DATASHEET

RELEASED 7/25/19

16-Channel Buffered Output Analog Multiplexer

RHD5921

Features

- Single power supply operation at 3.3V or 5V
- Radiation performance
  - Total dose: >1 Mrad(Si); Dose rate = 50-300 rad(Si)/s
  - ELDRS Immune
  - SEL Immune >100 MeV-cm^2/mg
  - Neutron Displacement Damage >10^{14} neutrons/cm^2
- Full military temperature range
- Low Power consumption when enabled
- CMOS analog switching allows rail to rail operation and low switch impedance
- Address bus (A_{0-3}), and one enable line
- High input impedance
- Designed for aerospace and high reliability space applications
- Packaging – Hermetic ceramic
  - 24-pin, 0.614"L x 0.300"W x 0.120"Ht SOIC
  - Typical Weight 2 grams
- **Radiation Hardness Assurance Plan: DLA Certified to MIL-PRF-38534, Appendix G.**

General Description

The RHD5921 is a radiation hardened, single supply, 16 channel buffered output multiplexer in a 24-pin SOIC package. The RHD5921 design uses specific circuit topology and layout methods to mitigate total ionizing dose effects and single event latchup. These characteristics make the RHD5921 especially suited for the harsh environment encountered in Deep Space missions. It is guaranteed operational from -55°C to +125°C. Available screened in accordance with MIL-PRF-38534 Class K, the RHD5921 is ideal for demanding military and space applications.

Organization and Application

The RHD5921 is a 16 to 1 CMOS 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 CMOS Rail-to-Rail amplifier. When the RHD5921 is disabled, the chip is put into a power-down state and the output is tri-stated.

The devices will not latch with SEU events to above 100 MeV-cm^2/mg. Total dose degradation is minimal to above 1 Mrad(Si). Displacement damage environments to neutron fluence equivalents in the mid 10^{14} neutrons per cm^2 range are readily tolerated. There is no sensitivity to low-dose rate (ELDRS) effects. SEU effects are application dependent.

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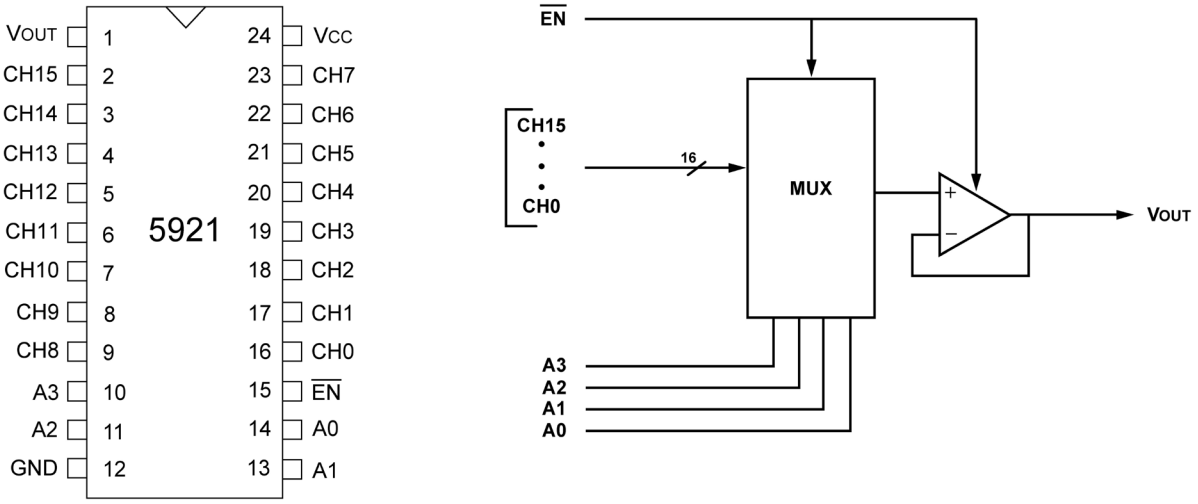

Figure 1: 16-Channel Buffered Analog MUX

Note:

1) Package and lid are electrically isolated from signal pads.

