



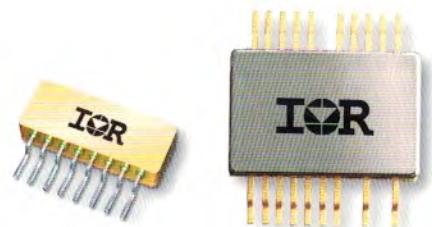
Product Guide

EAR99 Space Grade Products

IR HiRel, An Infineon Technologies Company, has developed an extensive line of power management product solutions to fulfill the design needs of our customers. These products include radiation hardened MOSFETs, solid state relays, MOSFET gate driver ICs, and DC-DC converters. The products are designed for critical space missions of up to 15 years in orbit. Many of the products are available now and others will be available in the very near future. Please consult your local IR HiRel representative for pricing and availability.

Radiation Hardened Solid State Relays

Intended for general purpose power switches replacing mechanical relays. The products are well suited for all major satellite power buses. The products have TID > 100 Krads and SEE immunity and are available in space flight standard packages.



Radiation Hardened Solid State Relay TID > 100 Krads, SEE immunity, Class K⁽⁶⁾

Part Number ⁽²⁾	Voltage (V)	Current (ADC)	# of Poles	Input Buffer	Speed	Package Style	Package Dimensions (L" x W" x H")
RDHA720SF06A1NK	60	20	1	Non buffered	Fast	8 pin surface mount	1.375 x 0.80 x 0.27
RDHA701CD10A2NX	100	1	2	Non buffered	Fast	8 pins ceramic	0.37 x 0.47 x 0.28
RDHA701FP10A8CK	100	1	8	Non buffered	Medium	64 pin flat pack	1.73 x 1.065 x 0.21
RDHA701FP10A8QK	100	1	8	5V buffered	Controlled	64 pin flat pack	1.73 x 1.065 x 0.21
RDHA710FR10A1NX	100	10	1	Non buffered	Fast	22 pin flat pack	0.645 x 0.745 x 0.195
RDHA710SE10A2FK	100	10	2	3.3V buffered	Fast	8 pin surface mount	1.375 x 0.80 x 0.27
RDHA710SE10A2QK	100	10	2	5V buffered	Fast	8 pin surface mount	1.375 x 0.80 x 0.27
RDHA710SE10A2SK	100	10	2	3.3V buffered	Controlled	8 pin surface mount	1.375 x 0.80 x 0.27
RDHB710SE20A2SX	200	10	1	3.3V buffered	Controlled	8 pin surface mount	1.375 x 0.80 x 0.27

S60 - Radiation Hardened MOSFETs

Developed for optimum SEE performance with LET of 60MeV·cm²/mg. The key electrical performances are very similar to the legacy products. All products are available in the space flight standard packages.

Radiation Hardened MOSFETs - N Channel⁽⁴⁾ TID > 100 Krads, SEE with LET = 60 MeV·cm²/mg

Part Number ⁽¹⁾	V _{DS} (V)	R _{DS(on)} (mΩ)	Q _G (nC)	I _D @25°C (A)	V _{GSmax} (V)	Die Size	Package
IRHLUB7S70Z4	60	680	3.6	0.8	±10	Z	UB
IRHLF7S7110	100	290	11	6.0	±10	1	TO-39
IRHF6S7130	100	65	50	11.7	±20	3	TO-39
IRHNJ6S7130	100	42	50	22	±20	3	SMD 0.5
IRHYS6S7130CM	100	42	50	20	±20	3	TO-257 (LO)
IRHMS6S7160	100	11	170	45	±20	6	TO-254 (LO)
IRHNA6S7160	100	10	170	56	±20	6	SMD 2
IRHF6S7230	200	153	42	9.1	±20	3	TO-39
IRHNJ6S7230	200	130	42	16	±20	3	SMD 0.5
IRHYS6S7230CM	200	130	42	16	±20	3	TO-257 (LO)
IRHMS6S7260	200	29	240	45	±20	6	TO-254 (LO)
IRHNA6S7260	200	28	240	56	±20	6	SMD 2
IRHF6S7234	250	233	50	5.4	±20	3	TO-39
IRHNJ6S7234	250	210	50	12.4	±20	3	SMD 0.5
IRHYS6S7234CM	250	220	40	12	±20	3	TO-257 (LO)
IRHMS6S7264	250	41	220	45	±20	6	TO-254 (LO)
IRHNA6S7264	250	40	220	50	±20	6	SMD 2



Radiation Hardened MOSFETs - P Channel⁽⁴⁾ TID > 100 Krads, SEE with LET = 60 MeV·cm²/mg

