



DESCRIPTION

The A4714 is a dual, low on-resistance, low voltage, bidirectional, single-pole/double-throw (SPDT) CMOS analog switches designed to operate from a single +1.8V to +5.5V supply. Targeted applications include battery powered equipment that benefit from low $R_{ON}(0.5\Omega)$ and fast switching speeds ($t_{ON} = 16ns$, $t_{OFF} = 15ns$). The on resistance profile is very flat over the full analog signal range. This ensures excellent linearity and low distortion when switching audio signals.

The A4714 is a committed dual single-pole/double-throw (SPDT) that consist of two normally open (NO) and two normally close (NC) switches. This configuration can be used as a dual 2-to-1 multiplexer.

The A4714 is available in MSOP10 Package.

ORDERING INFORMATION

Package Type	Part Number	
MSOP10 SPQ: 3,000pcs/Reel	MS10	A4714MS10R
		A4714MS10VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

FEATURES

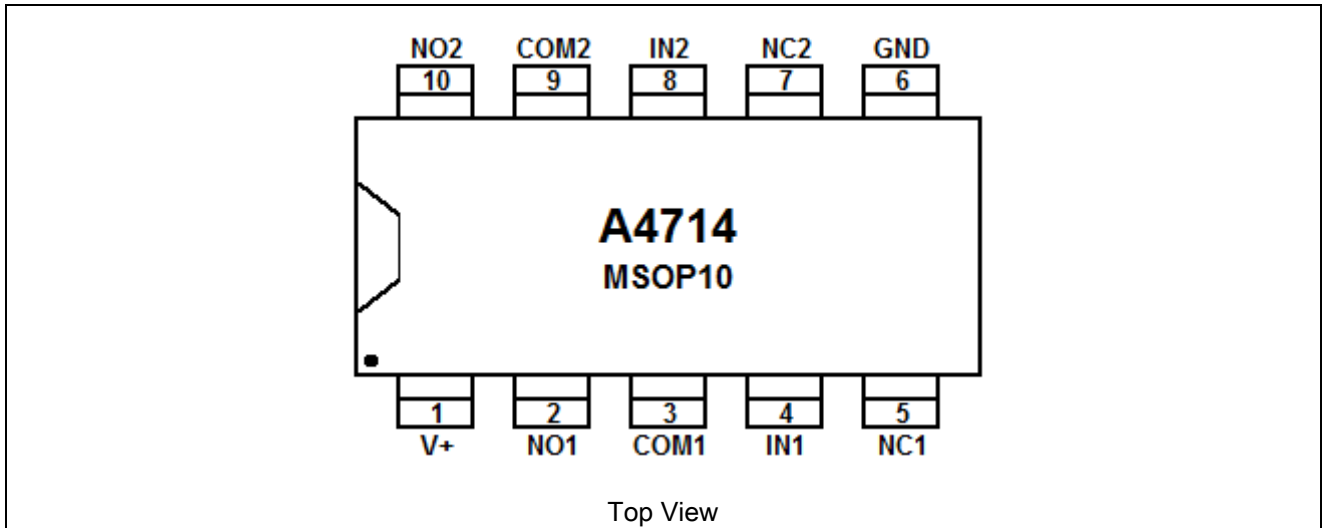
- Low voltage operation : 1.8 V to 5.5 V
- Low on-resistance: 0.5Ω (TYP)
- Low on-resistance flatness
- -3 dB bandwidth: 30 MHz
- Fast switching time : $t_{ON}=16ns$, $t_{OFF}=15ns$
- Rail-to-rail operation
- Typical power consumption (<0.01μW)
- TTL/CMOS compatible
- Microsize package
- Available in MSOP10 Package

APPLICATION

- Battery powered, handheld and portable equipments
- Cellular/mobile phones
- Laptops, notebooks, palmtops
- Communication systems
- Sample-and-hold Circuits
- Audio signal routing
- Audio and video switching
- Portable test and measurement
- Medical equipment



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	V+	Power Supply
2,10	NO1,NO2	Normally-open terminal
3,9	COM1,COM2	Common terminal
4,8	IN1,IN2	Digital control pin to connect the COM terminal to the NO or NC terminals
5,7	NC1,NC2	Normally-closed terminal
6	GND	Ground



ABSOLUTE MAXIMUM RATINGS

V+ to GND	-0.3V ~ 6V
Analog, Digital Voltage Range	-0.3V ~ V ₊ +0.3V
Continuous Current NO,NC,COM	±300mA
Peak Current NO, NC, or COM	±500mA
Operating Temperature Range	-40°C ~ 125°C
Junction Temperature	150°C
Storage Temperature	-65°C~150°C
Lead Temperature(soldering , 10s)	+300°C
ESD	4000V

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



ELECTRICAL CHARACTERISTICS

V+ = +5V ±10%, GND = 0V, T_A = -40°C to +125°C, unless otherwise noted. Typical values are at T_A = +25°C.

