



FEATURES:

- SMD Package
- Single Output Models
- Low Ripple and Noise
- Industry Standard Pinout
- Input / Output Isolation 1500 & 3000 VDC
- Operating Temperature -40°C to +105°C
- RoHS Compliant
- Continuous Short Circuit Protection ‡

Models Single output



| Model | Input Voltage (V) | Output Voltage (V) | Output Current Max / Min (mA) | Isolation (VDC) | Input Current Max No Load (mA) | Max Capacitive Load (µF) | Efficiency (%) |
|---------------------|-------------------|--------------------|-------------------------------|-----------------|----------------------------------|--------------------------|----------------|
| AM1LS-0303S-NZ | 2.97-3.63 | 3.3 | 303 / 30 | 1500 | 415 25 | 220 | 73 |
| AM1LS-0305S-NZ | 2.97-3.63 | 5 | 200 / 20 | 1500 | 388 25 | 220 | 78 |
| AM1LS-0503S-NZ | 4.5-5.5 | 3.3 | 303 / 30 | 1500 | 263 20 | 220 | 76 |
| AM1LS-0505S-NZ | 4.5-5.5 | 5 | 200 / 20 | 1500 | 250 20 | 220 | 80 |
| AM1LS-0506S-NZ | 4.5-5.5 | 6 | 167 / 17 | 1500 | 250 20 | 220 | 80 |
| AM1LS-0509S-NZ | 4.5-5.5 | 9 | 111 / 12 | 1500 | 250 20 | 220 | 80 |
| AM1LS-0512S-NZ | 4.5-5.5 | 12 | 84 / 9 | 1500 | 250 20 | 220 | 80 |
| AM1LS-0515S-NZ | 4.5-5.5 | 15 | 67 / 7 | 1500 | 250 20 | 220 | 80 |
| AM1LS-0524S-NZ ‡ | 4.5-5.5 | 24 | 42 / 4 | 1500 | 250 20 | 220 | 80 |
| AM1LS-1203S-NZ | 10.8-13.2 | 3.3 | 303 / 30 | 1500 | 111 15 | 220 | 75 |
| AM1LS-1205S-NZ | 10.8-13.2 | 5 | 200 / 20 | 1500 | 104 15 | 220 | 80 |
| AM1LS-1209S-NZ | 10.8-13.2 | 9 | 111 / 12 | 1500 | 104 15 | 220 | 80 |
| AM1LS-1212S-NZ | 10.8-13.2 | 12 | 84 / 9 | 1500 | 103 15 | 220 | 81 |
| AM1LS-1215S-NZ | 10.8-13.2 | 15 | 67 / 7 | 1500 | 103 15 | 220 | 81 |
| AM1LS-1224S-NZ | 10.8-13.2 | 24 | 42 / 4 | 1500 | 103 15 | 220 | 81 |
