

HIGH TEMPERATURE ANALOG MULTIPLEXERS HT506/507 16-CHANNEL SINGLE / 8-CHANNEL DUAL

FEATURES

- Specified Over -55 to +225°C
- Break-Before-Make Switching
- No Latch-up
- On Resistance 400Ω at 225°C
- 8-Channel Leakage 1.2μA at 225°C
- Split and Single Supply Capability

APPLICATIONS

- Down-Hole Oil Well
- Avionics
- Turbine Engine Control
- Industrial Process Control
- Nuclear Reactor
- Electric Power Conversion
- Heavy Duty Internal Combustion Engines

GENERAL DESCRIPTION

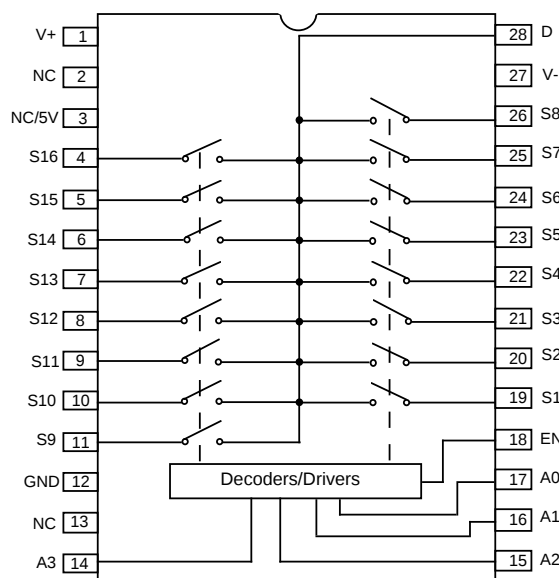
The HT506/507 monolithic multiplexers consist of sixteen analog switches, 4-bit decode for channel selection, reference for logic switching thresholds, and enable pin for device deactivation where applications require. These multiplexers are fabricated with Honeywell's dielectrically isolated latch-up free high temperature (HTMOS™) linear process.

Performance is specified over the full -55 to +225°C temperature range. Typically, parts will operate up to

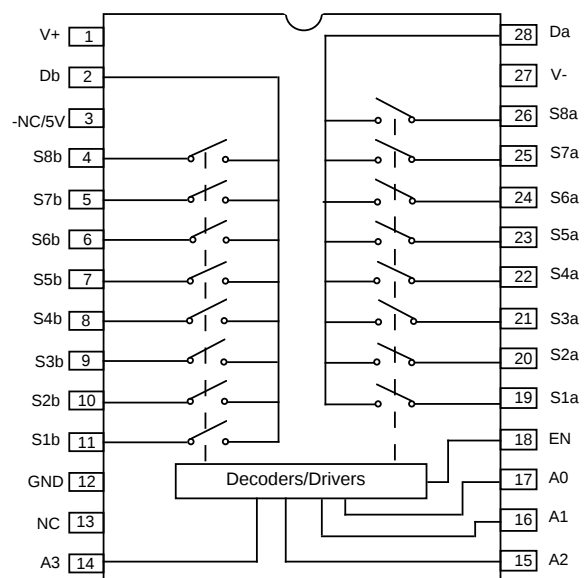
+300°C for a year, with derated performance. All parts are burned in at 250°C to eliminate infant mortality.

The input buffers are designed to operate from either TTL or CMOS levels while providing a break-before-make action. The HT506 switches one of sixteen inputs to a common output, while the HT507 switches one of eight differential inputs to a differential output. These parts are available in standard pinout 28-pin DIPs.

