

License-free power FETs for space

Ecosystem of N- and P-channel options from -200 V to -600 V

Infineon has a long history of serving the space industry with high reliability radiation hardened semiconductor solutions. We understand the requirements and challenges of designing for reliable performance in the extreme thermal, mechanical and radiation environments of space. For decades, customers have relied on Infineon power solutions in thousands of mission-critical space, aerospace and national security programs. Many of these missions are still in operation today.

Together with our subsidiary, International Rectifier HiRel Products (IR HiRel), an Infineon Technologies company, Infineon combines world-class heritage with deep technical expertise to deliver benchmark power solutions for space. Our license-free rad hard power management offering is recognized globally for its excellent performance, reliability, supply longevity and unparalleled design heritage.

License-free rad hard space power FETs

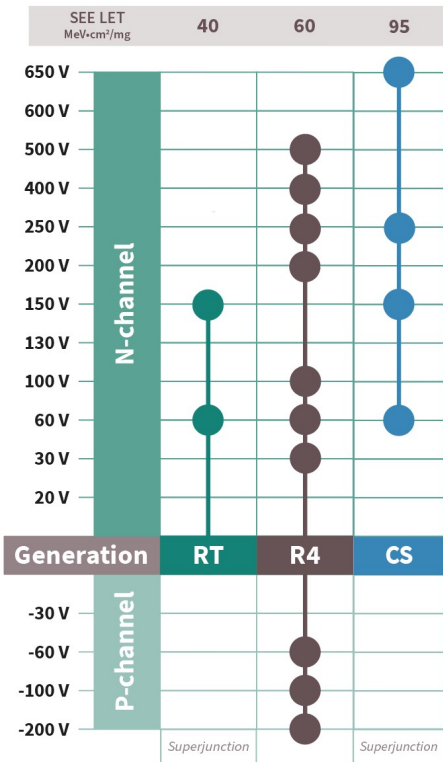
Infineon offers a broad selection of license-free N-channel and P-channel rad hard MOSFETs in a wide range of packaging options, spanning from -200 V to 650 V.

Key features

- ESA-qualified options
- Best in class radiation hardness and electrical performance
- Radiation tolerant FETs for short-term, 2-5 year, LEO missions and constellations
- Broad selection of N- and P-channel power MOSFETs, including highest voltage rad hard space-qualified FET on the market

Target applications

- Space-grade DC-DC converters
- Intermediate bus converters
- Motor controllers
- Other high-speed switching designs
- High-side and low-side load switching
- Overload protection switching



- Rad tolerant MOSFETs are plastic encapsulated and optimized for 2-5 year mission lifetime
- R4 is an all purpose legacy design with extensive space heritage
- CS superjunction PowerMOS are ESA-qualified and offer best-in-class electrical performance and radiation hardness



New space



Space



Defense technology

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Infinion PowerMOS transistors

Based on Infineon's unique CoolMOS™ superjunction technology, the single radiation hard PowerMOS transistors are the worldwide benchmark in radiation hardness and electrical performance.

- TID hardness is specified up to 100 krad(Si) (300 krad(Si) on request)
- SEE tested up to LET 95 MeV•cm²/mg with Pb and LET 62 MeV•cm²/mg with Xe ions

With their extremely low specific RDS(on) and comfortable Safe Operating Area (SOA), Infineon's PowerMOS transistors deliver best-in-class radiation performance for all kinds of space applications.

The PowerMOS family is rated 60 V to 650 V in through hole and SMD package options screened to ESCC-5000 and available as ESA QPLs. These MOSFETs are also available as qualified bare die.

