

High Temperature Analog Multiplexers

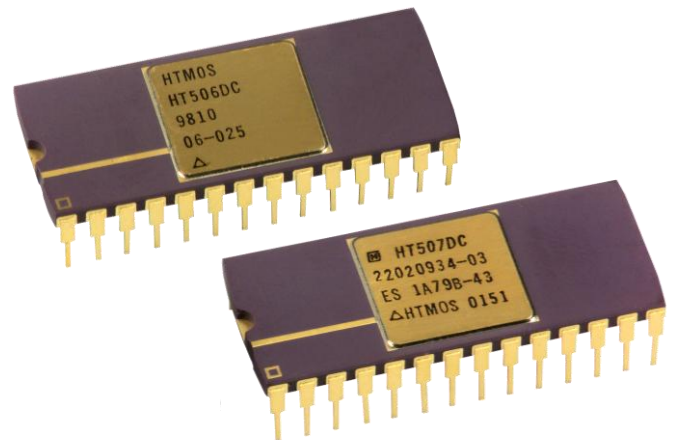
16-Channel Single-Ended / 8-Channel Differential

HT506 / HT507

The High Temperature HT506/HT507 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. 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 the sixteen single-ended inputs to a common output, while the HT507 switches one of the eight differential inputs to a differential output. These parts are available in standard pinout 28-pin DIP Ceramic Packages.

Applications

- Down-Hole Oil, Gas, and Geothermal Well
- Avionics
- Turbine Engine Control
- Industrial Process Control
- Electric Power Conversion
- Heavy Duty Internal Combustion Engine

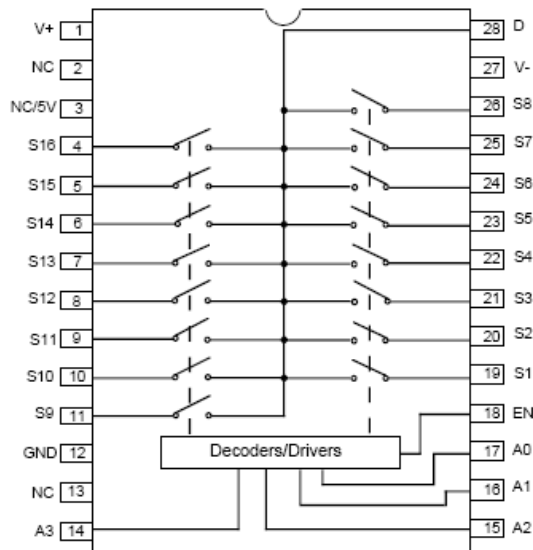


FEATURES AND BENEFITS

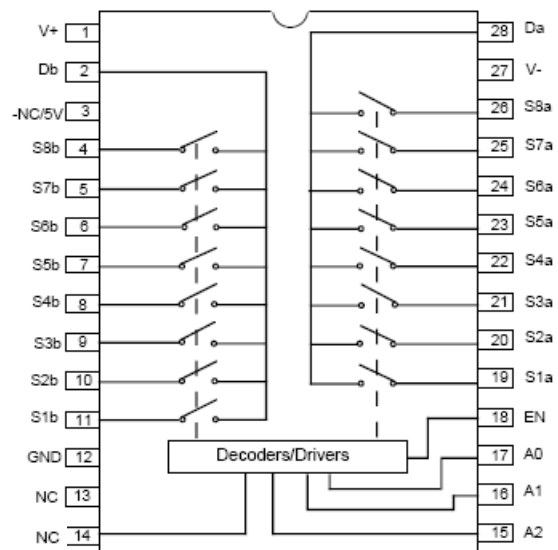
- | | |
|---|--|
| ▶ Specified over -55 to +225°C | ▶ Designed to continuously operate for at least 5 years at 225°C |
| ▶ 16:1 Single-Ended or 8:1 Differential Configuration | ▶ Enable and address inputs compatible with TTL and/or 5V CMOS logic |
| ▶ No latch-up | ▶ 10V analog input/output range ($\pm 5V$ or 0 to 10V) |
| ▶ On resistance 400 Ω at 225°C | ▶ Split and single supply capability |
| ▶ Output leakage less than 2.5 μA at 225°C | ▶ Break-Before-Make Switching |

PACKAGE PINOUTS

PACKAGE PINOUT HT506



PACKAGE PINOUT HT507



ELECTRICAL CHARACTERISTICS (Split Supply)

Temperature range -55 to +225°C, typical @ +25°C, $V_+ = +5V$, $V_- = -5V$, $GND=0V$, $V_{IL}=0.8$, $V_{IH} = 2.4V$, unless otherwise specified

Symbol	Parameters	Test Conditions	Typical (1)	Worst Case (2)		Units
				MIN	MAX	
Analog Switch						
V _{ANALOG}	Analog Signal Range			-5	5	V
r _{DS(ON)}	Drain-Source On-Resistance	V _D ±5V, I _S = -10mA Sequence Each Switch On	100		400	Ω
Δr _{DS(ON)}	r _{DS(ON)} Matching between Channels	V _D = ±5V	2			%
I _{S(OFF)}	Source Off Leakage Current	V _{EN} = 0V	0.01		200	nA
I _{D(OFF)}	Drain Off Leakage Current	V _D = ±5V, V _{EN} = 0V, V _S = ±5V	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 = 2.4V, 10V		-1	1	μA
I _{IL}	Logic Low Input Current	V _{EN} = 0V, 2.4V, V _A =0V		-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 =1nF, V _S =0V, R _S =0Ω	TBD			pC
O _{IS}	Off Isolation	V _{EN} =0V, R _L =1kΩ, f=100kHz	TBD			dB
Power Supplies						
I+	Positive Supply Current	V _{EN} = V _A = 0V or 5V	50		250	μA
I-	Negative Supply Current		-0.01	-20		μA

(1) Typical operating conditions: $V_+ = 5V$, $V_- = -5V$, $T_A = 25^\circ C$.