| AM1LS-1515S-NZ | 13.5-16.5 | 15 | 67 / 7 | 1500 | 82 10 | 220 | 81 |
| AM1LS-2405S-NZ | 21.6-26.4 | 5 | 200 / 20 | 1500 | 52 7 | 220 | 80 |
| AM1LS-2409S-NZ | 21.6-26.4 | 9 | 111 / 12 | 1500 | 52 7 | 220 | 80 |
| AM1LS-2412S-NZ | 21.6-26.4 | 12 | 84 / 9 | 1500 | 52 7 | 220 | 80 |
| AM1LS-2415S-NZ | 21.6-26.4 | 15 | 67 / 7 | 1500 | 51 7 | 220 | 81 |
| AM1LS-2424S-NZ | 21.6-26.4 | 24 | 42 / 4 | 1500 | 51 7 | 220 | 81 |
| AM1LS-0303SH30-NZ | 2.97-3.63 | 3.3 | 303 / 30 | 3000 | 415 25 | 220 | 73 |
| AM1LS-0305SH30-NZ | 2.97-3.63 | 5 | 200 / 20 | 3000 | 388 25 | 220 | 78 |
| AM1LS-0503SH30-NZ | 4.5-5.5 | 3.3 | 303 / 30 | 3000 | 263 20 | 220 | 76 |
| AM1LS-0505SH30-NZ | 4.5-5.5 | 5 | 200 / 20 | 3000 | 250 20 | 220 | 80 |
| AM1LS-0509SH30-NZ | 4.5-5.5 | 9 | 111 / 12 | 3000 | 250 20 | 220 | 80 |
| AM1LS-0512SH30-NZ | 4.5-5.5 | 12 | 84 / 9 | 3000 | 250 20 | 220 | 80 |
| AM1LS-0515SH30-NZ | 4.5-5.5 | 15 | 67 / 7 | 3000 | 250 20 | 220 | 80 |
| AM1LS-0524SH30-NZ ‡ | 4.5-5.5 | 24 | 42 / 4 | 3000 | 250 20 | 220 | 80 |
| AM1LS-1203SH30-NZ | 10.8-13.2 | 3.3 | 303 / 30 | 3000 | 111 15 | 220 | 75 |
| AM1LS-1205SH30-NZ | 10.8-13.2 | 5 | 200 / 20 | 3000 | 104 15 | 220 | 80 |
| AM1LS-1209SH30-NZ | 10.8-13.2 | 9 | 111 / 12 | 3000 | 104 15 | 220 | 80 |
| AM1LS-1212SH30-NZ | 10.8-13.2 | 12 | 84 / 9 | 3000 | 103 15 | 220 | 81 |
| AM1LS-1215SH30-NZ | 10.8-13.2 | 15 | 67 / 7 | 3000 | 103 15 | 220 | 81 |
| AM1LS-1224SH30-NZ | 10.8-13.2 | 24 | 42 / 4 | 3000 | 103 15 | 220 | 81 |
| AM1LS-2405SH30-NZ | 21.6-26.4 | 5 | 200 / 20 | 3000 | 52 7 | 220 | 80 |
| AM1LS-2409SH30-NZ | 21.6-26.4 | 9 | 111 / 12 | 3000 | 52 7 | 220 | 80 |
| AM1LS-2415SH30-NZ | 21.6-26.4 | 15 | 84 / 9 | 3000 | 51 7 | 220 | 81 |
| AM1LS-2424SH30-NZ | 21.6-26.4 | 24 | 67 / 7 | 3000 | 51 7 | 220 | 81 |

