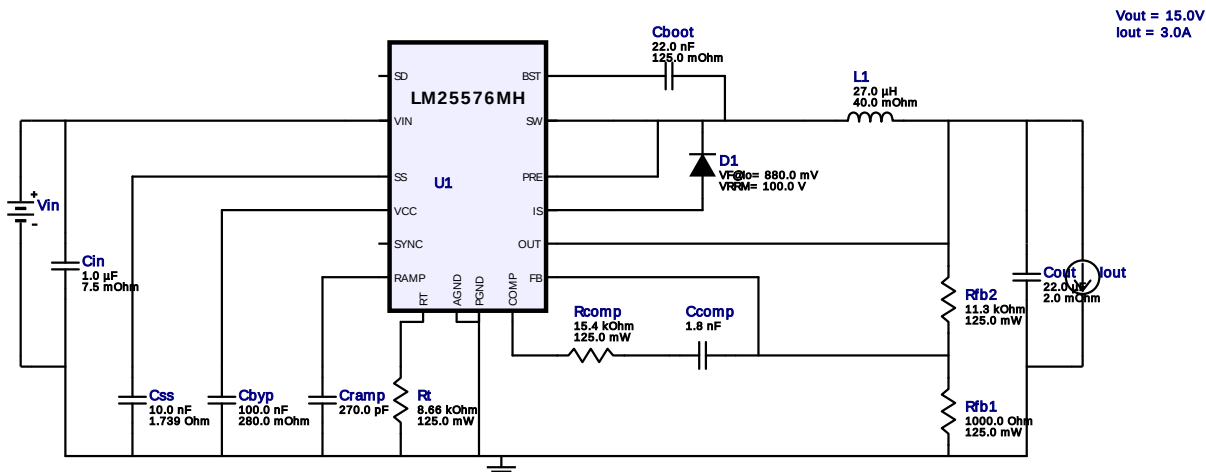


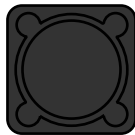
WEBENCH® Design Report

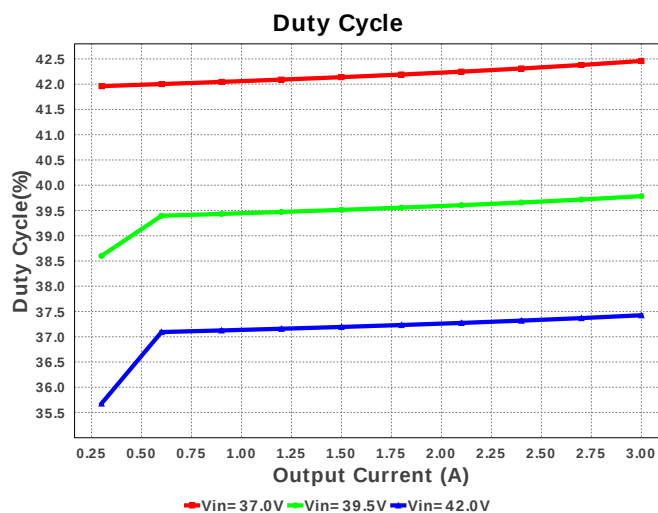
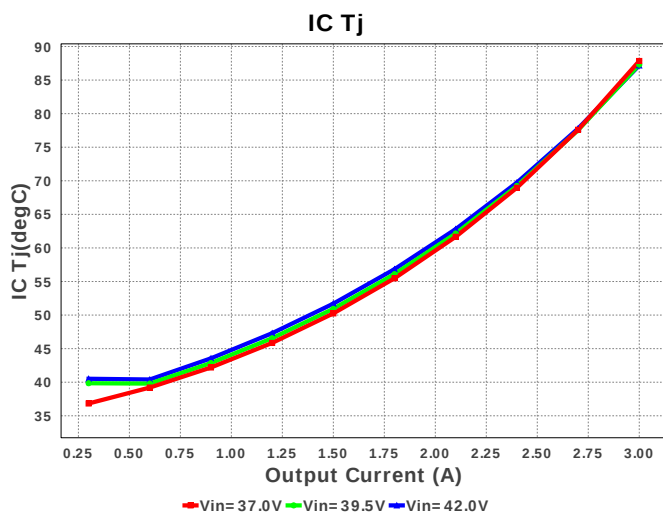
Design : 4738396/7 LM25576MHX/NOPB
LM25576MHX/NOPB 37.0V-42.0V to 15.00V @ 3.0A

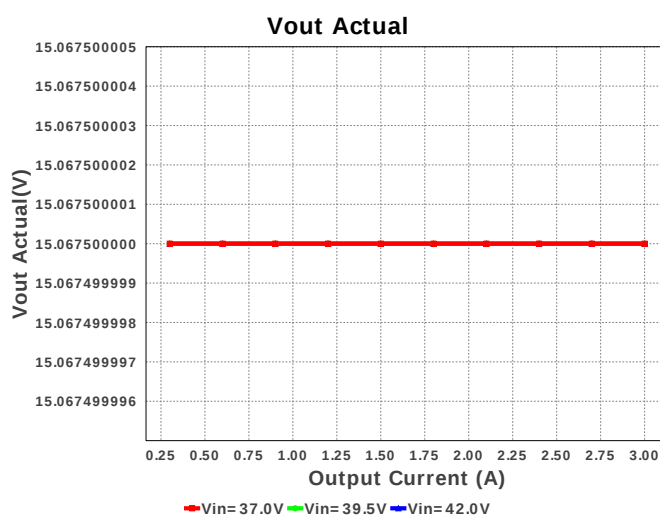
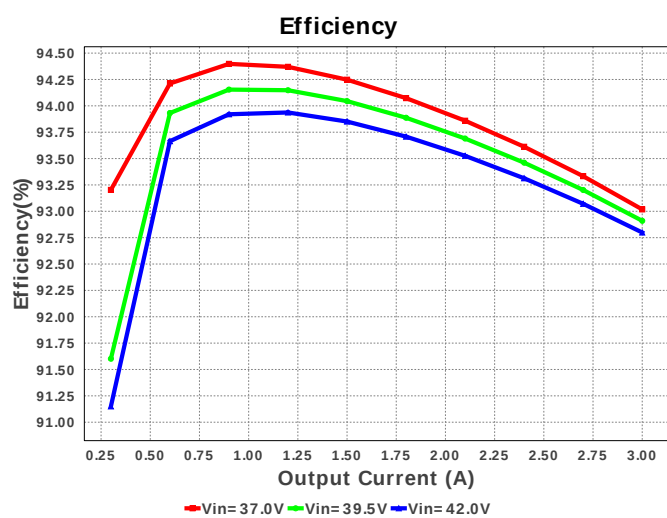
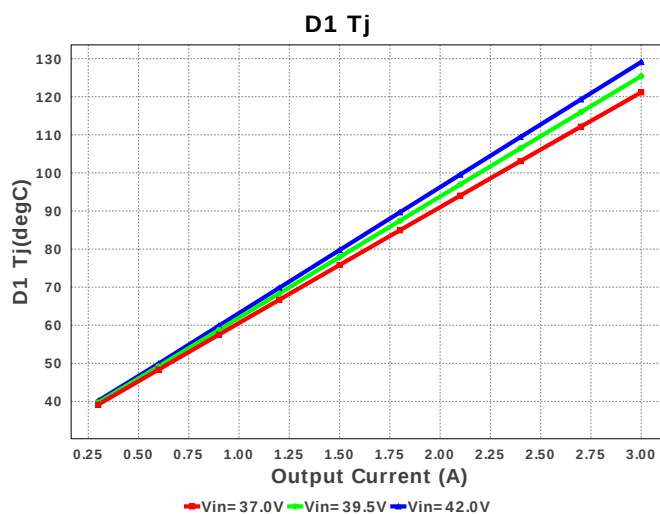
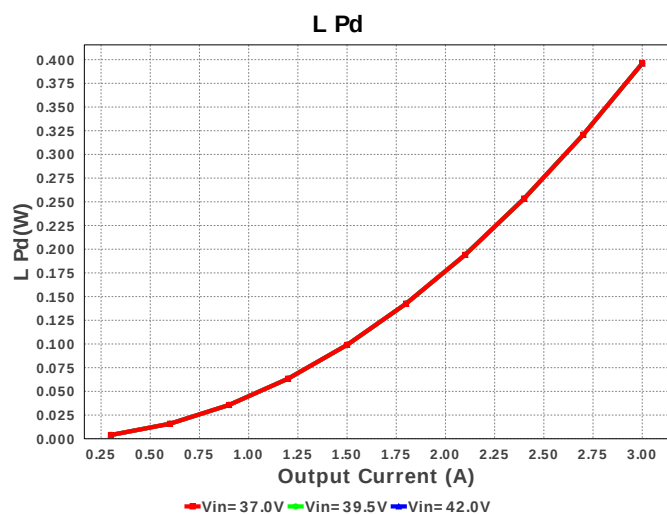
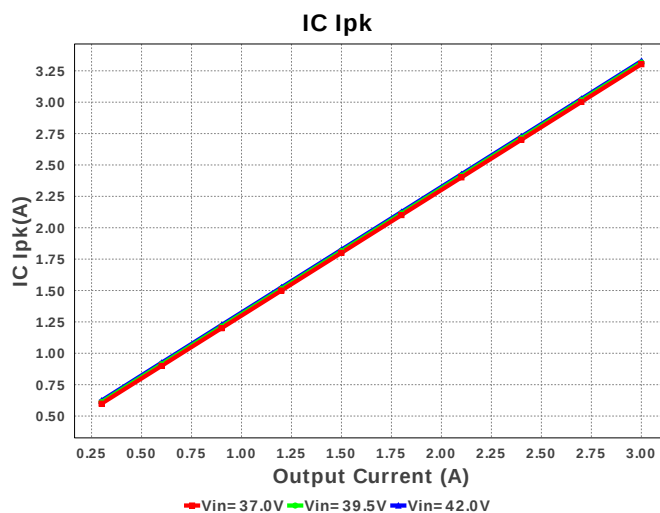
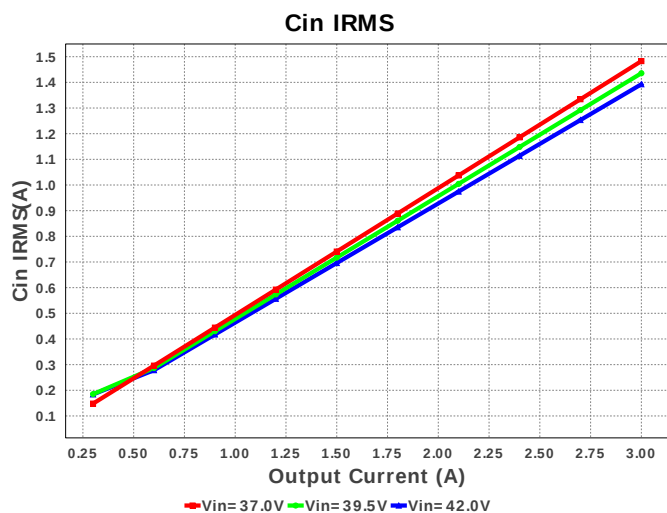


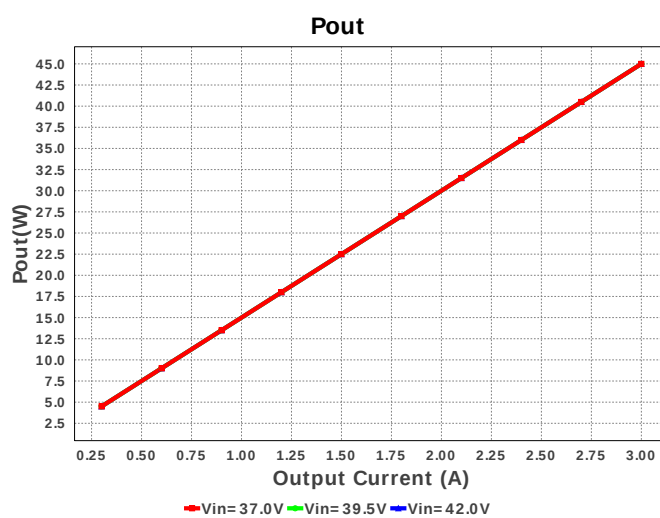
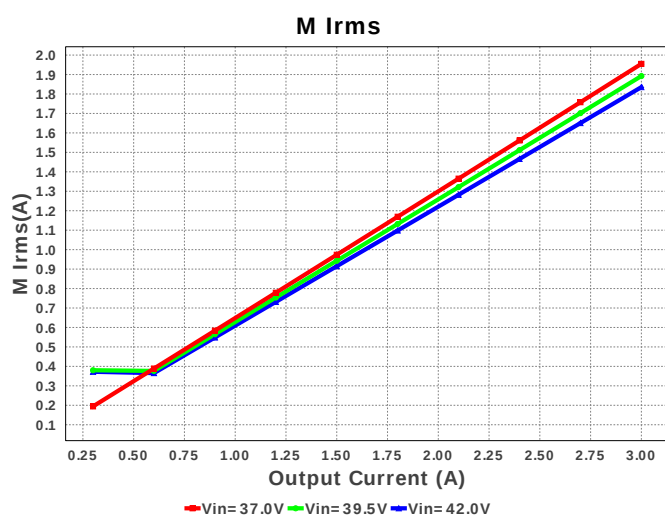
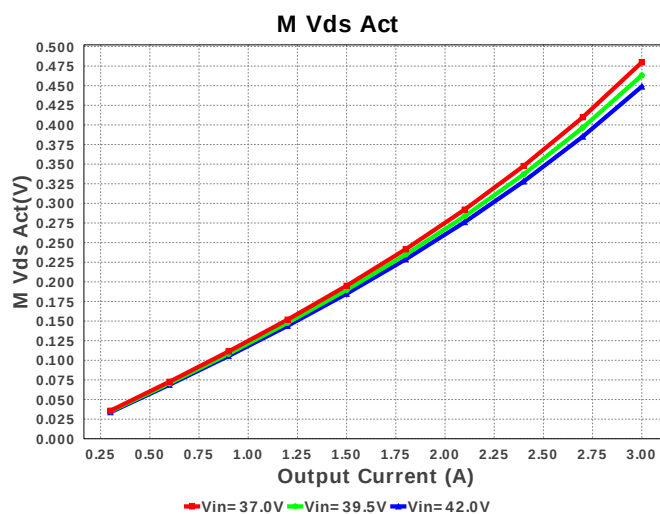
