



## FEATURES:

- RoHS compliant
- High efficiency up to 82%
- Low profile plastic package
- 7 pin SIP package
- Operating temperature -40°C to + 105°C
- Continuous short circuit protection
- Pin compatible with multiple manufacturers
- Up to 3000VDC Isolation

### 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 Typ. (%) |
|---------------------|-------------------|--------------------|-------------------------|-----------------|----------------------------------------|----|---------------------------|---------------------|
| AM1DS-0303S-NZ*     | 3.0-3.6           | 3.3                | 303                     | 1500            | 415                                    | 25 | 220                       | 78                  |
| AM1DS-0305S-NZ*     | 3.0-3.6           | 5                  | 200                     | 1500            | 388                                    | 25 | 220                       | 79                  |
| AM1DS-0505S-NZ      | 4.5-5.5           | 5                  | 200                     | 1500            | 250                                    | 20 | 220                       | 80                  |
| AM1DS-0505SJZ*      | 4.5-5.5           | 5                  | 200                     | 1500            | 257                                    | 10 | 2400                      | 82                  |
| AM1DS-0509S-NZ      | 4.5-5.5           | 9                  | 112                     | 1500            | 250                                    | 20 | 220                       | 80                  |
| AM1DS-0512S-NZ      | 4.5-5.5           | 12                 | 83                      | 1500            | 248                                    | 20 | 220                       | 81                  |
| AM1DS-0515S-NZ      | 4.5-5.5           | 15                 | 67                      | 1500            | 248                                    | 20 | 220                       | 81                  |
| AM1DS-0524S-NZ ‡    | 4.5-5.5           | 24                 | 42                      | 1500            | 248                                    | 20 | 220                       | 81                  |
| AM1DS-1205S-NZ      | 10.8-13.2         | 5                  | 200                     | 1500            | 111                                    | 15 | 220                       | 80                  |
| AM1DS-1209S-NZ      | 10.8-13.2         | 9                  | 112                     | 1500            | 92                                     | 15 | 220                       | 80                  |
| AM1DS-1212S-NZ      | 10.8-13.2         | 12                 | 83                      | 1500            | 92                                     | 15 | 220                       | 81                  |
| AM1DS-1215S-NZ      | 10.8-13.2         | 15                 | 67                      | 1500            | 90                                     | 15 | 220                       | 81                  |
| AM1DS-1515S-NZ*     | 13.5-16.5         | 15                 | 67                      | 1500            | 84                                     | 10 | 220                       | 80                  |
| AM1DS-2403S-NZ*     | 21.6-26.4         | 3.3                | 303                     | 1500            | 56                                     | 7  | 220                       | 79                  |
| AM1DS-2405S-NZ      | 21.6-26.4         | 5                  | 200                     | 1500            | 51                                     | 7  | 220                       | 79                  |
| AM1DS-2412S-NZ      | 21.6-26.4         | 12                 | 83                      | 1500            | 52                                     | 7  | 220                       | 81                  |
| AM1DS-2415S-NZ      | 21.6-26.4         | 15                 | 67                      | 1500            | 52                                     | 7  | 220                       | 81                  |
| AM1DS-2424S-NZ ‡    | 21.6-26.4         | 24                 | 42                      | 1500            | 52                                     | 7  | 220                       | 82                  |
| AM1DS-0305SH30-NZ*  | 3.0-3.6           | 5                  | 200                     | 3000            | 388                                    | 25 | 220                       | 79                  |
| AM1DS-0505SH30-NZ   | 4.5-5.5           | 5                  | 200                     | 3000            | 250                                    | 20 | 220                       | 80                  |
| AM1DS-0509SH30-NZ   | 4.5-5.5           | 9                  | 112                     | 3000            | 250                                    | 20 | 220                       | 80                  |
| AM1DS-0512SH30-NZ   | 4.5-5.5           | 12                 | 83                      | 3000            | 248                                    | 20 | 220                       | 80                  |
| AM1DS-0515SH30-NZ   | 4.5-5.5           | 15                 | 67                      | 3000            | 248                                    | 20 | 220                       | 81                  |
| AM1DS-0524SH30-NZ ‡ | 4.5-5.5           | 24                 | 42                      | 3000            | 248                                    | 20 | 220                       | 81                  |
| AM1DS-1205SH30-NZ   | 10.8-13.2         | 5                  | 200                     | 3000            | 111                                    | 15 | 220                       | 80                  |
| AM1DS-1209SH30-NZ   | 10.8-13.2         | 9                  | 112                     | 3000            | 111                                    | 15 | 220                       | 80                  |
| AM1DS-1212SH30-NZ   | 10.8-13.2         | 12                 | 83                      | 3000            | 92                                     | 15 | 220                       | 81                  |
| AM1DS-1215SH30-NZ   | 10.8-13.2         | 15                 | 67                      | 3000            | 92                                     | 15 | 220                       | 81                  |
| AM1DS-1224SH30-NZ ‡ | 10.8-13.2         | 24                 | 42                      | 3000            | 92                                     | 15 | 220                       | 80                  |
| AM1DS-2405SH30-NZ   | 21.6-26.4         | 5                  | 200                     | 3000            | 51                                     | 7  | 220                       | 79                  |
| AM1DS-2409SH30-NZ   | 21.6-26.4         | 9                  | 112                     | 3000            | 51                                     | 7  | 200                       | 80                  |
| AM1DS-2412SH30-NZ   | 21.6-26.4         | 12                 | 83                      | 3000            | 52                                     | 7  | 220                       | 81                  |
| AM1DS-2415SH30-NZ   | 21.6-26.4         | 15                 | 67                      | 3000            | 52                                     | 7  | 220                       | 81                  |
| AM1DS-2424SH30-NZ ‡ | 21.6-26.4         | 24                 | 42                      | 3000            | 52                                     | 7  | 220                       | 82                  |