Product table

Product name	ESCC part number	Package	V _{DSS} (V)	Q _G (nC)	R _{DS(on)} @25°C	I _{DC} @25°C	I _{dpuls} (A)	Power dissipation (W)	Gate voltage	ESD class	ESA qualified
BUY06CS23K-01(ES)	5205 032 03	TO-257AA	60	26	36	23	100	75	+/- 20	2	QPL
BUY06CS23K-01(P)		TO-257AA	60	26	36	23	100	75	+/- 20	2	
BUY06CS35J-01(ES)	5205 032 01	SMD-0.5	60	25	28	35	100	75	+/- 20	2	QPL
BUY06CS35J-01(P)		SMD-0.5	60	25	28	35	100	75	+/- 20	2	
BUY06CS45B-01(ES)	5205 032 04	TO-254AA	60	75	14	45	200	208	+/- 20	2	QPL
BUY06CS45B-01(P)		TO-254AA	60	75	14	45	200	208	+/- 20	2	
BUY06CS80A-01(ES)	5205 032 02	SMD-2	60	175	5.6	80	300	250	+/- 20	2	QPL
BUY06CS80A-01(ES)		SMD-2	60	175	5.6	80	300	250	+/- 20	2	
BUY15CS23J-01(ES)	5205 031 01	SMD-0.5	150	25	55	23	93	75	+/- 20	1C	QPL
BUY15CS23J-01(P)		SMD-0.5	150	25	55	23	93	75	+/- 20	1C	
BUY15CS23K-01(ES)	5205 031 03	TO-257AA	150	25	55	23	93	75	+/- 20	1C	QPL
BUY15CS23K-01(P)		TO-257AA	150	25	55	23	93	75	+/- 20	1C	
BUY15CS45B-01(ES)	5205 031 04	TO-254AA	150	75	23	57	180	208	+/- 20	1C	QPL
BUY15CS45B-01(P)		TO-254AA	150	75	23	57	180	208	+/- 20	1C	
BUY15CS57A-01(ES)	5205 031 02	SMD-2	150	160	9	57	224	250	+/- 20	1C	QPL
BUY15CS57A-01(ES)		SMD-2	150	160	9	57	224	250	+/- 20	1C	
BUY25CS12J-01 (ES)	5205 026	SMD-0.5	250	42	100	12.4	50	75	+/- 20	1C	QPL
BUY25CS12J-01 (P)		SMD-0.5	250	42	100	12.4	50	75	+/- 20	1C	
BUY25CS12K-01 (ES)	5205 030 01	TO-257AA	250	42	120	12.4	50	75	+/- 20	1C	QPL
BUY25CS12K-01 (P)		TO-257AA	250	42	120	12.4	50	75	+/- 20	1C	
BUY25CS12K-11 (ES)	5205 030 02	TO-257AA	250	42	120	12.4	50	75	+/- 20	1C	QPL
BUY25CS12K-11 (P)		TO-257AA	250	42	120	12.4	50	75	+/- 20	1C	
BUY25CS45B-01 (ES)	5205 030 03	TO-254AA	250	100	45	45	180	208	+/- 20	1C	QPL
BUY25CS45B-01 (P)		TO-254AA	250	100	45	45	180	208	+/- 20	1C	
BUY25CS54A-01 (ES)	5205 027	SMD-2	250	180	25	54	214	250	+/- 20	1C	QPL
BUY25CS54A-01 (P)		SMD-2	250	180	25	54	214	250	+/- 20	1C	
BUY65CS08J-01(ES)	5205 033 01	SMD-0.5	650	23	370	8	24	75	+/- 20	1C	QPL
BUY65CS08J-01(P)		SMD-0.5	650	23	370	8	24	75	+/- 20	1C	
BUY65CS28A-01(ES)	5205 033 02	SMD-2	650	67	116	28	80	215	+/- 20	1C	QPL
BUY65CS28A-01(P)		SMD-2	650	67	116	28	80	215	+/- 20	1C	

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Radiation tolerant N-channel PowerMOS FETs

Infineon’s radiation tolerant PowerMOS FETs 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 MeV · cm²/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 MOS-FETs 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°C.

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

ESD class voltage ranges

ESD class	Voltage (V)
0	<250
1A	250-499
1B	500-999
1C	1,000-1,999





ESD class	Voltage (V)
2	2,000-3,999
3A	4,000-7,999
3B	8,000-15,999
Nonsensitive	16,000+

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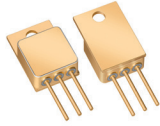

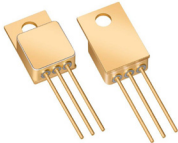
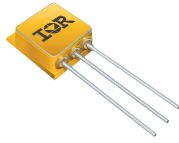
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Package overview

Surface mount

SMD-0.2	SMD-0.5	SMD-2	TO-263
			

Through hole

MO-036AB	TO-205AF	TO-247	TO-254
			
Tabless TO-254	TO-257	Tabless TO-257	
			

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