A3	A2	A1	A0	$\overline{EN}$	"ON" Channel 1/
X	X	X	X	H	NONE
L	L	L	L	L	CH0
L	L	L	H	L	CH1
L	L	H	L	L	CH2
L	L	H	H	L	CH3
L	H	L	L	L	CH4
L	H	L	H	L	CH5
L	H	H	L	L	CH6
L	H	H	H	L	CH7
H	L	L	L	L	CH8
H	L	L	H	L	CH9
H	L	H	L	L	CH10
H	L	H	H	L	CH11
H	H	L	L	L	CH12
H	H	L	H	L	CH13
H	H	H	L	L	CH14
H	H	H	H	L	CH15

1) Between (CH0-CH15) and V_{OUT}

Figure 2: Truth Table

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Absolute Maximum Ratings

Parameter	Range	Units
Case Operating Temperature Range	-55 to +125	ºC
Storage Temperature Range	-65 to +150	ºC
Supply Voltage ($+V_{CC}$)	+7.0	V
Digital Input Overvoltage (V_{EN}, V_A)	< V_{CC} +0.4 > GND -0.4	V V
Analog Input Overvoltage (CH0-CH15)	< V_{CC} +0.4 > GND -0.4	V
Input Current	±10	mA
Thermal resistance, junction-to-case	5	ºC/W
ESD: Class 2, MIL-STD-883, Method 3015.8	2,000 -to- 3,999	V

Notice:

1) Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress rating only; functional operation beyond the "Operation Conditions" is not recommended and extended exposure beyond the "Operation Conditions" may affect device reliability.

Recommended Operating Conditions

Symbol	Parameter	Typical	Units
$+V_{CC}$	Power Supply Voltage	+3.3 -to- +5.0	V
V_{EN}, V_A	Logic Low Level	30% V_{CC}	V
V_{EN}, V_A	Logic High Level	70% V_{CC}	V

Electrical Performance Characteristics lA, 1/

Parameter	Symbol	Conditions V_{CC} = 3.3V ±10%	Temperature	MIN	MAX	Units
Supply Current ($+V_{CC}$)	$+I_{CC}$	V_{IN} = 70% V_{CC}, V_{EN} = 30% V_{CC}, 1/	+25ºC	-	1.15	mA
			+125ºC	-	1.05	
			-55ºC	-	1.25	
	$+I_{SBY}$	V_{EN} = 70% V_{CC}, 1/	+25ºC	-	55	µA
			+125ºC	-	70	
			-55ºC		35	
Output ON Voltage 1	$V_{ON}1$	V_{IN} = 5 Volts, R_L = 10K	All	2.85	3.6	V
Output ON Voltage 2	$V_{ON}2$	V_{IN} = 5 Volts, R_L = 1K	+25ºC	2.55	3.3	V
			+125ºC	2.5	3.25	
			-55ºC	2.6	3.35	
Input Offset Voltage	V_{OS}	V_{IN} = 3.3 Volts, R_L = 10K	+25ºC	-4.75	4.75	mV
			+125ºC	-5.5	5.5	
			-55ºC	-4	4	

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Electrical Performance Characteristics lA, 1/