### 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 Typ. (%) |
|-----------------|-------------------|--------------------|-------------------------|-----------------|----------------------------------------|----|---------------------------|---------------------|
| AM1DS-0305D-NZ* | 2.97-3.63         | ±5                 | ±100                    | 1500            | 274                                    | 20 | 100                       | 78                  |
| AM1DS-0312D-NZ* | 2.97-3.63         | ±12                | ±42                     | 1500            | 248                                    | 20 | 100                       | 78                  |
| AM1DS-0505D-NZ  | 4.5-5.5           | ±5                 | ±100                    | 1500            | 274                                    | 20 | 100                       | 80                  |
| AM1DS-0505D-JZ  | 4.5-5.5           | ±5                 | ±100                    | 1500            | 286                                    | 10 | 1200                      | 82                  |
| AM1DS-0509D-NZ  | 4.5-5.5           | ±9                 | ±56                     | 1500            | 250                                    | 20 | 100                       | 80                  |
| AM1DS-0512D-NZ  | 4.5-5.5           | ±12                | ±42                     | 1500            | 248                                    | 20 | 100                       | 80                  |
| AM1DS-0515D-NZ  | 4.5-5.5           | ±15                | ±34                     | 1500            | 248                                    | 20 | 100                       | 81                  |

|                     |           |     |      |      |     |    |     |    |
|---------------------|-----------|-----|------|------|-----|----|-----|----|
| AM1DS-0524D-NZ ‡    | 4.5-5.5   | ±24 | ±21  | 1500 | 248 | 20 | 100 | 81 |
| AM1DS-1205D-NZ      | 10.8-13.2 | ±5  | ±100 | 1500 | 92  | 15 | 100 | 80 |
| AM1DS-1212D-NZ      | 10.8-13.2 | ±12 | ±42  | 1500 | 92  | 15 | 100 | 81 |
| AM1DS-1215D-NZ      | 10.8-13.2 | ±15 | ±34  | 1500 | 90  | 15 | 100 | 81 |
| AM1DS-1512D-NZ*     | 13.5-16.5 | ±12 | ±42  | 1500 | 92  | 15 | 100 | 80 |
| AM1DS-1515D-NZ      | 13.5-16.5 | ±15 | ±34  | 1500 | 84  | 10 | 100 | 80 |
| AM1DS-2405D-NZ      | 21.6-26.4 | ±5  | ±100 | 1500 | 53  | 7  | 100 | 79 |
| AM1DS-2412D-NZ      | 21.6-26.4 | ±12 | ±42  | 1500 | 51  | 7  | 100 | 81 |
| AM1DS-2415D-NZ      | 21.6-26.4 | ±15 | ±34  | 1500 | 51  | 7  | 100 | 82 |
| AM1DS-2424D-NZ ‡    | 21.6-26.4 | ±24 | ±21  | 1500 | 51  | 7  | 100 | 82 |
|                     |           |     |      |      |     |    |     |    |
| AM1DS-0505DH30-NZ   | 4.5-5.5   | ±5  | ±100 | 3000 | 274 | 20 | 100 | 80 |
| AM1DS-0509DH30-NZ   | 4.5-5.5   | ±9  | ±56  | 3000 | 250 | 20 | 100 | 80 |
| AM1DS-0512DH30-NZ   | 4.5-5.5   | ±12 | ±42  | 3000 | 248 | 20 | 100 | 80 |
| AM1DS-0515DH30-NZ   | 4.5-5.5   | ±15 | ±34  | 3000 | 250 | 20 | 100 | 81 |
| AM1DS-0524DH30-NZ ‡ | 4.5-5.5   | ±24 | ±21  | 3000 | 250 | 20 | 100 | 81 |
| AM1DS-1205DH30-NZ   | 10.8-13.2 | ±5  | ±100 | 3000 | 248 | 20 | 100 | 81 |
| AM1DS-1212DH30-NZ   | 10.8-13.2 | ±12 | ±42  | 3000 | 92  | 15 | 100 | 81 |
| AM1DS-1215DH30-NZ   | 10.8-13.2 | ±15 | ±34  | 3000 | 90  | 15 | 100 | 79 |
| AM1DS-1224DH30-NZ ‡ | 10.8-13.2 | ±24 | ±21  | 3000 | 90  | 15 | 100 | 79 |
| AM1DS-2405DH30-NZ   | 21.6-26.4 | ±5  | ±100 | 3000 | 53  | 7  | 100 | 81 |
| AM1DS-2409DH30-NZ   | 21.6-26.4 | ±9  | ±56  | 3000 | 53  | 7  | 100 | 81 |
| AM1DS-2412DH30-NZ   | 21.6-26.4 | ±12 | ±42  | 3000 | 51  | 7  | 100 | 81 |
| AM1DS-2415DH30-NZ   | 21.6-26.4 | ±15 | ±34  | 3000 | 51  | 7  | 100 | 82 |
| AM1DS-2424DH30-NZ ‡ | 21.6-26.4 | ±24 | ±21  | 3000 | 51  | 7  | 100 | 82 |

‡ With Momentary short circuit protection of 1 second

\* Reference in the Safety Table

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                       | 3.3       | 2.97–3.63 or 3.0-3.6 |         | VDC   |
|                                     | 5         | 4.5-5.5              |         |       |
|                                     | 12        | 10.8-13.2            |         |       |
|                                     | 15        | 13.5-16.5            |         |       |
|                                     | 24        | 21.6-26.4            |         |       |
| Filter                              | Capacitor |                      |         |       |
| Absolute Maximum Rating             | 3.3       |                      | 7       | VDC   |
|                                     | 5         |                      | 9       |       |
|                                     | 12        |                      | 18      |       |
|                                     | 15        |                      | 21      |       |
|                                     | 24        |                      | 30      |       |
| Peak Input Voltage time             |           |                      | 1       | s     |
| No Load Input Current               |           |                      | 50      | mA    |
| AM1DS-0505SJZ input no load current |           | 5                    | 10      | mA    |

## Isolation Specifications

| Parameters         | Conditions | Typical | Rated      | Units |
|--------------------|------------|---------|------------|-------|
| Tested I/O voltage | 60 sec     |         | 1500, 3000 | VDC   |
| Resistance         |            | > 1000  |            | MOhm  |
| Capacitance        |            | 20      |            | pF    |

