# 32.5–80 Watt Hybrid

## *Features*

- Rad Hard: TID > 100kRad(Si)
- 2:1 margin: Operates beyond 200kRad TID
- No SEE: LET > 82MeV*cm$^2$/mg
- Proton Resistant: No optocouplers used
- Specifically engineered for 50 VDC satellite bus
- Completely self contained Thick Film Hybrid DC-DC Converter
- No external filter caps required
- Fully isolated design
- "Inhibit-not" function
- Power on soft start
- 200 kHz operation for low ripple and fast response time
- Built-in EMI input filter meets MIL-STD-461C requirements CE01, CE03, CS01, CS02 and CS06
- Short circuit and overvoltage protection
- Capability of external sync for switching frequencies
- Built-in test capability

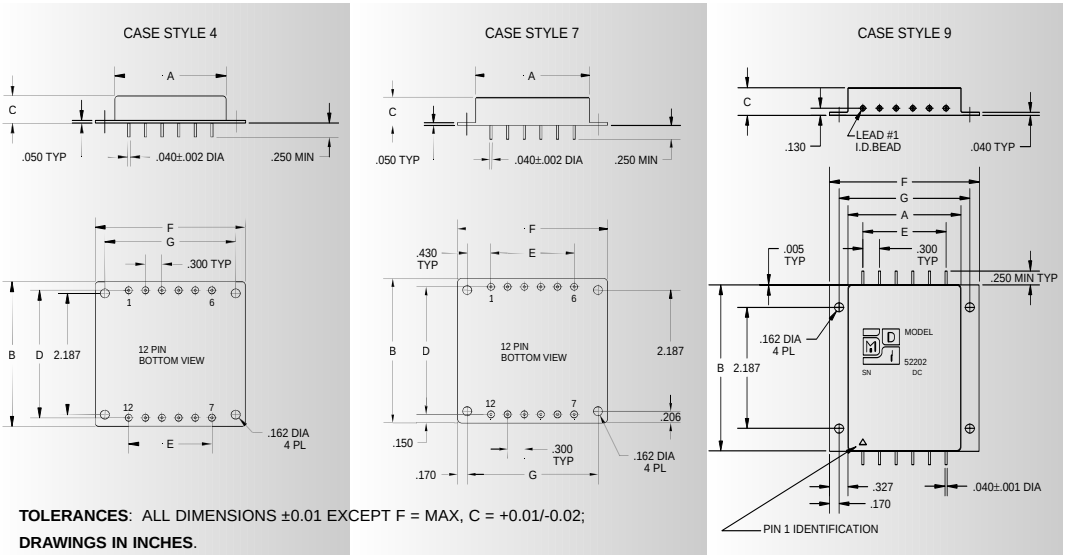
## *Specifications*

**INPUT**: 50 VDC nominal
Range: 30 to 75 VDC continuous
**ISOLATION**:
Input to case: 500 VDC
Input to output: 500 VDC
Output to case: 100 VDC
**ENVIRONMENT**:
Storage temperature: -55°C to +150°C
Shock: 50 G's
Acceleration: 500 G's
Vibration: 30 G's
Grades EU, L, & S:
Full Power Output at $T_{case}$ = +85°C
Linearly derates to zero at $T_{case}$ = +115°C
Grades LE, & SE:
Full Power Output at $T_{case}$ = +125°C
Linearly derates to zero at $T_{case}$ = +135°C
Grades L & LE:
TID up to 45kRad(Si)
No SEE up to 60MeV*cm2/mg
**WEIGHT**: 160 grams typical

| SINGLE OUTPUT DEVICES | | 7031-S02 (30W) | | | 7031-S02.5 (37.5W) | | | 7031-S03.3 (50W) | | | 7031-S05 (75W) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | CONDITION | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX |
| Output voltage | — | +1.9 | +2.0 | +2.1 | +2.4 | +2.5 | +2.6 | +3.2 | +3.3 | +3.4 | +4.9 | +5.0 | +5.1 |
| Output current | $V_{in\ min}$ — $V_{in\ max}$ | — | — | 15A | — | — | 15A | — | — | 15A | — | — | 15A |
| Efficiency | $P_{out}$ = max rated load | 55% | 58% | — | 60% | 63% | — | 65% | 68% | — | 70% | 73% | — |
| Line regulation | $P_{out}$ = max rated load $V_{in\ min}$ — $V_{in\ max}$ | — | 10mV | 30mV | — | 10mV | 30mV | — | 10mV | 30mV | — | 10mV | 50mV |
| Load regulation | $P_{out}$ = 10% to F.L. | — | 10mV | 30mV | — | 10mV | 30mV | — | 10mV | 30mV | — | 10mV | 50mV |
| Output ripple | F.L. BW 2 MHz $mV_{pp}$ | — | 25 | 50 | — | 30 | 60 | — | 30 | 65 | — | 40 | 85 |