Parameter	Symbol	Conditions V_{CC} = 3.3V ±10%	Temperature	MIN	MAX	Units
Address High-to-Low to Output	T_AHL	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	0.70	1.55	µs
			+125°C	0.75	1.50	
			-55°C	0.75	1.70	
Address Low-to-High to Output	T_ALH	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	0.15	2.15	µs
			+125°C	0.60	1.85	
			-55°C	0.15	2.45	
Output High to-Output Low	T_F	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	0.70	1.55	µs
			+125°C	0.70	1.50	
			-55°C	0.80	1.80	
Address to Output Slew	SR_{AO}	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	1.25	2.70	V/µs
			+125°C	1.35	2.75	
			-55°C	1.05	2.50	
Time from Enable to Output data	$T_{ON}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v, R_L = 1K per Figure 2	+25°C	0.95	1.90	µs
			+125°C	1.00	1.95	
			-55°C	0.90	1.95	
Time from Enable to Hi-Z	$T_{OFF}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v,R_L = 1K per Figure 2	+25°C	175	265	ns
			+125°C	195	295	
			-55°C	160	245	
Leakage Current: Digital Inputs (A0-A3), $\overline{(EN)}$ 2/	I_{AL}, I_{ENL}	V_A = 30% V_{CC}	+25°C, -55°C	-2	2	nA
			+125°C	-5	5	
	I_{AH}, I_{ENH}	V_A = 70% V_{CC}	+25°C, -55°C	-2	2	
			+125°C	-5	5	
Leakage Current Analog Inputs (CH0-CH15) 2/	$+I_{LKIN}$	V_{IN} = +5V, V_{EN} =70% V_{CC}, Output and all unused MUX inputs under test = 0V	+25°C, -55°C	-3	3	nA
			+125°C	-5	5	
Leakage Current Analog Outputs (V_{OUT}) 2/	I_{LKOUT}	Tri-state, V_{EN} > 70% V_{CC}	+25°C, -55°C	-2	2	nA
			+125°C	-5	5	
Analog Input - to - Output Slew	SR_{IO}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	+25°C	1.25	2.60	V/µs
			+125°C	1.30	2.55	
			-55°C	1.00	2.45	
Time from Input High -to- Output High	T_{IH-OH}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	+25°C	0.30	1.00	µs
			+125°C	0.30	1.15	
			-55°C	0.35	1.05	
Time from Input Low -to- Output Low	T_{IL-OL}	V_{EN} = 30%V_{CC},V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	+25°C	0.35	1.00	µs
			+125°C	0.50	1.20	
			-55°C	0.30	0.95	

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Electrical Performance Characteristics IB, 1/

Parameter	Symbol	Conditions V_{CC} = 5.0V ±10%	Temperature	MIN	MAX	Units
Supply Current (+V_{CC})	+I_{CC}	V_{IN} = 70% V_{CC}, V_{EN} = 30% V_{CC}	+25°C	-	1.75	mA
			+125°C	-	1.6	
			-55°C	-	2.0	
	+I_{SBY}	V_{EN} = 70% V_{CC}	+25°C, 55°C	-	225	µA
			+125°C	-	230	
Output ON Voltage 1	$V_{ON}1$	V_{IN} = 5 Volts, R_L = 10K	All	4.35	5.44	V
Output ON Voltage 2	$V_{ON}2$	V_{IN} = 5 Volts, R_L = 1K	+25°C	3.95	5.00	V
			+125°C	3.90	4.95	
			-55°C	4.00	5.05	
Input Offset Voltage	V_{OS}	V_{IN} = 3.3 Volts, R_L = 10K	+25°C	-4.75	4.75	mV
			+125°C	-5.50	5.50	
			-55°C	-4.00	4.00	
Address High-to-Low to Output	T_AHL	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	1.00	1.95	µs
			+125°C	1.05	1.90	
			-55°C	1.05	2.20	
Address Low-to-High to Output	T_ALH	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	0.65	2.40	µs
			+125°C	1.05	2.15	
			-55°C	0.25	2.90	
Output High to-Output Low	T_F	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	0.90	1.85	µs
			+125°C	0.90	1.75	
			-55°C	1.00	2.15	
Address to Output Slew	SR_{AO}	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	+25°C	1.70	3.40	V/µs
			+125°C	1.85	3.45	
			-55°C	1.45	3.15	
Time from Enable to Output data	$T_{ON}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v, R_L = 1K per Figure 2	+25°C	0.85	1.70	µs
			+125°C	0.95	1.70	
			-55°C	0.90	1.85	