Parameter	Symbol	Conditions	+25°C	-40°C ~ +125°C	Max/Min	Unit
Analog Signal Range	V _{COM}			0	MIN	V
	V _{NC} , V _{NO}			V+	MAX	
On-Resistance	R _{ON}	0 ≤ V _{NO} or V _{NC} ≤ V+, I _{COM} = -10mA, TEST Circuit 1	0.5		TYP	Ω
			0.9	1.1	MAX	
On-Resistance Match Between Channels	ΔR _{ON}	0 ≤ V _{NO} or V _{NC} ≤ V+, I _{COM} = -10mA, TEST Circuit 1	0.05		TYP	Ω
			0.10	0.13	MAX	
On-Resistance Flatness	R _{FLAT(ON)}	0 ≤ V _{NO} or V _{NC} ≤ V+, I _{COM} = -10mA, TEST Circuit 1	0.25		TYP	Ω
			0.3	0.4	MAX	
Source OFF Leakage Current	I _{NC(OFF)} I _{NO(OFF)}	V _{NO} or V _{NC} = 4.5V/1V, V+ = 5.5V, V _{COM} = 1V/4.5V, Test Circuit 2	±4		TYP	nA
			±10	±1000	MAX	
Channel ON Leakage Current	I _{NC(ON)} I _{NO(ON)} I _{COM(ON)}	V _{NO} or V _{NC} = V _{COM} = 1V/4.5V V+ = 5.5V, Test Circuit 3	±4		TYP	nA
			±10	±1000	MAX	
Input High Voltage	V _{INH}			2.4	MIN	V
Input Low Voltage	V _{INL}			0.8	MAX	V
Input Current	I _{INH} or I _{INL}	V _{IN} = V _{INH} or V _{INL}	±0.01		TYP	μA
			±0.1	±1	MAX	
Turn-On Time	t _{ON}	V _{NO} or V _{NC} = 3V, R _L = 300Ω, C _L = 35pF, Test Circuit 4	16		TYP	ns
Turn-Off Time	t _{OFF}	V _{NO} or V _{NC} = 3V, R _L = 300Ω, C _L = 35pF, Test Circuit 4	15		TYP	ns
Bandwidth-3dB	BW	R _L = 50Ω, C _L = 5pF, Test Circuit 5	30		TYP	MHz
Source OFF Capacitance	C _{NC(OFF)} C _{NO(OFF)}		82		TYP	pF
Channel ON Capacitance	C _{NC(ON)} C _{NO(ON)} C _{COM(ON)}		380		TYP	pF
Power Supply Current	I+	V+ = 5.5V, V _{IN} = 0V or V+	0.001		TYP	μA
			0.1	1	MAX	



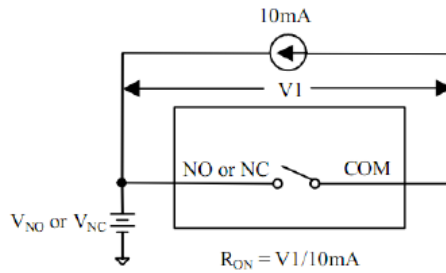
V+ = +3V ±10%, GND = 0V, T_A = -40°C to +125°C, unless otherwise noted. Typical values are at T_A = +25°C.