| SINGLE OUTPUT DEVICES | | 7031-S05.2 (78W) | | | 7031-S12 (75W) | | | 7031-S15 (75W) | | | 7031-S28 (70W) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | CONDITION | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX |
| Output voltage | — | +5.1 | +5.2 | +5.3 | +11.9 | +12.0 | +12.1 | +14.9 | +15.0 | +15.1 | +27.8 | +28.0 | +28.2 |
| Output current | $V_{in\ min}$ — $V_{in\ max}$ | — | — | 15A | — | — | 6.25A | — | — | 5A | — | — | 2.5A |
| Efficiency | $P_{out}$ = max rated load | 70% | 73% | — | 77% | 81% | — | 78% | 82% | — | 77% | 81% | — |
| Line regulation | $P_{out}$ = max rated load $V_{in\ min}$ — $V_{in\ max}$ | — | 10mV | 50mV | — | 20mV | 100mV | — | 25mV | 125mV | — | 50mV | 250mV |
| Load regulation | $P_{out}$ = 10% to F.L. | — | 10mV | 50mV | — | 20mV | 100mV | — | 25mV | 125mV | — | 50mV | 250mV |
| Output ripple | F.L. BW 2 MHz $mV_{pp}$ | — | 40 | 85 | — | 60 | 150 | — | 75 | 180 | — | 150 | 350 |

| Model No. | Case Style | Pin Count | Mounting |
|---|---|---|---|
| 7031 | 4 | 12 | Solder Sealed PCB Mount with Flange |
| 7031 LF | 7 | 12 | Seam Weld PCB Mount with Flange |
| 7031 ZF | 9 | 12 | Seam Weld Chassis Mount with Flange |
| 7031 PD | 11 | 12 | Solder Sealed Flangeless PCB Stud Mount |




**TOLERANCES**: ALL DIMENSIONS ±0.01 EXCEPT F = MAX, C = +0.01/-0.02;
**DRAWINGS IN INCHES**.

## Case Dimensions

Units: inches | millimeters

| Case Style | | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|
| 4 | | 2.040 \| 51.816 | 2.610 \| 66.294 | 0.495 \| 12.573 | 2.300 \| 58.420 | 1.500 \| 38.100 | 2.710 \| 68.834 | 2.360 \| 59.944 |
| 7 | LF | 2.040 \| 51.816 | 2.610 \| 66.294 | 0.495 \| 12.573 | 2.300 \| 58.420 | 1.500 \| 38.100 | 2.710 \| 68.834 | 2.360 \| 59.944 |
| 9 | ZF | 2.040 \| 51.816 | 3.010 \| 76.454 | 0.495 \| 12.573 | — \| — | 1.500 \| 38.100 | 2.710 \| 68.834 | 2.360 \| 59.944 |
| 11 | PD | 2.040 \| 51.816 | 2.610 \| 66.294 | 0.495 \| 12.573 | 2.300 \| 58.420 | 1.500 \| 38.100 | — \| — | — \| — |

9006

# DC-DC CONVERTERS
## PROTON RAD HARD 100K+™ SERIES 7031

**MAGNETICALLY ISOLATED**

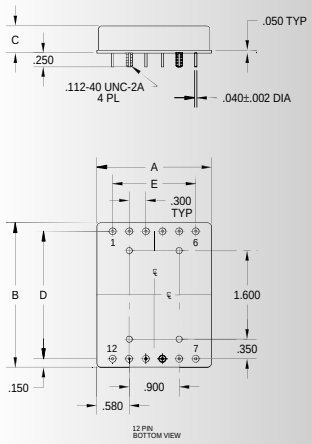
**50 VDC**

| DUAL OUTPUT DEVICES | | 7031-D05 (75W) | | | 7031-D12 (74.4W) | | | 7031-D15 (75W) | | | 7031-D20 (76W) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | CONDITION | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX |
| Output voltage | $+I_{out} = -I_{out}$ | +4.9<br>-4.9 | +5.0<br>-5.0 | +5.1<br>-5.1 | +11.9<br>-11.9 | +12.0<br>-12.0 | +12.1<br>-12.1 | +14.9<br>-14.9 | +15.0<br>-15.0 | +15.1<br>-15.1 | +19.9<br>-19.9 | +20.0<br>-20.0 | +20.1<br>-20.1 |
| Output current* | $V_{in\ min}$ — $V_{in\ max}$ | ±266mA | — | ±7.5A | ±158mA | — | ±3.1A | ±127mA | — | ±2.5A | ±190mA | — | ±1.9A |
| Efficiency | $P_{out}$ = max rated load | 72% | 75% | — | 77% | 81% | — | 78% | 82% | — | 78% | 83% | — |
| Line regulation | $P_{out}$ = max rated load<br>$V_{in\ min}$ — $V_{in\ max}$ | — | ±10mV | ±50mV | — | ±20mV | ±100mV | — | ±25mV | ±125mV | — | ±25mV | ±125mV |
| Load regulation† | $P_{out}$ = 10% to F.L. | — | ±10mV | ±50mV | — | ±20mV | ±100mV | — | ±25mV | ±125mV | — | ±25mV | ±125mV |
| Output ripple | F.L. BW 2 MHz<br>$mV_{pp}$ | — | 40 | 85 | — | 60 | 150 | — | 75 | 180 | — | 75 | 180 |

