

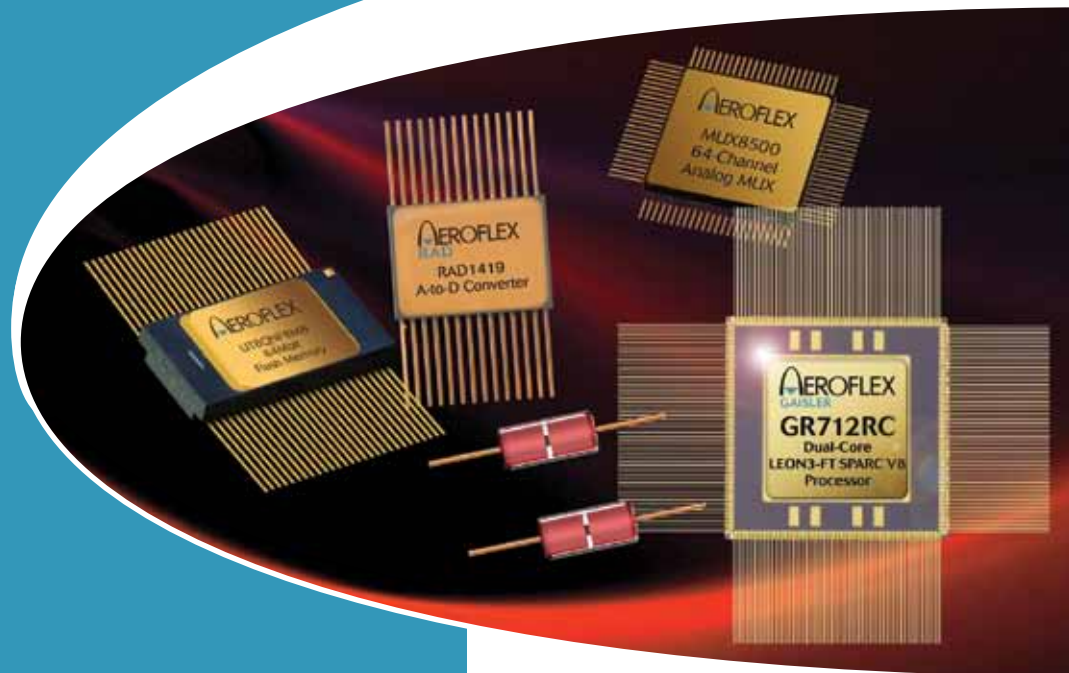


A passion for performance.

**Aeroflex  
Microelectronic  
Solutions**

Digital,  
Analog,  
Power,  
RFMW,  
Motion...Solutions

**for HiRel Applications**



# Product Short Form

January 2012

# Aeroflex Microelectronic Solutions Product Short Form

Aeroflex Microelectronic Solutions is comprised of ten divisions – Colorado Springs, Gaisler, Motion Control, Plainview, RAD, RFMW (ACC, Inmet, Metelics, Nanjing, Weinschel) – offering digital, analog, power, RFMW and Motion Solutions for HiRel Applications with their standard and custom ASIC integrated circuits, Circuit Card Assembly, IP and Radiation Effects Testing.

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THESE ARE SOME OF THE PRODUCT WE DEVELOPED AT  
AER OFLEX PLAINVIEW MICROELECTRONICS DURING THE 1984-2012  
TIME FRAME INCLUDING SOME OF THE MIL-STD-1553 FROM MARCONI  
CIRCUIT TECHNOLOGY .  
HIGHLIGHTED SISTER DIVISION PRODUCTS ARE DELETED

# Standard Products for HiRel Applications



## Analog-to-Digital Converters

[aeroflex.com/AtoD](http://aeroflex.com/AtoD)

Description	Total Dose (krads(Si))	Latch-Up Immune (MeV-cm <sup>2</sup> /mg)	Voltage (V)	Package	Class S	QML Q & V	SMD #
RAD1419	800ksps, 14-bit sampling analog-to-digital converter	100	55	±5V	28 FP	S	N/A
UT14AD20P	14-bit, 20-MSps pipeline analog-to-digital converter	300	120	1.8/3.3V	100 CQFP		Q,V* TBD
UT16AD40P †	16-bit, 40-MSps pipeline analog-to-digital converter	300	120	1.8/3.3V	100 CQFP		Q,V* TBD
UT16AD40DC †	16-bit, 40-MSps pipeline analog-to-digital converter for DC Inputs	300	120	1.8/3.3V	100 CQFP		Q,V* TBD
UT16AD80P †	16-bit, 80-MSps pipeline analog-to-digital converter	300	120	1.8/3.3V	100 CQFP		Q,V* TBD

† Product in development. Please call 800-645-8862 for more information or visit the web site [aeroflex.com/HiRel](http://aeroflex.com/HiRel).

\* QML V pending.

## Multiplexed Analog-to-Digital Converters

[aeroflex.com/AtoD](http://aeroflex.com/AtoD)

Description	Package	SMD #
Single power supply operation: 3.3V to 5V Radiation performance: CMOS ELDRS Immune Total dose > 1 Mrad(Si) SEL Immune > 100 MeV-cm <sup>2</sup> /mg Displacement Damage > 10 <sup>14</sup> neutrons/cm <sup>2</sup>		
The RHD5950 takes 16 analog sensor signals and using 4 address inputs and an enable input, selects one of the 16 analog inputs and converts the signal to 14 digital output bits. The 14-bit digital output has a tri-state control allowing the connection of multiple RHD5950s. This provides very high level of telemetry integration interfacing many sensor voltage readings to the digital processor data bus.	48 CQFP	5962-1220301KXC



## Digital-to-Analog Converters

[aeroflex.com/AtoD](http://aeroflex.com/AtoD)

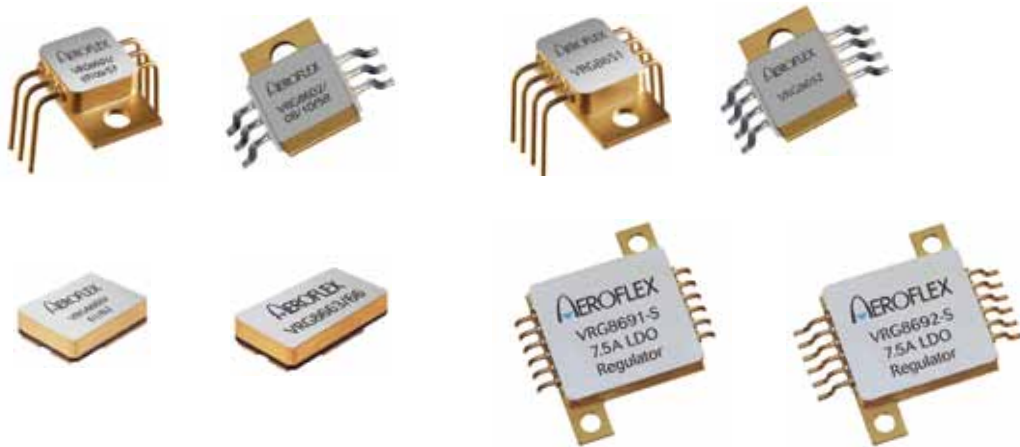
Description	Package	SMD #
Single power supply operation: 3.3V to 5V Radiation performance: CMOS ELDRS Immune Total dose > 1 Mrad(Si) SEL Immune > 100 MeV-cm <sup>2</sup> /mg Displacement Damage > 10 <sup>14</sup> neutrons/cm <sup>2</sup>		
RHD5930	Digital to Analog Converter, 11-bit, ladder output	16 SOIC 5962-1120801KXC
RHD5931	Digital to Analog Converter, 11-bit, buffered output	16 SOIC 5962-1120802KXC