Parameter	Symbol	Conditions	+25°C	-40°C ~ +125°C	Max/Min	Unit
Analog Signal Range	V _{COM}			0	MIN	V
	V _{NC} , V _{NO}			V+	MAX	
On-Resistance	R _{ON}	0 ≤ V _{NO} or V _{NC} ≤ V+, I _{COM} = -10mA, TEST Circuit 1	0.6		TYP	Ω
			1.0	1.3	MAX	
On-Resistance Match Between Channels	ΔR _{ON}	0 ≤ V _{NO} or V _{NC} ≤ V+, I _{COM} = -10mA, TEST Circuit 1	0.05		TYP	Ω
			0.10	0.13	MAX	
On-Resistance Flatness	R _{FLAT(ON)}	0 ≤ V _{NO} or V _{NC} ≤ V+, I _{COM} = -10mA, TEST Circuit 1	0.25		TYP	Ω
			0.3	0.4	MAX	
Source OFF Leakage Current	I _{NC(OFF)} I _{NO(OFF)}	V _{NO} or V _{NC} = 3V/1V, V+ = 3.3V, V _{COM} = 1V/3V, Test Circuit 2	±5		TYP	nA
			±11	±1000	MAX	
Channel ON Leakage Current	I _{NC(ON)} I _{NO(ON)} I _{COM(ON)}	V _{NO} or V _{NC} = V _{COM} = 1V/3V V+ = 3.3V, Test Circuit 3	±5		TYP	nA
			±11	±1000	MAX	
Input High Voltage	V _{INH}			2.4	MIN	V
Input Low Voltage	V _{INL}			0.5	MAX	V
Input Current	I _{INH} or I _{INL}	V _{IN} = V _{INH} or V _{INL}	±0.01		TYP	μA
			±0.1	±1	MAX	
Turn-On Time	t _{ON}	V _{NO} or V _{NC} = 2V, R _L = 300Ω, C _L = 35pF, Test Circuit 4	17		TYP	ns
Turn-Off Time	t _{OFF}	V _{NO} or V _{NC} = 2V, R _L = 300Ω, C _L = 35pF, Test Circuit 4	16		TYP	ns
Bandwidth-3dB	BW	R _L = 50Ω, C _L = 5pF, Test Circuit 5	30		TYP	MHz
Source OFF Capacitance	C _{NC(OFF)} C _{NO(OFF)}		82		TYP	pF
Channel ON Capacitance	C _{NC(ON)} C _{NO(ON)} C _{COM(ON)}		380		TYP	pF
Power Supply Current	I+	V+ = 3.3V, V _{IN} = 0V or V+	0.001		TYP	μA
			0.1	1	MAX	