Part Number ⁽¹⁾	V _{DS} (V)	R _{DS(on)} (mΩ)	Q _G (nC)	I _D @25°C (A)	V _{GSmax} (V)	Die Size	Package
IRHLNJ7S97034	-60	72	36	-22	±10	3	SMD 0.5
IRHLYS7S97034CM	-60	74	36	-20	±10	3	TO-257 (LO)
IRHLF7S97034	-60	95	36	-1.6	±10	3	TO-39
IRHLUB7S970Z4	-60	1350	2.8	-0.53	±10	Z	UB
IRHNA5S97064	-60	16	200	-56	±20	6	SMD 2
IRHMS5S97064	-60	17	160	-45	±20	6	TO-254 (LO)
IRHNJ5S97130	-100	205	45	-12.5	±20	3	SMD 0.5
IRHYS5S97130CM	-100	205	45	-12.5	±20	3	TO-257 (LO)
IRHF5S97130	-100	228	45	-6.7	±20	3	TO-39
IRHNA5S97160	-100	49	170	-52	±20	6	SMD 2
IRHMS5S97160	-100	50	170	-45	±20	6	TO-254 (LO)
IRHNJ5S97230	-200	505	45	-8.0	±20	3	SMD 0.5
IRHYS5S97230CM	-200	510	45	-8.0	±20	3	TO-257 (LO)
IRHF5S97230	-200	533	45	-4.5	±20	3	TO-39
IRHNA5S97260	-200	102	180	-35.5	±20	6	SMD 2
IRHMS5S97260	-200	103	180	-32	±20	6	TO-254 (LO)



1. Add SCS suffix for space quality screening.
 2. Part numbers shown are for flight models with applicable standard screenings. Refer to product data sheets for other screening classifications and EM model. For LA series, insert 28 for 28V input or 100 for 100V input model in place of xx as applicable.
 3. For dual output models, the current rating is maximum for either output as long as the power drawn for the other output does not exceed the maximum power rating of the converter.
 4. In qualification.
 5. Other output combinations are available. Each output can be as low as 1V and up to 5V. Maximum output is 5W or 1.5A for each output.
 6. Released products.

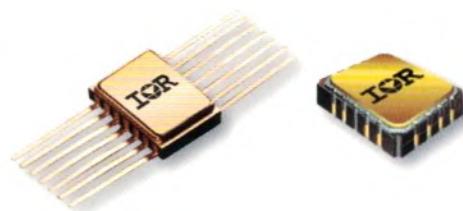
Radiation Hardened MOSFET Gate Driver ICs

Designed to drive IR HiRel's rad-hard MOSFETs to simplify drive circuits, reduce components count and improve reliability.

Radiation Hardened Driver IC TID > 100 Krads, SEE with LET = 60 MeV·cm²/mg

Part Number ⁽¹⁾	Description	Package
RIC7S113A4 ⁽⁶⁾	400V, 2A, high and low side driver	14 pin flat pack
RIC7S113E4 ⁽⁶⁾	400V, 2A, high and low side driver	LCC-18
RIC7S113L4 ⁽⁶⁾	400V, 2A, high and low side driver	MO-036
RIC7S4424 ^{(4)*}	20V, 3A, dual output low side driver, non-inverting	8 pin flat pack

* Estimated SEE with LET = 60 MeV·cm²/mg



Radiation Hardened DC-DC Converters

Available in 5W, 10W, 20W, and 40W single, dual and triple outputs. Also available is the AF series EMI filter, to be used with the ARE converters when compliance with MIL-STD-461C/E/D/F conducted emission is required. Developed for optimum SEE performance with LET of 40 to 60 MeV·cm²/mg. TID rating is 50 to 100 Krads minimum.

ARE Series: 4- 5W Single/Dual Outputs TID > 100 Krads, SEE to LET = 60 MeV·cm²/mg, Class K⁽⁴⁾

Part Number ⁽²⁾	Input Voltage (V)	Output Voltage (VDC)	Output Current (A) ⁽³⁾	Typ. Efficiency (%)
ARE2803R3S	18 - 50	3.3	1.21	71
ARE2805S	18 - 50	5	1	75
ARE2812S	18 - 50	12	0.42	79
ARE2815S	18 - 50	15	0.33	80
ARE2805D	18 - 50	±5	0.8	75
ARE2812D	18 - 50	±12	0.33	79
ARE2815D	18 - 50	±15	0.27	79
ARE10003R3S	65 - 110	3.3	1.21	71
ARE10005S	65 - 110	5	1	75
ARE10012S	65 - 110	12	0.42	79
ARE10015S	65 - 110	15	0.33	80
ARE10005D	65 - 110	±5	0.8	75
ARE10012D	65 - 110	±12	0.33	79
ARE10015D	65 - 110	±15	0.27	79



