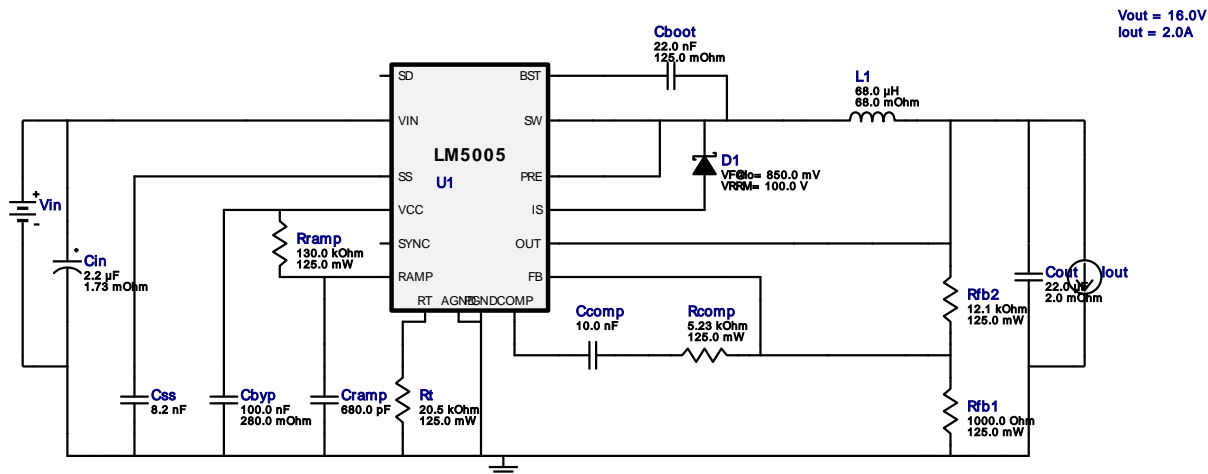








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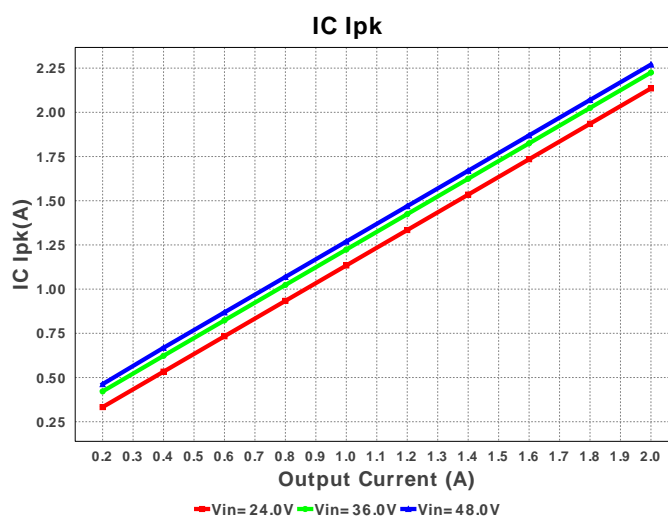
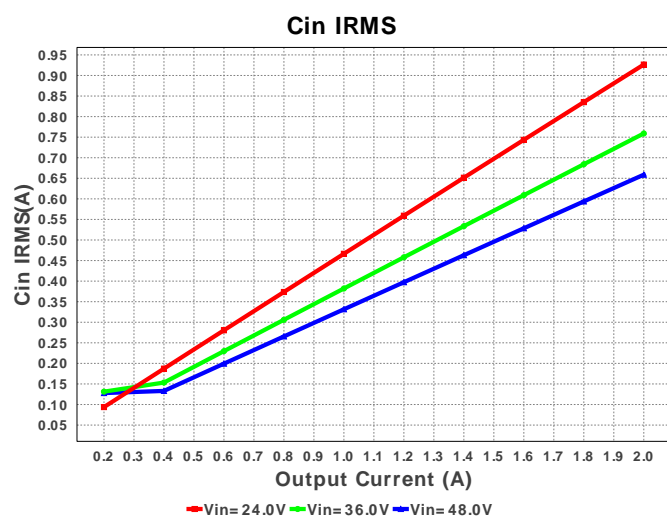
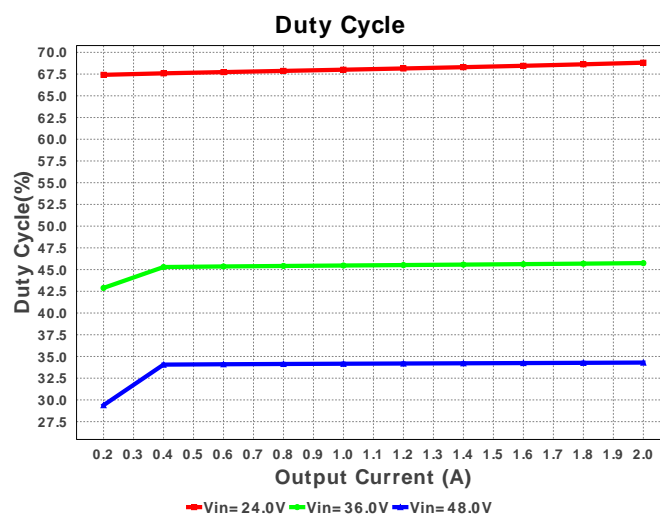
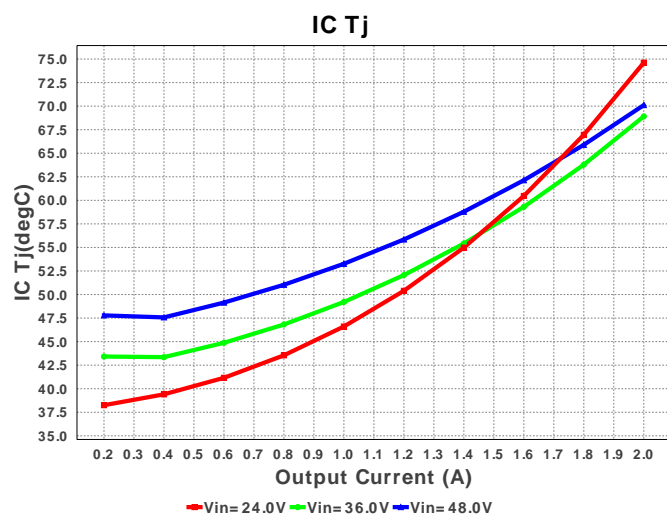
Design : 4466246/45 LM5005MHX/NOPB
LM5005MHX/NOPB 24.0V-48.0V to 16.00V @ 2.0A

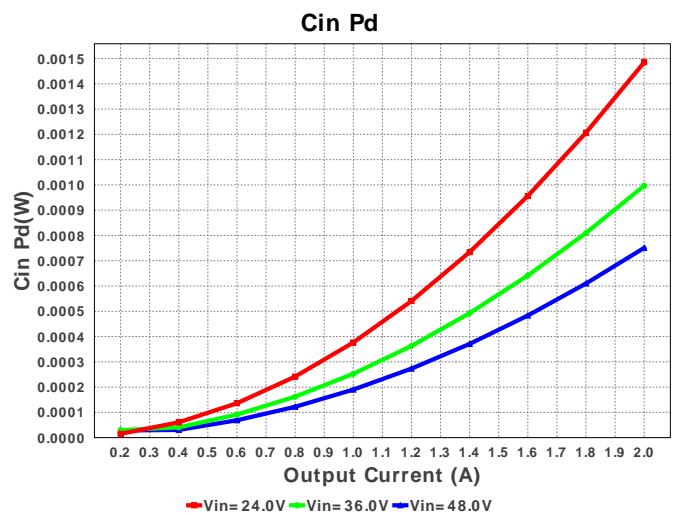
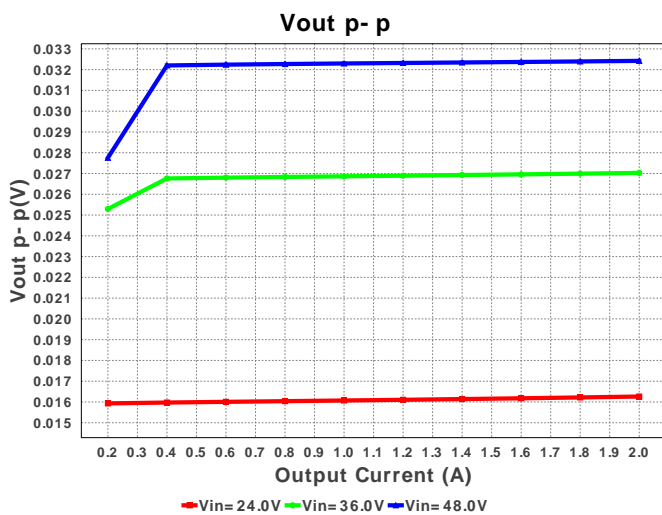
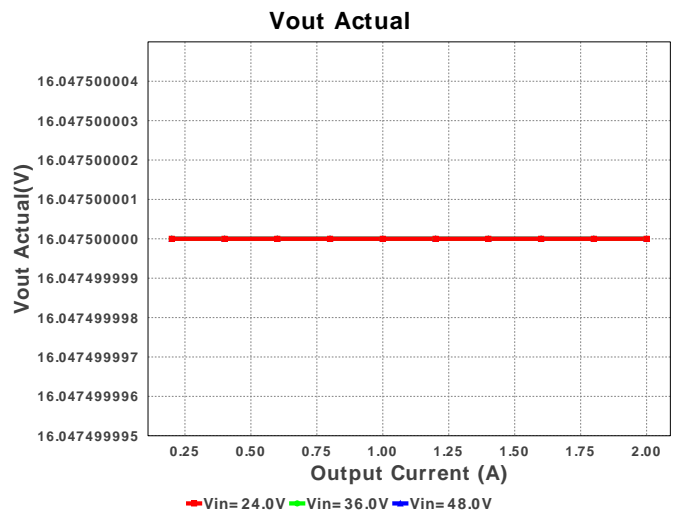
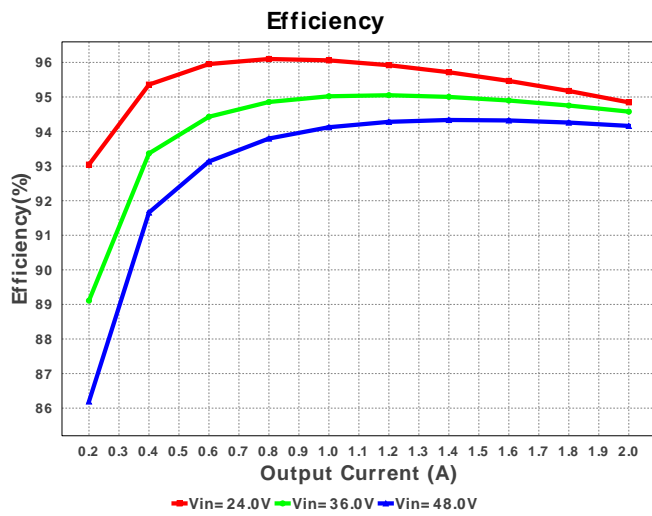
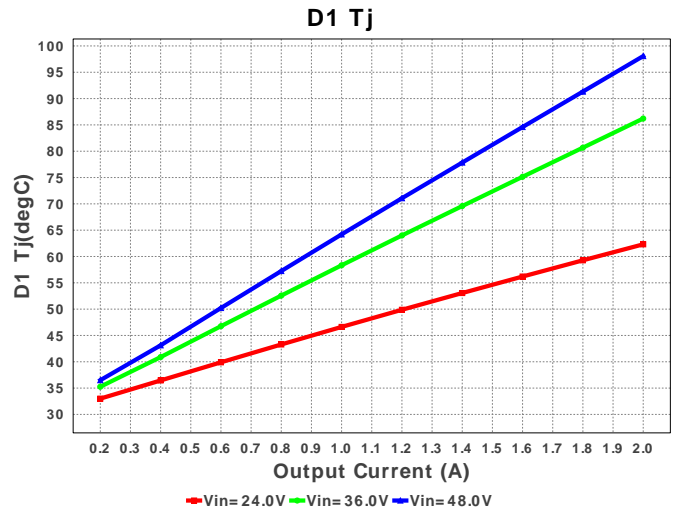
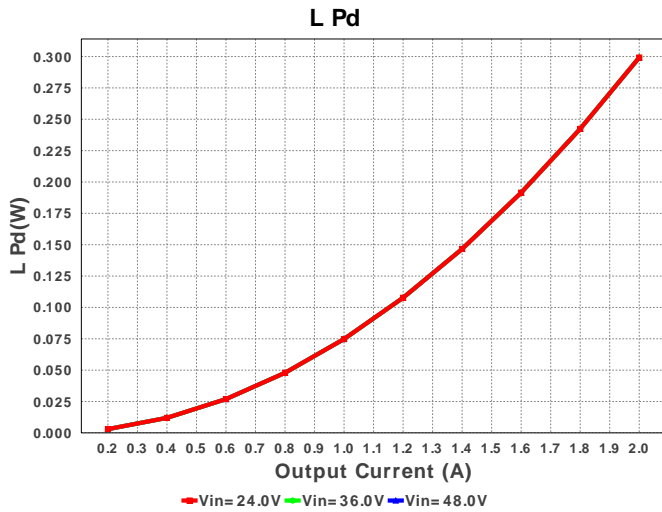


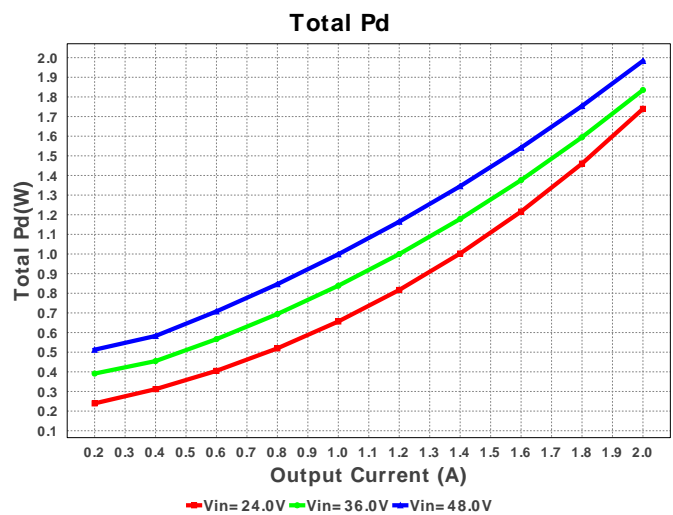
