

Series AM3G-NZ

3 Watt | DC-DC Converter

FEATURES:



- 1500 and 3000VDC I/O Isolation
- Very low no load consumption
- Remote On/Off Control
- 8 pin SIP package
- Operating temperature -40°C to 85°C
- Continuous Short circuit protection
- Wide 2:1 input range
- High efficiency up to 84%



Models

Single output

| Model | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Capacitive Load (µF) | Efficiency (%) | Ripple & Noise Typ. / Max. (mVp-p) |
|--------------------|-------------------|--------------------|-------------------------|-----------------|----------------------|----------------|------------------------------------|
| AM3G-0503S-NZ | 4.5-9 | 3.3 | 758 | 1500 | 1800 | 68 | 40 / 75 |
| AM3G-0505S-NZ | 4.5-9 | 5 | 500 | 1500 | 2200 | 73 | 40 / 75 |
| AM3G-0509S-NZ | 4.5-9 | 9 | 278 | 1500 | 1000 | 74 | 40 / 75 |
| AM3G-0512S-NZ | 4.5-9 | 12 | 208 | 1500 | 680 | 77 | 40 / 75 |
| AM3G-0515S-NZ | 4.5-9 | 15 | 167 | 1500 | 470 | 74 | 40 / 75 |
| AM3G-0524S-NZ | 4.5-9 | 24 | 125 | 1500 | 330 | 76 | 40 / 75 |
| AM3G-1203S-NZ | 9-18 | 3.3 | 758 | 1500 | 2700 | 75 | 40 / 75 |
| AM3G-1205S-NZ | 9-18 | 5 | 600 | 1500 | 2200 | 76 | 40 / 75 |
| AM3G-1209S-NZ | 9-18 | 9 | 333 | 1500 | 1000 | 79 | 40 / 75 |
| AM3G-1212S-NZ | 9-18 | 12 | 250 | 1500 | 680 | 82 | 70 / 100 |
| AM3G-1215S-NZ | 9-18 | 15 | 200 | 1500 | 470 | 83 | 70 / 100 |
| AM3G-1224S-NZ | 9-18 | 24 | 125 | 1500 | 330 | 81 | 100 / 150 |
| AM3G-2403S-NZ | 18-36 | 3.3 | 758 | 1500 | 2700 | 74 | 40 / 75 |
| AM3G-2405S-NZ | 18-36 | 5 | 600 | 1500 | 2200 | 81 | 40 / 75 |
| AM3G-2409S-NZ | 18-36 | 9 | 333 | 1500 | 1000 | 83 | 40 / 75 |
| AM3G-2412S-NZ | 18-36 | 12 | 250 | 1500 | 680 | 83 | 40 / 75 |
| AM3G-2415S-NZ | 18-36 | 15 | 200 | 1500 | 470 | 83 | 100 / 150 |
| AM3G-2424S-NZ | 18-36 | 24 | 125 | 1500 | 330 | 83 | 100 / 150 |
| AM3G-4803S-NZ | 36-75 | 3.3 | 758 | 1500 | 2700 | 75 | 100 / 150 |
| AM3G-4805S-NZ | 36-75 | 5 | 600 | 1500 | 2200 | 76 | 40 / 75 |
| AM3G-4812S-NZ | 36-75 | 12 | 250 | 1500 | 680 | 80 | 40 / 75 |
| AM3G-4815S-NZ | 36-75 | 15 | 200 | 1500 | 470 | 84 | 40 / 75 |
| AM3G-4824S-NZ | 36-75 | 24 | 125 | 1500 | 330 | 82 | 70 / 100 |
| AM3G-0505SH30-NZ | 4.5-9 | 5 | 500 | 3000 | 2200 | 73 | 40 / 75 |
| AM3G-0509SH30-NZ | 4.5-9 | 9 | 278 | 3000 | 1000 | 74 | 40 / 75 |
| AM3G-0512SH30-NZ | 4.5-9 | 12 | 208 | 3000 | 680 | 77 | 40 / 75 |
| AM3G-0515SH30-NZ | 4.5-9 | 15 | 167 | 3000 | 470 | 74 | 40 / 75 |
| AM3G-1203SH30-NZ | 9-18 | 3.3 | 758 | 3000 | 2700 | 75 | 40 / 75 |
| AM3G-1205SH30-NZ | 9-18 | 5 | 600 | 3000 | 2200 | 76 | 40 / 75 |
| AM3G-1209SH30-NZ | 9-18 | 9 | 333 | 3000 | 1000 | 79 | 70 / 100 |
| AM3G-1212SH30-NZ | 9-18 | 12 | 250 | 3000 | 680 | 82 | 100 / 150 |
| AM3G-1215SH30-NZ | 9-18 | 15 | 200 | 3000 | 470 | 83 | 100 / 150 |
| AM3G-1224SH30-NZ | 9-18 | 24 | 125 | 3000 | 330 | 81 | 100 / 150 |
| AM3G-2403SH30-NZ # | 18-36 | 3.3 | 758 | 3000 | 2700 | 74 | 40 / 75 |
| AM3G-2405SH30-NZ # | 18-36 | 5 | 600 | 3000 | 2200 | 81 | 40 / 75 |
| AM3G-2409SH30-NZ # | 18-36 | 9 | 333 | 3000 | 1000 | 83 | 40 / 75 |
| AM3G-2412SH30-NZ # | 18-36 | 12 | 250 | 3000 | 680 | 83 | 40 / 75 |
| AM3G-2415SH30-NZ # | 18-36 | 15 | 200 | 3000 | 470 | 83 | 100 / 150 |
| AM3G-2424SH30-NZ # | 18-36 | 24 | 125 | 3000 | 330 | 83 | 100 / 150 |
| AM3G-4803SH30-NZ | 36-75 | 3.3 | 758 | 3000 | 2700 | 75 | 100 / 150 |
| AM3G-4805SH30-NZ | 36-75 | 5 | 600 | 3000 | 2000 | 76 | 40 / 75 |
| AM3G-4812SH30-NZ | 36-75 | 12 | 250 | 3000 | 680 | 80 | 40 / 75 |
| AM3G-4815SH30-NZ | 36-75 | 15 | 200 | 3000 | 470 | 84 | 70 / 100 |