# Standard Products for HiRel Applications

## Adjustable Voltage Regulators

aeroflex.com/VoltReg

	Total # Regulators	LDO Regulator Dropout Voltage	# Positive Regulators	Positive Voltage Range (V)	# Negative Regulators	Negative Voltage Range (V)	Positive Output Current (A)	Negative Output Current (A)	Total Dose (krads(Si))	Package	Package Size L x W x H (inches)	Thru-Hole	Surface Mount	# Leads	SMD #
VRG8601	2		1	1.2 to 37	1	-1.2 to -27	1.5	1.5	100	TO-257	0.65x0.42x0.220	■	■	6	5962-0521901KXC
VRG8602	2		1	1.2 to 37	1	-1.2 to -27	1.5	1.5	100	TO-257	0.65x0.42x0.220	■	■	6	5962-0521901KYC
VRG8607	2		2	1.2 to 37			1.5	1.5	100	TO-257	0.65x0.42x0.220	■	■	6	5962-0521903KXC
VRG8608	2		2	1.2 to 37			1.5	1.5	100	TO-257	0.65x0.42x 0.220	■	■	6	5962-0521903KYC
VRG8609	2				2	-1.2 to -27	1.5	1.5	100	TO-257	0.65x0.42x0.220	■	■	6	5962-0521904KXC
VRG8610	2				2	-1.2 to -27	1.5	1.5	100	TO-257	0.65x0.42x 0.220	■	■	6	5962-0521904KYC
VRG8651	2	1.30	1	1.3 to 23	1	-2.5 to -25	1.0	3.0	100	TO-257	0.75x0.42x0.220	■	■	8	5962-0920101KUC
VRG8652	2	1.30	1	1.3 to 23	1	-2.5 to -25	1.0	3.0	100	TO-257	0.75x0.42x0.220	■	■	8	5962-0920101KZC
VRG8653	2	1.60	1	1.3 to 30	1	-2.5 to -25	3.0	3.0	100	TO-257	0.75x0.42x0.220	■	■	8	5962-1021301KUC
VRG8654	2	1.60	1	1.3 to 30	1	-2.5 to -25	3.0	3.0	100	TO-257	0.75x0.42x0.220	■	■	8	5962-1021301KZC
VRG8657	2	1.30	2	1.3 to 23			1.0		100	TO-257	0.65x0.42x0.220	■	■	6	5962-0920102KXC
VRG8658	2	1.30	2	1.3 to 23			1.0		100	TO-257	0.65x0.42x0.220	■	■	6	5962-0920102KYC
VRG8660	1		1	1.2 to 37			1.5		100	SMD-0.5	0.40x0.30x0.130	■	■	3	5962-0920601KXC
VRG8661	1				1	-1.2 to -27		1.5	100	SMD-0.5	0.40x0.30x0.130	■	■	3	5962-0920602KXC
VRG8662	1	1.30	1	1.3 to 23			1.0		100	SMD-0.5	0.40x0.30x0.130	■	■	3	5962-0920701KXC
VRG8663	1	1.05			1	-2.5 to -25		3.0	100	SMD	0.55x0.30x0.130	■	■	5	5962-0920702KYC
VRG8666	1	0.50	1	0.1 to 34			1.0		100	SMD	0.55x0.30x0.130	■	■	5	5962-1120502KXC
VRG8684	1	1.60	1	1.3 to 30			3.0		100	SMD-0.5	0.40x0.30x0.130	■	■	3	5962-0924501KXC
VRG8687	2	1.60	2	1.3 to 30			3.0		100	TO-257	0.75x0.42x0.220	■	■	8	5962-1021302KUC
VRG8688	2	1.60	2	1.3 to 30			3.0		100	TO-257	0.75x0.42x0.220	■	■	8	5962-1021302KZC
VRG8691	1	0.50	1	1.0 to 3.3			7.5		100	Power	0.90x1.00x0.220	■	■	12	5962-0923701KXC
VRG8692	1	0.50	1	1.0 to 3.3			7.5		100	Power	0.90x1.00x0.220	■	■	12	5962-0923701KYC