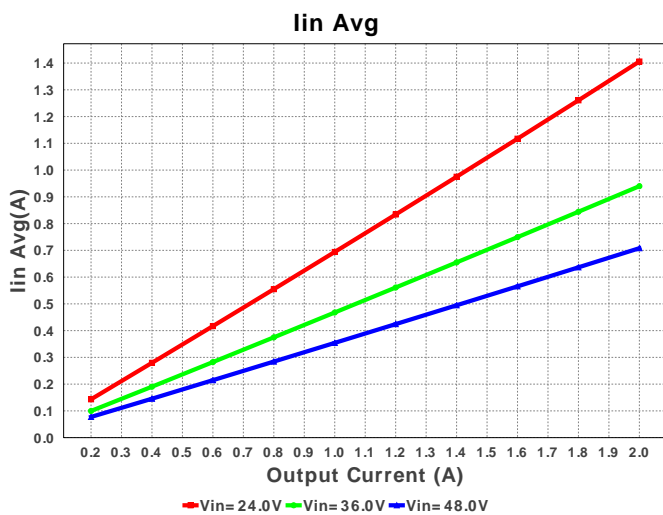
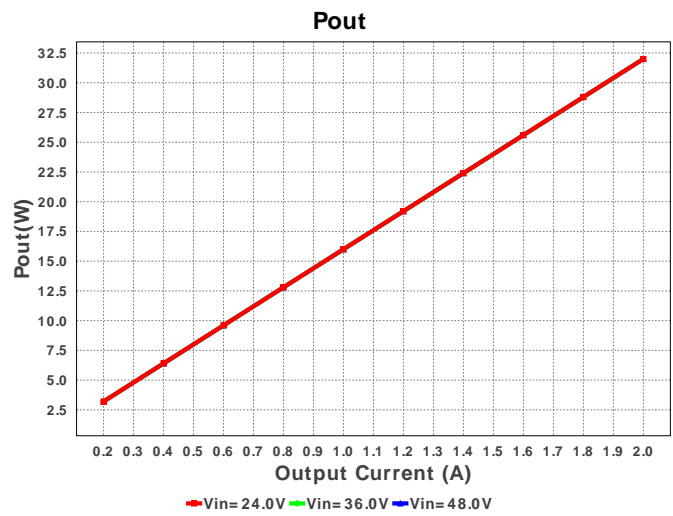
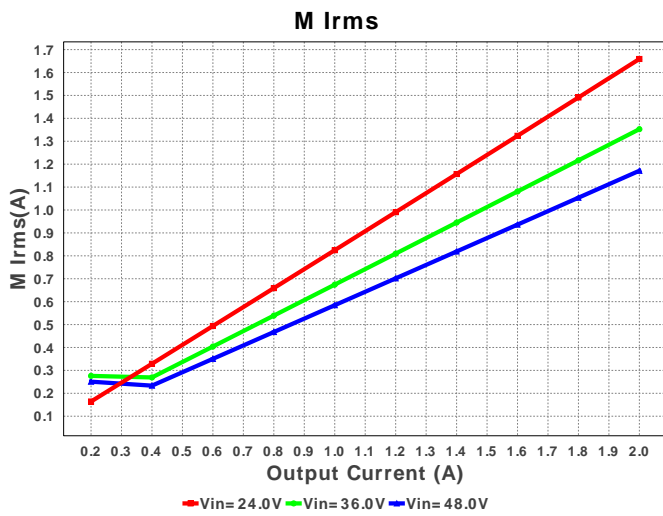
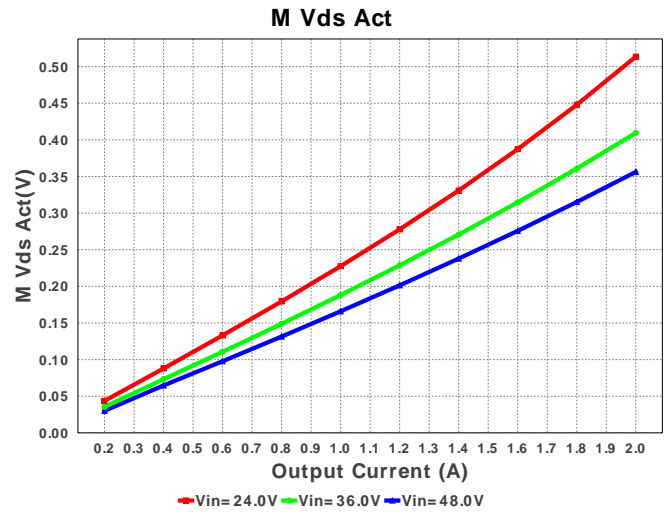
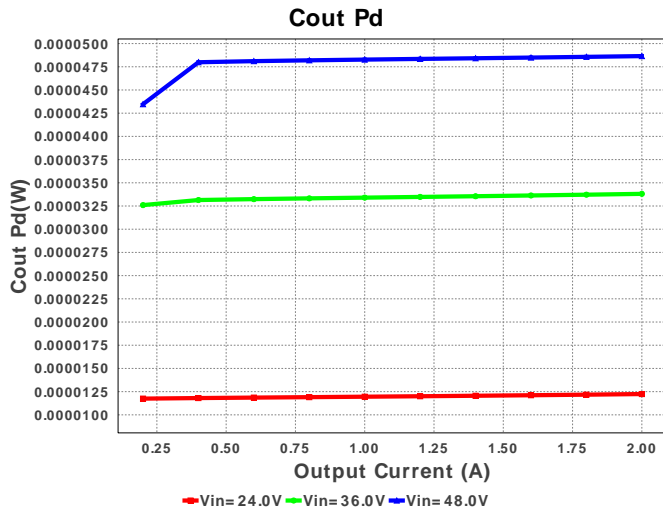
Electrical BOM

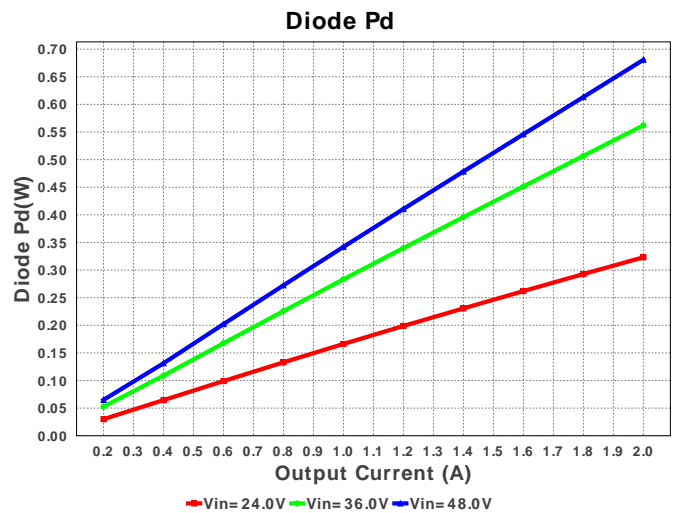
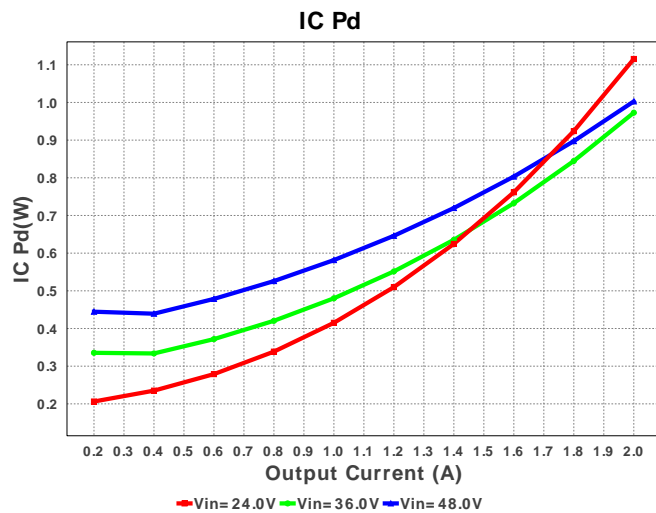
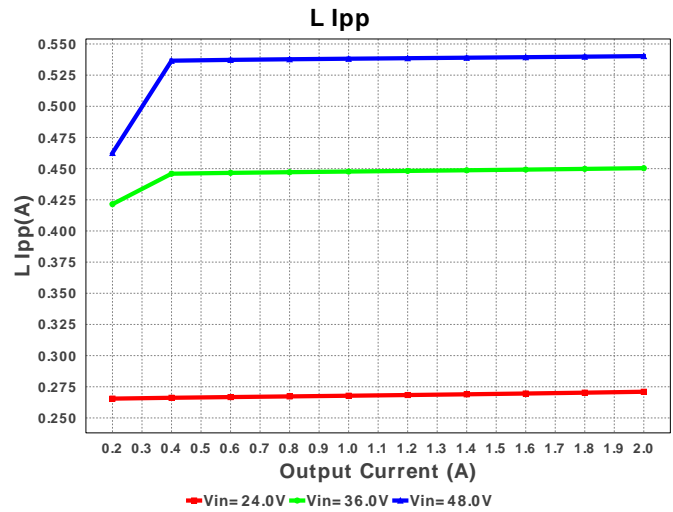
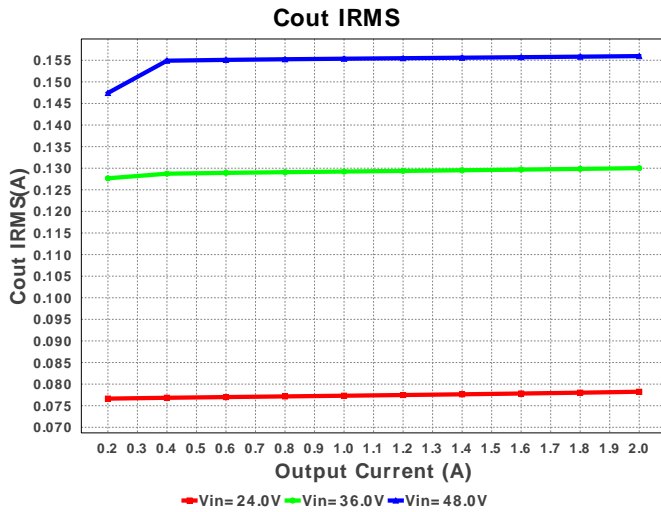
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C223K5RACTU Series= X7R	Cap= 22.0 nF ESR= 125.0 mOhm VDC= 50.0 V IRMS= 645.0 mA	1	\$0.01	0805 7 mm ²
2.	Cbyp	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Ccomp	MuRata	GRM155R71E103KA01D Series= X7R	Cap= 10.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
