

## Series AM3G-Z

### 3 Watt | DC-DC Converter



#### FEATURES:

- RoHS Compliant
- High Efficiency up to 84%
- Remote On / Off Control
- 8 Pin SIP Package
- Operating Temperature -40°C to + 85°C
- Continuous Short Circuit Protection
- Wide 2:1 Input Range
- Input / Output Isolation 1600 & 3000 VDC

#### Models

##### Single output



| Model          | Input Voltage (V) | Output Voltage (V) | Output Current Max (mA) | Isolation (VDC) | Input Current Full Load   No Load (mA) |    | Max. Capacitive Load (μF) | Efficiency (%) |
|----------------|-------------------|--------------------|-------------------------|-----------------|----------------------------------------|----|---------------------------|----------------|
| AM3G-0503SZ    | 4.5-9             | 3.3                | 700                     | 1600            | 640                                    | 65 | 2200                      | 74             |
| AM3G-0505SZ    | 4.5-9             | 5                  | 600                     | 1600            | 800                                    | 70 | 2200                      | 76             |
| AM3G-0512SZ    | 4.5-9             | 12                 | 250                     | 1600            | 750                                    | 75 | 470                       | 82             |
| AM3G-0515SZ    | 4.5-9             | 15                 | 200                     | 1600            | 750                                    | 75 | 470                       | 82             |
| AM3G-1203SZ    | 9-18              | 3.3                | 700                     | 1600            | 260                                    | 25 | 2200                      | 76             |
| AM3G-1205SZ    | 9-18              | 5                  | 600                     | 1600            | 320                                    | 15 | 2200                      | 81             |
| AM3G-1212SZ    | 9-18              | 12                 | 250                     | 1600            | 305                                    | 35 | 470                       | 84             |
| AM3G-1215SZ    | 9-18              | 15                 | 200                     | 1600            | 305                                    | 35 | 470                       | 84             |
| AM3G-2403SZ    | 18-36             | 3.3                | 700                     | 1600            | 133                                    | 15 | 2200                      | 74             |
| AM3G-2405SZ    | 18-36             | 5                  | 600                     | 1600            | 160                                    | 15 | 2200                      | 79             |
| AM3G-2412SZ    | 18-36             | 12                 | 250                     | 1600            | 156                                    | 20 | 470                       | 82             |
| AM3G-2415SZ    | 18-36             | 15                 | 200                     | 1600            | 152                                    | 20 | 470                       | 84             |
| AM3G-4803SZ    | 36-72             | 3.3                | 700                     | 1600            | 66                                     | 10 | 2200                      | 75             |
| AM3G-4805SZ    | 36-72             | 5                  | 600                     | 1600            | 82                                     | 10 | 2200                      | 78             |
| AM3G-4812SZ    | 36-72             | 12                 | 250                     | 1600            | 78                                     | 15 | 470                       | 81             |
| AM3G-4815SZ    | 36-72             | 15                 | 200                     | 1600            | 78                                     | 15 | 470                       | 81             |
|                |                   |                    |                         |                 |                                        |    |                           |                |
| AM3G-0503SH30Z | 4.5-9             | 3.3                | 700                     | 3000            | 640                                    | 65 | 2200                      | 74             |
| AM3G-0505SH30Z | 4.5-9             | 5                  | 600                     | 3000            | 800                                    | 70 | 2200                      | 76             |
| AM3G-0512SH30Z | 4.5-9             | 12                 | 250                     | 3000            | 750                                    | 75 | 470                       | 82             |
| AM3G-0515SH30Z | 4.5-9             | 15                 | 200                     | 3000            | 750                                    | 75 | 470                       | 82             |
| AM3G-1203SH30Z | 9-18              | 3.3                | 700                     | 3000            | 260                                    | 25 | 2200                      | 76             |
| AM3G-1205SH30Z | 9-18              | 5                  | 600                     | 3000            | 320                                    | 15 | 2200                      | 81             |
| AM3G-1212SH30Z | 9-18              | 12                 | 250                     | 3000            | 305                                    | 35 | 470                       | 84             |
| AM3G-1215SH30Z | 9-18              | 15                 | 200                     | 3000            | 305                                    | 35 | 470                       | 84             |
| AM3G-2403SH30Z | 18-36             | 3.3                | 700                     | 3000            | 133                                    | 15 | 2200                      | 74             |
| AM3G-2405SH30Z | 18-36             | 5                  | 600                     | 3000            | 160                                    | 15 | 2200                      | 79             |
| AM3G-2412SH30Z | 18-36             | 12                 | 250                     | 3000            | 156                                    | 20 | 470                       | 82             |
| AM3G-2415SH30Z | 18-36             | 15                 | 200                     | 3000            | 152                                    | 20 | 470                       | 84             |
| AM3G-4803SH30Z | 36-72             | 3.3                | 700                     | 3000            | 66                                     | 10 | 2200                      | 75             |
| AM3G-4805SH30Z | 36-72             | 5                  | 600                     | 3000            | 82                                     | 10 | 2200                      | 78             |
| AM3G-4812SH30Z | 36-72             | 12                 | 250                     | 3000            | 78                                     | 15 | 470                       | 81             |
| AM3G-4815SH30Z | 36-72             | 15                 | 200                     | 3000            | 78                                     | 15 | 470                       | 81             |