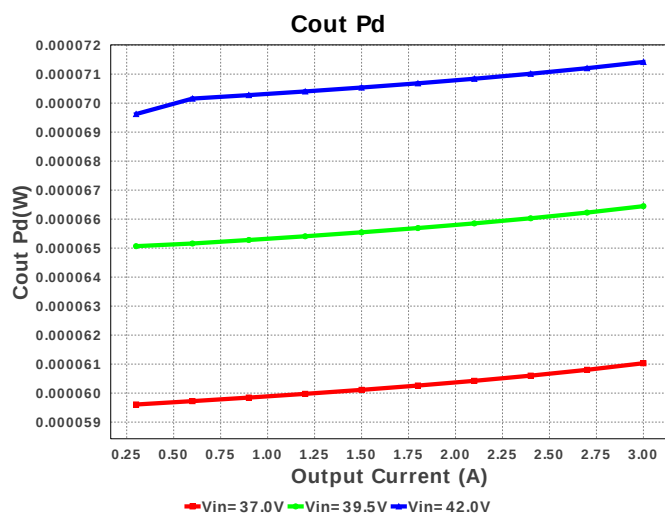
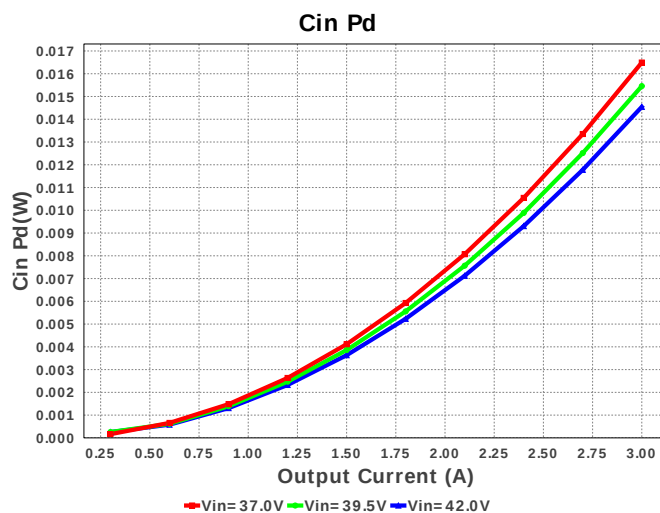
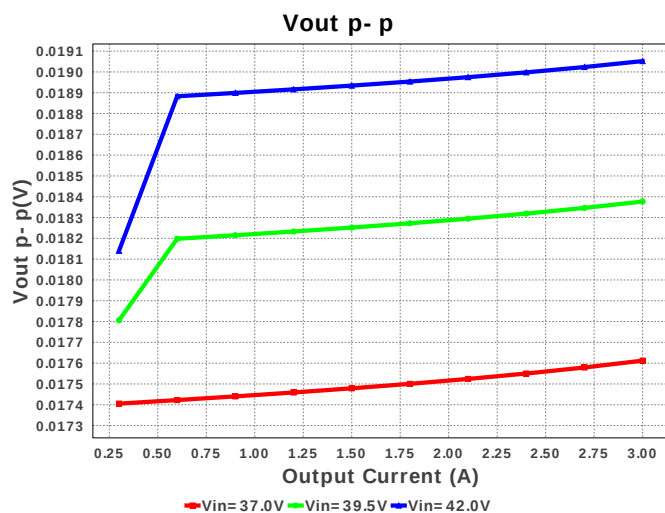
Electrical BOM

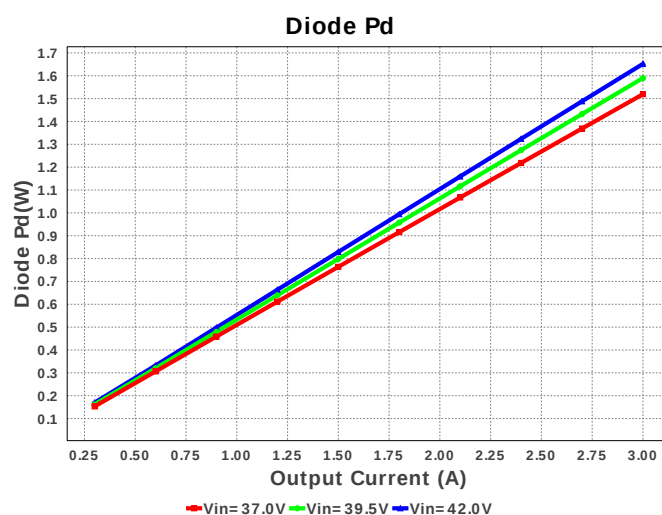
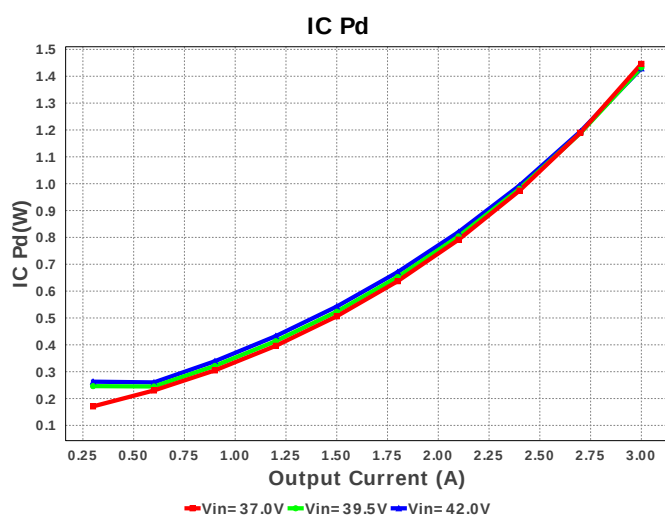
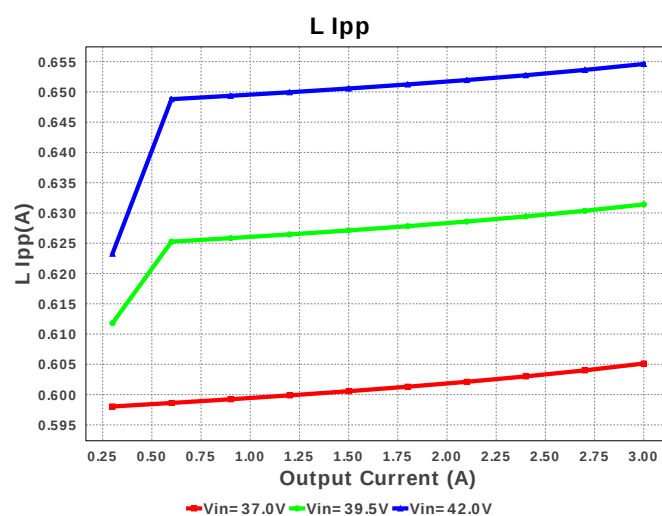
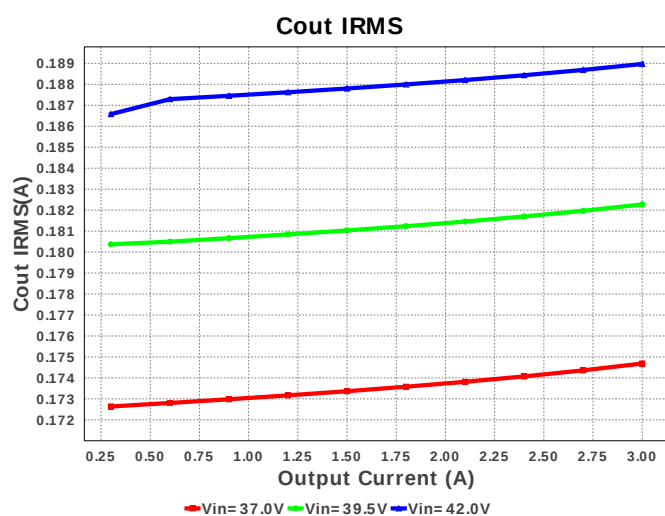
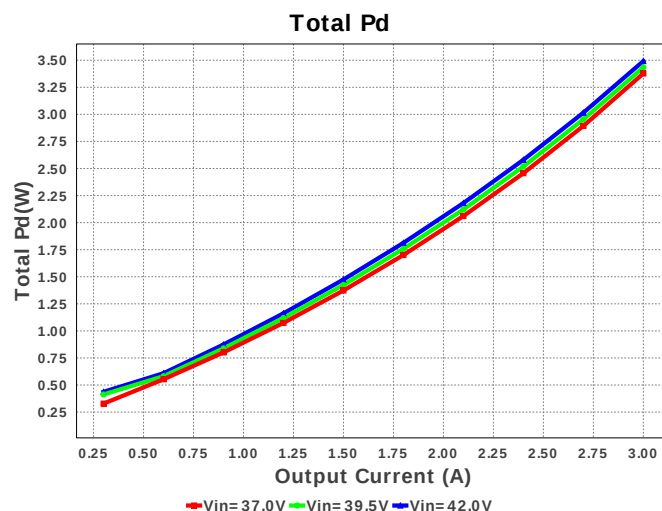
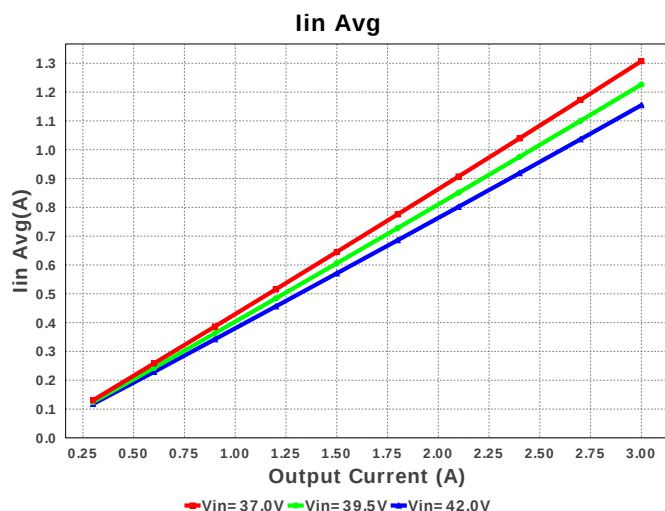
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C223K5RACTU Series= X7R	Cap= 22.0 nF ESR= 125.0 mOhm VDC= 50.0 V IRMS= 645.0 mA	1	\$0.01	 0805 7 mm ²
2.	Cbyp	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Ccomp	MuRata	GRM188R71E182KA01D Series= X7R	Cap= 1.8 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm ²