(2) Worst case operating conditions: $V_+ = +5V \pm 10\%$, $V_- = -5V \pm 10\%$, $T_A = -55$ to $125^\circ C$.

ELECTRICAL CHARACTERISTICS (Single Supply)

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

Symbol	Parameters	Test Conditions	Typical (1)	Worst Case (2)		Units
				MIN	MAX	
Analog Switch						
V _{ANALOG}	Analog Signal Range	V _D = 3V, 10V, I _S = 1mA Sequence Each Switch On	11			V
r _{DS(ON)}	Drain-Source On-Resistance		80		400	Ω
Δr _{DS(ON)}	r _{DS(ON)} Matching between Channels		2			%
I _{S(OFF)}	Source Off Leakage Current	V _{EN} = 0V	0.01		200	nA
I _{D(OFF)}	Drain Off Leakage Current	V _S =0.5V or 10V	0.04	-2500	2500	nA
I _{D(ON)}	Drain On Leakage Current	V _S = V _D = +10V 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 = 2.4V, 10V		-1	1	μA
I _{IL}	Logic Low Input Current	V _{EN} = 0V, 2.4V, V _A =0V		-1	1	μA
C _{IN}	Logic Input Capacitance	f=1MHz	7			pF
Dynamic Characteristics						
t _{ON(EN)}	Address/Enable Turn-On Time	trise/tfall<50ns		100	400	ns
t _{OFF(EN)}	Address/Enable Turn-Off Time		30	200		
Q	Charge Injection	C _L =1nF, V _S =6, R _S =0	TBD			pC
Power Supplies						
I+	Positive Supply Current	V _{EN} = 0V or 5V, V _A = 0V or 5V	50		250	μA
I-	Negative Supply Current		-0.01	-20		μA

(1) Typical operating conditions: V+ = 10V, V- = GND =0V, TA= 25°C.

(2) Worst case operating conditions: V+ = +10V ±10%, V- = GND =0V, TA = -55 to 125°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
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_{AL} ≤ 0.8V

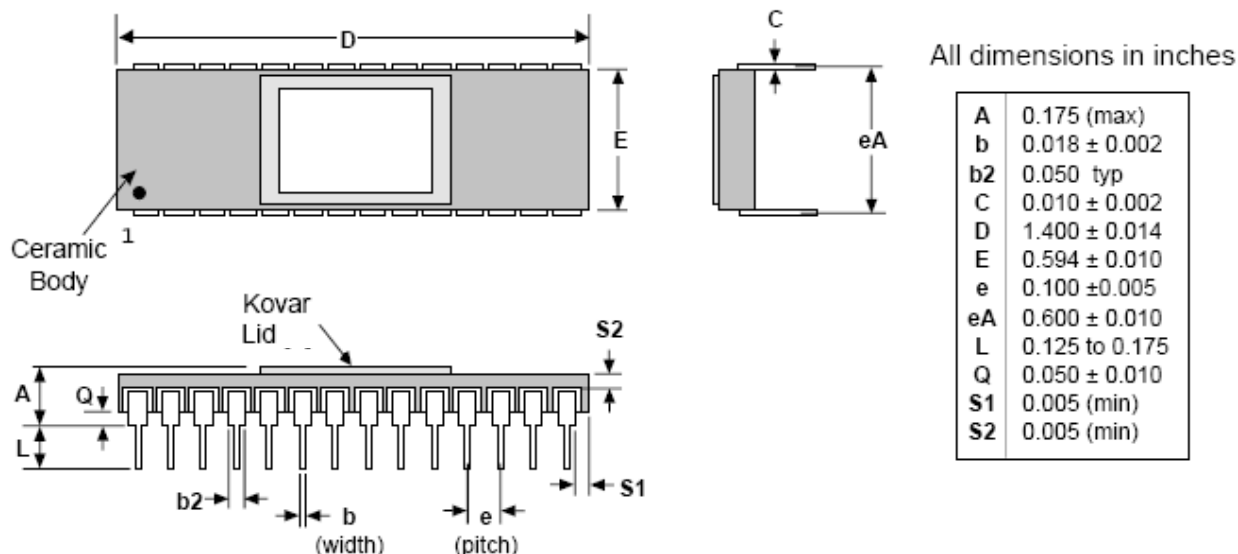
Logic "1" = V_{AH} ≥ 2.4V

X = Irrelevant

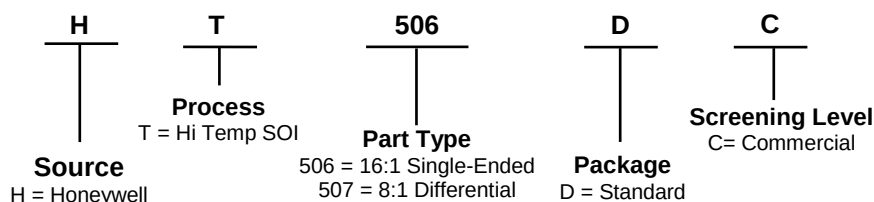
ABSOLUTE MAXIMUM RATINGS

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

28-LEAD PACKAGE



ORDERING INFORMATION



Find out more

For more information on Honeywell's High Temperature Electronics visit us online at www.honeywell.com/hightemp or contact us at 800-323-8295 or 763-954-2474. Customer Service Email: ps.customer.support@honeywell.com.

Honeywell reserves the right to make changes to improve reliability, function or design. Honeywell does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights nor the rights of others.