‡ With Momentary short circuit protection of 1 second

Models
Dual output

| Model | Input Voltage (V) | Output Voltage (V) | Output Current Max / Min (mA) | Isolation (VDC) | Input Current Max No Load (mA) | | Max Capacitive Load(μF) | Efficiency (%) |
|---------------------|-------------------|--------------------|-------------------------------|-----------------|----------------------------------|----|-------------------------|----------------|
| AM1LS-0305D-NZ | 2.97-3.63 | ±5 | ±100 / ±10 | 1500 | 415 | 25 | 100 | 78 |
| AM1LS-0312D-NZ | 2.97-3.63 | ±12 | ±42 / ±5 | 1500 | 388 | 25 | 100 | 80 |
| AM1LS-0315D-NZ | 2.97-3.63 | ±15 | ±33 / ±3 | 1500 | 263 | 20 | 100 | 80 |
| AM1LS-0505D-NZ | 4.5-5.5 | ±5 | ±100 / ±10 | 1500 | 250 | 20 | 100 | 80 |
| AM1LS-0509D-NZ | 4.5-5.5 | ±9 | ±56 / ±6 | 1500 | 250 | 20 | 100 | 80 |
| AM1LS-0512D-NZ | 4.5-5.5 | ±12 | ±42 / ±5 | 1500 | 250 | 20 | 100 | 81 |
| AM1LS-0515D-NZ | 4.5-5.5 | ±15 | ±33 / ±3 | 1500 | 250 | 20 | 100 | 81 |
| AM1LS-0524D-NZ ‡ | 4.5-5.5 | ±24 | ±21 / ±2 | 1500 | 250 | 20 | 100 | 81 |
| AM1LS-1205D-NZ | 10.8-13.2 | ±5 | ±100 / ±10 | 1500 | 111 | 15 | 100 | 75 |
| AM1LS-1209D-NZ | 10.8-13.2 | ±9 | ±56 / ±6 | 1500 | 104 | 15 | 100 | 80 |
| AM1LS-1212D-NZ | 10.8-13.2 | ±12 | ±42 / ±5 | 1500 | 104 | 15 | 100 | 80 |
| AM1LS-1215D-NZ | 10.8-13.2 | ±15 | ±33 / ±3 | 1500 | 103 | 15 | 100 | 81 |
| AM1LS-1224D-NZ | 10.8-13.2 | ±24 | ±21 / ±2 | 1500 | 103 | 15 | 100 | 81 |
| AM1LS-2405D-NZ | 21.6-26.4 | ±5 | ±100 / ±10 | 1500 | 82 | 10 | 100 | 82 |
| AM1LS-2409D-NZ | 21.6-26.4 | ±9 | ±56 / ±6 | 1500 | 52 | 7 | 100 | 82 |
| AM1LS-2412D-NZ | 21.6-26.4 | ±12 | ±42 / ±5 | 1500 | 52 | 7 | 100 | 82 |
| AM1LS-2415D-NZ | 21.6-26.4 | ±15 | ±33 / ±3 | 1500 | 51 | 7 | 100 | 82 |
| AM1LS-2424D-NZ | 21.6-26.4 | ±24 | ±21 / ±2 | 1500 | 51 | 7 | 100 | 82 |
| AM1LS-0505DH30-NZ | 4.5-5.5 | ±5 | ±100 / ±10 | 3000 | 250 | 20 | 100 | 80 |
| AM1LS-0509DH30-NZ | 4.5-5.5 | ±9 | ±56 / ±6 | 3000 | 250 | 20 | 100 | 80 |
| AM1LS-0512DH30-NZ | 4.5-5.5 | ±12 | ±42 / ±5 | 3000 | 250 | 20 | 100 | 81 |
| AM1LS-0515DH30-NZ | 4.5-5.5 | ±15 | ±33 / ±3 | 3000 | 250 | 20 | 100 | 81 |
| AM1LS-0524DH30-NZ ‡ | 4.5-5.5 | ±24 | ±21 / ±2 | 3000 | 250 | 20 | 100 | 81 |
| AM1LS-1205DH30-NZ | 10.8-13.2 | ±5 | ±100 / ±10 | 3000 | 111 | 15 | 100 | 80 |
| AM1LS-1209DH30-NZ | 10.8-13.2 | ±9 | ±56 / ±6 | 3000 | 104 | 15 | 100 | 80 |
| AM1LS-1212DH30-NZ | 10.8-13.2 | ±12 | ±42 / ±5 | 3000 | 104 | 15 | 100 | 81 |
| AM1LS-1215DH30-NZ | 10.8-13.2 | ±15 | ±33 / ±3 | 3000 | 103 | 15 | 100 | 81 |
| AM1LS-1224DH30-NZ | 10.8-13.2 | ±24 | ±21 / ±2 | 3000 | 103 | 15 | 100 | 81 |
| AM1LS-2405DH30-NZ | 21.6-26.4 | ±5 | ±100 / ±10 | 3000 | 82 | 10 | 100 | 82 |
| AM1LS-2409DH30-NZ | 21.6-26.4 | ±9 | ±56 / ±6 | 3000 | 52 | 7 | 100 | 82 |
| AM1LS-2412DH30-NZ | 21.6-26.4 | ±12 | ±42 / ±5 | 3000 | 52 | 7 | 100 | 82 |
| AM1LS-2415DH30-NZ | 21.6-26.4 | ±15 | ±33 / ±3 | 3000 | 51 | 7 | 100 | 82 |
| AM1LS-2424DH30-NZ | 21.6-26.4 | ±24 | ±21 / ±2 | 3000 | 51 | 7 | 100 | 82 |

‡ With Momentary short circuit protection of 1 second

NOTE 1: Add suffix "TR" to a part number when ordering in tape and reel package

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.

