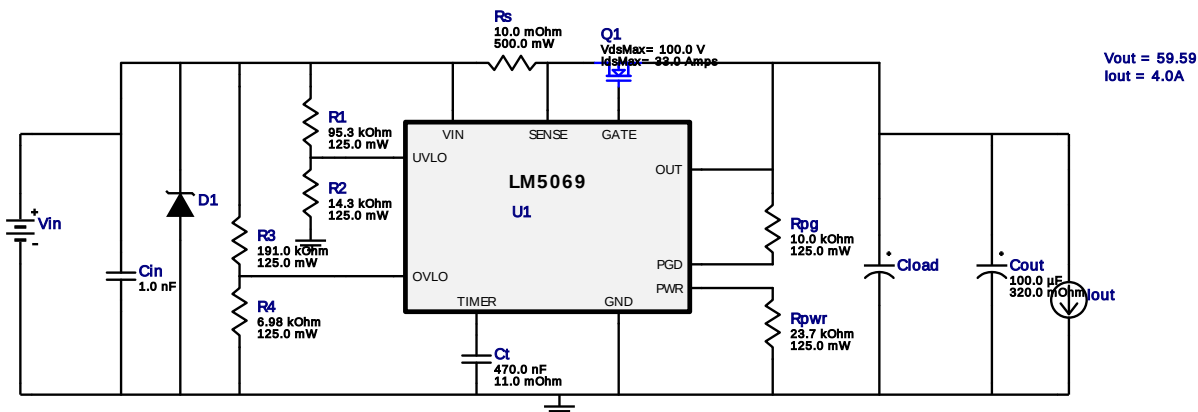
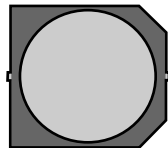
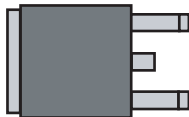


WEBENCH® Design Report

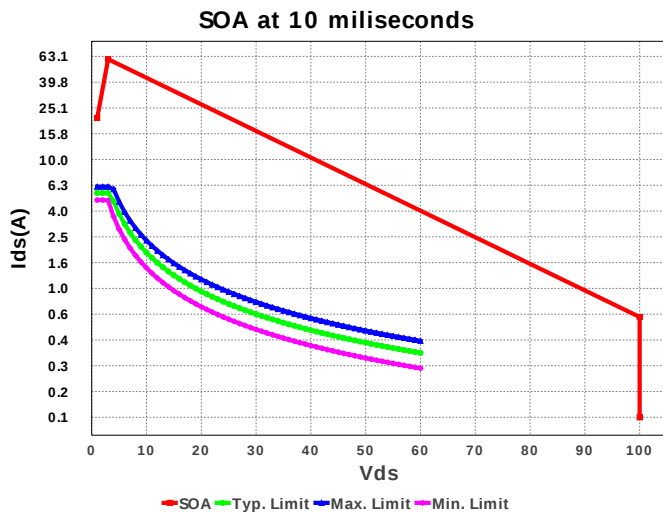
Design : 4766139/4 LM5069MM-2/NOPB
LM5069MM-2/NOPB 30.0V-60.0V to 59.59V @ 5.0A



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM155R72A102KA01D Series= X7R	Cap= 1.0 nF VDC= 100.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Cout	Panasonic	EEV-FK1K101Q Series= FK	Cap= 100.0 uF ESR= 320.0 mOhm VDC= 80.0 V IRMS= 500.0 mA	1	\$0.45	 SM_RADIAL_H13 264 mm ²
3.	Ct	AVX	0805YC474KAT2A Series= X7R	Cap= 470.0 nF ESR= 11.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	 0805 7 mm ²
4.	D1	Littelfuse	5.0SMDJ70A	Zener	1	\$0.85	 SMC 83 mm ²
5.	Q1	International Rectifier	IRF540NSPBF	VdsMax= 100.0 V IdsMax= 33.0 Amps	1	\$0.80	 DDPK 210 mm ²
6.	R1	Panasonic	ERJ-6ENF9532V Series= ERJ-6E	Res= 95.3 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
7.	R2	Panasonic	ERJ-6ENF1432V Series= ERJ-6E	Res= 14.3 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
8.	R3	Panasonic	ERJ-6ENF1913V Series= ERJ-6E	Res= 191.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	R4	Panasonic	ERJ-6ENF6981V Series= ERJ-6E	Res= 6.98 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rpg	Panasonic	ERJ-6ENF1002V Series= ERJ-6E	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
11.	Rpwr	Panasonic	ERJ-6ENF2372V Series= ERJ-6E	Res= 23.7 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
12.	Rs	Stackpole Electronics Inc	CSR1206FK10L0 Series= ?	Res= 10.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	\$0.11	 1206 11 mm ²
13.	U1	Texas Instruments	LM5069MM-2/NOPB	Switcher	1	\$1.30	 MUB10A 24 mm ²