4.	Cin	TDK	C3225X7R2A225K230AB Series= X7R	Cap= 2.2 uF ESR= 1.73 mOhm VDC= 100.0 V IRMS= 5.5932 A	1	\$0.19	1210_250 15 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	CC0805KRX7R9BB681 Series= X7R	Cap= 680.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
7.	Css	MuRata	GRM155R71E822KA01D Series= X7R	Cap= 8.2 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
8.	D1	Micro Commercial Components	SK310A-TP	Vf@Io= 850.0 mV VRRM= 100.0 V	1	\$0.10	SMA 37 mm ²
9.	L1	Coilcraft	MSS1210-683MEB	L= 68.0 uH DCR= 68.0 mOhm	1	\$0.81	MSS1210 204 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rcomp	Panasonic	ERJ-6ENF5231V Series= ERJ-6E	Res= 5.23 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-6ENF1212V Series= ERJ-6E	Res= 12.1 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
13.	Rramp	Panasonic	ERJ-6ENF1303V Series= ERJ-6E	Res= 130.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
14.	Rt	Panasonic	ERJ-6ENF2052V Series= ERJ-6E	Res= 20.5 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
15.	U1	Texas Instruments	LM5005MHX/NOPB	Switcher	1	\$1.75	 MXA20A 71 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	658.79 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	