Input Specifications

| Parameters | Nominal | Typical | Maximum | Units |
|--|-----------|-----------|---------|-------|
| Voltage Range | 3 | 2.97-3.63 | | VDC |
| | 5 | 4.5-5.5 | | |
| | 12 | 10.8-13.2 | | |
| | 15 | 13.5-16.5 | | |
| | 24 | 21.6-26.4 | | |
| Absolute Max Input Voltage (1 sec max) | 3 Vin | | 5 | VDC |
| | 5 Vin | | 9 | |
| | 12 Vin | | 18 | |
| | 15 Vin | | 21 | |
| | 24 Vin | | 30 | |
| Filter | Capacitor | | | |

Isolation Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|--------------------|------------|----------------------------|---------|-------|
| Tested I/O Voltage | 60 sec | 1500 models 3000 Models | | VDC |
| Resistance | 500VDC | >1000 | | MOhm |
| Capacitance | | 20 | | pF |

Output Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|--|------------------------------------|--------------|---------|----------|
| Voltage Accuracy | 100% load (see tolerance chart) | ±2.5 | | % |
| Short Circuit Protection | Continuous, unless marked with ‡ | | | |
| Short Circuit Restart | Auto-Recovery | | | |
| Line Voltage Regulation | For ±1% of Vin 3.3V models only | ±1.2 ±1.5 | | % of Vin |
| Load Voltage Regulation (10% - 100% Load) | 3.3V | 18 | | % |
| | 5 V | 12 | | |
| | 6 V | 10 | | |
| | 9 V | 8 | | |
| | 12 V | 7 | | |
| | 15 V | 6 | | |
| 24 V | 5 | | | |
| Temperature Coefficient | 100% load | ±0.03 | | %/°C |
| Ripple & Noise | | 60 | | mV p-p |

General Specifications

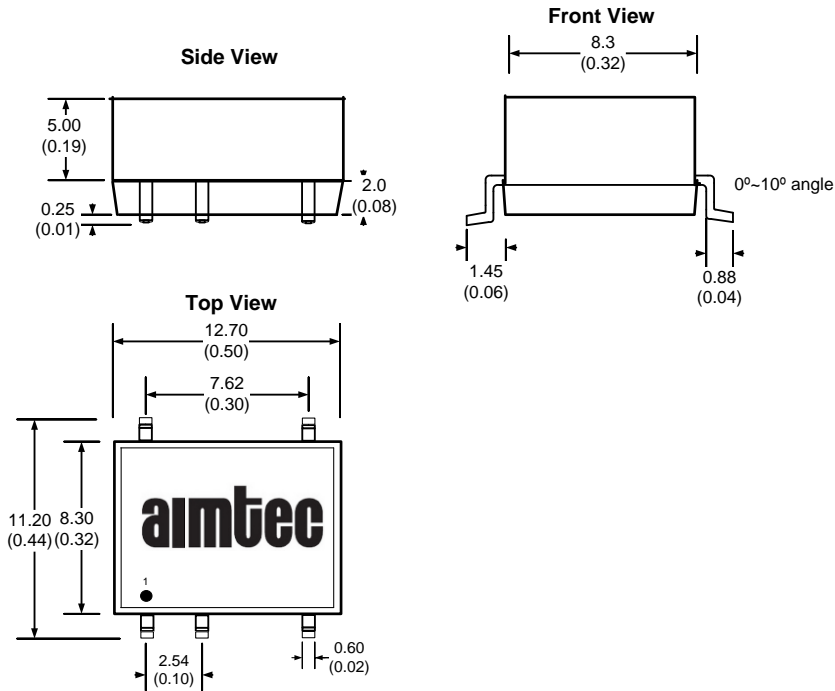
| Parameters | Conditions | Typical | Maximum | Units |
|-------------------------------|---|--|---|-------|
| Switching frequency | 100% load | 100 | 300 | KHz |
| Operating temperature | With derating above +100 | -40 to +105 | | °C |
| Storage temperature | | -55 to +125 | | °C |
| Cooling | Free air convection | | | |
| Storage Humidity | Non Condensing | | 95 | % RH |
| Case material | Epoxy resin (UL94-V0) | | | |
| Weight | | Single 1.5 Dual 1.8 | | g |
| Dimensions (L x W x H) | | Single Output 0.50 x 0.44 x 0.28 inches Dual Output 0.60 x 0.44 x 0.28 inches | 12.70 x 11.20 x 7.25mm 15.24 x 11.20 x 7.25 mm | |
| MTBF | >3500Khrs (MIL-HDBK -217F, Ground Benign, t=+25°C)hours | | | |
| Maximum soldering temperature | 1.5mm from case for 10 sec | | 300 | °C |
| Maximum case temperature | | | 130 | °C |