#### Models

##### Dual output

| Model       | Input Voltage (V) | Output Voltage (V) | Output Current Max (mA) | Isolation (VDC) | Input Current Full Load   No Load (mA) |    | Max. Capacitive Load (μF) | Efficiency (%) |
|-------------|-------------------|--------------------|-------------------------|-----------------|----------------------------------------|----|---------------------------|----------------|
| AM3G-0505DZ | 4.5-9             | ±5                 | ±300                    | 1600            | 800                                    | 90 | ±470                      | 77             |
| AM3G-0512DZ | 4.5-9             | ±12                | ±125                    | 1600            | 760                                    | 90 | ±220                      | 81             |
| AM3G-0515DZ | 4.5-9             | ±15                | ±100                    | 1600            | 750                                    | 90 | ±100                      | 82             |
| AM3G-1205DZ | 9-18              | ±5                 | ±300                    | 1600            | 320                                    | 45 | ±470                      | 80             |
| AM3G-1212DZ | 9-18              | ±12                | ±125                    | 1600            | 308                                    | 45 | ±220                      | 83             |
| AM3G-1215DZ | 9-18              | ±15                | ±100                    | 1600            | 312                                    | 45 | ±100                      | 82             |
| AM3G-2405DZ | 18-36             | ±5                 | ±300                    | 1600            | 160                                    | 20 | ±470                      | 80             |
| AM3G-2412DZ | 18-36             | ±12                | ±125                    | 1600            | 154                                    | 20 | ±220                      | 83             |
| AM3G-2415DZ | 18-36             | ±15                | ±100                    | 1600            | 154                                    | 20 | ±100                      | 83             |