# Standard Products for HiRel Applications

## Analog Multiplexer Modules

aeroflex.com/Mux

	Total Channels	Common	Kelvin Measurement	Transorb Input ESD Protection	# Address Busses	# Enable Lines	V+	V-	V <sub>big</sub>	RDSON (Ω Typical)	Access Time (ns Typical)	Input Range - Min(V)	Input Range - Max(V)	Total Dose - Max(Si)	SEL - LET <sub>TH</sub> MeV - cm <sup>2</sup> /mg	Package	SMD #
RHD5928 *	8	8			1	1	+5V	GND	N/A	<750	150	0V	+5V	1000	100	16 SOIC	Pending
MUX8520	16	16	■		1	1	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	56 CQFP	5962-0922901KXC
MUX8530	16	16	■		1	1	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	56 CQFP	5962-0923001KXC
MUX8560 *	16	16			1	1	+5V	GND	+5V	<2000	<500			300	90	56 CQFP	5962-1021001KXC
RHD5920 *	16	16			1	1	+5V	GND	N/A	<750	150	0V	+5V	1000	100	24 SOIC	5962-1024301KXC
RHD5921 * Buffered	16	16			1	1	+5V	GND	N/A	N/A	<2000	0V	+5V	1000	100	24 SOIC	5962-1024302KXC
RHD5922 * Sample/Hold	16	16			1	1	+5V	GND	N/A	N/A	<5000	0V	+5V	1000	100	24 SOIC	5962-1024303KXC
MUX8521	16		16	■	1	1	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	56 CQFP	5962-0922902KXC
MUX8531	16		16	■	1	1	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	56 CQFP	5962-0923002KXC
MUX8561 *	16		16		1	1	+5V	GND	+5V	<2000	<500			300	90	56 CQFP	5962-1021002KXC
MUX8522	32	32			2	2	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	56 CQFP	5962-0922903KXC
MUX8523	32	32		■	2	2	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	56 CQFP	5962-0922904KXC
MUX8532	32	32			2	2	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	56 CQFP	5962-0923003KXC
MUX8533	32	32		■	2	2	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	56 CQFP	5962-0923004KXC
MUX8562 *	32	32			2	2	+5V	GND	+5V	<2000	<500			300	90	56 CQFP	5962-1020901KXC
RHD8544 *	32	32			2	2	+5V	GND	N/A	<750	150	0V	+5V	1000	100	56 CQFP	Pending
MUX8503	48	48		■	1	3	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	96 CQFP	5962-0323403KXC
MUX8513	48	48		■	1	3	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	96 CQFP	5962-0920302KXC
RHD8543 *	48	48			1	3	+5V	GND	N/A	<750	150	0V	+5V	1000	100	96 CQFP	Pending
MUX8502	48		48	■	1	3	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	96 CQFP	5962-0323401KXC
MUX8506	48		48		1	3	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	96 CQFP	5962-0323402KXC
MUX8512	48		48	■	1	3	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	96 CQFP	5962-0920301KXC
MUX8500	64	32	32	■	2	4	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	96 CQFP	5962-0050201KXC
MUX8507	64	32	32		2	4	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	96 CQFP	5962-1021201KXC
MUX8510	64	32	32	■	2	4	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	96 CQFP	5962-0920201KXC
MUX8501	64	64		■	2	4	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	96 CQFP	5962-0050202KXC
MUX8509	64	64			2	4	+15V	-15V	+5V	<2000	<1500	-5V	+15V	300	120	96 CQFP	5962-1021202KXC
MUX8511	64	64		■	2	4	+15V	-15V	+5V	<1200	<600	-5V	+15V	150	90	96 CQFP	5962-0920202KXC
RHD8541 *	64	64			2	4	+5V	GND	N/A	<750	150	0V	+5V	1000	100	96 CQFP	Pending

\* Power Supply requirements: Only +5V and ground.



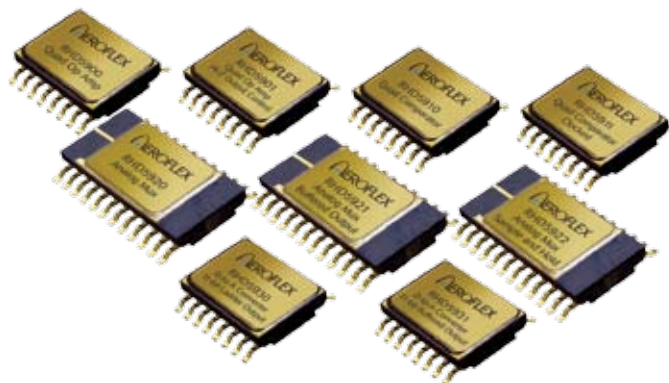
# Standard Products for HiRel Applications

**Analog Function Series  
RadHard-by-Design**  
aeroflex.com/rhdseries

	Description	Package	SMD #
	Single power supply operation: 3.3V to 5V Radiation performance: CMOS ELDRS Immune Total dose > 1 Mrad(Si) SEL Immune > 100 MeV-cm <sup>2</sup> /mg Displacement Damage > 10 <sup>14</sup> neutrons/cm <sup>2</sup>		
<b>Quad Op Amps</b>			
RHD5900	Quad Operational Amplifier with rail-to-rail input and outputs for general purpose operational amplifier applications.	16 SOIC	5962-1024101KXC
RHD5901	Quad Operational Amplifier configured with enable/disable control. Pairs of amplifiers are put in a power-down condition with their outputs in a high-impedance state.	16 SOIC	5962-1024102KXC
RHD5902	Higher-speed version of RHD5901 providing wider bandwidth and faster slew rate.	16 SOIC	5962-1024103KXC
RHD5903 †	Differential output operational amplifier. Outputs are centered at VDD/2.	20 SOIC	Pending
<b>Quad Instrumentation Amps</b>			
RHD5904 †	Quad version of the standard instrumentation configuration. Gain 1, output centered at VDD/2.	16 SOIC	Pending
RHD5905 †	Differential output version of RHD5904.	20 SOIC	Pending
<b>Quad Comparators</b>			
RHD5910	Quad Comparator, High Speed, for operation with dynamic signals on either or both inputs. Comparison is continuous as the circuit functions as high gain open loop amplifier with a digital output.	16 SOIC	5962-1024201KXC
RHD5911	Quad Comparator with clocked comparator pairs to access & hold data until needed.	16 SOIC	5962-1024202KXC
RHD5912 †	Quad Comparator with open drain outputs.	16 SOIC	5962-1024203KXC
<b>Analog Multiplexers</b>			
RHD5920	16:1 analog multiplexer. Channel selection is controlled by 4-bit binary addressing and an active low enable.	24 SOIC	5962-1024301KXC
RHD5921	16:1 buffered output voltage multiplexer. Channel selection is controlled by 4-bit binary addressing and an active low enable. Multiplexed voltages are buffered by a unity gain rail-to-rail amplifier.	24 SOIC	5962-1024302KXC
RHD5922	16:1 sample-and-hold multiplexer. Channel selection is controlled by a 4-bit address bus. Signal acquisition is controlled by internal low leakage sample-and-hold circuitry buffered by a unity gain rail-to-rail amplifier.	24 SOIC	5962-1024303KXC
RHD5928	8 channel CMOS multiplexer. Channel selection is controlled by 3 bit binary addressing and an active low enable. All inputs and outputs are diode protected.	16 SOIC	Pending
RHD8541	64 channels provided by four 16:1 multiplexers. Two address busses A(3:0) and B(3:0) and four enable lines afford flexible organization.	96 CQFP	Pending
RHD8543 *	48 channels. Triple 16:1, common address inputs A0:A3, separate enable and output.	96 CQFP	Pending
RHD8544 *	32 channels. Dual 16:1, separate address inputs A0:A3 and B0:B3, separate enable and output.	56 CQFP	Pending
<b>Digital-to-Analog Converters</b>			
RHD5930	Digital to Analog Converter, 11-bit, ladder output.	16 SOIC	5962-1120801KXC
RHD5931	Digital to Analog Converter, 11-bit, buffered output.	16 SOIC	5962-1120802KXC
<b>Multiplexed Analog-to-Digital Converters</b>			
RHD5950	The RHD5950 takes 16 analog sensor signals and using 4 address inputs and an enable input, selects one of the 16 analog inputs and converts the signal to 14 digital output bits. The 14-bit digital output has a tri-state control allowing the connection of multiple RHD5950s. This provides very high level of telemetry integration interfacing many sensor voltage readings to the digital processor data bus.	48 CQFP	5962-1220301KXC

† Product in development.

\* Power Supply requirements: Only +5V and ground.



