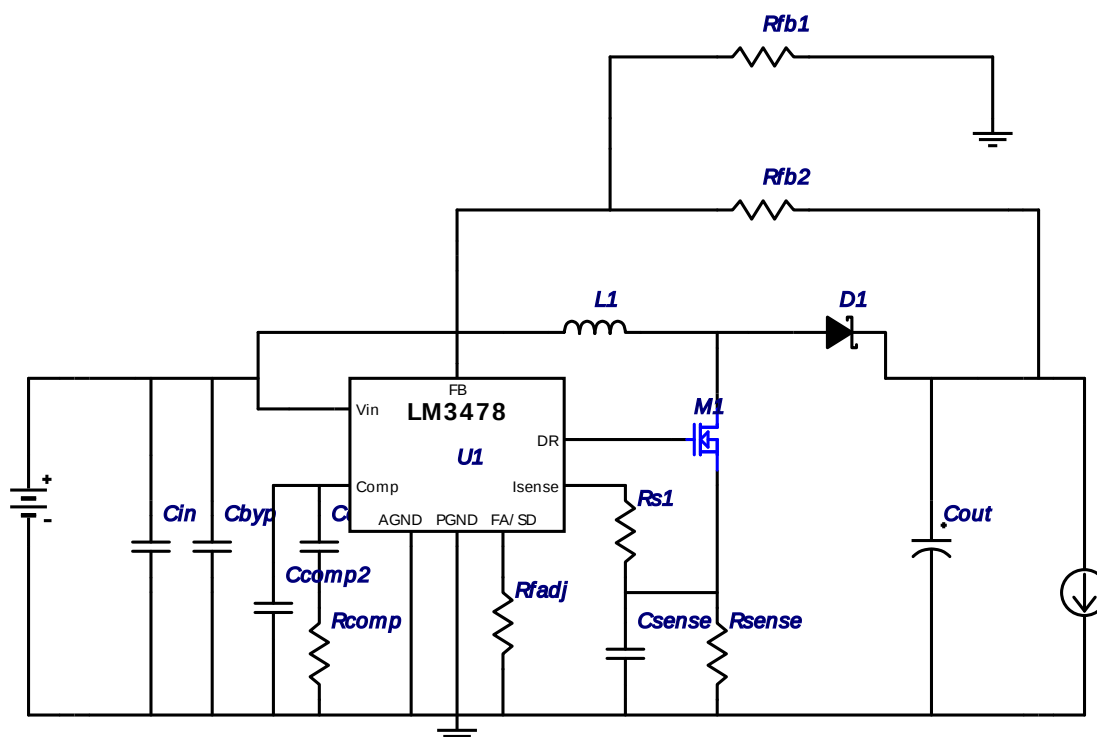
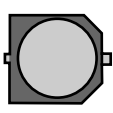


WEBENCH® Design Report

Design : 901433/52 LM3478MM
LM3478MM 7.2V-7.2V to 13.5V @ 0.04A



Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Cbyp	AVX	08053C104KAT2A Series= X7R	1	\$0.01	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	 0805 13mm2
2.	Ccomp	Yageo America	CC0805KRX7R9BB222 Series= X7R	1	\$0.01	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	 0805 13mm2
3.	Ccomp2	Yageo America	CC0805KRX7R9BB821 Series= X7R	1	\$0.01	Cap= 820.0 pF VDC= 50.0 V IRMS= 0.0 A	 0805 13mm2
4.	Cin	Kemet	C0805C106K8PACTU Series= X5R	3	\$0.05	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	 0805 13mm2
5.	Cout	Panasonic	EEE-FK1H101P Series= FK	2	\$0.24	Cap= 100.0 µF ESR= 340.0 mOhm VDC= 50.0 V IRMS= 350.0 mA	 SM_RADIAL_F 124mm2
6.	Csense	MuRata	GRM216R71H103KA01D Series= X7R	1	\$0.01	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	 0805 13mm2
7.	D1	ON Semiconductor	MBR0530T1G	1	\$0.06	VF@Io= 430.0 mV VRRM= 30.0 V	 SOD-123 22mm2