Models
Dual output

| Model | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Capacitive Load (µF) | Efficiency (%) | Ripple & Noise Typ. / Max. (mV) |
|------------------|-------------------|--------------------|-------------------------|-----------------|----------------------|----------------|---------------------------------|
| AM3G-0505D-NZ | 4.5-9 | ±5 | ±250 | 1500 | ±1000 | 74 | 40 / 75 |
| AM3G-0512D-NZ | 4.5-9 | ±12 | ±104 | 1500 | ±470 | 77 | 40 / 75 |
| AM3G-0515D-NZ | 4.5-9 | ±15 | ±83 | 1500 | ±330 | 77 | 40 / 75 |
| AM3G-1205D-NZ | 9-18 | ±5 | ±300 | 1500 | ±1000 | 78 | 40 / 75 |
| AM3G-1209D-NZ | 9-18 | ±9 | ±167 | 1500 | ±680 | 79 | 40 / 75 |
| AM3G-1212D-NZ | 9-18 | ±12 | ±125 | 1500 | ±470 | 80 | 40 / 75 |
| AM3G-1215D-NZ | 9-18 | ±15 | ±100 | 1500 | ±330 | 80 | 40 / 75 |
| AM3G-2405D-NZ | 18-36 | ±5 | ±300 | 1500 | ±1000 | 78 | 40 / 75 |
| AM3G-2409D-NZ | 18-36 | ±9 | ±167 | 1500 | ±680 | 81 | 40 / 75 |
| AM3G-2412D-NZ | 18-36 | ±12 | ±125 | 1500 | ±470 | 83 | 40 / 75 |
| AM3G-2415D-NZ | 18-36 | ±15 | ±100 | 1500 | ±330 | 83 | 40 / 75 |
| AM3G-4805D-NZ | 36-75 | ±5 | ±300 | 1500 | ±680 | 80 | 100 / 150 |
| AM3G-4812D-NZ | 36-75 | ±12 | ±125 | 1500 | ±470 | 82 | 40 / 75 |
| AM3G-4815D-NZ | 36-75 | ±15 | ±100 | 1500 | ±330 | 82 | 40 / 75 |
| AM3G-0505DH30-NZ | 4.5-9 | ±5 | ±250 | 3000 | ±1000 | 74 | 40 / 75 |
| AM3G-0512DH30-NZ | 4.5-9 | ±12 | ±104 | 3000 | ±470 | 77 | 40 / 75 |
| AM3G-0515DH30-NZ | 4.5-9 | ±15 | ±83 | 3000 | ±330 | 77 | 40 / 75 |
| AM3G-1205DH30-NZ | 9-18 | ±5 | ±300 | 3000 | ±1000 | 78 | 40 / 75 |
| AM3G-1212DH30-NZ | 9-18 | ±12 | ±125 | 3000 | ±470 | 79 | 40 / 75 |
| AM3G-1215DH30-NZ | 9-18 | ±15 | ±100 | 3000 | ±330 | 80 | 40 / 75 |
| AM3G-2405DH30-NZ | 18-36 | ±5 | ±300 | 3000 | ±1000 | 79 | 40 / 75 |
| AM3G-2409DH30-NZ | 18-36 | ±9 | ±167 | 3000 | ±680 | 81 | 40 / 75 |
| AM3G-2412DH30-NZ | 18-36 | ±12 | ±125 | 3000 | ±470 | 83 | 40 / 75 |
| AM3G-2415DH30-NZ | 18-36 | ±15 | ±100 | 3000 | ±330 | 83 | 40 / 75 |
| AM3G-4805DH30-NZ | 36-75 | ±5 | ±300 | 3000 | ±1000 | 79 | 40 / 75 |
| AM3G-4812DH30-NZ | 36-75 | ±12 | ±125 | 3000 | ±470 | 82 | 40 / 75 |
| AM3G-4815DH30-NZ | 36-75 | ±15 | ±100 | 3000 | ±330 | 82 | 40 / 75 |