# Standard Products for HiRel Applications



## Clock Solutions

[aeroflex.com/clocks](http://aeroflex.com/clocks)

	Frequency	# of Clocks	Crystal Capable	LVDS Ref	LVCMOS Outputs	LVDS Outputs	Total Dose (krads(Si))	LET <sub>ONSET</sub> MeV - cm <sup>2</sup> /mg	Saturated Cross Section (cm <sup>2</sup> ) per bit	Latch-Up Immune MeV - cm <sup>2</sup> /mg	V <sub>DD</sub> Core	V <sub>DD</sub> I/O	Package	QML Q & V	SMD #
UT7R995	6 to 200 MHz	8		■			100	109	*	>109	3.3V	2.25 to 3.6V	48 CFP	QV	5962-05214
UT7R995C	6 to 200 MHz	8	■	■			100	109	*	>109	3.3V	2.25 to 3.6V	48 CFP	QV	5962-05214
UT54ALVC2525		8		■			100-1000	109	*	>111	2.0V thru 3.6V	2.0V thru 3.6V	14 CFP	QV	5962-06233
UT7R2XLR816 <sup>†</sup>	2 to 200 MHz	16	■	■	■	■	100	109	*	>109	3.3V	2.25 to 3.6V	168 CLGA 168 CBGA 168 CCGA	QV	5962-08243
UT7R995C-EVB	Includes user selected crystal or digital interface, flexible feedback selection series, thevenin termination options for output clocks, and independent core and output power supplies. Includes all cabling accessories needed for quick set up.														

<sup>†</sup> Product in development.

\* The device memory storage elements do not upset.

## Comparators

[aeroflex.com/opamp](http://aeroflex.com/opamp)

	Description	Package	SMD #
	Single power supply operation: 3.3V to 5V Radiation performance: CMOS ELDRS Immune Total dose > 1 Mrad(Si) SEL Immune > 100 MeV-cm <sup>2</sup> /mg Displacement Damage > 10 <sup>14</sup> neutrons/cm <sup>2</sup>		
RHD5910 Quad Comparator	Quad Comparator, High Speed, for operation with dynamic signals on either or both inputs. Comparison is continuous as the circuit functions as high gain open loop amplifier with a digital output.	16 SOIC	5962-1024201KXC
RHD5911 Quad Comparator	Quad Comparator with clocked comparator pairs to access & hold data until needed.	16 SOIC	5962-1024202KXC
RHD5912 Quad Comparator <sup>†</sup>	Quad Comparator with open drain outputs.	16 SOIC	5962-1024203KXC

<sup>†</sup> Product in development.



# Standard Products for HiRel Applications

## MOSFETs aeroflex.com/MOSFETS

	Breakdown Potential (V)	RDS(ON) (mOhms)	Drain Current (A)	Gate Charge (nC)	Total Dose krad(Si)	SEE *	Die Size	Package	Screening
RAD7214-NCx	250	1200	1.5	15	100	Au, Xe	1	Bare Die	Prototype, EM, Space
RAD7214-NFx	250	1200	1.5	15	100	Au, Xe	1	TO-39	Prototype, EM, Space
RAD7234-NCx	250	200	9.0	50	100	Au, Xe	3	Bare Die	Prototype, EM, Space
RAD7234-NNJx	250	200	9.0	50	100	Au, Xe	3	SMD 0.5	Prototype, EM, Space
RAD7234-NYx	250	1200	1.2	15	100	Au, Xe	3	TO-257AA	Prototype, EM, Space
RAD7214-NQx	250	1200	1.2	15	100	Au, Xe	Quad	LCC-28	Prototype, EM, Space
RAD7214-NGx	250	1200	1.2	15	100	Au, Xe	Quad	DIP-14	Prototype, EM, Space
RAD7264-NCx	250	51	28	150	100	Au, Xe	6	Bare Die	Prototype, EM, Space
RAD7264-NNAx	250	54	28	150	100	Au, Xe	6	SMD 2	Prototype, EM, Space
RAD7264-NMx	250	59	28	150	100	Au, Xe	6	TO-254AA	Prototype, EM, Space

\* SEE (Single Event Effects)

Units exhibit immunity to SEGR and SEB at listed ion when tested at full rated drain potential and in the off-state. The following ion characteristics were used: Xe, 10MeV/n Berkeley beam. Initial LET of approximately 60MeV-cm<sup>2</sup>/mg. Au, 1.7MeV/n Brookhaven beam. Initial LET of approximately 84MeV-cm<sup>2</sup>/mg. See SEB/SEGR reports for full details.

x = P for prototypes, E for engineering samples, S for Class S.

### Aeroflex RAD MOSFET Numbering

RAD	7	1	1	0	-	N	M	P	X
	TID Level	Breakdown	Die Size	Breakdown Adder		Channel Type	Package	Screening	Technology
	7-100 krad(Si)	1 - 100V 2 - 200V	1 - Size 1 3 - Size 3 6 - Size 6	0 - None 3 - 30V 4 - 50V		N - N Type P - P Type M - Mixed	C - Bare Die F - TO39 NJ - SMD 0.5 M - TO-254AA Q - LCC 28 Pin G - DIP 14 Pin NA - SMD 2 Y - TO-257AA	P - Proto E - EM S - Space	Reserved



# Standard Products for HiRel Applications

## Nuclear Event Detector (NED)

[aeroflex.com/HiRel](http://aeroflex.com/HiRel)

Description	Total Dose krad(Si)	LET <sub>ONSET</sub> MeV - cm <sup>2</sup> /mg	Latch-Up Immune MeV - cm <sup>2</sup> /mg	Voltage (V)	Package	QML Q & V	
						SMD #	
UTNEDCC301 Dual channel, multi-radiation, nuclear event detector. User-selectable dose rate thresholds from 1E5 to 1E7 rad(Si)/sec using threshold adjust resistor. Response time of < 10 nsec.	1000	100	110	5	14 CFP	N/A	SCD



## Op Amps

[aeroflex.com/opamp](http://aeroflex.com/opamp)

Description	Package	SMD #
Single power supply operation: 3.3V to 5V Radiation performance: CMOS ELDRS Immune Total dose > 1 Mrad(Si) SEL Immune > 100 MeV-cm <sup>2</sup> /mg Displacement Damage > 10 <sup>14</sup> neutrons/cm <sup>2</sup>		
RHD5900 Quad Op Amp Quad Operational Amplifier with rail-to-rail input and outputs for general purpose operational amplifier applications.	16 SOIC	5962-1024101KXC
RHD5901 Quad Op Amp Quad Operational Amplifier configured with enable/disable control. Pairs of amplifiers are put in a power-down condition with their outputs in a high-impedance state.	16 SOIC	5962-1024102KXC
RHD5902 Quad Op Amp Higher-speed version of RHD5901 providing wider bandwidth and faster slew rate.	16 SOIC	5962-1024103KXC
RHD5903 Quad Op Amp † Differential output operational amplifier. Outputs are centered at VDD/2.	20 SOIC	Pending
RHD5904 Quad Instrumentation Amplifiers † Quad version of the standard instrumentation configuration. Gain 1, output centered at VDD/2.	16 SOIC	Pending
RHD5905 Quad Instrumentation Amplifiers † Differential output version of RHD5904.	20 SOIC	Pending

† Product in development. Please call 800-645-8862 for more information or visit the web site [aeroflex.com/HiRel](http://aeroflex.com/HiRel).