Safety Specifications

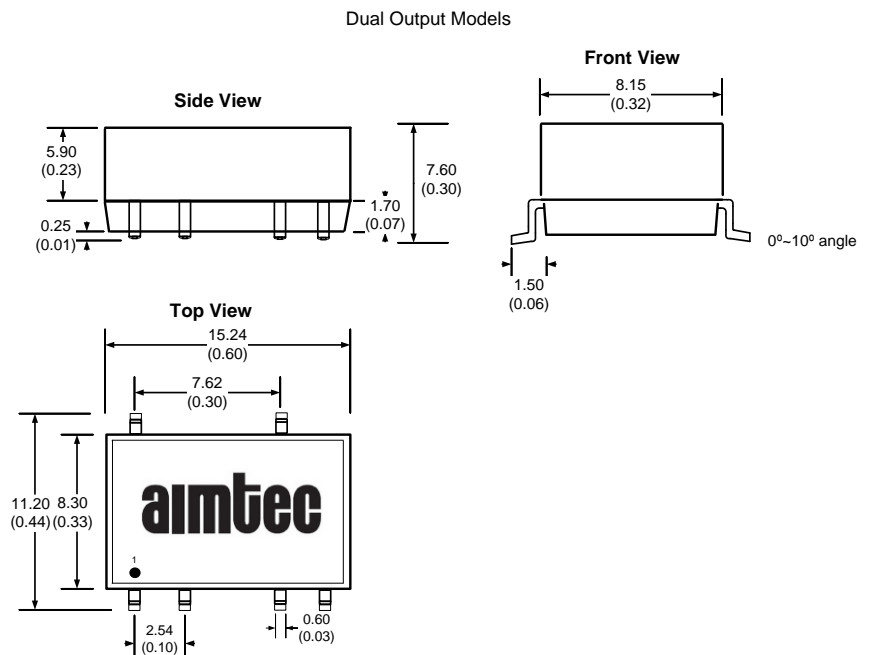
| Parameters | |
|------------------|--|
| Agency approvals | cULus (without 15V input and without dual output models) |
| Standards | UL 60950-1 |

Pin Out Specifications and Dimensions

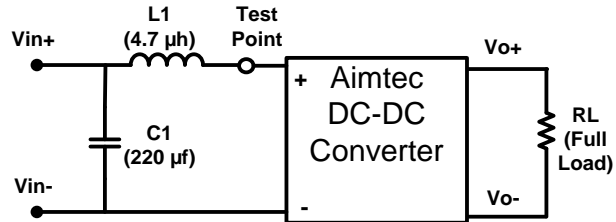
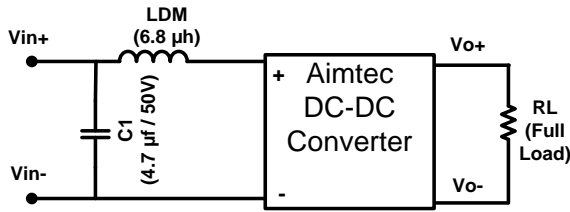
| Pin | Single |
|-----|-----------|
| 1 | - V Input |
| 2 | + V Input |
| 3 | No Pin |
| 4 | -V Output |
| 5 | +V Output |
| 6 | No Pin |
| 7 | No Pin |
| 8 | N.C. |



| Pin | Dual Output Models |
|-----|--------------------|
| 1 | -V Input |
| 2 | +V Input |
| 3 | No Pin |
| 4 | Common |
| 5 | -V Output |
| 6 | No Pin |
| 7 | +V Output |
| 8 | No Pin |
| 9 | No Pin |
| 10 | N.C. |