Electrical Performance Characteristics IB, 1/

Parameter	Symbol	Conditions V_{CC} = 5.0V ±10%	Temperature	MIN	MAX	Units
Time from Enable to Hi-Z	$T_{OFF}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v, R_L = 1K per Figure 2	+25°C	170	255	ns
			+125°C	190	275	
			-55°C	155	235	
Leakage Current: Digital Inputs (A0-A3), $\overline{(EN)}$ 2/	I_{AL}, I_{ENL}	V_A = 30% V_{CC}	+25°C, -55°C	-2	2	nA
			+125°C	-5	5	
	I_{AH}, I_{ENH}	V_A = 70% V_{CC}	+25°C, -55°C	-2	2	
			+125°C	-5	5	
Leakage Current Analog Inputs (CH0-CH15) 2/	$+I_{LKIN}$	V_{IN} = +5V, V_{EN} =70% V_{CC}, Output and all unused MUX inputs under test = 0V	+25°C, -55°C	-3	3	nA
			+125°C	-5	5	
Leakage Current Analog Outputs (V_{OUT}) 2/	I_{LKOUT}	Tri-state, V_{EN} > 70% V_{CC}	+25°C, -55°C	-2	2	nA
			+125°C	-5	5	
Analog Input - to - Output Slew	SR_{IO}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	+25°C	1.60	3.30	V/µs
			+125°C	1.70	3.25	
			-55°C	1.10	3.60	
Time from Input High -to- Output High	T_{IH-OH}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	+25°C	0.40	1.65	µs
			+125°C	0.45	1.90	
			-55°C	0.45	1.40	
Time from Input Low -to- Output Low	T_{IL-OL}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	+25°C	0.45	1.05	µs
			+125°C	0.55	1.15	
			-55°C	0.40	1.15	

Notes are found at the end of table IIB

Radiation Electrical Performance Characteristics IIA

(T_C = +25°C, +V_{CC} = +3.3V ±10%) 1/, 3/

Parameter	Symbol	Test Conditions V_{CC} = +3.3 volts ±10%	MIN / MAX	100 krad(Si)	300 krad(Si)	650 krad(Si)	1 Mrad(Si)	Units
Supply Current	$+I_{CC}$	V_{EN} = 30%V_{CC}, All Analog input = 0v, A_{0-3} = 0v, No Load	MIN	-	-	-	-	mA
			MAX	1.1	1.05	1.05	1.05	
	$+I_{SBY}$	V_{EN} = 70%V_{CC}, All Analog input = 0v, A_{0-3} = 0v, No Load	MIN	-	-	-	-	µA
			MAX	50	45	40	35	
Output ON Voltage1	$V_{ON}1$	V_{EN} = 30%V_{CC}, V_{IN} = V_{CC}, R_L = 10K	MIN	2.85	2.85	2.85	2.85	V
			MAX	3.6	3.6	3.6	3.6	
Output ON Voltage2	$V_{ON}2$	V_{EN} = 30%V_{CC}, V_{IN} = V_{CC}, R_L = 1K	MIN	2.55	2.55	2.55	2.55	V
			MAX	3.3	3.3	3.3	3.3	
Input Offset Voltage	V_{OS}	V_{EN} = 30%V_{CC}, V_{IN} = 50%V_{CC}, R_L = 10K	MIN	-4.75	-6	-7	-7.5	mV
			MAX	4.75	6	7	7.5	
Address High-to-Low to Output	T_AHL	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC},10kHz pulse R_L = 10K per Figure 2	MIN	0.7	0.9	1.05	1.15	µs
			MAX	1.6	1.7	1.9	2.05	
Address Low-to-High to Output	T_ALH	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	MIN	0.15	0.15	0.3	0.35	µs
			MAX	2.25	2.4	2.65	2.9	
Output High to-Output Low	T_F	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	MIN	0.75	0.85	0.85	0.85	µs
			MAX	1.65	1.75	2.15	2.5	
Address to Output Slew	SR_{AO}	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	MIN	1.15	0.95	0.7	0.7	V/µs
			MAX	2.6	2.5	2.3	2.25	
Time from Enable to Output data	$T_{ON}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v, R_L = 1K per Figure 2	MIN	1	1.1	1.2	1.25	µs
			MAX	2	2.25	2.8	3.25	

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Radiation Electrical Performance Characteristics IIA