Input Specifications

| Parameters | Nominal | Typical | Maximum | Units |
|--------------------------------|--|---------|---------|-------|
| Voltage range | 5 | 4.5-9 | | VDC |
| | 12 | 9-18 | | |
| | 24 | 18-36 | | |
| | 48 | 36-75 | | |
| Filter | Capacitor | | | |
| Maximum Rating | 5 Vin | 12 | | VDC |
| | 12 Vin | 25 | | |
| | 24 Vin | 50 | | |
| | 48 Vin | 100 | | |
| Peak Input Voltage time | | | 1 | sec |
| No load input current | 5 Vin | 60 | | mA |
| | 12 Vin | 25 | | |
| | 24 Vin | 20 | | |
| | 48 Vin | 5 | | |
| Input Reflected Ripple Current | 5 Vin | 20 | | mA |
| | 12 Vin | 20 | | |
| | 24 Vin | 55 | | |
| | 48 Vin | 55 | | |
| On/Off Control* | ON – open or Isolated; OFF – high (current 5-10mA) | | | |

*Note: Exceeding 20mA of control current will permanently damage the converter.

Isolation Specifications

| Parameters | Conditions | Typical | Rated | Units |
|--------------------|----------------------------|---------|------------|-------|
| Tested I/O voltage | 60sec, <1mA | | 1500, 3000 | VDC |
| Resistance | | > 1000 | | MOhm |
| Capacitance | 100kHz, 1V, 1500VDC models | 120 | | pF |
| | 100kHz, 1V, 3000VDC models | 50 | | |

Output Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|------------------------------|---------------------------|---------------|----------------|-------|
| Voltage accuracy | 5 to 100% load | ±2 | | % |
| No Load Voltage accuracy | | ±5 | | |
| Voltage balance | Dual Output balanced load | ±1 | | % |
| Short Circuit Protection | | Continuous | | |
| Short Circuit Restart | | Auto-recovery | | |
| Line voltage regulation | LL~HL | ±0.5 | | % |
| Load voltage regulation | load 5~100% | ±0.6 | | % |
| Temperature coefficient | | ±0.02 | | %/°C |
| Transient Recovery Time | 25% load step | 2 | | msec |
| Transient Response Deviation | 25% load step | ±5 | | % |
| Ripple & Noise | At 20MHz Bandwidth | | See model list | |

General Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|-----------------------|--------------------------------|---|---------|-------|
| Switching frequency | 100% load | 250 | | KHz |
| Operating temperature | With derating above 85°C | -40 to +85 | | °C |
| Storage temperature | | -55 to +125 | | °C |
| Case Temperature | | 105 | | °C |
| Lead Temperature | 1.5mm from case for 10 Seconds | 300 | | °C |
| Cooling | | Free air convection | | |
| Humidity | | | 95 | % |
| Case material | | Plastic (UL94V-0 rated) | | |
| Weight | | 4.9 | | g |
| Dimensions (L x Wx H) | | 0.87 x 0.37 x 0.47 inch, 22 x 9.5 x 12 mm | | |
| MTBF | | >1 000 000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C) | | |

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

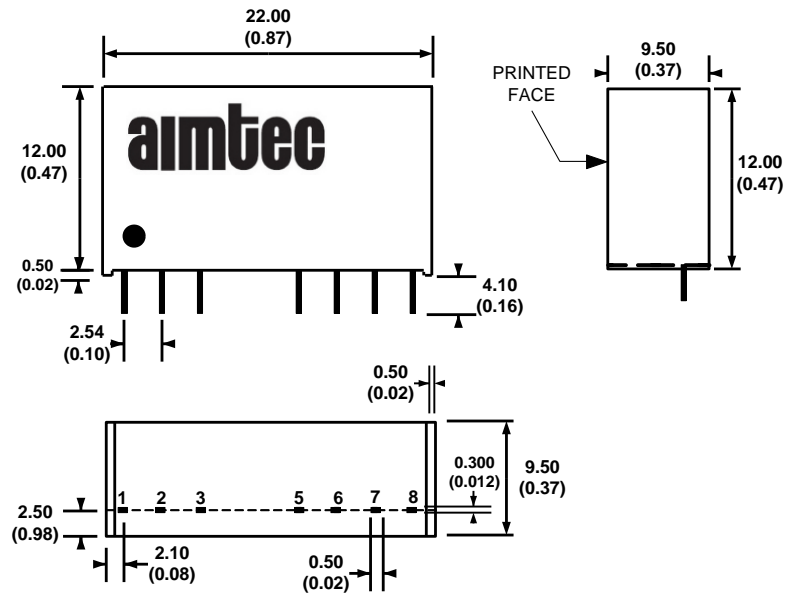
Safety Specifications

| Parameters | |
|-----------------------------------|---|
| Agency approvals | cULus UL62368-1(For models marked with # only) |
| Standards | IEC/EN60950-1 compliant |
| | EN 55032/CISPR32, Class B, with EMI recommended circuit |
| | IEC 61000-4-2, Contact ±4KV, Criteria B |
| | IEC 61000-4-3, 10V/m, Criteria A |
| | IEC 61000-4-4, ±2KV, Criteria B, with EMS recommended circuit |
| | IEC 61000-4-5, L-L ±2KV, Criteria B, with EMS recommended circuit |
| | IEC 61000-4-6, 3Vrms, Criteria A |
| IEC 61000-4-29, 0-70%, Criteria B | |

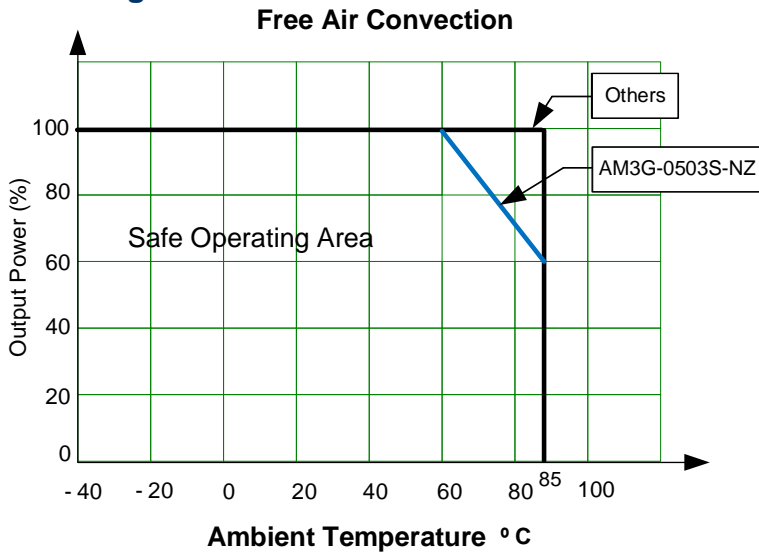
Pin Out Specifications

| Pin | Single | Dual |
|-----|----------------|----------------|
| 1 | - V Input | - V Input |
| 2 | + V Input | + V Input |
| 3 | On/Off Control | On/Off Control |
| 5 | N.C. | N.C. |
| 6 | + V Output | + V Output |
| 7 | - V Output | Common |
| 8 | CS | - V Output |