## Output Specifications

| Parameters               | Conditions                       | Typical                                   | Maximum | Units    |
|--------------------------|----------------------------------|-------------------------------------------|---------|----------|
| Voltage accuracy         |                                  | ±5                                        |         | %        |
| Short Circuit protection | Continuous, unless marked with ‡ |                                           |         |          |
| Short circuit restart    | Auto recovery                    |                                           |         |          |
| Line voltage regulation  | For 1.0% change of Vin           | ±1.2                                      |         | % of Vin |
| Load voltage regulation  | load 10~100%                     | 10%                                       |         | %        |
| Temperature coefficient  |                                  | ±0.02                                     |         | %/°C     |
| Ripple & Noise           | 20MHz Bandwidth                  | (output 3.3/5/12) 30<br>(output 15/24) 60 |         | mV p-p   |
| Minimum Load Current     |                                  | 10                                        |         | % of Max |

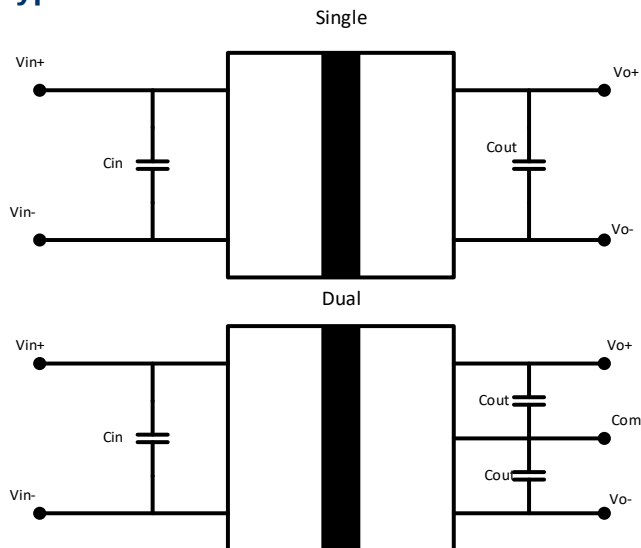
## General Specifications

| Parameters                                                | Conditions                                             | Typical                  | Maximum                | Units |
|-----------------------------------------------------------|--------------------------------------------------------|--------------------------|------------------------|-------|
| Switching frequency                                       | 100% load                                              | 100 - 300                |                        | KHz   |
| Switching frequency (for part number with suffix JZ)      | 100% load                                              | 270                      |                        | KHz   |
| Operating temperature                                     | With derating above 85°C                               | -40 to +105              |                        | °C    |
| Storage temperature                                       |                                                        | -55 to +125              |                        | °C    |
| Maximum case temperature                                  |                                                        |                          | 100                    | °C    |
| Derating                                                  | Not-Required                                           |                          |                        | %/°C  |
| Cooling                                                   | Free air convection                                    |                          |                        |       |
| Humidity                                                  |                                                        |                          | 95                     | % RH  |
| Case material                                             | Non-conductive black plastic (UL94V-0 rated)           |                          |                        |       |
| Weight                                                    |                                                        | 2.3                      |                        | g     |
| Dimensions (L x W x H)                                    |                                                        | 0.76 x 0.24 x 0.37inches | 19.5 x 6.00 x 9.35mm   |       |
| Dimensions (L x W x H)<br>For part numbers with suffix JZ |                                                        | 0.77 x 0.24 x 0.4inches  | 19.65 x 6.00 x 10.16mm |       |
| MTBF                                                      | >3,500,000hrs (MIL-HDBK -217F, Ground Benign, t=+25°C) |                          |                        |       |
| Maximum soldering temperature                             | 1.5 mm from case for 10sec                             |                          | 300                    | °C    |

## Safety Specifications

| Parameters       |                                  |                                                                               |
|------------------|----------------------------------|-------------------------------------------------------------------------------|
| Agency approvals | cULus                            |                                                                               |
| Standards        | Information technology Equipment | UL 60950-1 (except the models marked with *)<br>UL 62368 (AM1DS-0505SJZ only) |

