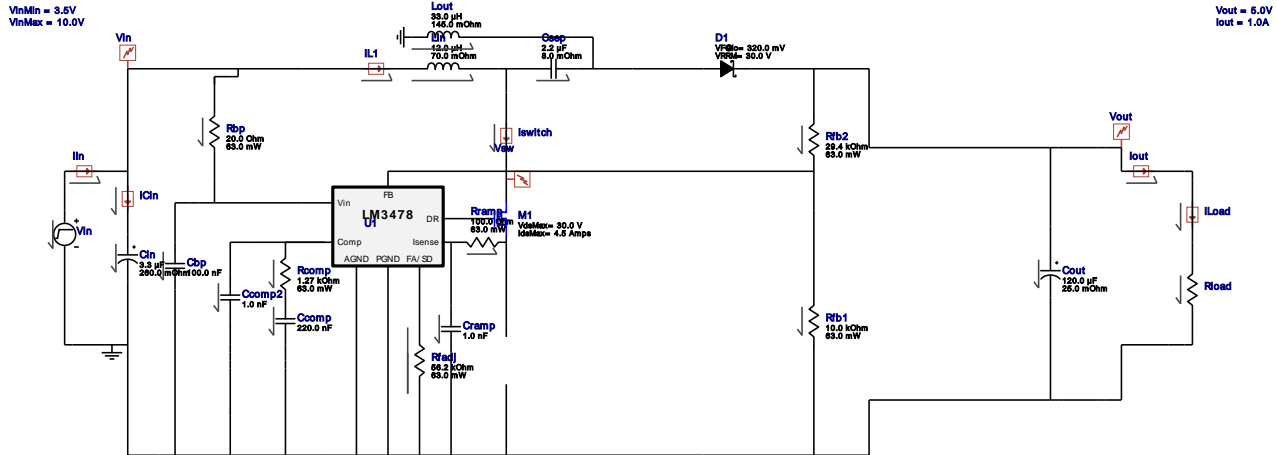










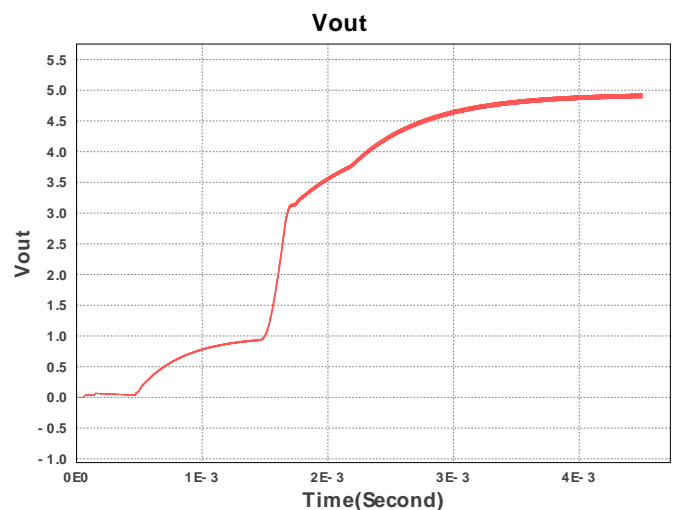
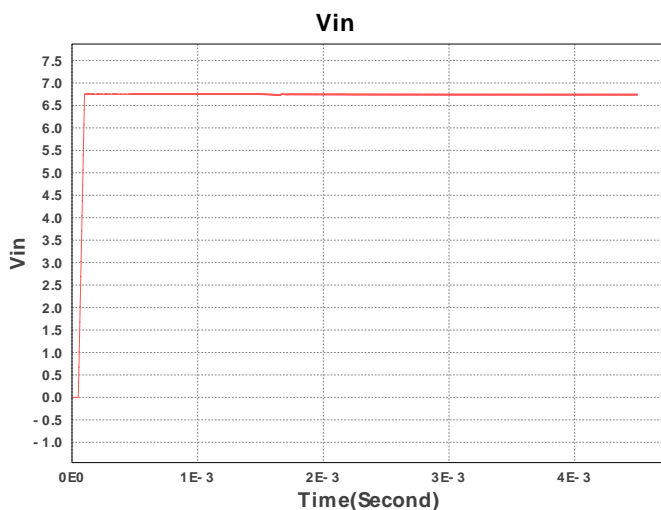
WEBENCH® Electrical Simulation Report