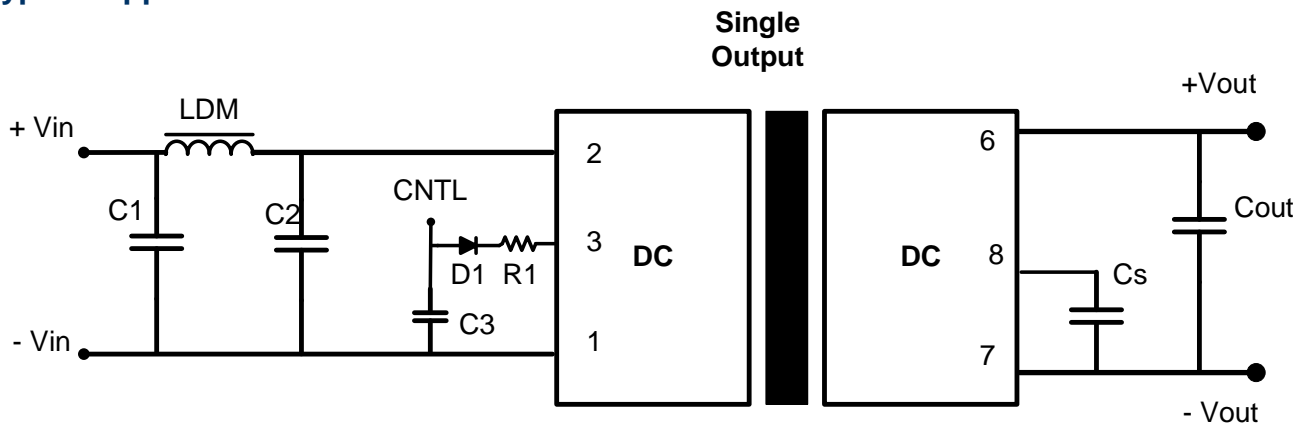
Dimensions



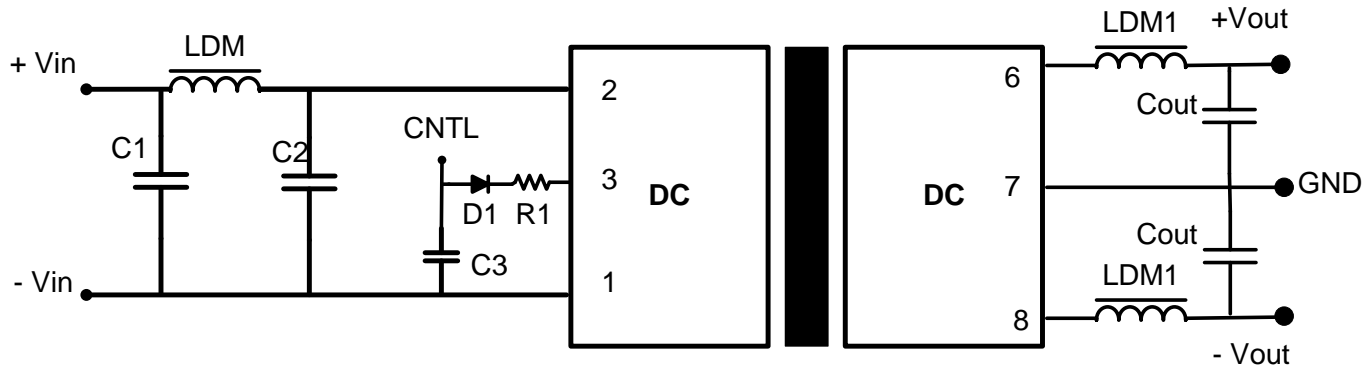
Derating



Typical Application Circuits



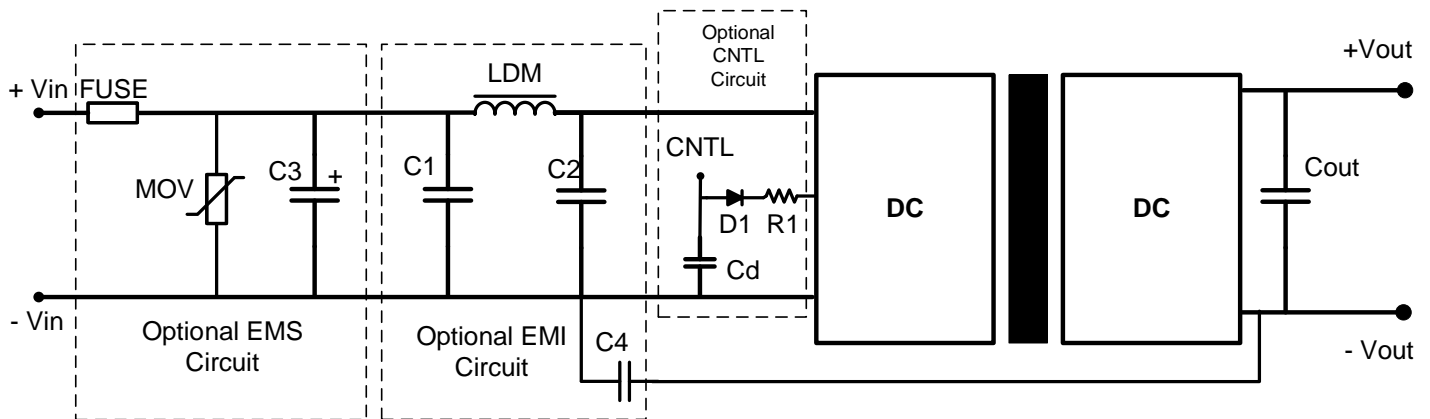
Dual Output



| Model | C1 | C2 | LDM | C3 | D1 | R1 | LDM1 | CS | Cout |
|--------|-------|------|-------------|-------------|--------------|-------------|-------------|-----------|-------|
| 5 Vin | 100µF | 47µF | 4.7 - 12 µH | 47nF / 100V | RB160M-60/1A | See Formula | 2.2 - 10 µH | 10 - 22µF | 100µF |
| 12 Vin | 100µF | 47µF | 4.7 - 12 µH | 47nF / 100V | RB160M-60/1A | See Formula | 2.2 - 10 µH | 10 - 22µF | 100µF |
| 24 Vin | 10µF | 1µF | 4.7 - 12 µH | 47nF / 100V | RB160M-60/1A | See Formula | 2.2 - 10µH | 10 - 22µF | 100µF |
| 48 Vin | 10µF | 1µF | 4.7 - 12 µH | 47nF / 100V | RB160M-60/1A | See Formula | 2.2 - 10 µH | 10 - 22µF | 100µF |

- $R1 = ((V_{cd} - V_{d1} - 1.0) / I_{cntl}) - 300$
- Cs is for ripple & noise reduction, leave it opened if there is no ripple & noise reduction requirement.