## Typical Recommended Circuit

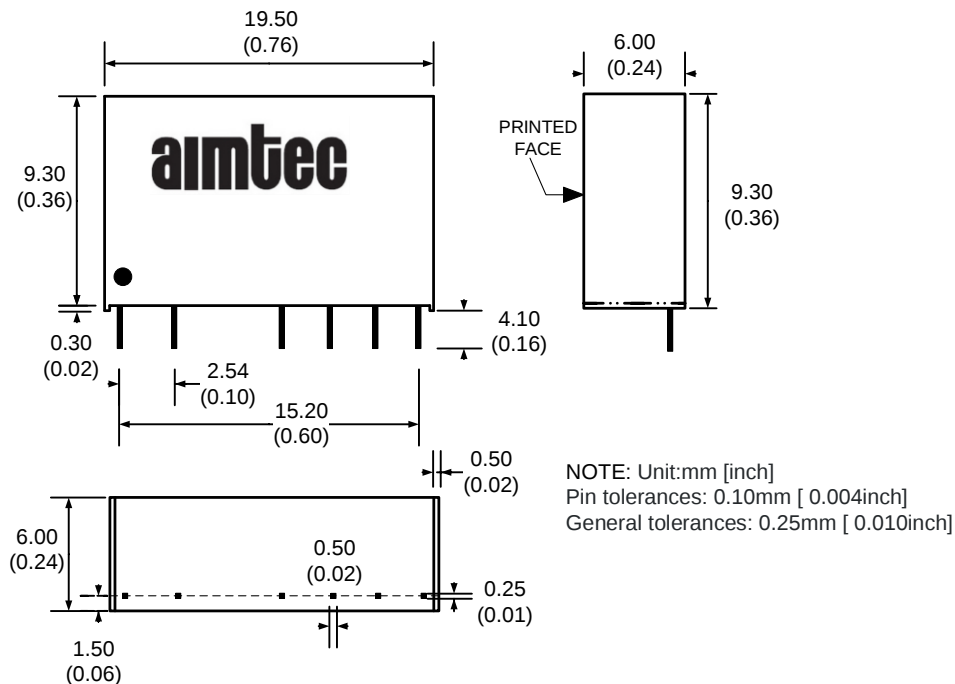


| Vin       | Cin | Vout      | Cout        | Vout (Dual)           | Cout (Dual)  |
|-----------|-----|-----------|-------------|-----------------------|--------------|
| 3.3 & 5 V | 4.7 | 3.3 & 5 V | 10 $\mu$ F  | $\pm$ 3.3 & $\pm$ 5 V | 4.7 $\mu$ F  |
| 12 V      | 2.2 | 12 V      | 2.2 $\mu$ F | $\pm$ 12 V            | 1 $\mu$ F    |
| 15 V      | 2.2 | 15 & 24 V | 1 $\mu$ F   | $\pm$ 15 & $\pm$ 24 V | 0.47 $\mu$ F |
| 24 V      | 1   | -         | -           |                       |              |