(T_C = +25°C, +V_{CC} = +3.3V ±10%) 1/, 3/

Parameter	Symbol	Test Conditions V_{CC} = +3.3 volts ±10%	MIN / MAX	100 krad(Si)	300 krad(Si)	650 krad(Si)	1 Mrad(Si)	Units
Time from Enable to Hi-Z	$T_{OFF}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v, R_L = 1K per Figure 2	MIN	175	165	165	165	ns
			MAX	265	260	260	260	
Leakage Current - Digital Inputs	I_{ADDR}, I_{EN}	V_{ADDR}, V_{EN} Low = 30%V_{CC} V_{ADDR}, V_{EN} High = 70%V_{CC}	MIN	-3	-5	-5	-6	nA
			MAX	3	5	5	6	
Leakage Current - Analog Inputs, 4/	I_{LKIN}	V_{EN} = 70%V_{CC}, V_{IN} = V_{CC} All unused Analog inputs = 0v, V_{OUT}= 0v, No Load	MIN	-5	-5	-10	-20	nA
			MAX	5	5	10	20	
Leakage Current - Analog Outputs	I_{LKOUT}	V_{EN} = 70%V_{CC}, All Analog inputs = 0v, V_{OUT}= 0v, No Load	MIN	-3	-5	-5	-6	nA
			MAX	3	5	5	6	
Analog Input - to - Output Slew	SR_{IO}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	MIN	1.1	0.95	0.65	0.60	V/µs
			MAX	2.5	2.4	2.25	2.2	
Time from Input High -to- Output High	T_{IH-OH}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC},10KHz pulse All unused Analog inputs = 0v, R_L = 1K	MIN	0.35	0.40	0.40	0.40	µs
			MAX	1.35	1.35	1.60	2	
Time from Input Low -to- Output Low	T_{IL-OL}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	MIN	0.35	0.40	0.40	0.45	µs
			MAX	1.0	1.35	2.2	2.6	

Radiation Electrical Performance Characteristics IIB

(T_C = +25°C, +V_{CC} = +5.0V ±10%) 1/, 3/

Parameter	Symbol	Test Conditions V_{CC} = +5.0 volts ±10%	MIN/ MAX	100 krad(Si)	300 krad(Si)	650 krad(Si)	1 Mrad(Si)	Units
Supply Current	$+I_{CC}$	V_{EN} = 30%V_{CC}, All Analog input = 0v, A_{0-3} = 0v, No Load	MIN	-	-	-	-	mA
			MAX	1.7	1.65	1.65	1.65	
	$+I_{SBY}$	V_{EN} = 70%V_{CC}, All Analog input = 0v, A_{0-3} = 0v, No Load	MIN	-	-	-	-	µA
			MAX	220	215	200	195	
Output ON Voltage1	$V_{ON}1$	V_{EN} = 30%V_{CC}, V_{IN} = V_{CC}, R_L = 10K	MIN	4.35	4.35	4.35	4.35	V
			MAX	5.44	5.44	5.44	5.44	
Output ON Voltage2	$V_{ON}2$	V_{EN} = 30%V_{CC}, V_{IN} = V_{CC}, R_L = 1K	MIN	3.95	3.95	3.95	3.95	V
			MAX	5.0	5.0	5.0	5.0	
Input Offset Voltage	V_{OS}	V_{EN} = 30%V_{CC}, V_{IN} = 50%V_{CC}, R_L = 10K	MIN	-4.75	-6	-7	-7.5	mV
			MAX	4.75	6	7	7.5	
Address High-to-Low to Output	T_AHL	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	MIN	1	1	1.05	1.1	µs
			MAX	2.05	2.15	2.35	2.5	
Address Low-to-High to Output	T_ALH	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	MIN	0.75	0.75	0.8	0.8	µs
			MAX	2.5	2.7	2.9	3	
Output High to-Output Low	T_F	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	MIN	0.9	0.95	0.95	0.95	µs
			MAX	1.95	2.05	2.25	2.35	
Address to Output Slew	SR_{AO}	V_{EN} = 30%V_{CC}, Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v to V_{CC}, 10kHz pulse R_L = 10K per Figure 2	MIN	1.6	1.55	1.35	1.3	V/µs
			MAX	3.3	3.15	3.0	2.95	
Time from Enable to Output data	$T_{ON}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v, R_L = 1K per Figure 2	MIN	0.95	1.05	1.1	1.1	µs
			MAX	1.8	1.9	2.05	2.2	

