

Radiation tolerant N-channel Power MOSFETs

A family of radiation tolerant N-channel MOSFETs in plastic packages for LEO missions and (mega) constellations

The Enhanced Commercial Power MOSFETs in plastic packages are designed to meet the requirements for short term, 2-5 year, LEO missions and constellations. The products are single event effect (SEE) tolerant and specified with a LET of $46 \text{ MeV} \cdot \text{cm}^2/\text{mg}$. They can be used in space applications without further radiation tests, like proton tests. They also withstand a Total Ionizing Dose of 30 krad(Si), which supports the targeted mission lifetime of 2-5 years.

The product family offers four different N-channel MOSFETs based on the unique Infineon CoolMOS™ super-junction technology. This makes them ideal for fast switching applications. There are two voltage options, 60 V and 150 V, supporting the most common bus voltages of 28 V and 54 V used in LEO satellites. The $R_{DS(on)}$ values range from 15 mΩ to 60 mΩ.

There are two plastic package options available, the surface mount TO-263 and the through hole TO-247. The TO-263 supports easy assembly and re-flow soldering, while the TO-247 can be used for an optimized cooling concept for higher currents. Both package types have leads plated with matte tin to reduce whisker build.

The radiation tolerant N-channel MOSFETs are qualified according to the automotive standard AEC-Q101 with an operating temperature from -40°C to $+125^\circ\text{C}$.



TO-247 package



TO-263 package

Key features

Product features

- Optimized for LEO missions and constellations
- Radiation tolerant
 - LET of $46 \text{ MeV} \cdot \text{cm}^2/\text{mg}$
 - TID of 30 krad(Si)
- Automotive qualified according to AEC-Q101 standard
- Two voltage classes: 60 V and 150 V V_{DS} (max)
- $R_{DS(on)}$ (max) @ 25°C from 15 mΩ to 60 mΩ
- Surface mount and thru hole packages available

Target applications

- Ideally suited for all power related applications including
 - Power condition unit
 - Power distribution unit
 - DC-DC converters

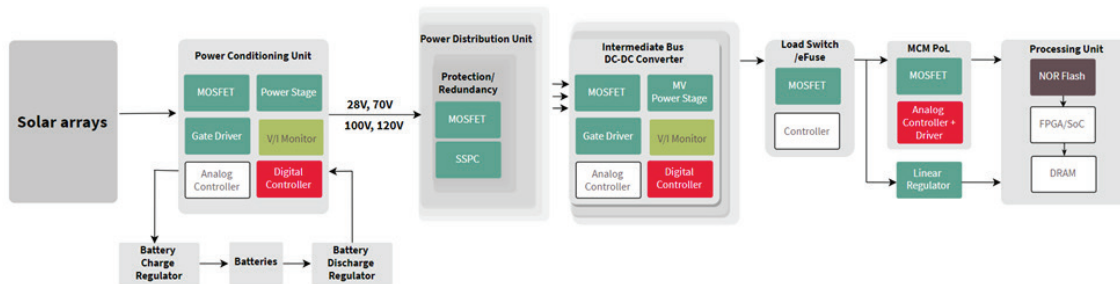
Key benefits

- No component level testing at customer side, as SEE and TID levels are specified on product level
- Commercially attractive due to high volume assembly lines

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Space power architecture



Product table

Product name	Package	Channel	BV_{DSS} (V)	Q_G (nC)	$R_{DS(on)}$ @25°C	I_{DC} @25°C	I_{dpuls} (A)	Power dissipation (W)	Gate voltage	Die size
BUP06CN015E-01	TO-247	N	60	75	15	45	200	390	+/- 20	6
BUP06CN035L-01	TO-263	N		25	35	35	100	150	+/- 20	3
BUP15CN027E-01	TO-247	N	150	75	27	45	180	390	+/- 20	6
BUP15CN060L-01	TO-263	N		25.5	60	23	93	150	+/- 20	3



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Published by
Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg, Germany

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Public
Document number: B119-I1426-V1-7600-NA-EC-P
Date: 10/2023

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