Operating Values

#	Name	Value	Category	Description
1.	Iin Avg	5.0 A	Current	Calculated typical current limit
2.	BOM Count	13	General	Total Design BOM count
3.	FootPrint	641.0 mm ²	General	Total Foot Print Area of BOM components
4.	Pout	297.967 W	General	Total output power
5.	Total BOM	\$3.6	General	Total BOM Cost
6.	Vout OP	59.593 V	Op_point	Operational Output Voltage
7.	Efficiency	99.297 %	Op_point	Steady state efficiency
8.	IOUT_OP	5.0 A	Op_point	Iout operating point
9.	Ilimit Max Act	6.15 A	Op_point	Calculated maximum current limit
10.	Ilimit Min Act	4.85 A	Op_point	Calculated minimum current limit
11.	Ilimit Typ Act	5.5 A	Op_point	Calculated typical current limit
12.	Lower OVLO	66.899 V	Op_point	Lower OVLO (Overvoltage-Lockout) threshold
13.	Lower UVLO	19.161 V	Op_point	Lower UVLO (Undervoltage-Lockout) threshold
14.	Max FET Plim	23.51 W	Op_point	Resulting Max FET Power Limit
15.	Min FET Plim	14.41 W	Op_point	Resulting Min FET Power Limit
16.	T_insert	340.58 ms	Op_point	Typical Insertion Time
17.	T_start	4.418 s	Op_point	Typical Restart Time
18.	Typical FET Plim	18.96 W	Op_point	Resulting Typical FET Power Limit
19.	Upper OVLO	70.91 V	Op_point	Upper OVLO (Overvoltage-Lockout) threshold
20.	Upper UVLO	21.162 V	Op_point	Upper UVLO (Undervoltage-Lockout) threshold
21.	VIN_OP	60.0 V	Op_point	Vin operating point
22.	IC Pd	2.111 W	Power	IC power dissipation
23.	M1 Pd	1.783 W	Power	FET Power Dissipation
24.	Total Pd	2.111 W	Power	Total Power Dissipation
25.	Fault time	12.522 ms		Fault Time

Design Inputs

#	Name	Value	Description
1.	Iout	4.0	Maximum Output Current
2.	OVLO	70.0	OVLO nominal
3.	UVLO	20.0	UVLO nominal
4.	VinMax	60.0	Maximum input voltage
5.	VinMin	30.0	Minimum input voltage
6.	base_pn	LM5069	Base Product Number
7.	currentLimit	5.0	Current limit
8.	outputLoadCapacitance	1.0	Output Load capacitance
9.	source	DC	Input Source Type
10.	Ta	30.0	Ambient temperature

Design Assistance

1. The LM5069 Webench Designer provides the design engineer with a fully functional HotSwap schematic for the positive voltage system. The created design calculates a complete BOM and the total cost of the BOM. Also, the Webench designer offers simulation to emulate the behavior of the device such as Power Sequence, Restart Sequence and Input Transients. To learn more about HotSwap devices and its applications, please refer to the following link: http://www.ti.com/analog/docs/analogtechdoc_hh.tsp?viewType=mostuseful&techDoc=1&rootFamilyId=64&familyId=420&docCategoryId=1&Input3=Go

2. **LM5069 Product Folder** : <http://www.ti.com/product/lm5069> : 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.

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