Radiation Electrical Performance Characteristics IIB

(T_C = +25°C, +V_{CC} = +5.0V ±10%) 1/, 3/

Parameter	Symbol	Test Conditions V_{CC} = +5.0 volts ±10%	MIN/ MAX	100 krad(Si)	300 krad(Si)	650 krad(Si)	1 Mrad(Si)	Units
Time from Enable to Hi-Z	$T_{OFF}EN$	V_{EN} = 0v to V_{CC}, 10kHz pulse Vin = V_{CC}, All unused Analog input = 0v, V_{ADDR} = 0v, R_L = 1K per Figure 2	MIN	170	160	160	155	ns
			MAX	255	250	250	250	
Leakage Current - Digital Inputs	I_{ADDR}, I_{EN}	V_{ADDR}, V_{EN} Low = 30%V_{CC} V_{ADDR}, V_{EN} High = 70%V_{CC}	MIN	-3	-5	-5	-6	nA
			MAX	3	5	5	6	
Leakage Current - Analog Inputs, **4/**	I_{LKIN}	V_{EN} = 70%V_{CC}, V_{IN} = V_{CC} All unused Analog inputs = 0v, V_{OUT}= 0v, No Load	MIN	-5	-5	-10	-20	nA
			MAX	5	5	10	20	
Leakage Current - Analog Outputs	I_{LKOUT}	V_{EN} = 70%V_{CC}, All Analog inputs = 0v, V_{OUT}= 0v, No Load	MIN	-3	-5	-5	-6	nA
			MAX	3	5	5	6	
Analog Input - to - Output Slew	SR_{IO}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	MIN	1.45	1.3	1.15	1.05	V/µs
			MAX	3.1	3.0	2.85	2.8	
Time from Input High -to- Output High	T_{IH-OH}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs = 0v, R_L = 1K	MIN	0.45	0.5	0.5	0.5	µs
			MAX	1.8	1.8	1.8	1.9	
Time from Input Low -to- Output Low	T_{IL-OL}	V_{EN} = 30%V_{CC}, V_{IN} = 0 to 70%V_{CC}, 10KHz pulse All unused Analog inputs =0v, R_L = 1K	MIN	0.45	0.45	0.55	0.55	µs
			MAX	1.05	1.2	1.25	1.35	

Notes:

1) Limits for Temperature (-55°C, +125°C) and various irradiation levels reflect the change from the Room (+25°C) limits.
2) Not production tested at -55°C. Limits are based on characterization data.
3) Specification reflects Total Dose exposure at 100krad(Si), 300krad(Si), 650krad(Si) and 1 Mrad(Si) per method 1019, condition A of MIL-STD-883 @ +25°C.
4) There was a measurement error during the 100krad(Si) post irradiation leakage testing for this parameter as seen on the control units. The limits are taken from the next higher TID level of 300krad(Si) which are ±5 nA.
5) Not production tested. Limits are based on V_{CC} = 5.0 volt characterization data.