4.	Cin	TDK	C3216X7R2A105M160AA Series= X7R	Cap= 1.0 uF ESR= 7.5 mOhm VDC= 100.0 V IRMS= 5.9235 A	1	\$0.11	 1206 11 mm ²
5.	Cout	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.16	 1210 15 mm ²
6.	Cramp	Yageo America	CC0805KRX7R9BB271 Series= X7R	Cap= 270.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
7.	Css	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm ²
8.	D1	Vishay-Semiconductor	SS10PH10-M3/86A	VF@Io= 880.0 mV VRRM= 100.0 V	1	\$0.29	 TO-277A 56 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	L1	Bourns	SRR1210-270M	L= 27.0 μ H DCR= 40.0 mOhm	1	\$0.44	 SRR1210 196 mm ²
10.	Rcomp	Panasonic	ERJ-6ENF1542V Series= ERJ-6E	Res= 15.4 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
11.	Rfb1	Panasonic	ERJ-6ENF1001V Series= ERJ-6E	Res= 1000.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
12.	Rfb2	Panasonic	ERJ-6ENF1132V Series= ERJ-6E	Res= 11.3 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
13.	Rt	Panasonic	ERJ-6ENF8661V Series= ERJ-6E	Res= 8.66 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
14.	U1	Texas Instruments	LM25576MHX/NOPB	Switcher	1	\$2.00	 MXA20A 71 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.393 