

# Infineon IR HiRel defense product selection guide

Design smaller, lighter, more reliable, and long-lasting equipment with Infineon's high reliability power and memory solutions



## DEFENSE APPLICATIONS

### Reliable memory and power solutions

At Infineon IR HiRel, an Infineon Technologies company, we design and manufacture best-in-class MIL-PRF qualified high reliability power and memory solutions for aerospace and defense applications. For over 40 years, IR HiRel has been a trusted supplier and partner to the Department of Defense (DoD) and other government agencies, such as the National Aeronautics and Space Administration (NASA) and the Defense Advanced Research Projects Agency (DARPA). IR HiRel also maintains a long-standing relationship with defense primes in the US and Western Europe. Our leading-edge Silicon (Si), Silicon Carbide (SiC), memory, and Gallium Nitride (GaN) commercial-off-the-shelf (COTS) portfolio set us apart by offering our customers unparalleled performance, reliability, and reduced design cycles. We simplify and accelerate your design process by performing extensive product qualification testing and meticulous screening in-house, ensuring reliable and efficient solutions every time. Our products have been designed and manufactured to endure the harshest operating conditions from the deepest depths of the ocean to the far reaches of the universe. For decades, designers and engineers have chosen IR HiRel products for their performance, quality and innovation. IR HiRel stands ready to help you solve your toughest design challenges now and into the future.

### Quality conformance testing

Our HiRel products meet various levels of quality conformance testing to ensure their performance in harsh military applications, including:

- MIL-PRF-19500/MIL-STD-750
- MIL-PRF-38534/MIL-STD-883
- MIL-PRF-38535/MIL-STD-883



Defense  
technology

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# Glossary

## Screening levels

- **Class H:** Class H is the standard military quality level provided in MIL-PRF-38534, General Specification for Hybrid Microcircuits. It is intended for space applications.
- **Level B:** Class level B defines the screening requirements for high reliability military applications as specified in MIL-STD-883 and is intended for use in class H products.
- **Level S:** Class level S defines the screening requirements for high reliability space applications as specified in MIL-STD-883 and is intended for use in class K products.
- **JAN:** JAN (Joint Army Navy) is the prefix assigned by the DLA to designate devices on the DLA qualified parts list.
- **JANTX:** Military screening level as specified in MIL-PRF-19500 for a DLA qualified device.
- **JANTXV:** Military with visual inspection screening level as specified in MIL-PRF-19500 for a DLA qualified device.
- **JANS:** Space level screening as specified in MIL-PRF-19500 for a DLA qualified device.

# Advanced packaging simplifies design

System designers are often challenged by making a reliable attachment of surface mount hermetic power packages to PCBs. Thermal expansion mismatch of the board and power package require unique solutions for extreme environment applications. Our defense memories meet QML-Q certifications, optimizing mil-aero applications with robust performance and reliability. Our HiRel power solutions are manufactured in MIL-PRF qualified facilities, bringing ruggedized discrete MOSFETs, power ICs, and IGBTs to the defense market.

## Screening and QCI

Our customers' applications demand high reliability devices that perform to specification in the harshest environments for 15 years and longer. Mission and product assurance are key priorities. To ensure top performance and operability, our products undergo rigorous screening and quality conformance inspections (QCI).

IR HiRel, an Infineon Technologies company, performs 100% screening of all components in accordance with specified quality levels. Additional testing eliminates nonconforming parts, increasing confidence in the reliability of long-lasting, high performance specification compliance.

Our high reliability products also undergo various levels of periodic quality conformance testing. Both the US and European communities have developed specifications detailing quality conformance testing sequence.

- US DLA (Defense Logistics Agency) specifications, MIL-PRF-19500 and MIL-STD-750, govern the quality conformance testing sequence performed on discrete MOSFET semiconductors manufactured to JANS or JANTXV levels.
- In Europe, ESA's (European Space Agency) ESCC 5000 is the standard for discrete semiconductors, hermetically sealed and die.