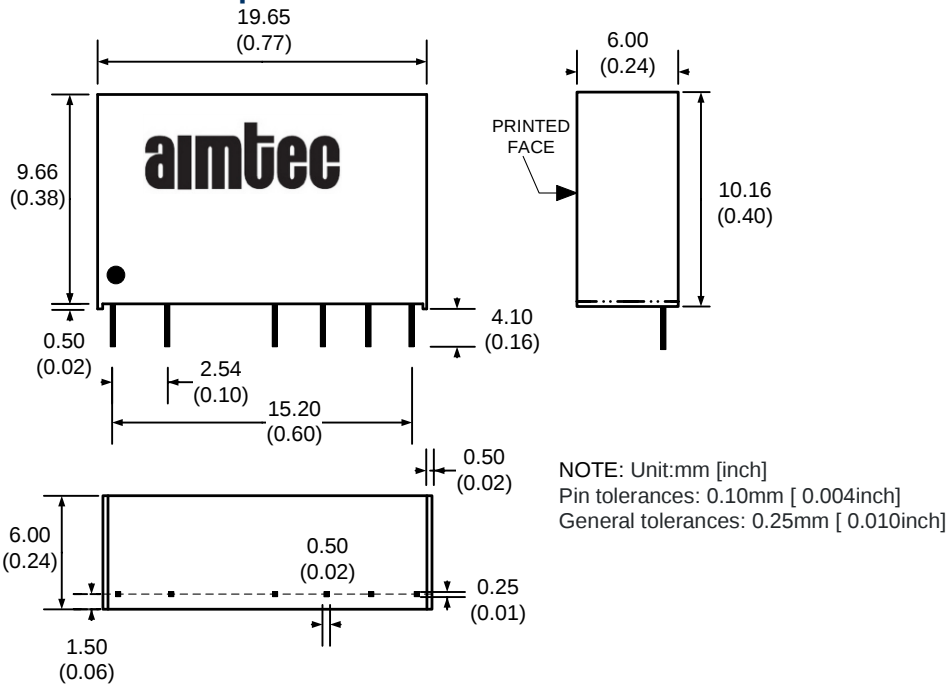
## Pin Out Specifications

| Pin | 1500 VDC   |            | 3000VDC    |            |
|-----|------------|------------|------------|------------|
|     | Single     | Dual       | Single     | Dual       |
| 1   | + V Input  | + V Input  | + V Input  | + V Input  |
| 2   | - V Input  | - V Input  | - V Input  | - V Input  |
| 4   | - V Output | - V Output | No pin     | No pin     |
| 5   | No pin     | Common     | - V Output | - V Output |
| 6   | + V Output | + V Output | No pin     | Common     |
| 7   | No pin     | No pin     | + V Output | + V Output |

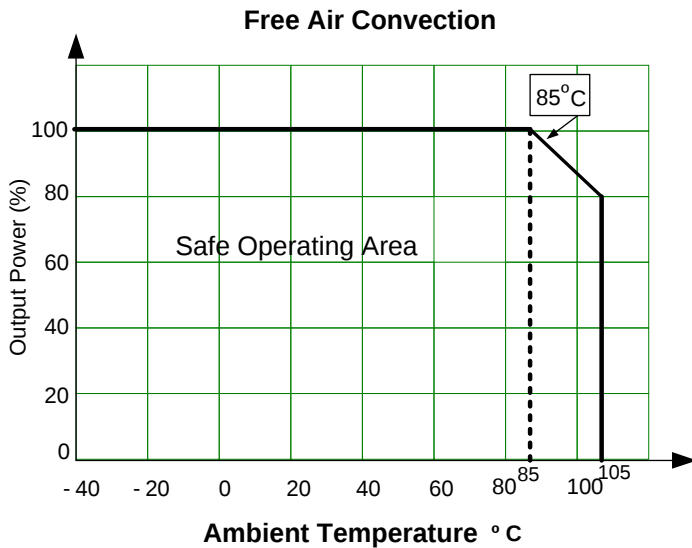
## Dimensions



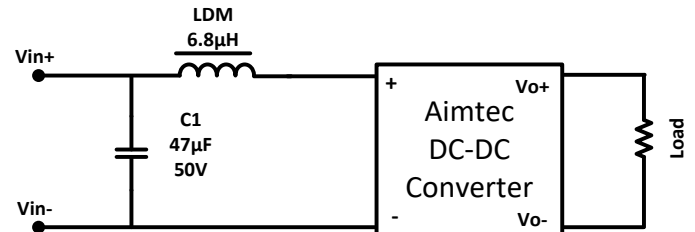
### Dimensions for part numbers with suffix JZ