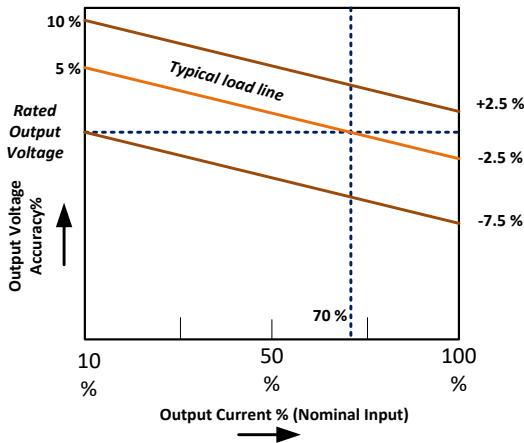


EMI Recommended Circuit (Class B) Input Reflected Ripple Current Test Circuit

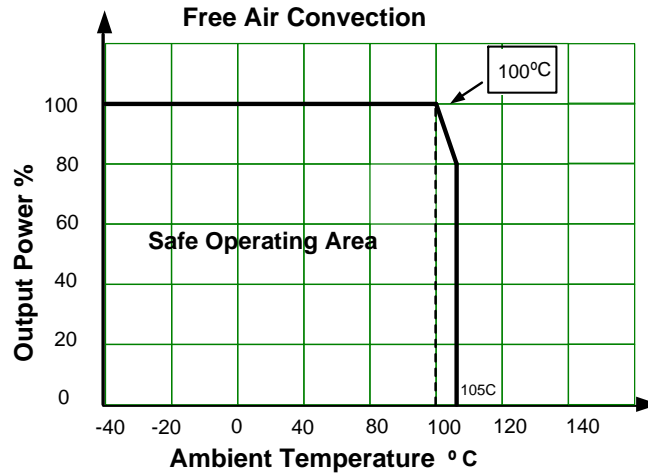


* Tested at full load, and nominal input

Load Accuracy Tolerance Graph



Derating

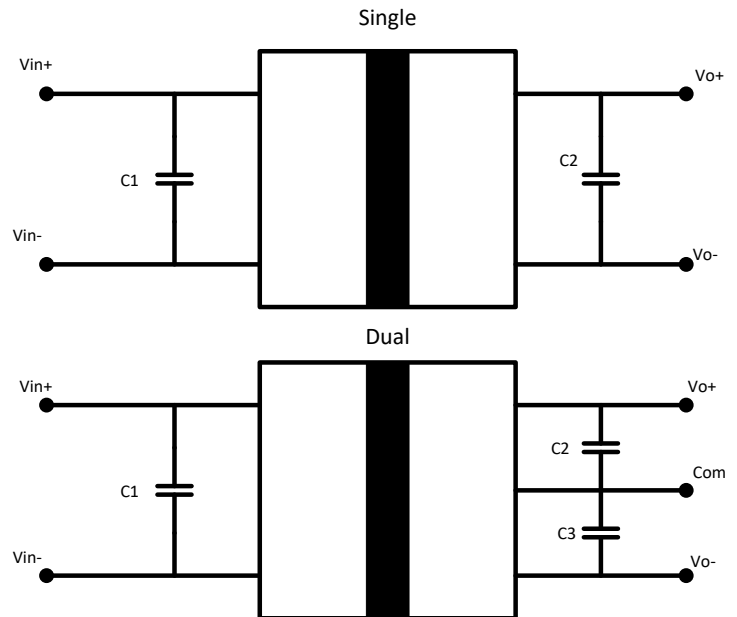


Recommended Circuits

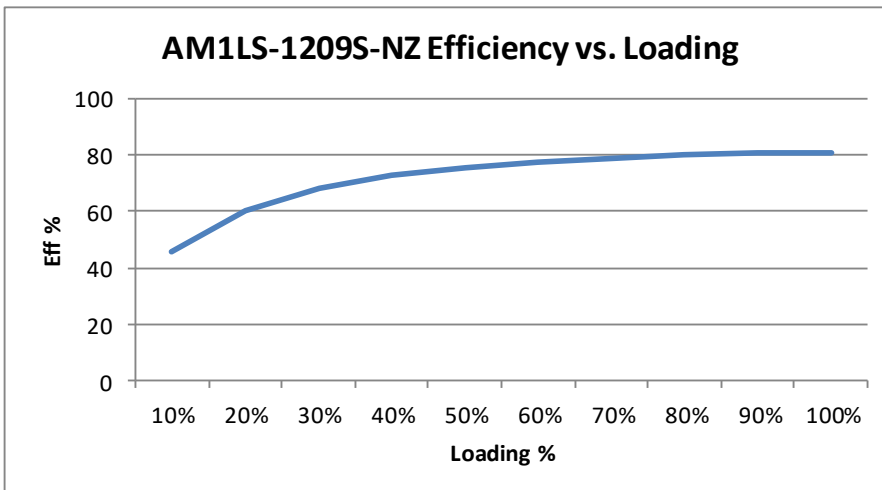
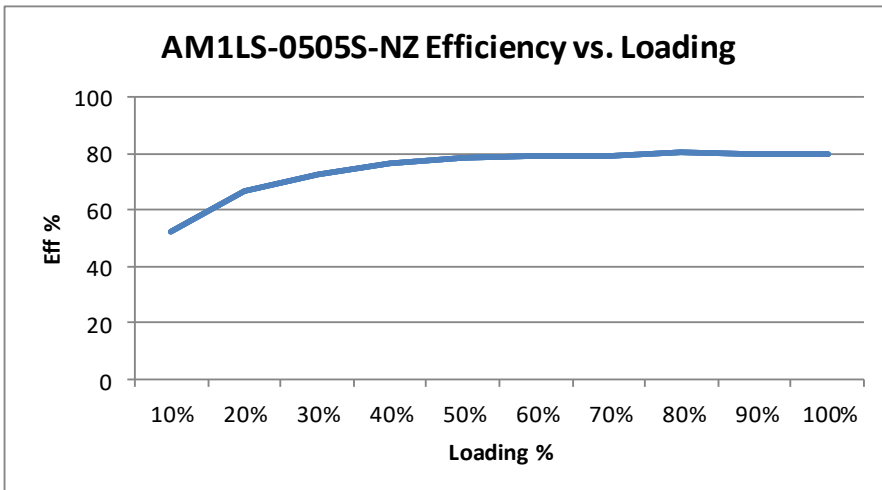
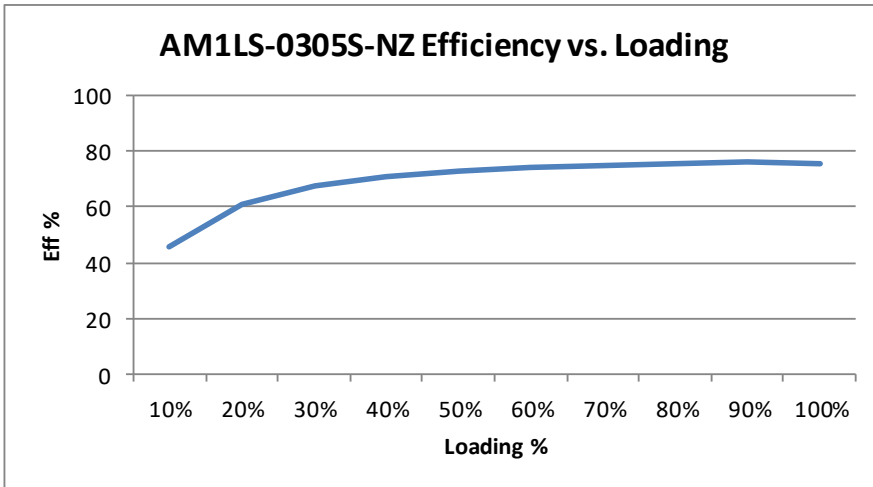
Capacitor selection Table

| Vin | C1 | Single VDC | C2 | Dual VDC | C2/C3 |
|-----|--------|------------|---------|----------|---------|
| 3.3 | 4.7 µF | 3.3 V | 10 µF | ±3.3 | 4.7 µF |
| 5 | 4.7 µF | 5V | 10µF | ±5V | 4.7 µF |
| | | 9 V | 4.7 µF | ±9V | 2.2 µF |
| 12 | 2.2µF | 12 V | 2.2µF | ±12 V | 1 µF |
| 15 | 2.2µF | 15 V | 1µF | ±15 V | 0.47 µF |
| 24 | 1µF | 24V | 0.47 µF | ±24 V | 0.47 µF |

- 1) Ensure output load of Min 10%, or specifications may not be met
- 2) Under normal operation, there is no protection for overload condition
- 3) Converter may exhibit start up delay if capacitive load exceeds recommended
- 4) Ceramic or electrolytic type capacitors are recommended, tantalum type may damage converter
- 5) Parallel connections, or hot swapping is not recommended



Typical Efficiency vs. Loading



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