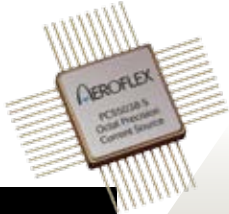


## PWM

[aeroflex.com/PWM](http://aeroflex.com/PWM)

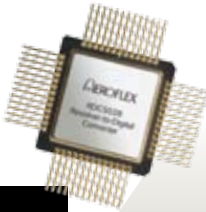
Description	Total Dose krad(Si)	LET <sub>ONSET</sub> MeV - cm <sup>2</sup> /mg	Latch-Up Immune MeV - cm <sup>2</sup> /mg	Package	SMD #
PWM5032 High-Speed PWM Controller Optimized for power applications: Buck, Boost, Flyback, Forward and Center-Tapped Push-Pull converters. 1V thru 12V @ 1.0A drive capability. Selectable 50%/100% duty cycle. Low power CMOS technology.	1000	20	100	24 SOIC	5962-0625102KXC
PWM5034 High-Speed PWM Controller Optimized for power applications: Buck, Boost, Flyback, Forward and Center-Tapped Push-Pull converters. 1V thru 12V @ 1.0A drive capability. Selectable 50%/100% duty cycle. Low power CMOS technology with unformed leads.	1000	20	100	24 FP	5962-0625102KYC

# Standard Products for HiRel Applications



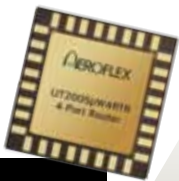
## PCS aeroflex.com/PCS

Description	Total Dose krad(Si)	Package	SMD #
PCS5035 Quintet Precision Current Source Monolithic quintet (5) precision current sources (each at 80μA) designed for thermistor current monitor and resistive sensor applications. Built-in comparators and precision internal 2.0VDC reference further simplifies the application design.	100	18 CFP	5962-0923401KXC
PCS5038 Octal Precision Current Source The PCS5038 was designed to provide the flexibility needed to support a very wide range of resistive sensors. It contains eight precision current sources that can be set to source from 100uA to 2mA each with a single external resistor. Any number of the eight current source outputs can be tied together allowing the PCS5038 to drive multiple current source values.	100	40 CQFP	5962-0923402KYC



## RDC aeroflex.com/RDC

Description	Total Dose krad(Si)	Latch-Up Immune MeV - cm <sup>2</sup> /mg	Package	SMD #
RDC5028 Resolver-to-Digital Converter 16-bit with accuracy to 5.3 arc minutes, single +5 volt @ 20mA represents HiRel best in class power consumption, selectable for 16-, 14-, 12- and 10-bit modes with velocity output. -55°C to 125°C operation.	1000	100	52 CQFP	5962-0423503KXC



## SpaceWire aeroflex.com/spacewire

Links	Data Rates Mbps	Voltages	Total Dose krad(Si)	LET <sub>TH</sub> (0.25) MeV - cm <sup>2</sup> /mg	Saturated Cross Section (cm <sup>2</sup> ) per device	Latch-Up Immune MeV - cm <sup>2</sup> /mg	Package	QML Q & V	SMD #	
UT200SpWPHY01 SpaceWire Physical Layer Transceiver	1	200	3.3V	100	109	5.0E-7 2.0E-7	>109	28 FP	Q,V	5962-06232
UT200SpW4RTR SpaceWire 4-port Router	4	200	2.5V, 3.3V	100	100	*	>100	255 CLGA	Q,V	5962-08244
UT200SpW4RTR-EVB 4-port Router Evaluation Board	The UT200SpWRTR-EVB is a 4-Port SpaceWire Router evaluation board designed to allow the system designer access to all the features of the UT200SpW4RTR 4-Port Router as defined in the datasheet. The evaluation board can also be plugged into the Aeroflex Gaisler LEON 3-FT evaluation board.									
UT100SpW02 SpaceWire Protocol Handler IP	The UT100SpW02 SpaceWire Protocol Handler IP is designed specifically for use with Aeroflex's RadHard Eclipse FPGA. Dual ECSS-E-ST-50-KC compliant links; data rates from 2 to 100 Mbps; 9 bit transmit and receive FIFO user interface.									

\* Contact factory for SEU report

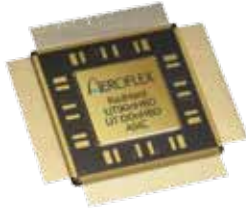
# Custom RadHard ASICs for HiRel Applications

## RadHard Digital ASIC Products [aeroflex.com/RadHardASIC](http://aeroflex.com/RadHardASIC)

### Description

UT0.6μCRH - 0.6μm	> 500K usable gates; clock rates >150 MHz; +5V and +3.3V operation; CMOS processed in commercial fab; RadHard from 100 to 300 krad(Si). QML V & Q.
UT0.25μHBD - 0.25μm	Up to 3.0M usable gates; toggle rates >1 GHz; single +3.3V supply or +3.3V I/O and +2.5V core operation; CMOS processed in commercial fab; RadHard from 100 krad(Si) to 1E6 rad(Si). QML V & Q.
UT130nHBD - 130nm	Ultra-low-power ASICs. Up to 15M usable gates; toggle rates up to 4 GHz; +3.3V/2.5V/1.8V I/O and +1.2V core operation; CMOS processed in commercial fab; RadHard from 100 to 300 krad(Si).
UT90nHBD - 90nm †	HBD performance ASICs. Up to 40M usable gates; toggle rates up to 10 GHz; +2.5V/1.8V I/O and +1.0V core operation; CMOS processed in commercial fab; RadHard from 100 to 300 krad(Si).
ASIC Design System	Supports design signoff in Synopsys and Mentor tools, and tools using VHDL and Verilog languages.
FPGA to ASIC Conversions	Convert RadHard (or non-RadHard) FPGAs (Field Programmable Gate Arrays) to high reliability RadHard ASICs.
Category 1A Trusted	Design, Assembly, and Backend Screening Services

† Product in development. Please call 800-645-8862 for more information or visit the web site [aeroflex.com/RadHardASIC](http://aeroflex.com/RadHardASIC).