### Models

#### Dual output (continued)

| Model          | Input Voltage (V) | Output Voltage (V) | Output Current Max (mA) | Isolation (VDC) | Input Current Full Load   No Load (mA) |    | Max. Capacitive Load (μF) | Efficiency (%) |
|----------------|-------------------|--------------------|-------------------------|-----------------|----------------------------------------|----|---------------------------|----------------|
| AM3G-4805DZ    | 36-72             | ±5                 | ±300                    | 1600            | 82                                     | 15 | ±470                      | 78             |
| AM3G-4812DZ    | 36-72             | ±12                | ±125                    | 1600            | 80                                     | 20 | ±220                      | 80             |
| AM3G-4815DZ    | 36-72             | ±15                | ±100                    | 1600            | 78                                     | 15 | ±100                      | 81             |
| AM3G-0505DH30Z | 4.5-9             | ±5                 | ±300                    | 3000            | 800                                    | 90 | ±470                      | 77             |
| AM3G-0512DH30Z | 4.5-9             | ±12                | ±125                    | 3000            | 760                                    | 90 | ±220                      | 81             |
| AM3G-0515DH30Z | 4.5-9             | ±15                | ±100                    | 3000            | 750                                    | 90 | ±100                      | 82             |
| AM3G-1205DH30Z | 9-18              | ±5                 | ±300                    | 3000            | 320                                    | 45 | ±470                      | 80             |
| AM3G-1212DH30Z | 9-18              | ±12                | ±125                    | 3000            | 308                                    | 45 | ±220                      | 83             |
| AM3G-1215DH30Z | 9-18              | ±15                | ±100                    | 3000            | 312                                    | 45 | ±100                      | 82             |
| AM3G-2405DH30Z | 18-36             | ±5                 | ±300                    | 3000            | 160                                    | 20 | ±470                      | 80             |
| AM3G-2412DH30Z | 18-36             | ±12                | ±125                    | 3000            | 154                                    | 20 | ±220                      | 83             |
| AM3G-2415DH30Z | 18-36             | ±15                | ±100                    | 3000            | 154                                    | 20 | ±100                      | 83             |
| AM3G-4805DH30Z | 36-72             | ±5                 | ±300                    | 3000            | 82                                     | 15 | ±470                      | 78             |
| AM3G-4812DH30Z | 36-72             | ±12                | ±125                    | 3000            | 80                                     | 20 | ±220                      | 80             |
| AM3G-4815DH30Z | 36-72             | ±15                | ±100                    | 3000            | 78                                     | 15 | ±100                      | 81             |

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                   | 5<br>12<br>24<br>48                                                                                                               | 4.5-9<br>9-18<br>18-36<br>36-72           |         | VDC    |
| Filter                          | Capacitor                                                                                                                         |                                           |         |        |
| Turn On Transient Process Time  |                                                                                                                                   | 300                                       |         | μs     |
| Transient Response Deviation    |                                                                                                                                   |                                           | ±3      | %      |
| Start-Up Time                   |                                                                                                                                   | 20                                        |         | ms     |
| Absolute Maximum Rating         | 5 Vin<br>12 Vin<br>24 Vin<br>48 Vin                                                                                               | -0.7-15<br>-0.7-36<br>-0.7-50<br>-0.7-100 |         | VDC    |
| Peak Input Voltage Time         |                                                                                                                                   |                                           | 100     | ms     |
| On/Off Control                  | ON – 0 to 1.3VDC Max.(Short circuit Pin 1 and Pin 3) or open circuit<br>OFF – 3 to 6VDC Max.(or 3mA to 6mA Max. via 1KΩ Resistor) |                                           |         |        |
| Input Reflected Ripple Current* |                                                                                                                                   | 35                                        |         | mA p-p |

\* The input reflected ripple current should be measured with connected 12μH inductor and 47μF input capacitor (ESR<1Ω at 100 KHz)

### Isolation Specifications

| Parameters         | Conditions | Typical     | Rated | Units |
|--------------------|------------|-------------|-------|-------|
| Tested I/O Voltage | 60 sec     | 1600 & 3000 |       | VDC   |
| Resistance         |            | > 1000      |       | MOhm  |
| Capacitance        |            | 680         |       | pF    |

### Output Specifications

| Parameters               | Conditions                                            | Typical | Maximum | Units |
|--------------------------|-------------------------------------------------------|---------|---------|-------|
| Voltage accuracy         |                                                       |         | ±1      | %     |
| Cross Regulation (Dual)  | 25% load on one output and 100% load on second output | ±5      |         | %     |
| Short Circuit Protection | Continuous                                            |         |         |       |

|                         |                    |       |      |        |
|-------------------------|--------------------|-------|------|--------|
| Short Circuit Restart   | Auto recovery      |       |      |        |
| Line Voltage Regulation | LL~HL              |       | ±0.5 | %      |
| Load Voltage Regulation | Load 25~100%       |       | ±1   | %      |
| Temperature Coefficient |                    | ±0.02 |      | %/°C   |
| Ripple & Noise          | At 20MHz Bandwidth |       | 75   | mV p-p |