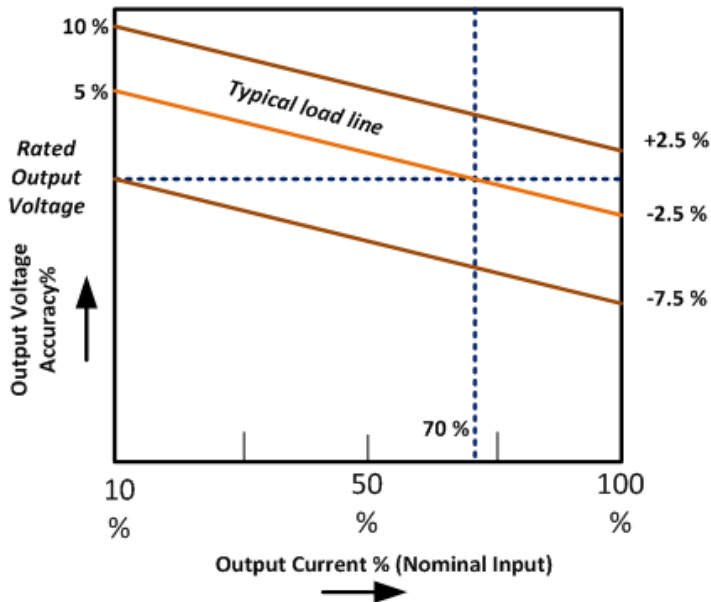
### Derating



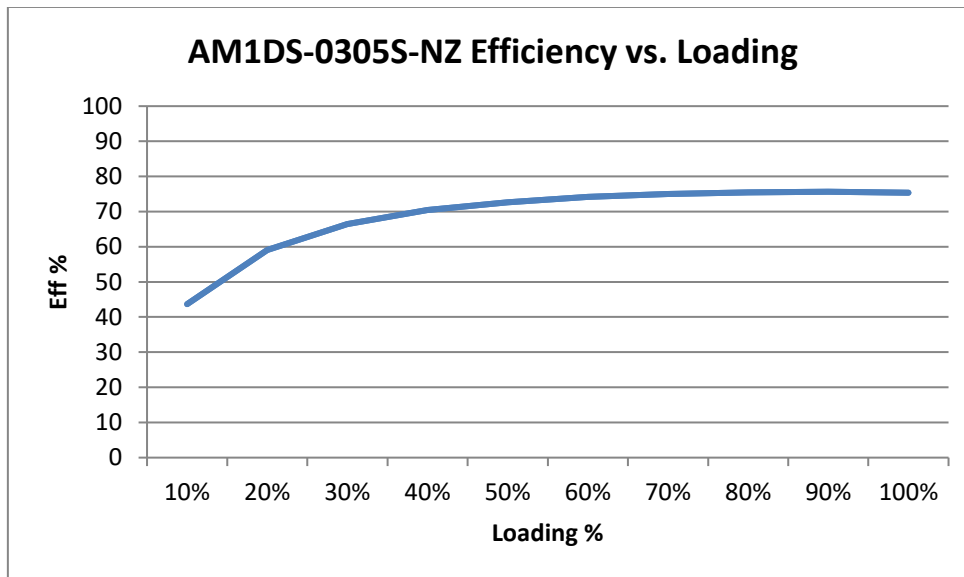
### EMI Recommended Circuit (Class B)