We offer rad hard power MOSFETs and diodes with the following screening and QCI levels based on DLA MIL-PRF-19500:

- DLA approved Qualified Product List (QPL) with S-level screenings to MIL-PRF-19500, sold under military part number starting with JAN branded prefix under DLA approved slash sheet. JANS is the most rigorous level of screening and acceptance requirements available to assure the performance, quality and reliability of discrete semiconductors intended for space flight applications.
- IR HiRel's Qualified IR List (QIRL) with S-level equivalent screenings to MIL-PRF-19500, manufactured and tested on the same production line with the same flow as MIL-PRF-19500 DLA approved line. QIRL part numbers have SCS suffixes.
- Source Control Drawing (SCD)
- Commercial off the shelf (COTS) with no QCI

For customers needing ESA ESCC-5000 qualified components, we offer the following quality levels:

- "P" for prototype level used in Engineering Modules (EM)
- "ES" for ESA space level, ESA satellites Flight Modules (FM)



# COTS+ customer engagement model

Infinion's high reliability and extreme environment services are designed to streamline your design process, providing efficient solutions that meet the most stringent application requirements. Our global partner network and cutting-edge technology expertise enable our customers to develop innovative products that thrive in challenging environments, from industrial automation to defense applications where reliability is paramount.

By leveraging our expertise, customers can accelerate their time to market with shorter qualification cycles, ensuring their products are ready for deployment when it matters most. Whether it's for mission-critical defense systems or industrial applications, our Field Application Engineers uniquely collaborate with customers to

meet the unique demands of each project, ensuring our customers can focus on what matters most: delivering reliable performance.

We offer a range of services to support our customers' go-to-market strategies. From data sheet markups to additional screening and bare die sales, we are committed to optimizing your efficiency. Our unique single manufacturing flow enables wafer lot traceability. Furthermore, our packaging, including hermetic options and plastic alternatives with the option for mil-temp qualification and lead-solder, allow us to meet the diverse needs of our customers. If you're interested in learning more about our high reliability and extreme environment add ons, please reach out to a local HiRel sales representative for more information.



## Leverage Infineon's product portfolio for defense applications through HiRel services

### Identification and traceability

- Single manufacturing flow
- Wafer lot traceability

### Upscreening

- 100% wafer level probe
- Increase wafer keep-out areas
- Tighter no-go criteria when running probe test patterns
- DPAT (Dynamic Part Average Test)
- AVI (Automatic Visual Inspection)
- Characterization over MIL temp-range -55°C to 125°C

### Continuity of supply/longevity program

- 100% wafer, die, or packaged device bank up to 20 years
- Redundant, U.S. based storage locations
- Controlled obsolescence

### Availability in die/wafer form

- Support die and wafer sales not offered by Infineon's commercial divisions

### Plastic or hermetic package

- Leverage HiRel's latest hermetic package technology
- Plastic with option for mil-temp qualification
- Americas-based assembly and test (hermetic packages)

**Have questions? Speak to an Infineon IR HiRel Regional Sales Manager to discuss Infineon's COTS+ capabilities.**

# High reliability power MOSFETs

Wide ranging portfolio of DLA and QPL qualified hermetically packaged MOSFETs manufactured on a MIL-PRF-19500 line.

## Single Channel high reliability power MOSFETs

Infineon IR HiRel offers a broad portfolio of high reliability single channel power MOSFETs. Our hermetically packaged N- and P-channel options leverage our well-known rugged MOSFET technology.