## General Specifications

| Parameters             | Conditions                                              | Typical     | Maximum | Units |
|------------------------|---------------------------------------------------------|-------------|---------|-------|
| Switching Frequency    | 100% load                                               | 100 to 650  |         | KHz   |
| Operating Temperature  | Full Load without Derating                              | -40 to +71  |         | °C    |
| Storage Temperature    |                                                         | -40 to +125 |         | °C    |
| Max Case Temperature   |                                                         |             | +100    | °C    |
| Cooling                | Free air convection                                     |             |         |       |
| Humidity               |                                                         |             | 95      | %     |
| Case Material          | Non-conductive black plastic                            |             |         |       |
| Potting Material       | Epoxy (UL94V-0 rated)                                   |             |         |       |
| Pin Material           | C5191R-H Solder coated                                  |             |         |       |
| Weight                 |                                                         | 4.8         |         | g     |
| Dimensions (L X W X H) | 0.86 x 0.36 x 0.44 inches 21.85 x 9.20 x 11.18 mm       |             |         |       |
| MTBF                   | >1 340 000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C) |             |         |       |

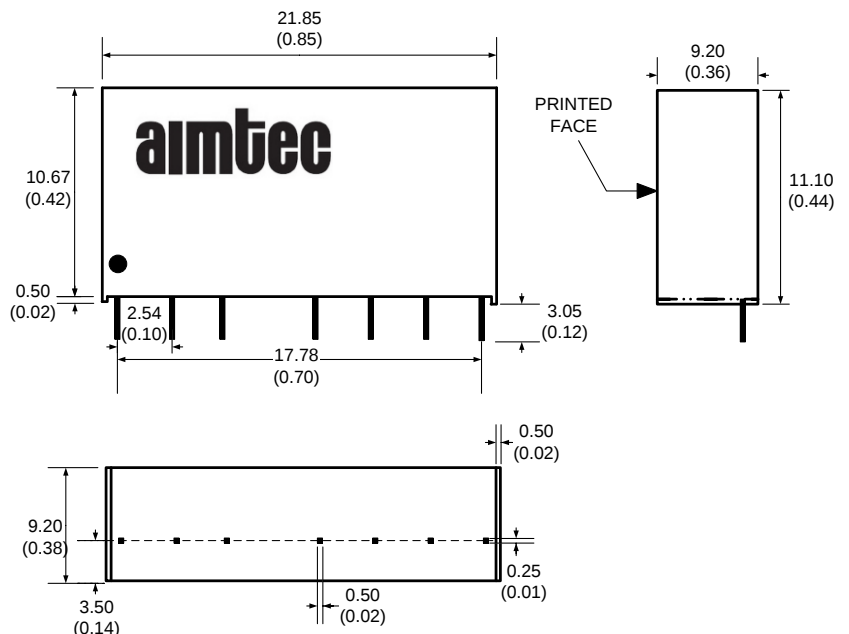
## Safety Specifications

| Parameters                                 |                                                                   |
|--------------------------------------------|-------------------------------------------------------------------|
| Agency Approval                            | CE, UL                                                            |
| Standards                                  | EN55032 Class A, EN55024                                          |
|                                            | IEC61000-4-2, Perf. Criteria A                                    |
|                                            | IEC61000-4-3, Perf. Criteria A                                    |
|                                            | IEC61000-4-4, Perf. Criteria A (external 220uF/100V cap required) |
|                                            | IEC61000-4-5, Perf. Criteria A (external 220uF/100V cap required) |
|                                            | IEC61000-4-6, Perf. Criteria A                                    |
|                                            | IEC61000-4-8, Perf. Criteria A                                    |
| IEC/EN/UL 60950-1:2001 & IEC/EN/UL 62368-1 |                                                                   |

