PRODUCT BRIEF

Radiation tolerant P-channel Power MOSFETs

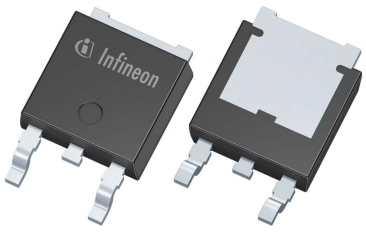
Radiation tolerant P-channel MOSFETs in a plastic package designed for short to medium mission lifecycles

Infineon HiRel's plastic-packaged radiation tolerant power MOSFETs are designed to meet the requirements of short term, 2-5 year, LEO missions and medium to large satellite constellations. The products are Single Event Effect (SEE) tolerant with a Linear Energy Transfer (LET) specification up to 46 MeV·cm²/mg. They can be used in space applications without further radiation tests, such as proton tests. They are rated to withstand a Total Ionizing Dose of 30 krad(Si) or 50 krad(Si), which supports the targeted mission lifetime of 2-5 years.

The P-channel product family currently offers four radiation tolerant MOSFETs, BUP06CP038F-01, BUP06CP045F-02, BUP03CP008C-01, and BUP03CP010C-02. These devices, built on Infineon's high volume power technology, are ideal for all fast switching applications.

The BUP06CP038F-01 and BUP06CP045F-02 devices are available in the surface mount TO-252-3 plastic package which supports easy assembly and re-flow soldering. Additionally, their leads are plated with matte tin to reduce whisker build. The BUP03CP008C-01 and BUP03CP010C-02 devices are available in the SuperSO8 package and have a high current carrying capability, making them ideal for high power applications.

This radiation tolerant P-channel MOSFETs are qualified for space applications according to the relevant tests of AEC-Q101 or JEDEC. They are specified with the junction temperature from -55°C to min +150°C.



TO-252 package



SuperSO8 package

Key features

Product features

- Optimized for short to medium missions and constellations
- Radiation tolerant
  - LET of 46 MeV·cm²/mg
  - TID of 30 krad(Si) or 50 krad(Si)
- Qualified for space applications according to AEC-Q101 or JEDEC standard
- Two voltage classes: -60 V and -30 V V_{DS} (max)
- $R_{DS(on)}$ (max) @ 25°C: from 8 mΩ to 45 mΩ
- ID @ 25°C: -35 A or -100 A
- Plastic SMD package PG-TO252 or SuperSO8

Target applications

- Protection switch
- Load switch
- Power distribution
- Battery management systems

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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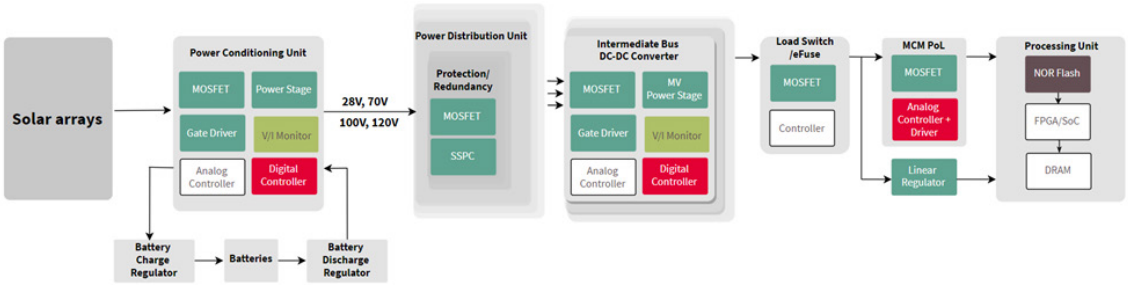
Space power architecture



Product table

Product name	Package	Channel	TID max (krad(Si))	BV_{DSS} (V)	Q_G (nC)	$R_{DS(on)}$ @25°C (mΩ)	I_{DC} @25°C (A)	I_{dpuls} (A)	Power dissipation (W)	Gate voltage
BUP06CP038F-01	TO-252-3	P	30	-60	63	38	-35	-140	125	+/- 20
BUP06CP045F-02	TO-252-3	P	50	-60	65	45	-35	-140	125	+/- 20
BUP03CP008C-01	TDSON-8-1	P	30	-30	61	8	-100	-200	83	+/- 20
BUP03CP010C-02	TDSON-8-1	P	50	-30	61	10	-100	-200	83	+/- 20

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

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Public

Date: 3/2026

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