### N-channel

Part Number	V <sub>BRDSS</sub> [V]	R <sub>DS(on)</sub> @25°C [mΩ]	I <sub>D</sub> @25°C [A]	Package	QPL Part No.	Qual
IRF3CMS17N80	800	340	15	TO-254AA Low Ohmic	-	-
2N6794	500	3000	1.5	TO-205AF	2N6794	DLA
IRFF420	500	3000	1.5	TO-205AF	2N6794	DLA
IRF430	500	1500	4.5	TO-204AA	2N6762	DLA
IRFY430CM	500	1500	4.5	TO-257AA	-	-
2N6802	500	1500	2.5	TO-205AF	2N6802	DLA
IRFE430	500	1500	2.5	18-pin LCC	2N6802U	DLA
IRFF430	500	1500	2.5	TO-205AF	2N6802	DLA
IRF440	500	850	8	TO-204AA	-	-
IRFM440	500	850	8	TO-254AA	2N7222	DLA
IRFN440	500	850	8	SMD-1	2N7222U	DLA
IRFY440CM	500	850	7	TO-257AA	-	-
IRFM450	500	415	12	TO-254AA	2N7228	DLA
IRFN450	500	415	12	SMD-1	2N7228U	DLA
2N6770	500	400	12	TO-204AA	2N6770	DLA
IRF450	500	400	12	TO-204AA	2N6770	DLA
IRF460	500	270	21	TO-204AE	-	-
IRFM460	500	270	19	TO-254AA	-	-
2N6786	400	3600	1.25	TO-205AF	2N6786	DLA
IRFF310	400	3600	1.25	TO-205AF	2N6786	DLA
2N6760	400	1000	5.5	TO-204AA	2N6760	DLA
IRF330	400	1000	5.5	TO-204AA	2N6760	DLA
2N6800	400	1000	3	TO-205AF	2N6800	DLA
IRFF330	400	1000	3	TO-205AF	2N6800	DLA
IRF340	400	550	10	TO-204AA	-	-
IRFN340	400	550	10	SMD-1	2N7221U	DLA
IRFY340CM	400	550	8.7	TO-257AA	-	-
IRFM350	400	315	14	TO-254AA	2N7227	DLA
IRFN350	400	315	14	SMD-1	2N7227U	DLA
2N6768	400	300	14	TO-204AE	2N6768	DLA
IRF350	400	300	14	TO-204AE	2N6768	DLA



Part Number	V <sub>BRDSS</sub> [V]	R <sub>DS(on)</sub> @25°C [mΩ]	I <sub>D</sub> @25°C [A]	Package	QPL Part No.	Qual
IRF360	400	200	25	TO-204AE	-	-
IRFM360	400	200	23	TO-254AA	-	-
2N6784	200	1500	2.25	TO-205AF	2N6784	DLA
IRFF210	200	1500	2.25	TO-205AF	2N6784	DLA
IRFY220	200	800	5	TO-204AA	-	-
IRF220	200	800	5	TO-204AA	-	-
2N6790	200	800	3.5	TO-205AF	2N6790	DLA
IRFF220	200	800	3.5	TO-205AF	2N6790	DLA
IRF230	200	400	9	TO-204AA	2N675	DLA
2N6798	200	400	5.5	TO-205AF	2N6798	DLA
IRFE230	200	400	5.5	LCC-18 package	2N6798	COTS
IRFF230	200	400	5.5	TO-205AF	2N6798	COTS
IRF240	200	180	18	TO-204AE	-	-
IRFM240	200	180	18	TO-254AA	2N7219	DLA
IRFN240	200	180	18	SMD-1	2N7219U	DLA
IRFY240CM	200	180	16	TO-257AA	-	-
IRFM250	200	100	27.4	TO-254AA	2N7225	DLA
IRFN250	200	100	27.4	SMD-1	2N7225U	DLA
2N6766	200	85	30	TO-204AE	2N6766	DLA
IRF250	200	85	30	TO-204AE	2N6766	DLA
IRFM260	200	60	35	TO-254AA	-	-
IRF5Y3315CM	150	85	18	TO-257AA	-	-
IRF5NJ3315	150	80	20	SMD-0.5	-	-
IRF5M3415	150	49	35	TO-254AA	-	-
2N6782	100	600	3.5	TO-205AF	2N6782	DLA
IRFE110	100	600	3.5	18-pin LCC	2N6782U	DLA
IRFF110	100	600	3.5	TO-205AF	2N6782	DLA
2N6788	100	300	6	TO-205AF	2N6788	DLA
IRFE120	100	300	6	18-pin LCC	2N6788U	DLA
IRFF120	100	300	6	TO-205AF	2N6788	DLA
IRF120	100	270	9.2	TO-204AA	-	-
IRFY130CM	100	180	14.4	TO-257AA	-	-
2N6756	100	180	14	TO-204AA	2N6756	DLA
IRF130	100	180	14	TO-204AA	2N6756	DLA
2N6796	100	180	8	TO-205AF	2N6796	DLA
IRFE130	100	180	8	18-pin LCC	2N6796U	DLA
IRFF130	100	180	8	TO-205AF	2N6796	DLA
IRFN150	100	81	34	SMD-1	2N7224U	DLA
IRF140	100	77	28	TO-204AE	-	-
IRFM140	100	77	28	TO-254AA	2N7218	DLA
IRFN140	100	77	28	SMD-1	2N7218U	DLA
IRFY140CM	100	77	16	TO-257AA	-	-
IRFM150	100	70	34	TO-254AA	2N7224	DLA
IRF5Y540CM	100	58	18	TO-257AA	-	-
IRF150	100	55	38	TO-204AE	2N6764	DLA
IRF5NJ540	100	52	22	SMD-0.5	-	-
IRF5Y3710CM	100	35	18	TO-257AA	-	-
IRF5M3710	100	30	35	TO-254AA	-	-
IRF5N3710	100	28	45	SMD-1	-	-
IRF7NA2907	75	4.5	75	SMD-2	-	-