155.965 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.269 A	Current	Peak switch current in IC
4.	Iin Avg	707.99 mA	Current	Average input current
5.	L Ipp	540.28 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.171 A	Current	Q lavg
7.	BOM Count	15	General	Total Design BOM count
8.	FootPrint	403.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	298.73 kHz	General	Switching frequency
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	356.222 mV	General	Voltage drop across the MosFET
12.	Pout	32.0 W	General	Total output power
13.	Total BOM	\$3.11	General	Total BOM Cost
14.	D1 Tj	98.069 degC	Op_Point	D1 junction temperature
15.	Vout Actual	16.048 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	16.0 V	Op_Point	Operational Output Voltage
17.	Duty Cycle	34.297 %	Op_point	Duty cycle
18.	Efficiency	94.163 %	Op_point	Steady state efficiency
19.	IC Tj	70.111 degC	Op_point	IC junction temperature
20.	ICThetaJA	40.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	2.0 A	Op_point	Iout operating point
22.	VIN_OP	48.0 V	Op_point	Vin operating point
23.	Vout p-p	32.422 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	750.828 μ W	Power	Input capacitor power dissipation
25.	Cout Pd	48.65 μ W	Power	Output capacitor power dissipation
26.	Diode Pd	680.693 mW	Power	Diode power dissipation
27.	IC Pd	1.003 W	Power	IC power dissipation
28.	L Pd	299.2 mW	Power	Inductor power dissipation
29.	Total Pd	1.984 W	Power	Total Power Dissipation
30.	Vout Tolerance	3.363 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	48.0	Maximum input voltage
3.	VinMin	24.0	Minimum input voltage
4.	Vout	16.0	Output Voltage
5.	base_pn	LM5005	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM5005** Product Folder : <http://www.ti.com/product/LM5005> : contains the data sheet and other resources.

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