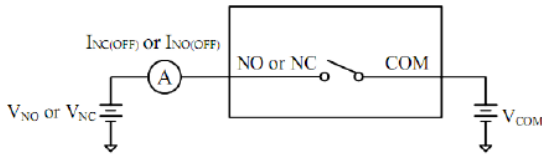


TEST CIRCUITS

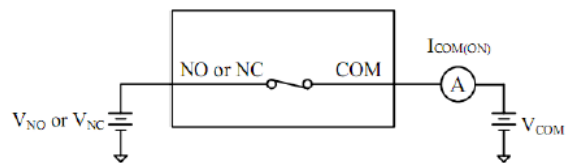
Test Circuit 1. ON-Resistance



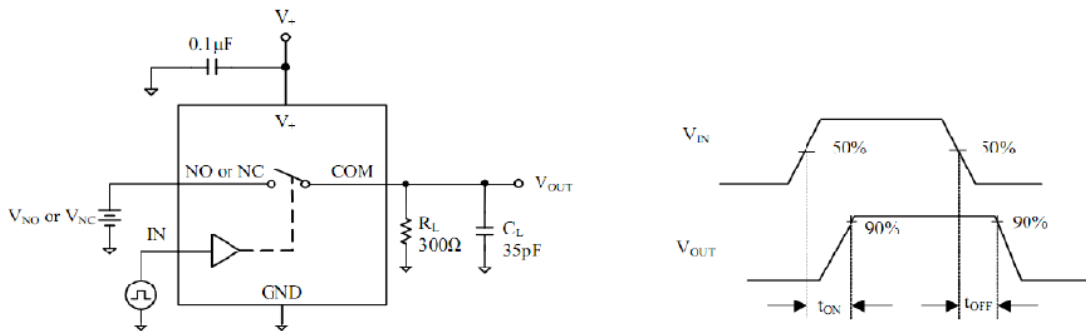
Test Circuit 2. OFF Leakage



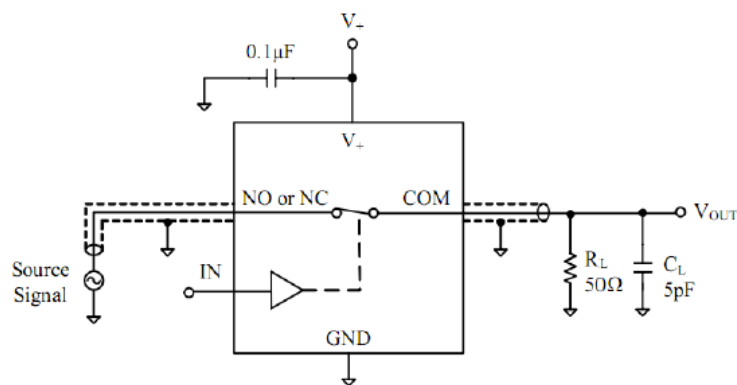
Test Circuit 3. On Leakage



Test Circuit 4. Switching Time

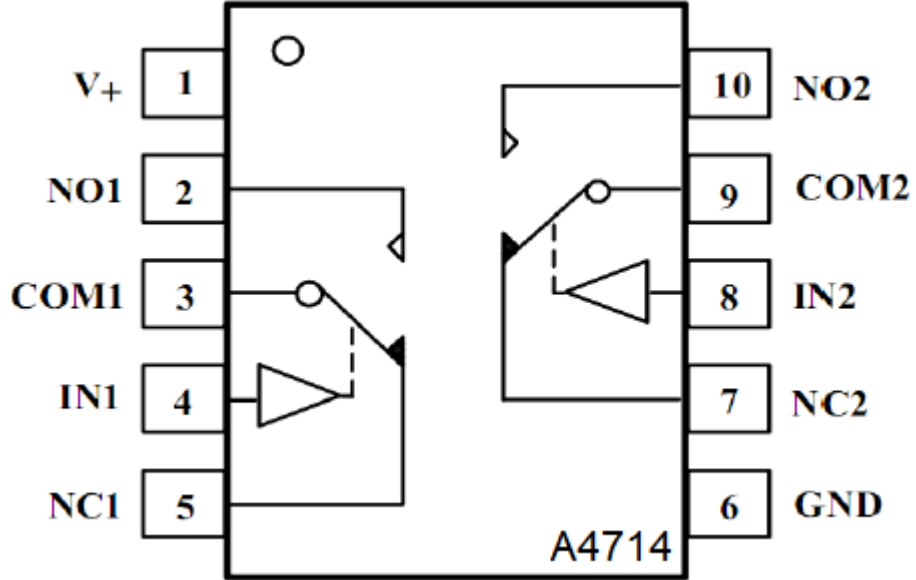


Test Circuit 5. Bandwidth





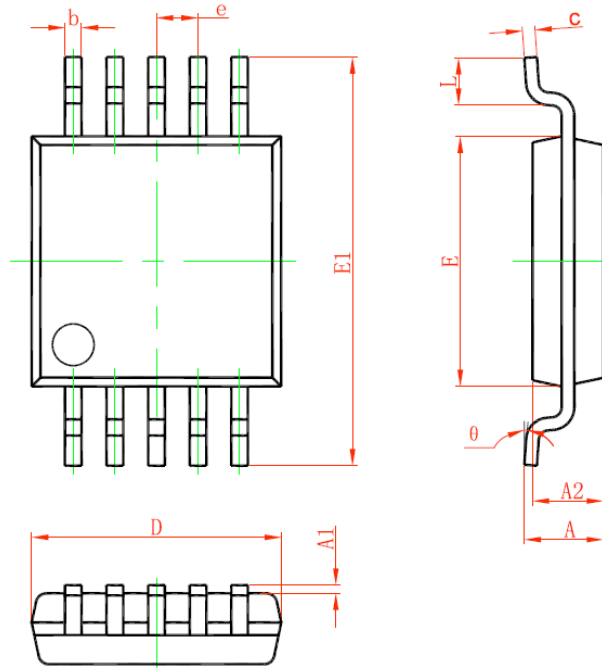
BLOCK DIAGRAM





PACKAGE INFORMATION

Dimension in MSOP10 (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.180	0.280	0.007	0.011
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.500(BSC)		0.020(BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.400	0.800	0.016	0.031
theta	0°	6°	0°	6°



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