Part Number	V <sub>BRDSS</sub> [V]	R <sub>DS(on)</sub> @25°C [mΩ]	I <sub>D</sub> @25°C [A]	Package	QPL Part No.	Qual
IRF7NA2907	75	4.5	75	SMD-2	-	-
IRFM054	60	27	35	TO-254AA	-	-
IRF054	60	22	45	TO-204AE	-	-
IRFN054	60	20	55	SMD-1	-	-
IRL5NJ024	55	60	17	SMD-0.5	-	-
IRF5NJZ34	55	40	22	SMD-0.5	-	-
IRF5NJZ48	55	16	22	SMD-0.5	-	-
IRF7Y1405CM	55	15.3	18	TO-257AA	-	-
IRF5M3205	55	15	35	TO-254AA	-	-
IRF7N1405	55	5.3	55	SMD-1	-	-
IRL5NJ7413	30	14	22	SMD-0.5	-	-

## P-channel

Part Number	V <sub>BRDSS</sub> [V]	R <sub>DS(on)</sub> @25°C [mΩ]	I <sub>D</sub> @25°C [A]	Package	QPL Part No.	Qual
IRFYB9130CM	100	300	-11.2	TO-257AA Tabless Low Ohmic	-	-
IRFG9110	100	140	-0.75	MO-036AB	2N7335	DLA
IRL5NJ7404	-20	40	-11	SMD-0.5	-	-
IRF5M4905	-55	30	-35	TO-254AA	-	-
IRF5N4905	-55	24	-55	SMD-1	-	-
IRFF9110	-100	1200	-2.5	TO-205AF	-	-
IRFE9120	-100	600	-3.5	18-pin LCC	2N6845U	DLA
2N6845	-100	600	-4	TO-205AF	2N6845	DLA
IRFF9120	-100	600	-4	TO-205AF	2N6845	DLA
2N6849	-100	300	-6.5	TO-205AF	2N6849	DLA
IRFE9130	-100	300	-6.5	18-pin LCC	2N6849U	DLA
IRFF9130	-100	300	-6.5	TO-205AF	2N6849	DLA
IRFY9130CM	-100	300	-11	TO-204AA	2N6804	DLA
IRFY9140CM	-100	200	-15.8	TO-257AA	-	-
IRF9140	-100	200	-18	TO-204AA	-	-
IRFM9140	-100	200	-18	TO-254AA	2N7236	DLA
IRFN9140	-100	200	-18	SMD-1	2N7236U	DLA
IRF5NJ9540	-100	117	-18	SMD-0.5	-	-
IRF5Y9540CM	-100	117	-18	TO-257AA	-	-
IRF5M5210	-100	70	-34	TO-254AA	-	-
IRF5N5210	-100	60	-31	SMD-1	-	-
IRF5NJ6215	-150	290	-11	SMD-0.5	-	-
IRF9230	-200	Coming Soon		TO-204AA	-	-
IRFF9210	-200	3000	-1.5	TO-205AF	-	-
2N6847	-200	1500	-2.5	TO-205AF	2N6847	DLA
IRFF9220	-200	1500	-2.5	TO-205AF	2N6847	DLA
IRFE9230	-200	800	-4	18-pin LCC	-	-
2N6851	-200	800	-4	TO-205AF	2N6851	DLA
IRFF9230	-200	800	-4	TO-205AF	2N6851	DLA
IRFY9240CM	-200	510	-9.4	TO-257AA	-	-
IRFM9240	-200	510	-11	TO-254AA	2N7237	DLA
IRFN9240	-200	510	-11	SMD-1	2N7237U	DLA
IRF9240	-200	500	-11	TO-204AA	-	-

# High reliability power MOSFETs

## Dual Channel high reliability power MOSFETs

Ideal for voltage control, fast switching, ease of paralleling and electrical parameter temperature stability applications, our dual channel power MOSFETs are lightweight and hermetically packaged.