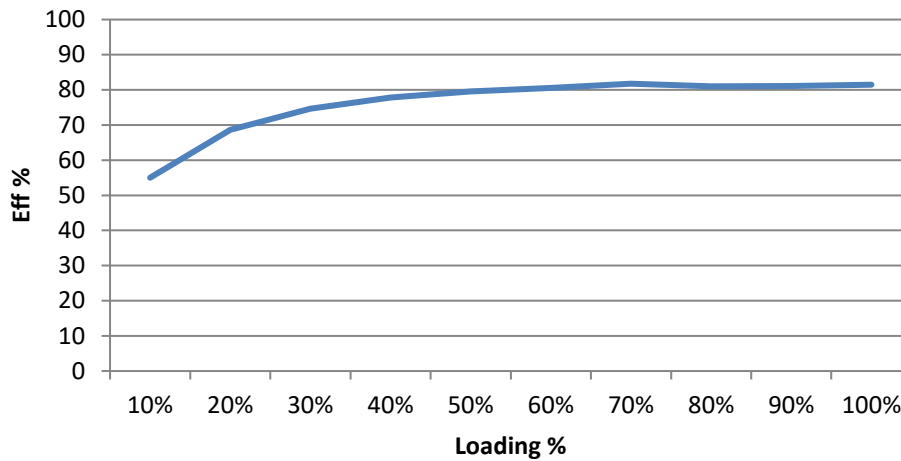
## Load Accuracy Tolerance Graph



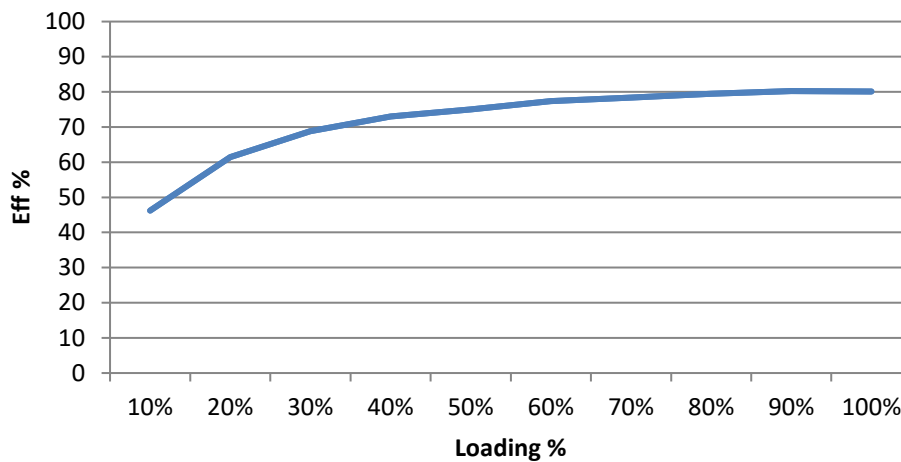
## Typical Efficiency Example Charts



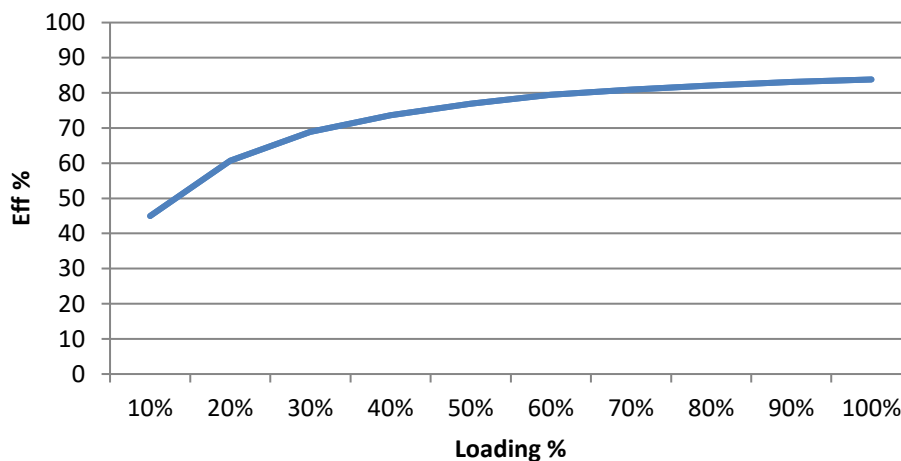
