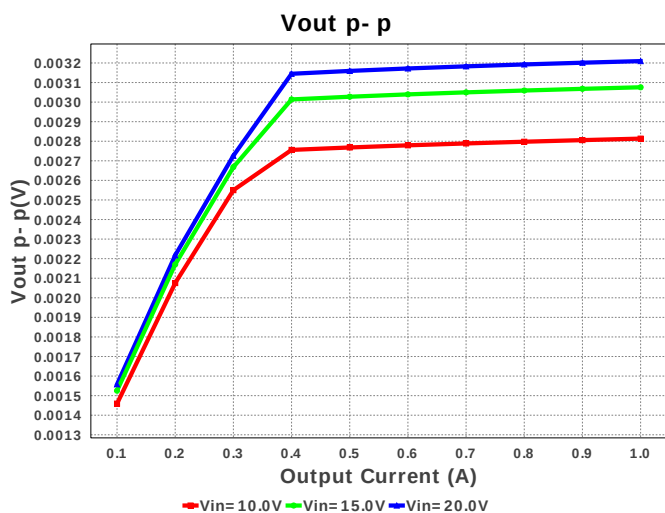
Cin IRMS

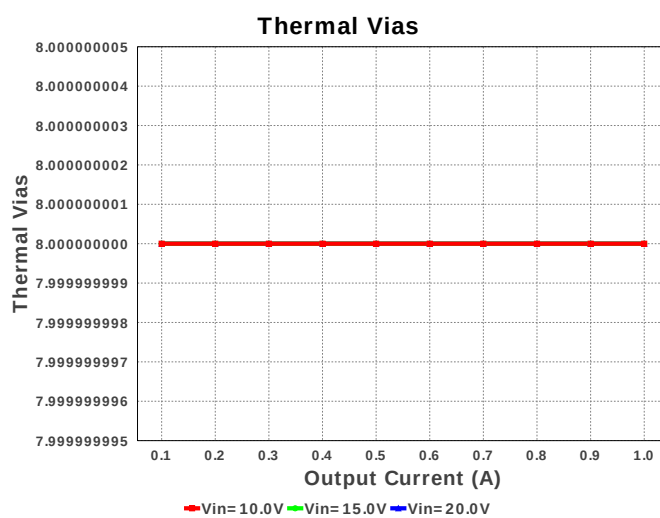
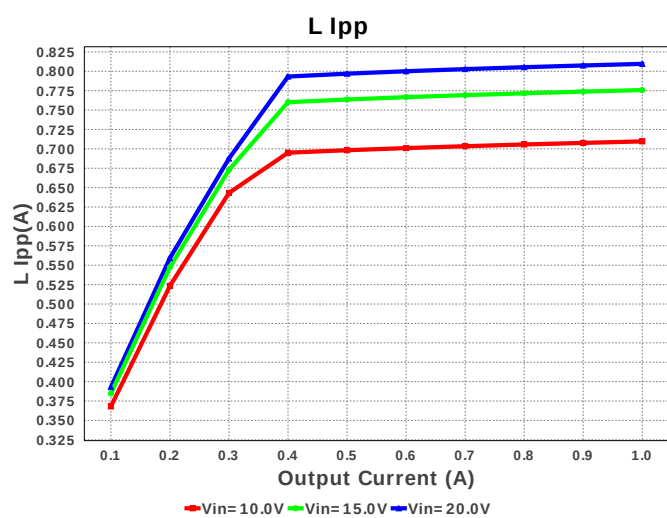