### Products

Part number	$V_{BRDSS}$ [V]	$R_{DS(on)}$ @25°C [mΩ]	$I_d$ @ 25°C [A]	Package	QPL Part No.	Qual
IRFG6110	100	700	-0.75	MO-036AB	2N7336	DLA
IRFG5110	100	700	-1	MO-06AB	-	-

## Quad Channel high reliability power MOSFETs

Enabling low on-state resistance and high transconductance, supporting thermal efficiency and reducing drain capacitance.

### Products

Part number	$V_{BRDSS}$ [V]	$R_{DS(on)}$ @25°C [mΩ]	$I_d$ @ 25°C [A]	Package	QPL Part No.	Qual
IRFG110	100	700	1	MO-036AB	2N7334	DLA

## Statuses

Visit [infineon.com/defense](https://www.infineon.com/defense) or contact our customer services team for product statuses. All listed products are active and preferred.

# High reliability power ICs

High speed, high power MOSFET and IGBT gate drivers.

Infineon IR HiRel's high reliability power ICs are designed to excel in extreme environments. Our portfolio includes high performance, high voltage power MOSFET and IGBT drivers, featuring independent high and low side referenced output channels, perfectly complementing our robust power MOSFETs.

## Products

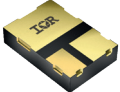






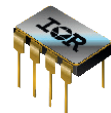

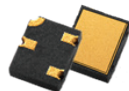


Part Number	VS max [V]	Supply Voltage [V]	Output Voltage [V]	Package	Configuration
IR2113L6	600	20	10	M-036AB	Hi & Lo Mos Drivers
IR2113L6SCB	600	20	10	M-036AB	
IR2113E6	600	20	10	18-pin LCC	
IR2113E6SCB	600	20	10	18-pin LCC	
IR2110E4SCB	600	20	10	18-pin LCC	
IR2110L4SCB	600	20	10	M-036AB	
IR212DSCS	600	20	10	M-036AB	3PH Bridge Driver
IR2110L4SCS	600	20	10	M-036AB	Hi & Lo Mos Drivers
IR2110E4	600	20	10	18-pin LCC	3PH Bridge Driver
IR2130D	600	20	10	M-036AB	
IR2130DSCB	600	20	10	M-036AB	
IR2110E4SCS	600	20	10	18-pin LCC	Hi & Lo Mos Drivers
IR2110L4	600	20	10	M-036AB	




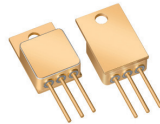
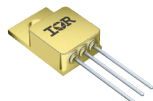

# Package overview

Whether surface mount or through hole, we offer a wide range of packages to suit your mission needs.

## Surface mount

SMD-0.1	SMD-0.2	SMD-0.5	SMD-0.5e
			
SMD-1	SMD-2	SupIR-SMD	MO-036AA
			
MO-36AB	UB	LCC-18	LCC-28
			

## Through hole

TO-205AF	TO-254	Tabless TO-254
		
TO-257	Tabless TO-257	
		

## Where to Buy

Infineon distribution partners and sales offices:

[www.infineon.com/WhereToBuy](http://www.infineon.com/WhereToBuy)

## Service Hotline

Infineon offers its toll-free **0800/4001** service hotline as one central number, available 24/7 in English, Mandarin and German.

Germany	0800 951 951 951 (German/English)
India	000 800 4402 951 (English)
USA	1-866 951 9519 (English/German)
Other countries	00* 800 951 951 951 (English/German)
Direct access	+49 89 234-0 (interconnection fee, German/English)

\* Please note: Some countries may require you to dial a code other than "00" to access this international number, please visit [www.infineon.com/service](http://www.infineon.com/service) for your country!



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Published by  
International Rectifier HiRel Products, Inc.  
An Infineon Technologies Company  
El Segundo, California 90245 USA

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Public  
Date: 12/2024

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We reserve the right to change this document and/or the information given herein at any time.

### Additional information

For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office ([www.infineon.com](http://www.infineon.com)).

### Warnings

Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Infineon Technologies Components may only be used in life-support devices or systems with the expressed written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system.

Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.