## Pin Out Specifications

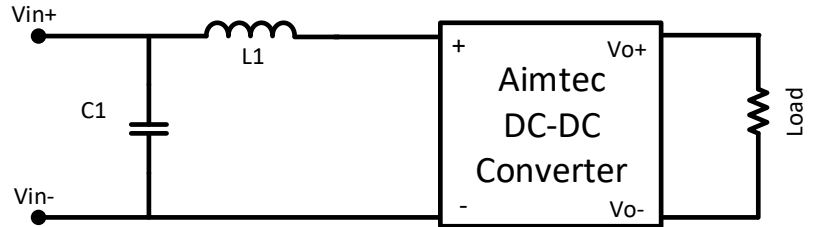
| Pin | 1600 & 3000VDC |                |
|-----|----------------|----------------|
|     | Single         | Dual           |
| 1   | - V Input      | - V Input      |
| 2   | + V Input      | + V Input      |
| 3   | On/Off Control | On/Off Control |
| 5   | N.C.           | N.C.           |
| 6   | + V Output     | + V Output     |
| 7   | - V Output     | Common         |
| 8   | N.C.           | - V Output     |

## Dimensions

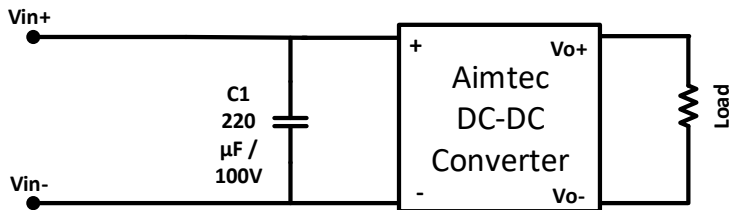


## Conducted Emissions

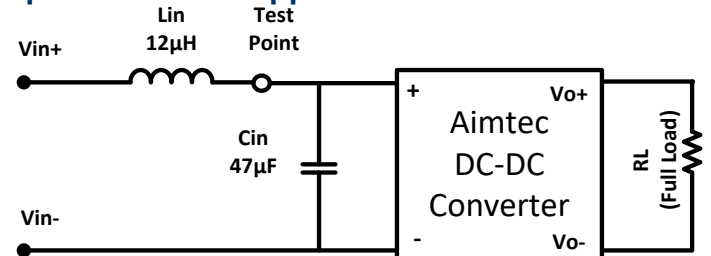
| Input Voltage | C1         | L1         |
|---------------|------------|------------|
| 5V            | 220uF/25V  | 5.6uH      |
| 12V Single    | 100uF/100V | 18 $\mu$ H |
| 12V Dual      | 2.2uF/100V | 18uH       |
| 24V           | 10uF/35V   | 18uH       |
| 48V           | 100uF/100V | 56uH       |