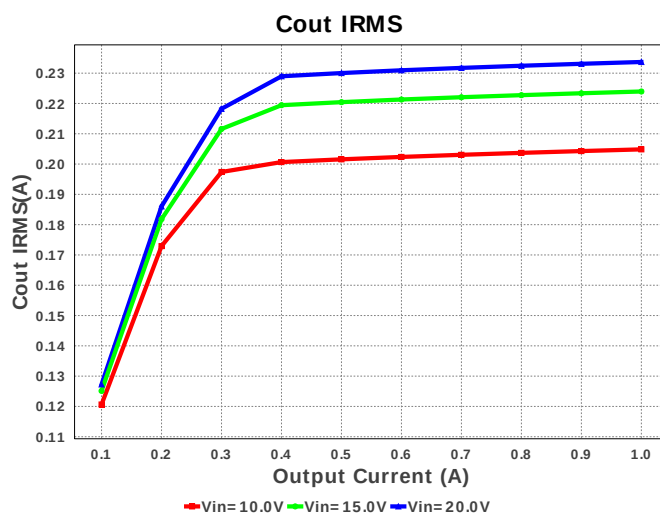
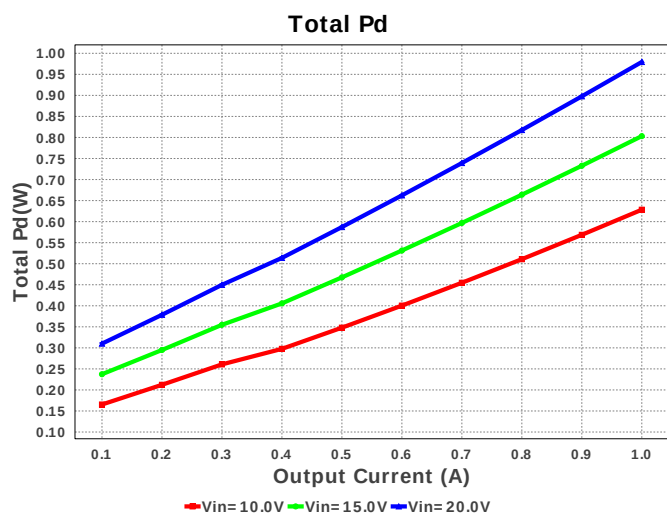
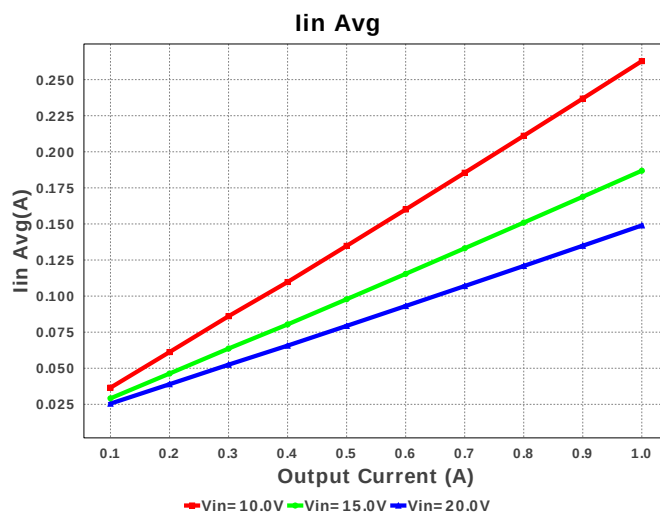
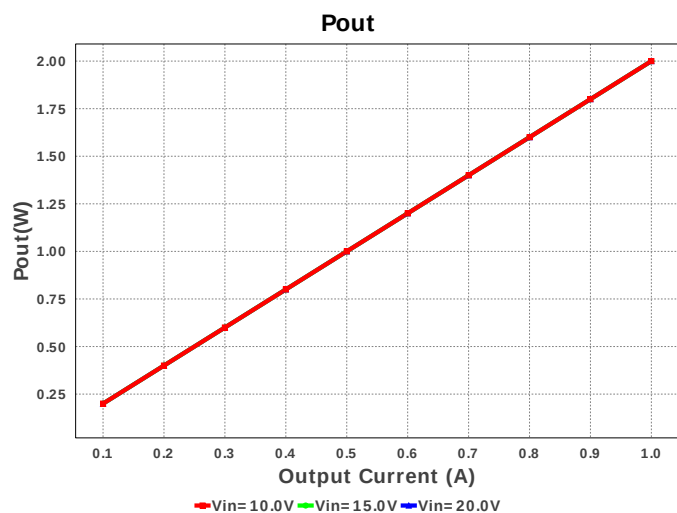