*Notes: *Up to 90% full power available from either output if rated output power is not exceeded; †balanced load conditions.*

| TRIPLE OUTPUT DEVICES | | 7031-T3.3/5 (32.25W) | | | 7031-T3.3/12 (42.75W) | | | 7031-T3.3/15 (47.25W) | | | 7031-T05 (32.5W) | | | 7031-T12 (43W) | | | 7031-T15 (47.5W) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | CONDITION | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX |
| Output voltage | $+I_{out} = -I_{out}$ | +3.2<br>+4.9<br>-4.9 | +3.3<br>+5.0<br>-5.0 | +3.4<br>+5.1<br>-5.1 | +3.2<br>+11.9<br>-11.9 | +3.3<br>+12.0<br>-12.0 | +3.4<br>+12.1<br>-12.1 | +3.2<br>+14.9<br>-14.9 | +3.3<br>+15.0<br>-15.0 | +3.4<br>+15.1<br>-15.1 | +4.9<br>+4.9<br>-4.9 | +5.0<br>+5.0<br>-5.0 | +5.1<br>+5.1<br>-5.1 | +4.9<br>+11.9<br>-11.9 | +5.0<br>+12.0<br>-12.0 | +5.1<br>+12.1<br>-12.1 | +4.9<br>+14.9<br>-14.9 | +5.0<br>+15.0<br>-15.0 | +5.1<br>+15.1<br>-15.1 |
| Output current | $V_{in\ min}$ — $V_{in\ max}$ | 750mA<br>±40mA | —<br>— | 7.5A<br>±750mA | 750mA<br>±40mA | —<br>— | 7.5A<br>±750mA | 750mA<br>±32mA | —<br>— | 7.5A<br>±750mA | 500mA<br>±40mA | —<br>— | 5A<br>±750mA | 500mA<br>±40mA | —<br>— | 5A<br>±750mA | 500mA<br>±32mA | —<br>— | 5A<br>±750mA |
| Efficiency | $P_{out}$ = max rated load | 65% | 68% | — | 65% | 68% | — | 65% | 68% | — | 65% | 68% | — | 70% | 73% | — | 70% | 73% | — |
| Line regulation | $P_{out}$ = max rated load<br>$V_{in\ min}$ — $V_{in\ max}$ | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV |
| Load regulation | $P_{out}$ = 10% to F.L. | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV | —<br>— | 10mV<br>25mV | 50mV<br>50mV |
| Output ripple | F.L. BW 2 MHz<br>$mV_{pp}$ | —<br>— | 30<br>— | 65<br>50 | —<br>— | 30<br>— | 65<br>50 | —<br>— | 30<br>— | 65<br>50 | —<br>— | 40<br>— | 85<br>50 | —<br>— | 40<br>— | 85<br>50 | —<br>— | 40<br>— | 85<br>50 |

CASE STYLE 11




| 7031-SXX output <24 VDC | | | | 7031-SXX output ≥24 VDC | | | | 7031-DXX | | | | 7031-TXX | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pin 1 | bit | Pin 7 | N/C | Pin 1 | bit | Pin 7 | adjust | Pin 1 | bit | Pin 7 | adjust | Pin 1 | bit | Pin 7 | N/C |
| Pin 2 | inhibit not | Pin 8 | main output | Pin 2 | inhibit not | Pin 8 | + remote sense | Pin 2 | inhibit not | Pin 8 | + remote sense | Pin 2 | inhibit not | Pin 8 | main output |
| Pin 3 | soft start | Pin 9 | main output ret | Pin 3 | soft start | Pin 9 | - remote sense | Pin 3 | soft start | Pin 9 | - remote sense | Pin 3 | soft start | Pin 9 | main output ret |
| Pin 4 | sync | Pin 10 | + remote sense | Pin 4 | sync | Pin 10 | main output | Pin 4 | sync | Pin 10 | + dual output | Pin 4 | sync | Pin 10 | + dual output |
| Pin 5 | + input | Pin 11 | adjust | Pin 5 | + input | Pin 11 | N/C | Pin 5 | + input | Pin 11 | dual output ret | Pin 5 | + input | Pin 11 | dual output ret |
| Pin 6 | input ret | Pin 12 | - remote sense | Pin 6 | input ret | Pin 12 | main output ret | Pin 6 | input ret | Pin 12 | - dual output | Pin 6 | input ret | Pin 12 | - dual output |

Please specify **GRADE LEVEL** for your application. EU grade units will be shipped if no option is specified.

**EU** Engineering Units
**L** 45 K+™, +85°C military/aerospace
**LE** 45 K+™, +125°C military/aerospace
**S** 100 K+™, +85°C space
**SE** 100 K+™, +125°C space

Revised 2026-04-30