## Surge

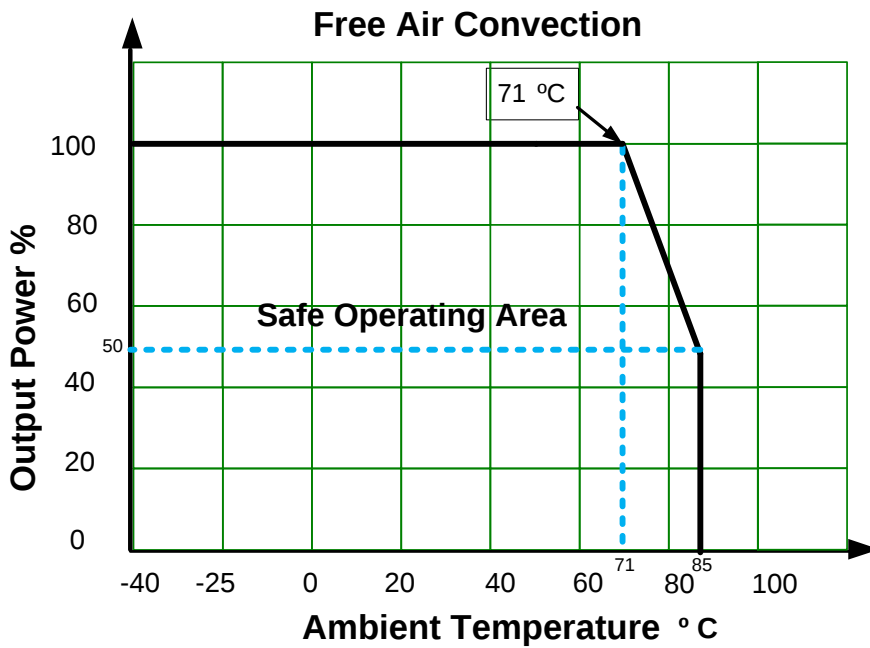


## Input Reflected Ripple

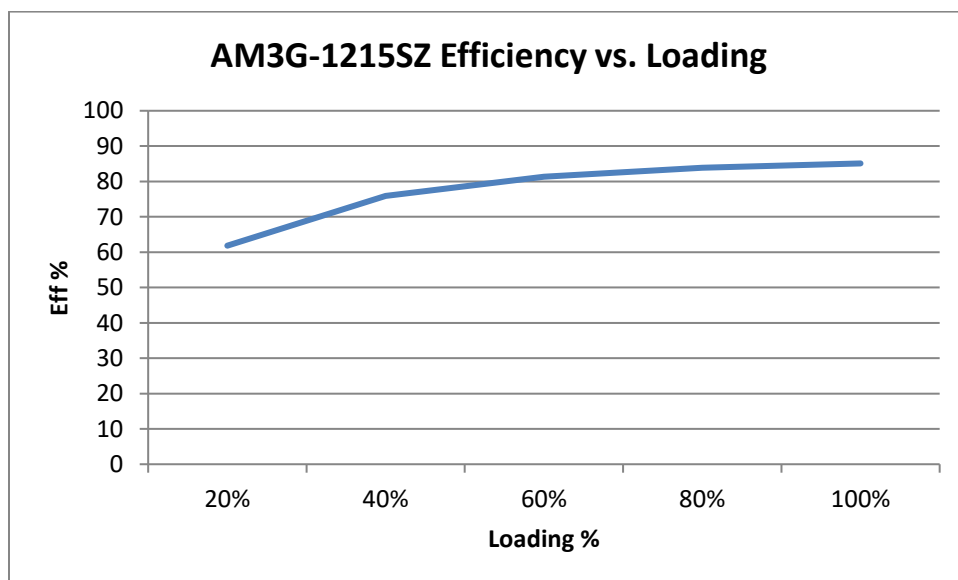
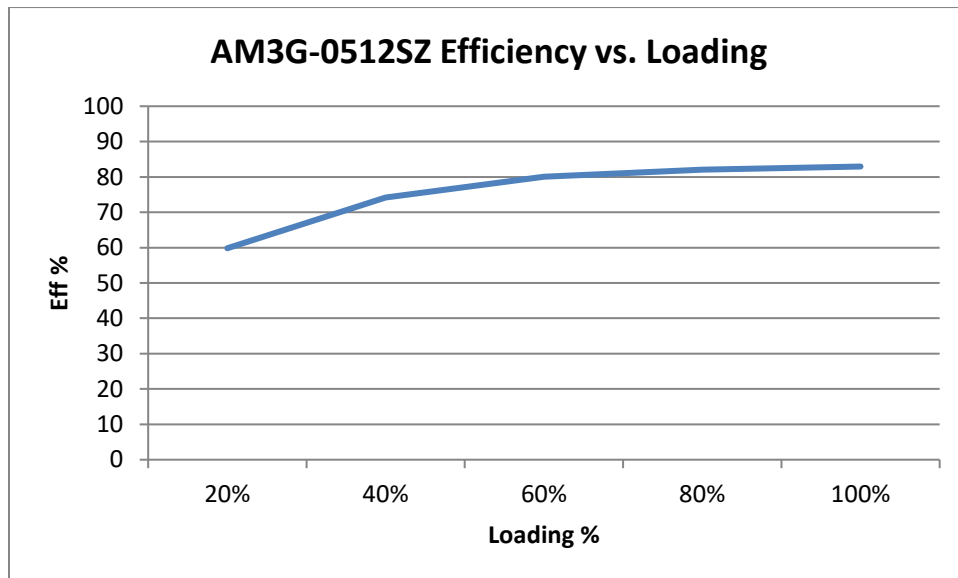