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	188.969 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	3.325 A	Current	Peak switch current in IC
4.	Iin Avg	1.155 A	Current	Average input current
5.	L Ipp	654.61 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.835 A	Current	Q lavg
7.	BOM Count	14	General	Total Design BOM count
8.	FootPrint	408.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	571.723 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	448.935 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	45.0 W	General	Total output power
13.	Total BOM	\$3.09	General	Total BOM Cost
14.	D1 Tj	129.118 degC	Op_Point	D1 junction temperature
15.	Vout Actual	15.068 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	15.0 V	Op_Point	Operational Output Voltage
17.	Duty Cycle	37.425 %	Op_point	Duty cycle
18.	Efficiency	92.799 %	Op_point	Steady state efficiency
19.	IC Tj	87.178 degC	Op_point	IC junction temperature
20.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	3.0 A	Op_point	Iout operating point
22.	VIN_OP	42.0 V	Op_point	Vin operating point
23.	Vout p-p	19.052 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	14.545 mW	Power	Input capacitor power dissipation
25.	Cout Pd	71.419 μ W	Power	Output capacitor power dissipation
26.	Diode Pd	1.652 W	Power	Diode power dissipation
27.	IC Pd	1.429 W	Power	IC power dissipation
28.	L Pd	396.0 mW	Power	Inductor power dissipation
29.	Total Pd	3.492 W	Power	Total Power Dissipation
30.	Vout Tolerance	3.353 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	3.0	Maximum Output Current
2.	VinMax	42.0	Maximum input voltage
3.	VinMin	37.0	Minimum input voltage
4.	Vout	15.0	Output Voltage
5.	base_pn	LM25576	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM25576** Product Folder : <http://www.ti.com/product/LM25576> : contains the data sheet and other resources.

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