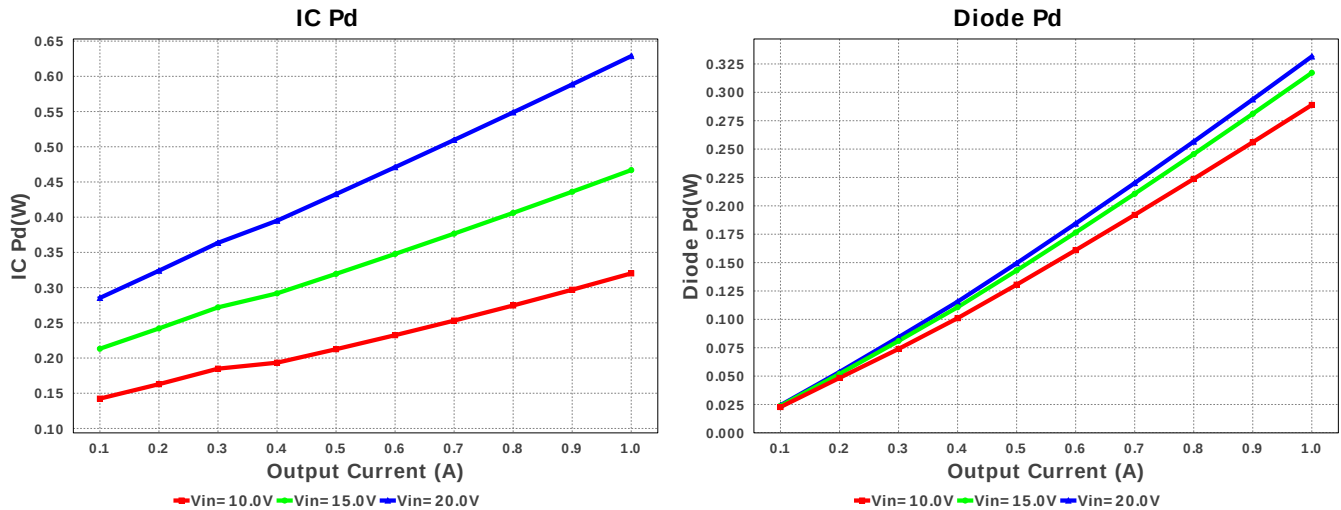
PCB Layers











Operating Values

#	Name	Value	Category	Description
1.	Bottom Cu	161.3 mm ²	Board_Layout	Recommended minimum area of bottom layer copper connected to DAP
2.	PCB Layers	2.0	Board_Layout	Recommended number of PCB layers for the necessary IC Thermal Resistance
3.	Thermal Vias	8.0	Board_Layout	Recommended number of 10 mil thermal vias under the IC
4.	Top Cu	32.3 mm ²	Board_Layout	Recommended minimum area of top layer copper connected to DAP
5.	Cin IRMS	300.428 mA	Current	Input capacitor RMS ripple current
6.	Cout IRMS	234.553 mA	Current	Output capacitor RMS ripple current
7.	IC Ipk	1.406 A	Current	Peak switch current in IC
8.	Iin Avg	149.33 mA	Current	Average input current
9.	L Ipp	812.51 mA	Current	Peak-to-peak inductor ripple current
10.	M1 Irms	342.583 mA	Current	Q Iavg
11.	BOM Count	9	General	Total Design BOM count
12.	FootPrint	166.0 mm ²	General	Total Foot Print Area of BOM components
13.	Frequency	2.0 MHz	General	Switching frequency
14.	IC Tolerance	10.0 mV	General	IC Feedback Tolerance
15.	M Vds Act	54.718 mV	General	Voltage drop across the MosFET
16.	Pout	2.0 W	General	Total output power
17.	Total BOM	\$1.71	General	Total BOM Cost
18.	D1 Tj	38.521 degC	Op_Point	D1 junction temperature
19.	Vout Actual	2.0 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
20.	Vout OP	2.0 V	Op_Point	Operational Output Voltage
21.	Duty Cycle	11.736 %	Op_point	Duty cycle
22.	Efficiency	66.964 %	Op_point	Steady state efficiency
23.	IC Tj	58.204 degC	Op_point	IC junction temperature
24.	ICThetaJA	45.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
25.	IOUT_OP	1.0 A	Op_point	Iout operating point
26.	VIN_OP	20.0 V	Op_point	Vin operating point
27.	Vout Act	2.0 V	Op_point	Achieved Vout with feedback resistor pair
28.	Vout p-p	3.221 mV	Op_point	Peak-to-peak output ripple voltage
29.	Cin Pd	181.236 μW	Power	Input capacitor power dissipation
30.	Cout Pd	205.481 μW	Power	Output capacitor power dissipation
31.	Diode Pd	340.843 mW	Power	Diode power dissipation
32.	IC Pd	626.746 mW	Power	IC power dissipation
33.	L Pd	18.7 mW	Power	Inductor power dissipation
34.	Total Pd	986.653 mW	Power	Total Power Dissipation
35.	Vout Tolerance	2.02 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	20.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	2.0	Output Voltage
5.	base_pn	LM27341	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM27341** Product Folder : <http://www.ti.com/product/LM27341> : contains the data sheet and other resources.

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).