## RadHard Mixed-Signal ASIC Products [aeroflex.com/RadHardASIC](http://aeroflex.com/RadHardASIC)

### Description

UT0.6μCRH-0.6μm	High voltage (20V), highly linear custom analog. Example analog IP - PLL, bandgap, op-amps; 5V (±2.5V), 3.3V (±1.65V), 2.5V (±1.25). HV CMOS up to 20V. Up to 500k usable gates; toggle rates up to 215MHz. I/O types include SSTL, LVDS, PCI, CML. RadHard from 100 to 300krad(Si).
UT0.35μCRH-0.35μm	High precision (up to 21 bits), highly integrated custom analog. Example analog IP - ADCs, DACs, PLL, bandgap; 10V (±5V), 5V (±2.5V), 3.3V (±1.65V). Up to 1.5M usable gates; toggle rates up to 375MHz. Non-volatile memory options. I/O types include SSTL, LVDS, USB, RS232/RS485 (±5V), PCI, CML. RadHard from 100 to 300krad(Si).
UT0.18μCRH-0.18μm	Highly integrated (up to 256 data conversion channels), high-precision custom analog. Example analog IP - ADCs, DACs, PLL, op-amps; 5V (±2.5V), 3.3V (±1.65V), 1.8V (±0.9V). Up to 8M usable gates; toggle rates up to 2.4GHz. Non-volatile memory options. I/O types include SSTL, LVDS, USB, PCI, CML. RadHard from 100 to 300krad(Si).
ASIC Design System	Full custom design to customer performance specification and/or supports design signoff in Synopsys/Mentor tools, and tools using VHDL/Verilog languages.

## Aeroflex Trusted Accreditation [aeroflex.com/trusted](http://aeroflex.com/trusted)

Aeroflex Colorado Springs received Category 1A Trusted Accreditation by the Defense Microelectronics Activity as a Microelectronics Trusted Source for DoD and all other U.S. government users. The scope of the accreditation includes:

- Design Services
- Aggregation Services
- Broker Services
- Packaging and Assembly Services
- Test Services

Aeroflex Plainview received Category 1A Trusted Accreditation in 2010. Their scope includes:

- Packaging/Assembly

# Microwave/RF Products for HiRel Applications



## Medium- and High-Power Amps

[aeroflex.com/Microwave](http://aeroflex.com/Microwave)

	Description	Features
PA001002-20	Low noise and high linearity	100 to 200 MHz, P0.1dB > 17 dBm, NF < 1.2 dB typical, Space qualified
PA001002-22	High linearity amplifier	100 to 200 MHz, P0.1dB > 19 dBm, 19 dB typical Gain, Space qualified
PA001003-20	Low noise and high linearity	100 to 300 MHz P0.1dB > 17 dBm, NF < 1.1 dB typical, Space qualified
PA00104-27	Medium-power amplifier	0.1 to 4.0 GHz, P1 dB > 27 dBm, 25 dB typical gain, Single power supply +10V to +15V
PA002005-21	High linearity amplifier	200 to 500 MHz, P0.1dB > 18 dBm, 20 dB typical gain, Space qualified
PA010020-33	Medium-power amplifier	1.0 to 2.0 GHz, 2 Watt output power at 1 dB G.C.P., Low noise - less than 4 dB
PA090102-38	High-power amplifier	Dual channel 9.0 to 10.2 GHz, 35 dB typical gain, > 20% power-added efficient, 8 W CW per channel
PA020180-3025-SS	Broadband power amplifier	2 to 18 GHz >30 dBm p1dB up to 18 GHz, 25 dB typical gain, single supply
PA020180-3922	Broadband high power amplifier	2 to 18 GHz >38 dBm Psat output power, 22 dB typical gain, single +28V (1.2A) supply

## RF Switches

[aeroflex.com/Microwave](http://aeroflex.com/Microwave)

	Description	Features
SWSP6T0002020-35	Absorptive RF switch	SP6T, high-isolation >38 dB @ 2 GHz, low insertion loss of 2.0 dB @ 1 GHz, Space qualified
SWSPDT-000030-45	Absorptive RF switch	SPDT, 0.1 to 3 GHz, fast switching speed, <25 ns, low current <200 uA, Space qualified
SWSPDT-000300-55	Absorptive RF Switch	SPDT very high Isolation >55 dB up to 3 GHz, compact size, low insertion loss, Space qualified

# Power Management Solutions for Battery Electronics

Battery Electronics Units <i>aeroflex.com/BEU</i>		Cells	Description	Size
Aeroflex Plainview's new Battery Electronics Units provide autonomous cell balancing for Lithium-Ion batteries. A series stack of Lithium-Ion cells are accurately charge balanced so the battery can be utilized to its fullest capacity. The cell balancing circuitry uses a set of bi-directional DC-DC converters that tie the cells of the battery to a common share bus. Cell charge is distributed among the multiple cells so that the charge of each cell is brought to the average charge of the other cells. Cell balancing can, therefore, be performed at any state of charge of the battery. Individual cell voltage monitors keep track of cells that may exceed charge limits. Precise voltage telemetry is provided for all cells and the battery. Optional features include reconditioning load control and cell bypass relay drivers.				
BEU8635	8, 12, 24	Balancing for 24-cell battery, with cell voltage monitoring and telemetry		11.50" L x 2.30" W x 5.25" H
BEU8636 †	8, 12, 24	Balancing for 24-cell battery, with cell voltage monitoring and telemetry and cell bypass relay drivers		11.50" L x 3.30" W x 5.25" H
BEU8637	8, 12	Independent balancing for two 12-cell batteries or redundant balancing for a single 12-cell battery, with cell voltage monitoring and telemetry		11.50" L x 4.00" W x 5.25" H
BEU8638 †	8, 12	Independent balancing for two 12-cell batteries or redundant balancing for a single 12-cell battery, with cell voltage monitoring and telemetry, reconditioning load control and cell bypass relay drivers		11.50" L x 5.20" W x 5.25" H
BEU8640	24	Dual redundant balancing for up to 24-cell battery, with cell voltage monitoring and telemetry, reconditioning load control and cell bypass relay drivers		11.50" L x 5.30" W x 5.25" H
BEU8642-EVAL	8	Balancing for 8-cell battery, with cell voltage monitoring and telemetry, temperature monitoring, built-in test, RS-232 output for data logging, LCD display for cell voltage, temperature and status		12.00" L x 9.00" W x 2.65" H
† Product in development. Please call 800-645-8862 for more information or visit the web site <a href="http://aeroflex.com/BEU">aeroflex.com/BEU</a> .				

Battery Interface Electronic Assembly <i>aeroflex.com/BEU</i>		Cells	Description	Size
BIE8678	8 – 32	The Battery Interface Electronic (BIE) assembly provides an interface between a space vehicle electrical power system (EPS) and its' Lithium Ion batteries (comprised of 8 to 32 cells). The BIE provides real time battery status monitoring, telemetry and control, and insures safe battery operation throughout the mission life. It is fully space qualified and is designed to support a wide range of missions including LEO, MEO, GEO, MEO, interplanetary and manned flight. The BIE assembly includes three primary components: the Voltage/Temperature Monitoring Module (VTM), the Over Charge Protection Module (OCP), and the Battery Isolation Switch.		6.95" W x 11.71" L x 4.50" H



# Radiation Effects Testing Capabilities

## Device Screening and Element Evaluation

[aeroflex.com/RAD](http://aeroflex.com/RAD)

Aeroflex RAD offers comprehensive screening services for your flight devices, lot conformance, and individual die element evaluation.