EMC Recommended Circuit



| Model | C1, C2 | C4 | LDM | MOV | TVS | C3 | Cd | D1 | R1 | Cout |
|--------|--------------|-----------|-------|--------|---------|--------------|-------------|---------------|-------------|-------|
| 5 Vin | 4.7µF / 50V | 1nF / 3KV | 12 µH | - | SMCJ13A | 680µF / 25V | 47nF / 100V | RB160M-60V/1A | See Formula | 100µF |
| 12 Vin | 4.7µF / 50V | 1nF / 3KV | 12 µH | S14K20 | SMCJ28A | 680µF / 25V | 47nF / 100V | RB160M-60V/1A | See Formula | 100µF |
| 24 Vin | 4.7µF / 50V | 1nF / 3KV | 12 µH | S20K30 | SMCJ48A | 330µF / 50V | 47nF / 100V | RB160M-60V/1A | See Formula | 100µF |
| 48 Vin | 4.7µF / 100V | 1nF / 3KV | 12 µH | S14K60 | SMCJ90A | 330µF / 100V | 47nF / 100V | RB160M-60V/1A | See Formula | 100µF |

Note: Fuse is user selectable, slow blow type
 $R1 = ((V_{cd} - V_{d1} - 1.0) / I_{cntl}) - 300$

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