\* Tested at full load, and nominal input

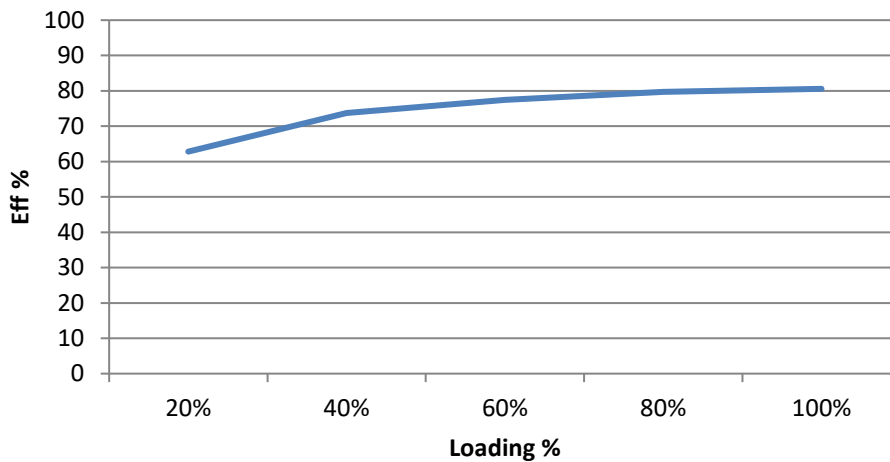
## Derating



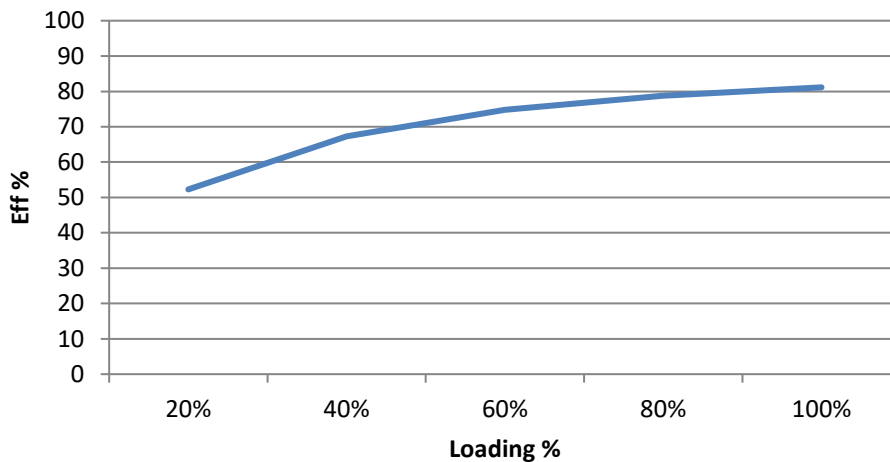
### Typical Efficiency Example Charts



**AM3G-2412SZ Efficiency vs. Loading**



**AM3G-4812SZ Efficiency vs. Loading**



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