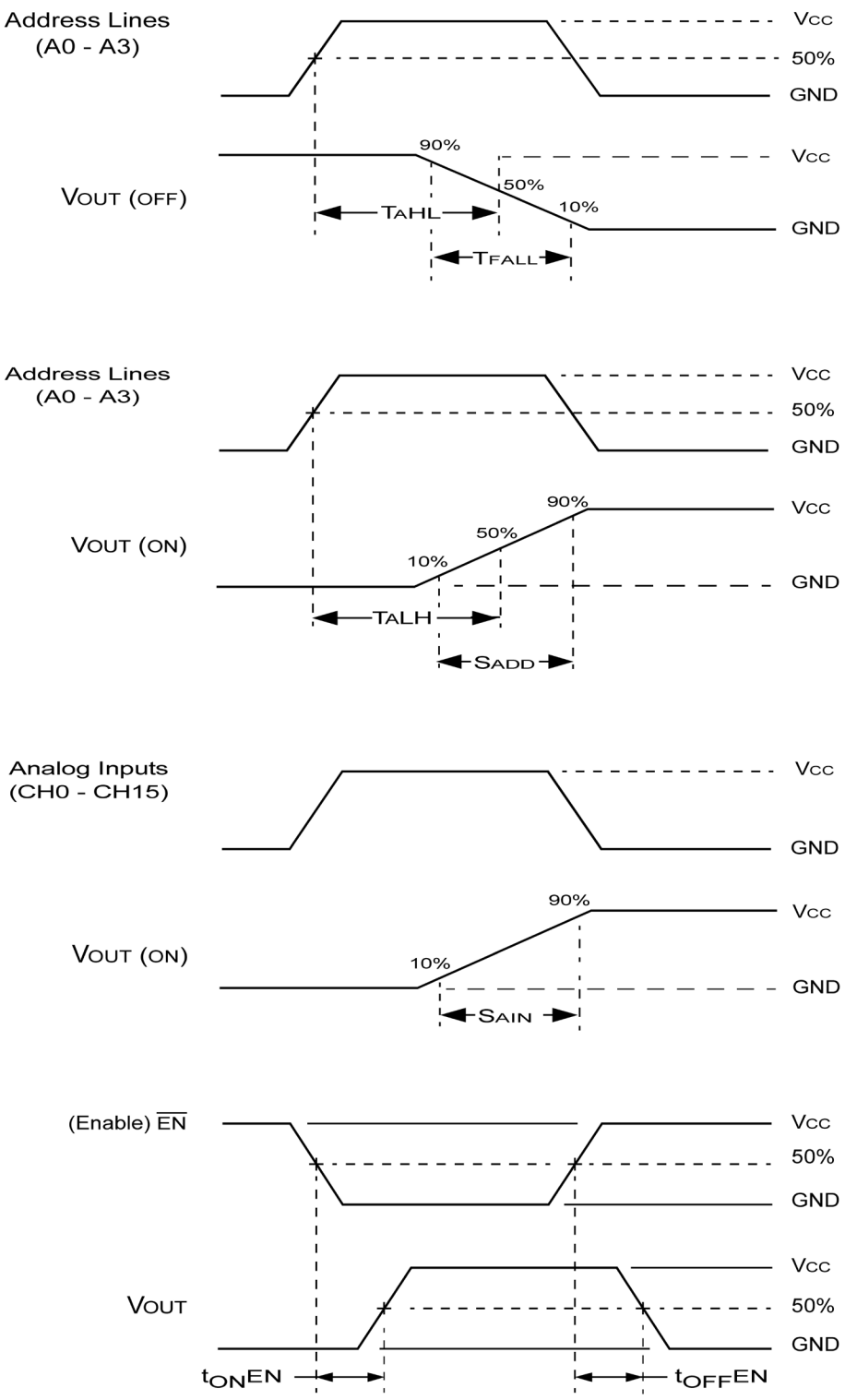

Figure 3: RHD5921 Switching Diagrams

16-Channel Buffered Output Analog Multiplexer

RHD5921

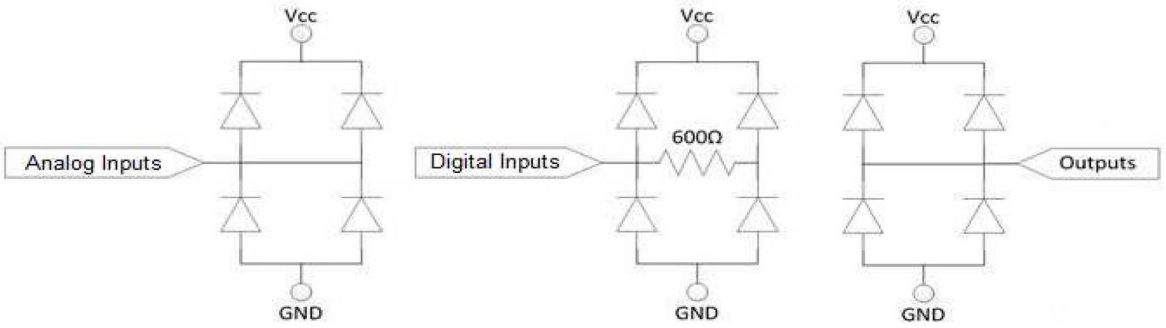

Figure 4: Protection Diodes

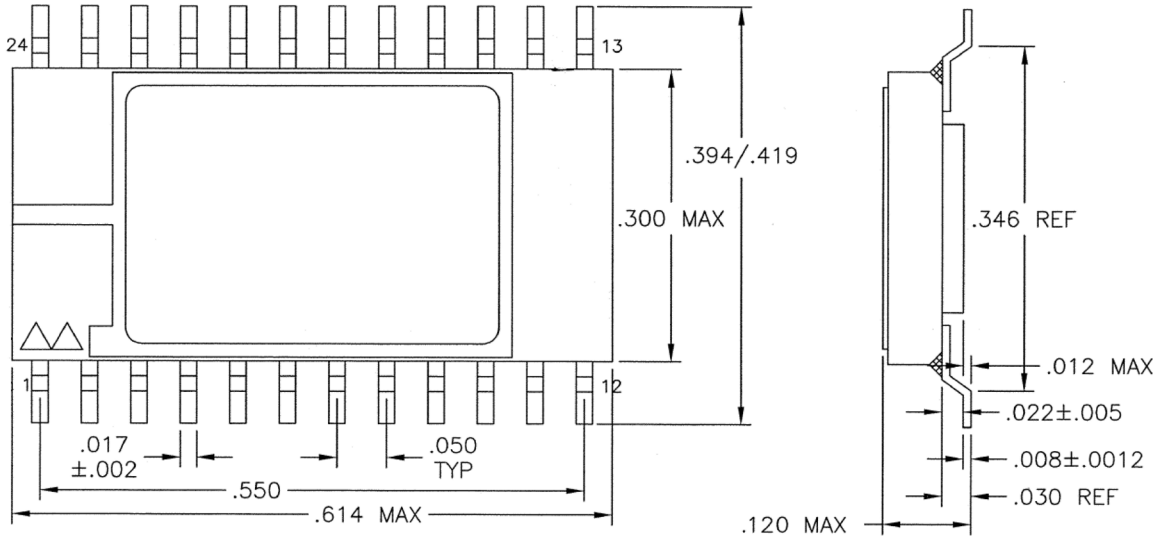

Figure 5: Package Outline

Note: Package and lid are electrically isolated from signal pads.

Ordering Information

Model	DLA SMD #	Screening	Package
RHD5921-7	-	Commercial Flow, +25°C testing only	24-pin SOIC
RHD5921-S	-	Military Temperature, -55°C to +125°C Screened in accordance with the individual Test Methods of MIL-STD-883 for Space Applications	
RHD5921-201-1S	5962-1024302KXC	In accordance with DLA SMD	
RHD5921-201-2S	5962-1024302KXA		
RHD5921-901-1S	5962H1024302KXC	In accordance with DLA Certified RHA Program Plan to RHA Level "H", 1 Mrad(Si)	
RHD5921-901-2S	5962H1024302KXA		

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Revision History

Date	Revision	Change Description
1/10/2017	E	a) Import into CAES format. b) Add Absolute Max Input Current and Thermal resistance. c) Remove ESD reference. d) Update Absolute Max Voltage. e) Remove Supply current Min limit and On-Voltage Max limits; for testing purposes only. f) Add notes for I_{CC} TID testing level limits. g) Add protection diode figure. h) Update Package height dimension.
6/20/2017	F	Remove 3.3 volt references.
7/25/2019	G	Add tables for 3.3v ±10% and 5.0v ±10% for Room Hot and Cold limits. Then add radiation limit tables for 3.3v ±10% and 5.0v ±10% for 100krad, 300krad, 650krad and 1Mrad. Add Diode Protection diagram. Update to the latest format. Add Titus.

DATASHEET

RELEASED 7/25/19

16-Channel Buffered Output Analog Multiplexer

RHD5921

Datasheet Definitions

	DEFINITION
Advanced Datasheet	CAES reserves the right to make changes to any products and services described herein at any time without notice. The product is still in the development stage and the datasheet **is subject to change**. Specifications can be **TBD** and the part package and pinout are **not final**.
Preliminary Datasheet	CAES reserves the right to make changes to any products and services described herein at any time without notice. The product is in the characterization stage and prototypes are available.
Datasheet	Product is in production and any changes to the product and services described herein will follow a formal customer notification process for form, fit or function changes.

The following United States (U.S.) Department of Commerce statement shall be applicable if these commodities, technology, or software are exported from the U.S.: These commodities, technology, or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law is prohibited.