### Screening Test Method Capabilities

Test Description	MIL-STD Test Methods	
	883	750
Adhesion of Lead Finish	2025	n/a
Bond Strength	2011	2037
Burn-in	1015	1039
Constant Acceleration	2001	2006
Die Shear	2019	2017
External Visual	2009	2071
Hermeticity	1014	1071
Internal Visual	2010	2072
Internal Water Vapor	1018	1018
Lead Integrity	2004	2036
Lid Torque	2024	n/a
Mechanical Shock	2002	2016
Moisture Resistance	1004	1021
Physical Dimensions	2016	2066
PIND	2020	2052
Radiography X-ray	2012	2076
Resistance to Solvents	2015	1022
Salt Atmosphere	1009	1041
Solderability	2003	2026
Steady State Life	1005	1026
Temperature Cycling	1010	1051
Thermal Shock	1011	1056
Vibration Variable Frequency	2007	2056

## Quick-Turn Prototype IC Assembly

[aeroflex.com/RAD](http://aeroflex.com/RAD)

Aeroflex RAD offers the following services: Quick-Turn Prototype IC Assembly in ceramic, etched out plastic, COB and flip chip.

### Quick-Turn Prototype IC Assembly Capabilities

- Dicing, Die Visual and Die Attach
  - Wafer Dicing (up to 12inch wafers)
  - Visual Inspection (50-500X)
  - Conductive and non-conductive epoxy die attach
  - Silver Glass and Eutectic die attach
  - Flip Chip
- Wirebond, Encapsulation and Marking
  - Gold and Aluminum Wirebond (to 35µm pitch)
  - Epoxy, Solder, and Glass Frit Lid Seal
  - Dam and Fill (Plastic Encapsulation)
    - Plastic Equivalent Devices
    - COB Glob Top
  - Package Ink Marking or Laser Marking
- Package Options
  - Multi-chip / Stacked Modules, Chip-On-Board (COB), and Custom Substrates
  - Ceramic Packages Including: BGA, PGA, J-Lead, Flat Pack, QFP, Sidebraze, Cerdip and others
  - Etched Cavity Plastic Packages Including: J-Lead, QFP, SOIC, TSSOP, QFN /MLF and others



*Cryogenic Dewar Test Chamber*

# Standard Products for Avionic Applications

## MIPS RISC 64Bit Microprocessors

[aeroflex.com/MIPS](http://aeroflex.com/MIPS)

	Description	CPU Speed (MHz)	Package
ACT-7000ASC-300F17(X)	64 bit SysAD bus interface in a cavity-up hermetic CQFP.	300	208 CQFP (1.12"sq)
ACT-7000ASC-300F24(X)	64 bit SysAD bus interface in a cavity-down hermetic CQFP.	300	208 CQFP (1.12"sq)
MIP7365-450B1(X)	64 bit SysAD bus interface in a TBGA.	450	Plastic 256 TBGA (26mm sq)
MIP7965-668F17(X)	64 bit SysAD bus interface in a cavity-up hermetic CQFP with EJTAG debug port.	668	208 CQFP (1.12"sq)
MIP7965-668F24(X)	64 bit SysAD bus interface in a cavity-down hermetic CQFP with EJTAG debug port.	668	208 CQFP (1.12"sq)
MIP7965-750B1(X)	64 bit SysAD bus interface in a TBGA with EJTAG debug port.	750	Plastic 256 TBGA (26mm sq)

(X) = Temperature range and screening code (see data sheet).



## Memory Modules

[aeroflex.com/avionics](http://aeroflex.com/avionics)

	Description	Access Speed (ns)	Package
	High-Speed, low-noise, low-voltage TTL (LVTTTL) compatible outputs. 3.3V operation with separate logic and output driver power pins. All inputs and outputs are synchronized with the CLK input to simplify system design and enhance use with high-speed microprocessors. Internal pipelined operation; column address can be changed every clock cycle. CAS latency (CL) programmable to 2 cycles from column-address entry. Cycle-by-cycle DQ-bus write mask capability with upper and lower byte control. Chip select and clock enable for enhanced-system interfacing. Auto-Refresh.		
Model: ACT-D1M96S-020F20X Ordering Part Number: 3369-BF20-M01C	6 low power 1M x 16 banks of SDRAM die packaged into a single SDRAM MCM organized as 2 independent 512K x 48 x 2 banks. Programmable burst lengths: 4 or 8. Serial Burst Sequence. 2 banks for on-chip interleaving (gapless accesses). 4K refresh (Total for Both Banks) Operates from 3.3V Power Supply +/- 10%.	20	200 CQFP (1.45" sq)
Model: ACT-D16M96S-020F20X Ordering Part Number: 3370-BF20-M21C-1	6 low power 4M x 16 x 4 banks of SDRAM die packaged into a single SDRAM MCM organized as 2 independent 4M x 48 x 4 banks. LVTTTL compatible outputs. 3.3V operation with separate logic and output driver power pins. Internal pipelined operation; column address can be changed every clock cycle. Programmable burst lengths: 1, 2, 4, 8, or full page. 64ms, 8,192-cycle refresh. Auto precharge, includes concurrent auto precharge, and auto refresh modes. Operates from 3.3V power supply ±5%.	20	200 CQFP (1.45" sq)

## Motor Drivers

[aeroflex.com/power](http://aeroflex.com/power)

	Description	Package
ACT5101-1 Three Phase Brushless DC Motor Driver	High-voltage three phase motor driver features a 500 VDS rating, 50A continuous current (up to 85°C) with 4 quadrant control, 6-step trapezoidal drive cap, isolated upper and lower gate drivers.	26 Plug-in package 3.0" x 2.1"

# Standard Products for Avionic Applications

## MIL-STD-1553 Encoder-Decoder [aeroflex.com/avionics](http://aeroflex.com/avionics)

Description	SMD #
CT1820 Series	5962-90636

## MIL-STD-1553 Integrated Terminals [aeroflex.com/avionics](http://aeroflex.com/avionics)

Description	SMD #
CT2512 / CT2512-FP	5962-8753503
CT2512-PCB / CT2512-FP-PCB	N/A
CT2542 / CT2542-FP	5962-8979803
CT2553 / CT2553-FP	5962-8869201
CT2553-PCB / CT2553-FP-PCB	N/A
CT2554 / CT2554-FP	5962-8869202
CT2554-PCB / CT2554-FP-PCB	N/A
CT2555 / CT2555-FP	5962-8869203
CT2555-PCB / CT2555-FP-PCB	N/A
CT2577-P119*	N/A
CT2578-P119	N/A
CT2578-F84	N/A
CT2579-P119*	N/A
ACT3492	N/A
ACT7005	N/A
ACT7006	N/A

N/A = not actively pursuing an SMD.