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
8.	L1	Coilcraft	MSS1260T-105KLB	1	\$0.72	L= 1.0 mH DCR= 1.27 Ohm	 MSS1260T 204mm2
9.	M1	Vishay-Siliconix	SI4446DY	1	\$0.26	VdsMax= 40.0 V IdsMax= 3.9 Amps	 SOIC-8 55mm2
10.	Rcomp	Vishay-Dale	CRCW080590K9FKEA Series= CRCW..e3	1	\$0.01	Res= 90.9 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
11.	Rfadj	Vishay-Dale	CRCW0805221KFKEA Series= CRCW..e3	1	\$0.01	Res= 221.0 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
12.	Rfb1	Vishay-Dale	CRCW080510K0FKEA Series= CRCW..e3	1	\$0.01	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
13.	Rfb2	Vishay-Dale	CRCW080597K6FKEA Series= CRCW..e3	1	\$0.01	Res= 97.6 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
14.	Rs1	Vishay-Dale	CRCW0805100RFKEA Series= CRCW..e3	1	\$0.01	Res= 100.0 Ohm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
15.	Rsense	Panasonic	ERJ-3RQFR68V Series= 227	1	\$0.02	Res= 680.0 mOhm Power= 100.0 mW Tolerance= 1.0%	 0603 10mm2
16.	U1	Texas Instruments	LM3478MM	1	\$0.93	Switcher	 MUA08A 34mm2

Operating Values

#	Name	Value	Category	Description
1.	Total BOM	\$2.71		Total BOM Cost
2.	Cin IRMS	9.985 m A	Current	Input capacitor RMS ripple current
3.	Cout IRMS	39.257 m A	Current	Output capacitor RMS ripple current
4.	Iin Avg	84.506 m A	Current	Average input current
5.	L Ipp	34.588 m A	Current	Peak-to-peak inductor ripple current
6.	L1 Irms	78.05 m A	Current	Inductor ripple current
7.	M Irms	85.134 m A	Current	MOSFET RMS ripple current
8.	SW Ipk	94.703 m A	Current	Peak switch current
9.	BOM Count	1.0	General	Total Design BOM count
10.	FootPrint	729.0 mm2	General	Total Foot Print Area of BOM components
11.	Frequency	102.014 k Hz	General	Switching frequency
12.	IC Tolerance	24.3 m V	General	IC Feedback Tolerance
13.	M Rdson	45.0 m Ohm	General	Drain-Source On-resistance
14.	M Vds Act	3.831 m V	General	M Vds
15.	Mode	CCM	General	Conduction Mode
16.	Pout	540.0 m W	General	Total output power
17.	D1 Tj	33.543 degC	Op_Point	D1 junction temperature
18.	Vout OP	13.5 V	Op_Point	Operational Output Voltage
19.	Duty Cycle	52.63 %	Op_point	Duty cycle
20.	Efficiency	88.751 %	Op_point	Steady state efficiency
21.	IC Tj	37.17 degC	Op_point	IC junction temperature
22.	ICThetaJA	200.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	40.0 m A	Op_point	Iout operating point
24.	M ThetaJA	90.0 degC/W	Op_point	MOSFET junction-to-ambient thermal resistance
25.	M TjOp	30.144 degC	Op_point	MOSFET junction temperature
26.	VIN_OP	7.2 V	Op_point	Vin operating point
27.	Vout p-p	5.88 m V	Op_point	Peak-to-peak output ripple voltage
28.	Cin Pd	99.693 n W	Power	Input capacitor power dissipation
29.	Cout Pd	261.989 μ W	Power	Output capacitor power dissipation
30.	Diode Pd	17.2 m W	Power	Diode power dissipation
31.	IC Pd	35.851 m W	Power	IC power dissipation
32.	L Pd	9.284 m W	Power	Inductor power dissipation
33.	M Pd	1.6 m W	Power	MOSFET power dissipation
34.	M1 PdCond	336.89 μ W	Power	M1 MOSFET conduction losses
35.	M1 PdSw	1.263 m W	Power	M1 MOSFET switching losses

#	Name	Value	Category	Description
36.	Rfb Pd	1.694 m W	Power	Rfb Power Dissipation
37.	Total Pd	68.444 m W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	40.0 mA	Maximum Output Current
2.	Iout1	40.0 mAmps	Output Current #1
3.	VinMax	7.2 V	Maximum input voltage
4.	VinMin	7.2 V	Minimum input voltage
5.	Vout	13.5 V	Output Voltage
6.	Vout1	13.5 Volt	Output Voltage #1
7.	base_pn	LM3478	Texas Instruments base part number
8.	Ta	30.0 degC	Ambient temperature
9.	UserFsw	100.227 kHz	Customer Selected Frequency

Design Assistance

1. **LM3478** Product Folder : <http://www.ti.com/product/LM3478> : contains the data sheet and other resources.

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