

# Aerospace low-power LEO rectifiers



## To meet the challenges of satellite constellations



### LEO rectifiers combine automotive quality with space traceability for satellite constellation designs

The LEO rectifiers from STMicroelectronics are low-voltage ultrafast diodes designed for satellite power circuits. AEC-Q101 qualified and manufactured using automotive processes, the rad-hard LEO1N58xx (xx= 11, 19, 22) diodes are rad-hard rectifiers tested according to TID, TNID, and SEB specifications, and they are housed in the tiny SOD128Flat package.

Manufacturing traceability enables the delivery of parts from the same wafer lot accompanied by lot acceptance tests and a certificate of conformity.

#### KEY FEATURES

- Schottky or Ultrafast families
- Wafer lot traceability
- Lot Acceptance Tests LAT:
  - HTRB, TC, parametric
- Housed in SOD128Flat:
  - Tiny footprint: 12 mm<sup>2</sup>
  - Thermal resistance: 13°C/W
- Radiation hardness:
  - TID 300 krad(Si)
  - TNID 3.1011 p/cm<sup>2</sup>
  - SEB 60 MeV.cm<sup>2</sup>/mg

#### KEY APPLICATIONS

- Satellite constellations
- Propulsion control PPU
- Power distribution DPU
- Solar generator
- Transceiver DC-DC
- Navigation controller
- LV DC-DC power supply
- Auxiliary power supply

# AEROSPACE LOW-POWER LEO RECTIFIERS

The Schottky or Ultrafast family rectifiers are intrinsically resistant to radiative environments as defined in the ECSS-QST-60-15C1 standard. ST LEO rectifiers exceed the standard and are characterized in total ionization dose test at high dose rates (TID), single effect burnout (SEB), and total non-ionization dose (TNID), as described below.

Symbol	Characteristics	Value
<b>TID</b>	As per ESCC 22900, HDR	300 krad(Si)
<b>TNID</b>	As per ESCC 22500	$3.10^{11}$ p/cm <sup>2</sup>
<b>SEB</b>	As per ESCC 25100, fluence : $10^7$ ions/cm <sup>2</sup>	60 MeV.cm <sup>2</sup> /mg

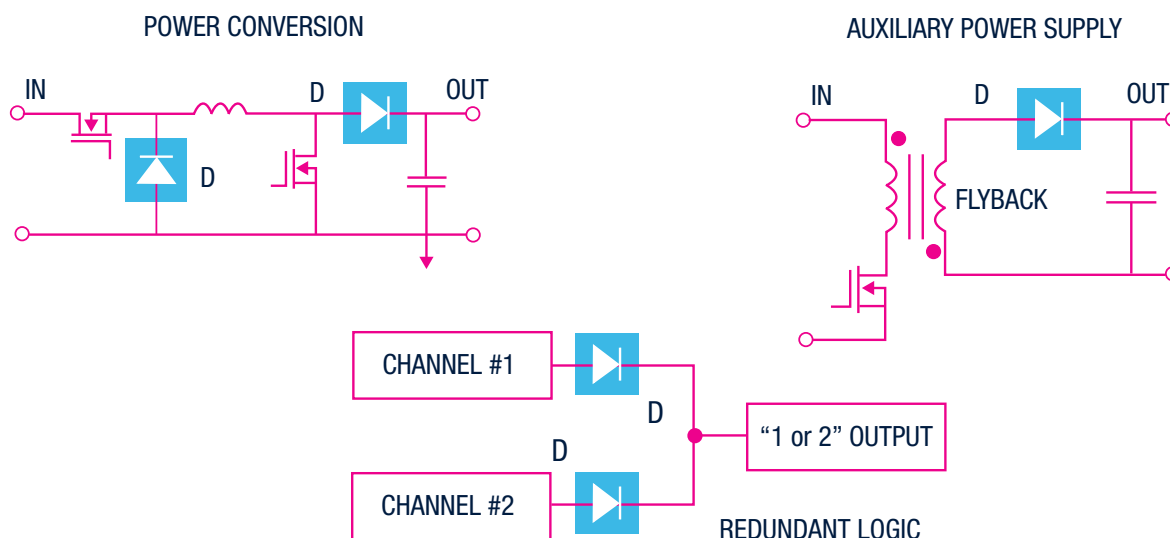


Note:  $T_{AMB} = 22^{\circ}\text{C}$

The SOD128Flat package is made of an ASTM E595 outgassing tested molding resin and is graded MSL1 for JSTD-020 moisture sensitivity. It connects the diode to the leads with a copper clip for a higher surge current rating, and its leads are 100% matte-tin plated and meet JESD 201 whisker test class 2.

The LEO rectifiers are suitable for switching mode power supplies and high frequency DC-DC converters, such as low-voltage, high-frequency inverters, OR-rings, free-wheeling, blocking diodes, and reverse polarity protection. It is well suited for critical mission equipment, including avionics and high reliability (Hi-Rel) industrial.

## Typical applications of the LEO rectifiers



## LEO rectifier electrical characteristics

Partnumber	$V_{RRM}$ (V)	$I_{FO}$ (A)	$V_F$ max at $125^{\circ}\text{C}$ and $I_{FO}$ (V)	$I_{FSM}$ (A)	$T_J$ max $^{\circ}\text{C}$	trr ns	Package
<b>Schottky rectifier</b>							
LE01N5819AF	45	1	0.45	25	150	-	SOD128F
LE01N5822AF	40	3	0.45	80	150	-	SOD128F
<b>Ultrafast rectifier</b>							
LE01N5811AF	150	6	0.97	105	175	35	SOD128F



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