**AM1DS-0505S-NZ Efficiency vs. Loading**

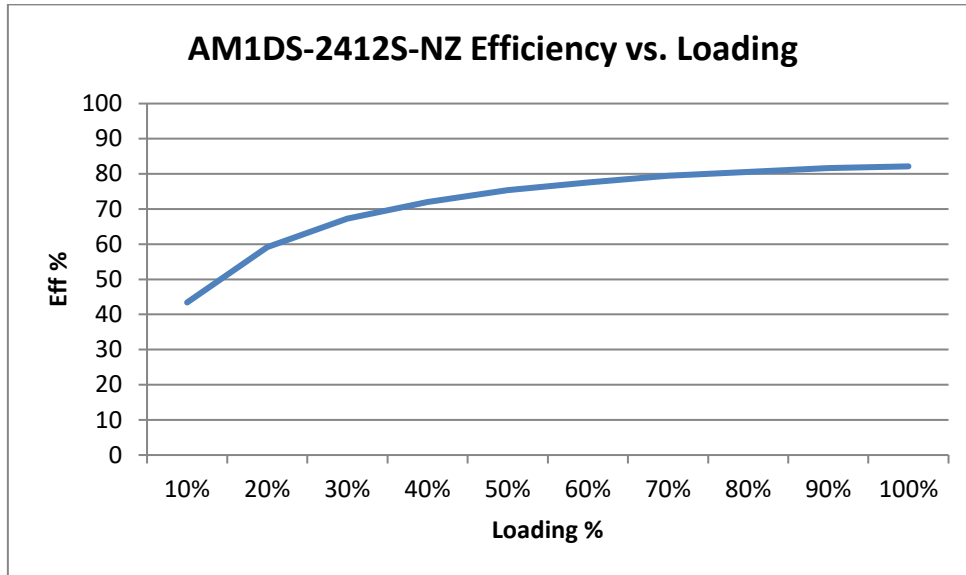


**AM1DS-1205S-NZ Efficiency vs. Loading**



**AM1DS-1515S-NZ Efficiency vs. Loading**





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