PACKAGE PINOUT HT506



PACKAGE PINOUT HT507



ELECTRICAL CHARACTERISTICS (Split Supply)

Temperature range -55 to +225°C, typical @ +25°C, V+ = +5V, V- = -5 V, V_{IL} = 0.8 V, V_{IH} = 2.4V, unless otherwise specified

Symbol	Parameter	Test Conditions	Typ (1)	Worst Case (2)		Unit
				Min	Max	
Analog Switch						
V _{ANALOG}	Analog Signal Range			-5	5	V
r _{DS(ON)}	Drain-Source On-Resistance	V _D ±5 V, I _S = -10 mA Sequence Each Switch On	100		400	Ω
Δr _{DS(ON)}	r _{DS(ON)} Matching between Channels	V _D = ±5 V	2			%
I _{S(OFF)}	Source Off Leakage Current	V _{EN} = 0 V	0.01		125	nA
I _{D(OFF)}	Drain Off Leakage Current	V _D = ±0.5 V, V _{EN} = 0 V, V _S = ±5 V	0.04	-2500	2500	nA
I _{D(ON)}	Drain On Leakage Current	Sequence Each Switch On	0.04	-2500	2500	nA
Digital Control						
V _{IH}	Logic High Input Voltage			2.4		V
V _{IL}	Logic Low Input Voltage		0.8			V
I _{IH}	Logic High Input Current	V _A = 2.4 V, 10 V		-1	1	μA
I _{IL}	Logic Low Input Current	V _{EN} = 0 V, 2.4 V, V _A = 0 V		-1	1	μA
C _{IN}	Logic input Capacitance	f = 1MHz	7			pF
Dynamic Characteristics						
t _{ON}	Address/Enable Turn-On Time	trise/tfall<50ns		100	400	ns
t _{OFF}	Address/Enable Turn-Off Time	trise/tfall<50ns		30	200	ns
Q	Charge Injection	C _L = 1 nF, V _S = 0 V, R _S = 0Ω	TBD			pC
O _{IS}	Off Isolation	V _{EN} = 0 V, R _L = 1kΩ, f = 100kHz	TBD			dB
C _{S(OFF)}	Source Off Capacitance	V _{EN} = 0 V, V _S = 0 V, f = 1MHz	TBD			pF
C _{D(OFF)}	Drain Off Capacitance	V _{EN} = 0 V, V _D = 0 V f = 1MHz HT506 HT507	TBD			pF
C _{D(ON)}	Drain On Capacitance	V _{EN} = 0 V, V _D = 0 V f = 1MHz HT506 HT507	TBD			pF
Power Supplies						
I+	Positive Supply Current	V _{EN} = V _A = 0 or 5 V	50		250	μA
I-	Negative Supply Current		-0.01	-20		μA

(1) Typical operating conditions: VDD=5.0 V +10%, TA=25°C, pre-radiation.

(2) Worst case operating conditions: VDD=4.5 V to 5.5 V, -55 to 125°C, post total dose at 25°C.

ELECTRICAL CHARACTERISTICS (Single Supply)

Temperature range -55 to +225°C, typical @ +25°C, $V_+ = 10\text{V}$,
 $V_- = 0\text{V}$, $V_{IL} = 0.8\text{V}$, $V_{IH} = 2.4\text{V}$, unless otherwise specified

Symbol	Parameter	Test Conditions	Typ (1)	Worst Case (2)		Unit
				Min	Max	
Analog Switch						
V _{ANALOG}	Analog Signal Range		11			V
r _{DS(ON)}	Drain-Source On-Resistance	V _D = 3 V, 10 V, I _S = 1mA Sequence Each Switch On	80		400	Ω
Δr _{DS(ON)}	r _{DS(ON)} Matching between Channels		2			%
I _{S(OFF)}	Source Off Leakage Current	V _{EN} = 0 V	0.01		200	nA
I _{D(OFF)}	Drain Off Leakage Current	V _S = 0.5 V or 10 V	0.04	-2000	2000	nA
I _{D(ON)}	Drain On Leakage Current		V _S = V _D = ±10 V equence Each Switch On	0.04	-2500	2500
Dynamic Characteristics						
t _{TRANS}	Switching Time of Multiplexer	V _{S1} = 10 V, V _{S8} = 0 V,V _{IN} = 2.4 V			400	ns
t _{ON(EN)}	Address/Enable Turn-On	trise/tfall<50ns		100	400	ns
t _{OFF(EN)}	Address/Enable Turn-Off Time			30	200	
Q	Charge Injection	C _L = 1 nF, V _S = 6 V, R _S = 0	TBD			pC
Power Supplies						
I+	Positive Supply Current	V _{EN} = 0 V or 5 V, V _A = 0 V or 5 V	50		250	μA
I-	Negative Supply Current		-0.01	-20		μA

(1) Typical operating conditions: $V_{\text{DD}} = 5.0\text{V}, T_A = 25^\circ\text{C}$.

