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

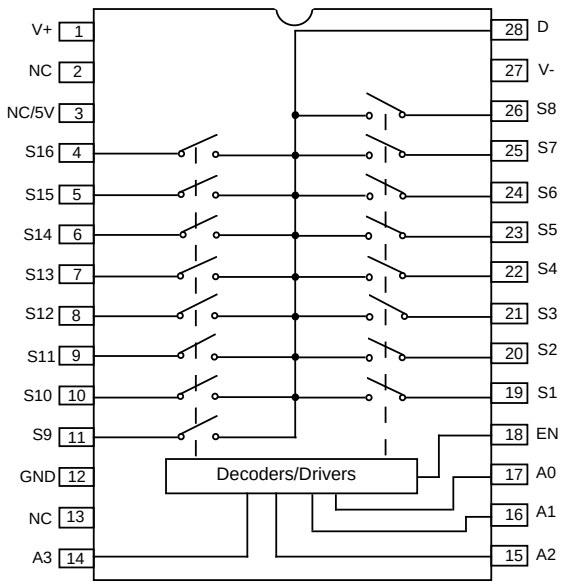
GENERAL DESCRIPTION

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.

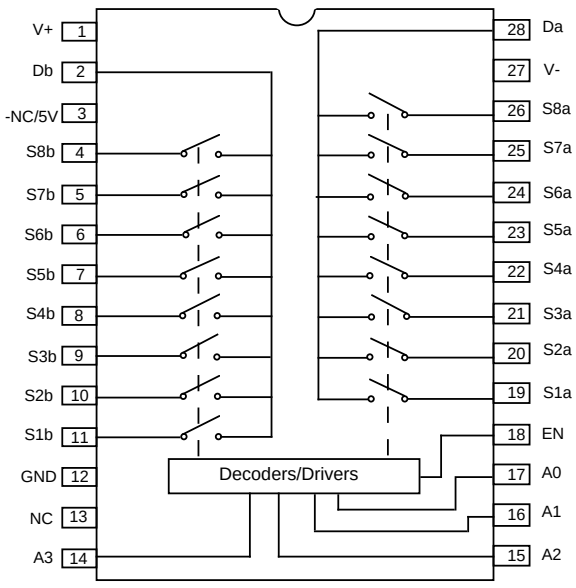
Performance is specified over the full -55 to +225°C temperature range. Typically, parts will operate up to +300°C for a year, with derated performance. All parts are burned in at 250°C to eliminate infant mortality.

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, Is = -10 mA Sequence Each Switch On	100		400	Ω
$\Delta r_{DS(ON)}$	$r_{DS(ON)}$ 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 HT506 f = 1MHz HT507	TBD			pF
$C_{D(ON)}$	Drain On Capacitance	V_{EN} = 0 V, V_D = 0 V HT506 f = 1MHz 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+ = 10V, V- = 0V, V_{IL} = 0.8 V, V_{IH} = 2.4V, unless otherwise specified

Symbol	Parameter	Test Conditions	Typ (1)	Worst Case (2)		
				Min	Max	Unit
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
$\Delta r_{DS(ON)}$	$r_{DS(ON)}$ 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	nA
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, VS = 6 V, RS = 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: VDD= 5.0 V,TA=25°C.
(2) Worst case operating conditions: VDD=10 V to ±10%, TA=-55°C to +225°C.

TRUTH TABLE—HT506

A3	A2	A1	AO	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

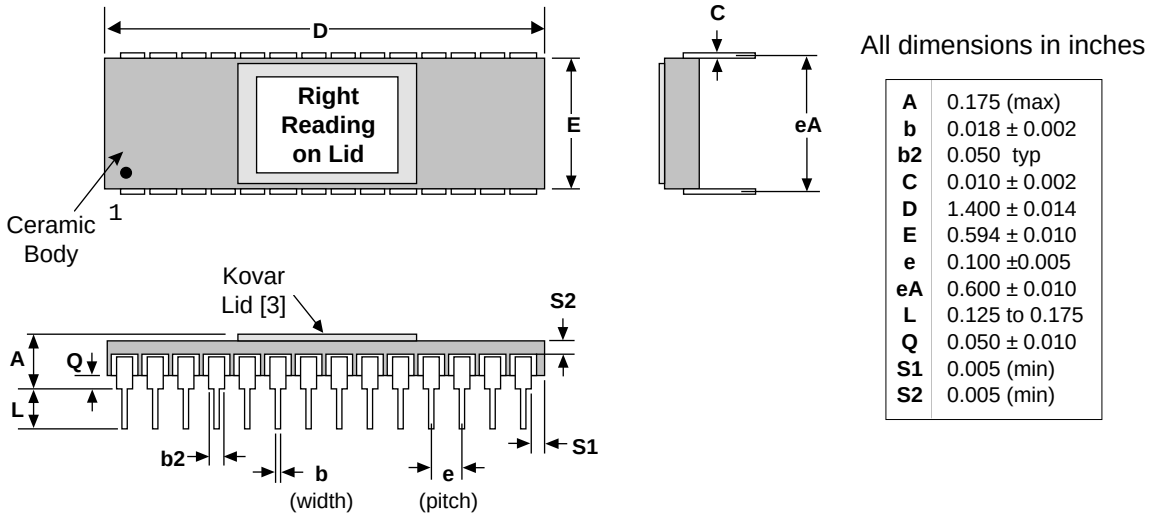
A2	A1	A0	EN	On Switch Pair
X	X	X	0	None
0	0	0	1	1
0	0	1	1	2
0	1	0	1	3
0	1	1	1	4
1	0	0	1	5
1	0	1	1	6
1	1	0	1	7
1	1	1	1	8

Logic “0” = VAL ≤ 0.8 V
Logic “0” = VAH ≥ 2.4 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



All dimensions in inches

A	0.175 (max)
b	0.018 ± 0.002
b2	0.050 typ
C	0.010 ± 0.002
D	1.400 ± 0.014
E	0.594 ± 0.010
e	0.100 ±0.005
eA	0.600 ± 0.010
L	0.125 to 0.175
Q	0.050 ± 0.010
S1	0.005 (min)
S2	0.005 (min)

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

HT507DC

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

C—Indicates screening level
C = Commercial
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