AF28461/AF100461: Input EMI Filter, MIL-STD-461C/D/E/FConducted Emission, Class K⁽⁴⁾

Part Number ⁽²⁾	Input Voltage (V)	Rated Current (A)	Compatible DC-DC Product Family
AF28461	18 - 50	1	ARA28, ARE28
AF100461	65 - 110	0.3	ARE100



D Series: 5-10W Dual Outputs, TID > 50 Krads, SEE to LET = 40 MeV·cm²/mg, Class K⁽⁶⁾

Part Number ⁽²⁾	Input Voltage (V)	Output Voltage V1/V2 (VDC)	Output Current A1/A2 (A) ⁽³⁾	Typ. Efficiency (%)
D2805D	18 - 50	±5	±1	58
D2812D	18 - 50	±12	±0.42	64
D2815D	18 - 50	±15	±0.33	65
D5001R803R3P ⁽⁵⁾	26 - 55	+1.8/+3.3	±1.5	47



LA Series: 20W Single/Dual/Triple Outputs TID > 100 Krads, SEE to LET = 60 MeV·cm²/mg Class K⁽⁴⁾

Part Number ⁽²⁾	Input Voltage 28V/100V (VDC)	Output Voltage V1/V2 (VDC)	Output Current V1/V2 (A)	Estimated Efficiency 28V/100V(%)
LAXx01S	18-50/40-110	1	6	75
LAXx01R5S	18-50/40-110	1.5	6	80
LAXx01R8S	18-50/40-110	1.8	6	81
LAXx02R5S	18-50/40-110	2.5	6	82
LAXx03R3S	18-50/40-110	3.3	6	83
LAXx05S	18-50/40-110	5	4	83
LAXx12S	18-50/40-110	12	1.67	84
LAXx15S	18-50/40-110	15	1.33	85
LAXx05D	18-50/40-110	±5	±2.0	81
LAXx12D	18-50/40-110	±12	±0.83	82
LAXx15D	18-50/40-110	±15	±0.67	84
LAXx01R802R5P ⁽⁷⁾	18-50/40-110	1.8/2.5	3/3	80
LAXx03R312T	18-50/40-110	3.3/±12	3.0/±0.42	83
LAXx03R315T	18-50/40-110	3.3/±15	3.0/±0.33	83
LAXx0512T	18-50/40-110	5/±12	2.0/±0.42	82
LAXx0515T	18-50/40-110	5/±15	2.0/±0.33	83

M3N Series: 30-40W Single/Dual/Triple Outputs, TID > 100 Krads, SEE to LET = 60 MeV·cm²/mg Class H⁽⁴⁾ and K⁽⁴⁾

Part Number ⁽²⁾	Input Voltage (V)	Output Voltage (VDC)	Output Current (A) ⁽³⁾	Typ. Efficiency (%)
M3N2803R3S	18 - 50	3.3	9.1	72
M3N2805S	18 - 50	5	8	77
M3N2812S	18 - 50	12	3.34	78
M3N2815S	18 - 50	15	2.67	80
M3N2805D	18 - 50	±5	6.4	78
M3N2812D	18 - 50	±12	2.67	79
M3N2815D	18 - 50	±15	2.14	80
M3N280512T	18 - 50	5, ±12	4.0, ±0.83	79
M3N280515T	18 - 50	5, ±15	4.0, ±0.67	79
M3N1003R3S	65 - 110	3.3	9.1	75
M3N10005S	65 - 110	5	8	81
M3N10012S	65 - 110	12	3.34	82
M3N10015S	65 - 110	15	2.67	83
M3N10005D	65 - 110	±5	6.4	81
M3N10012D	65 - 110	±12	2.67	82
M3N10015D	65 - 110	±15	2.14	83
M3N1000512T	65 - 110	5, ±12	4.0, ±0.833	79
M3N1000515T	65 - 110	5, ±15	4.0, ±0.667	79
M3N10003R3S	65 - 110	3.3	9.1	75



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Order Number: 120346SG_HiRel_EAR99

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Notes:

1. Add SCS suffix for space quality screening.
2. Part numbers shown are for flight models with applicable standard screenings. Refer to product data sheets for other screening classifications and EM model. For LA series, insert 28 for 28V input or 100 for 100V input model in place of xx as applicable.
3. For dual output models, the current rating is maximum for either output as long as the power drawn for the other output does not exceed the maximum power rating of the converter.

4. In qualification.

5. Other output combinations are available. Each output can be as low as 1V and up to 5V. Maximum output is 5W or 1.5A for each output.

6. Released products

7. Other output combinations are available. Each output can be as low as 1V and up to 15V. Maximum output is 10W or 3A for each output.