\* Contact Aeroflex at 800-645-8862; these are not in full production.





# MIL-STD-1553 Standard Products for Avionic Applications

## Data Bus Transceivers Single Channel *aeroflex.com/avionics*

	1553/1760	MacAir	Size	Package Type	Leads	Idle RCVR Outputs	Power Supplies	Turns Ratio	Transformer Center Tap Ground	SMD #
ACT4402	■		0.62" x 1.25"	Plug-in	24	Low	+5V, ±15V	1.4:1	■	TBD
ACT4402I	■		0.62" x 1.25"	Plug-in	24	High	+5V, ±15V	1.4:1	■	TBD
ACT4404N** (replaces CT3232M)	■	■	1.27" x 1.27"	Plug-in or Flatpack	24	High	+5V, ±12V to ±15V	1:1	Open	5962-91749
ACT4438-1, ACT4438-3	■		8 mm x 8 mm	BCC++	56	Low	+5V	2.5:1	■	TBD
ACT4444 (see ACT4462D)	■	■	9 mm x 9 mm	BCC++	64	Low/High	+5V, ±12V to ±15V	1:1	Open	TBD
ACT4445 (see ACT4487D)	■		9 mm x 9 mm	BCC++	64	Low/High	+5V, ±12V to ±15V	1.4:1	■	TBD
ACT4455	■		0.445" x 0.445"	LCC	28	Low	+5V	2.5:1	■	5962-96741
ACT4459	■		0.445" x 0.445"	LCC	28	High	+5V	2.5:1	■	5962-96741
ACT4406N (replaces ARX3404)	■	■	1.27" x 1.27"	Plug-in or Flatpack	24	High	+5V, ±12V to ±15V	1:1	Open	5962-89592
ACT4407N (replaces CT3231M)	■		1.27" x 1.27"	Plug-in or Flatpack	24	High	+5V, ±12V to ±15V	1:1	Open	5962-91749
ACT4417N	■		1.27" x 1.27"	Plug-in or Flatpack	24	High	+5V, ±12V to ±15V	1:1	Open	TBD
ACT4418N*	■	■	1.27" x 1.27"	Plug-in or Flatpack	24	Low	+5V, ±12V to ±15V	1:1	Open	5962-92085
ACT4435N (replaces CT1816 and CT1641)		H009	1.27" x 1.27"	Plug-in or Flatpack	24	High	+5V, ±12V to ±15V	1:1	Open	TBD
ACT4487 (equiv BUS8553) (replaces CT1487 and CT1487M)	■		0.805" x 1.385" 0.735" x 1.315"	Plug-in and Flatpack	24	High	±5V, ±15V	1.4:1	■	TBD

\* Variable Amplitude Transceiver (similar to ARX4418) - contact factory for information.

\*\* Has external threshold control.

# Standard Products for Avionic Applications

## Data Bus Transceivers Dual Channel\*

[aeroflex.com/avionics](http://aeroflex.com/avionics)

	1553/1760	MacAir	Size	Package Type	Leads	Variable Amplitude Transmitter	Power Supplies	Turns Ratio	Transformer Center Tap Ground	SMD #
ACT4419D	■		0.3" x 1.2"	Plug-in	20	■	+5V	2.5:1	■	TBD
ACT4419DF	■		0.3" x 1.2"	Flatpack	20	■	+5V	2.5:1	■	TBD
ACT4453	■		0.775" x 1.9"	Plug-in or Flatpack	36		+5V	2.12:1	■	5962-89522
ACT4458	■		0.6" x 0.8"	Flatpack	24		+5V	2.5:1	■	5962-92061
ACT4464	■		0.6" x 0.8"	Flatpack	24		+5V	2.5:1	■	5962-92061
ACT4461DF	■		0.6" x 0.8"	Flatpack	24		+5V	2.5:1	■	TBD
ACT4468D (equiv NHI-1567)	■		0.3" x 1.0"	Plug-in	20		+5V	2.5:1	■	TBD
ACT4468DF	■		0.3" x 1.0"	Flatpack	20		+5V	2.5:1	■	TBD
ACT4462D (pin selectable H009 transmitter)	■	■ H009	0.62" x 1.25"	Plug-in	24	■	+5V, ±12V to 15V	1:1	Open	TBD
ACT4469D		H009	0.62" x 1.25"	Plug-in	24	■	+5V, ±15V	1:1	■	TBD
ACT4479D		H009	0.775" x 1.5"	Plug-in	28		+5V, ±15V	1:1	■	TBD
ACT4479DF		H009	0.775" x 1.5"	Flatpack	28		+5V, ±15V	1:1	■	TBD
ACT4489D	■		0.775" x 1.9"	Plug-in	36		+5V, ±12V	1:1	■	TBD
ACT4489DF	■		0.775" x 1.9"	Flatpack	36		+5V, ±12V	1:1	■	TBD
ACT4433D	■		0.775" x 1.5"	Plug-in	28		+5V, ±12V	1:1	■	TBD
ACT4433DF	■		0.775" x 1.5"	Flatpack	28		+5V, ±12V	1:1	■	TBD
ACT4487D (replaces CT1487D)	■		0.775" x 1.9"	Plug-in	36		+5V, ±15V	1.4:1	■	5962-87579
ACT4487DI (replaces CT1487DI)	■		0.775" x 1.9"	Plug-in	36		+5V, ±15V	1.4:1	■	5962-89447
ACT4487DF (replaces CT1487DFP)	■		0.775" x 1.9"	Flatpack	36		+5V, ±15V	1.4:1	■	5962-87579
ACT4487DFI (replaces CT1487DIFP)	■		0.775" x 1.9"	Flatpack	36		+5V, ±15V	1.4:1	■	5962-89447
ACT4436D	■		0.775" x 1.5"	Plug-in	28		+5V, ±15V	1.4:1	■	TBD
ACT4436DI	■		0.775" x 1.5"	Plug-in	28		+5V, ±15V	1.4:1	■	5962-89447
ACT4436DF	■		0.775" x 1.5"	Flatpack	28		+5V, ±15V	1.4:1	■	TBD
ACT4436DFI	■		0.775" x 1.5"	Flatpack	28		+5V, ±15V	1.4:1	■	5962-89447
ACT4808N-D	■	■	0.775" x 1.9"	Plug-in	36		+5V, ±12V to ±15V	1:1	Open	TBD
ACT4808N-DF	■	■	0.775" x 1.9"	Flatpack	36		+5V, ±12V to ±15V	1:1	Open	TBD

\* See individual data sheets for receiver output idle low/high.