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbp	MuRata	GRM155R61C104KA88D Series= X5R	Cap= 100.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp	MuRata	GRM155C80G224KE01D Series= 379	Cap= 220.0 nF VDC= 4.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
3.	Ccomp2	Yageo America	CC0805JRNPO9BN102 Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	Panasonic	16SVP3R3M Series= 261	Cap= 3.3 µF ESR= 260.0 mOhm VDC= 16.0 V IRMS= 660.0 mA	1	\$0.34	CAPSMT_62_D55 28 mm ²
5.	Cout	Chemi-Con	APXE100ARA121MF61G Series= PXE	Cap= 120.0 µF ESR= 25.0 mOhm VDC= 10.0 V IRMS= 2.53 A	1	\$0.43	CAPSMT_62_F61 74 mm ²
6.	Cramp	Yageo America	CC0805JRNPO9BN102 Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
7.	Csep	Kemet	C0805C225K4RACTU Series= X7R	Cap= 2.2 µF ESR= 8.0 mOhm VDC= 16.0 V IRMS= 15.55 A	1	\$0.08	0805 7 mm ²
8.	D1	Toshiba	CMS06	VF@Io= 320.0 mV VRRM= 30.0 V	1	\$0.19	M-FLAT 19 mm ²
9.	Lin	Bourns	SDR1006-120ML	L= 12.0 µH DCR= 70.0 mOhm	1	\$0.27	SDR1006 139 mm ²
10.	Lout	Bourns	SRN8040-330M	L= 33.0 µH DCR= 145.0 mOhm	1	\$0.22	SRN8040 100 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	M1	Vishay-Siliconix	SI2316BDS-T1-E3	VdsMax= 30.0 V IdsMax= 4.5 Amps	1	\$0.22	 SOT-23 14 mm ²
12.	Rbp	Vishay-Dale	CRCW040220R0FKED Series= CRCW..e3	Res= 20.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
13.	Rcomp	Vishay-Dale	CRCW04021K27FKED Series= CRCW..e3	Res= 1.27 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
14.	Rfadj	Vishay-Dale	CRCW040256K2FKED Series= CRCW..e3	Res= 56.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	Rfb1	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
16.	Rfb2	Vishay-Dale	CRCW040229K4FKED Series= CRCW..e3	Res= 29.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
17.	Rramp	Vishay-Dale	CRCW0402100R0FKED Series= CRCW..e3	Res= 100.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
18.	Rsense	Ohmite	LVK20R027FER Series= ?	Res= 27.0 mOhm Power= 750.0 mW Tolerance= 1.0%	1	\$0.35	LVK20 0 mm ²
19.	U1	Texas Instruments	LM3478MM/NOPB	Switcher	1	\$0.80	 MUA08A 24 mm ²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Rload	R	Load Resistance	5.0 Ohm



Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	4.421 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.335 A	Current	Output capacitor RMS ripple current
3.	Csep IRMS	1.341 A	Current	SEPIC capacitor RMS ripple current
4.	D1 Irms	1.655 A	Current	D1 Irms
5.	IC Ipk	4.027 mA	Current	Peak switch current in IC
6.	Iin Avg	1.886 A	Current	Average input current
7.	Iin Ipk	2.071 A	Current	Iin peak current
8.	Iin Ipp	493.432 mA	Current	Peak-to-peak input inductor ripple current
9.	Iin Irms	1.84 A	Current	Iin ripple current
10.	Iout Ipk	1.069 A	Current	Iout peak current

#	Name	Value	Category	Description
11.	Lout Ipp	183.871 mA	Current	Peak-to-peak output inductor ripple current
12.	Lout Irms	983.621 mA	Current	Lout ripple current
13.	M1 Irms	2.287 A	Current	M1 MOSFET Irms
14.	BOM Count	19	General	Total Design BOM count
15.	FootPrint	448.0 mm ²	General	Total Foot Print Area of BOM components
16.	Frequency	325.0 kHz	General	Switching frequency
17.	IC Tolerance	24.3 mV	General	IC Feedback Tolerance
18.	Mode	CCM	General	Conduction Mode
19.	Total BOM	\$3.0	General	Total BOM Cost
20.	D1 Tj	73.406 degC	Op_Point	D1 junction temperature
21.	SEPIC Resonance Freq	17.788 kHz	Op_Point	SEPIC Resonance Frequency
22.	V SEPIC damping factor	116.036 m	Op_Point	V SEPIC damping factor
23.	Vin p-p	4.795 mV	Op_Point	Peak-to-peak input voltage
24.	Vsep p-p	949.374 mV	Op_Point	Peak-to-peak sepic voltage
25.	Cross Freq	4.103 kHz	Op_point	Bode plot crossover frequency
26.	Duty Cycle	65.5 %	Op_point	Duty cycle
27.	Efficiency	75.751 %	Op_point	Steady state efficiency
28.	Gain Marg	10.35 db	Op_point	Bode Plot Gain Margin
29.	IC Tj	38.054 degC	Op_point	IC junction temperature
30.	IOUT_OP	1.0 A	Op_point	Iout operating point
31.	M1 TjOP	98.16 degC	Op_point	M1 MOSFET junction temperature
32.	Phase Marg	72.015 deg	Op_point	Bode Plot Phase Margin
33.	Phase Shift	73.04 deg	Op_point	Bode Plot Phase Shift
34.	VIN_OP	3.5 V	Op_point	Vin operating point
35.	Vout p-p	81.823 mV	Op_point	Peak-to-peak output ripple voltage
36.	Cin Pd	5.081 µW	Power	Input capacitor power dissipation
37.	Cout Pd	44.53 mW	Power	Output capacitor power dissipation
38.	Csep Pd	14.379 mW	Power	SEPIC capacitor power dissipation
39.	D1 Pd	321.529 mW	Power	Diode power dissipation
40.	D1 PdCond	320.0 mW	Power	Diode conduction losses
41.	D1 PdSw	1.529 mW	Power	Diode switching losses
42.	IC Pd	40.27 mW	Power	IC power dissipation
43.	Lin Pd	238.579 mW	Power	Lin power dissipation
44.	Lout Pd	140.497 mW	Power	Lout power dissipation
45.	M1 Pd	651.914 mW	Power	M1 MOSFET total power dissipation
46.	M1 PdCond	555.551 mW	Power	M1 MOSFET conduction losses
47.	M1 PdSw	96.363 mW	Power	M1 MOSFET switching losses
48.	Rsense Pd	141.223 mW	Power	Rsense Power Dissipation
49.	Total Pd	1.601 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0 A	Maximum Output Current
2.	Iout1	1.0 Amps	Output Current #1
3.	VinMax	10.0 V	Maximum input voltage
4.	VinMin	3.5 V	Minimum input voltage
5.	Vout	5.0 V	Output Voltage
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	LM3478	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

Design Assistance

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

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