(2) Worst case operating conditions: $V_{\text{DD}} = 10\text{V to } \pm 10\%, T_A = -55^\circ\text{C to } +225^\circ\text{C}$.

TRUTH TABLE—HT506

A3	A2	A1	A0	EN	On Switch
X	X	X	X	0	None
0	0	0	0	1	1
0	0	0	1	1	2
0	0	1	0	1	3
0	0	1	1	1	4
0	1	0	0	1	5
0	1	0	1	1	6
0	1	1	0	1	7
0	1	1	1	1	8
1	0	0	0	1	9
1	0	0	1	1	10
1	0	1	0	1	11
1	0	1	1	1	12
1	1	0	0	1	13
1	1	0	1	1	14
1	1	1	0	1	15
1	1	1	1	1	16

TRUTH TABLE—HT507

A2	A1	A0	EN	On Switch Pair
X	X	X	0	None
0	0	0	1	1
0	0	1	1	2
0	1	0	1	3
0	1	1	1	4
1	0	0	1	5
1	0	1	1	6
1	1	0	1	7
1	1	1	1	8

Logic "0" = $V_{\text{AL}} \leq 0.8\text{V}$

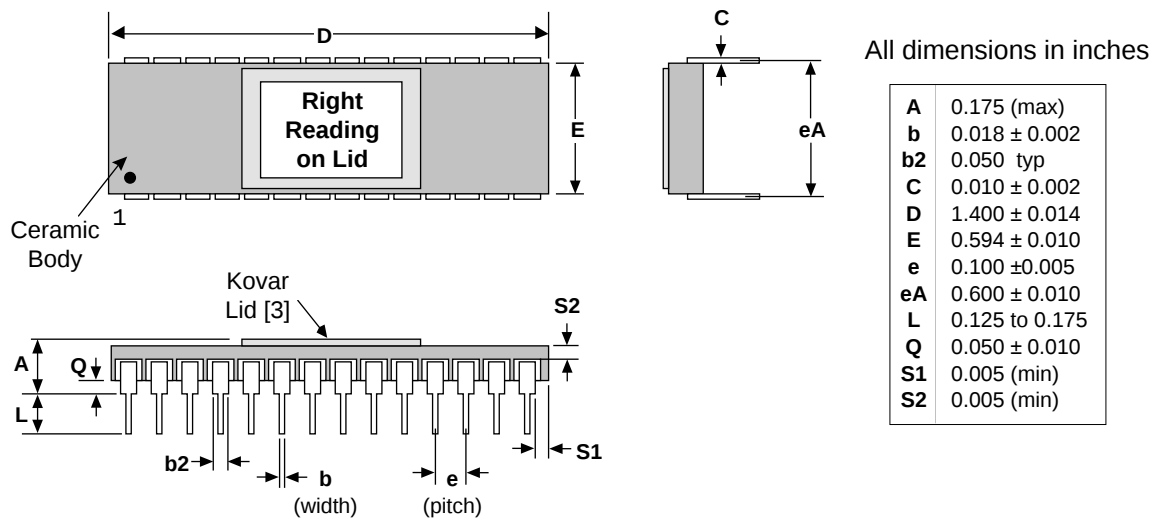
Logic "0" = $V_{\text{AH}} \geq 2.4\text{V}$

X = Don't care

ABSOLUTE MAXIMUM RATINGS

Voltages Referenced to V-, V+	+15V
Digital Inputs VS, VD	-0.5 to VDD +0.5V
Current (any terminal)	10 mA
Peak Current, S or D, (Pulsed at 1 ms, 10% Duty Cycle Max)	15mA
Storage Temperature	-65 to +325°C
Power Dissipation (Package)	500 mW
ESD Protection	1000V

28-LEAD PACKAGE



ORDERING INFORMATION

HT506DC

D—Indicates package type
D = Standard DIP*
*For packaging information, call Honeywell

C—Indicates screening level
C = Commercial
B = High Temperature Class B

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