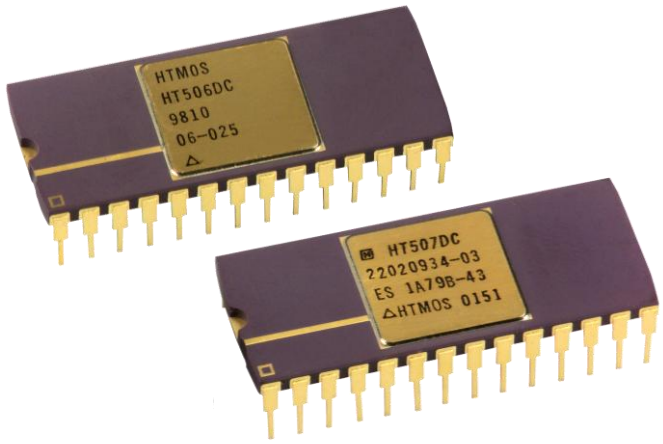
High Temperature Analog Multiplexers
16-Channel Single-Ended / 8-Channel Differential
HT506 / HT507

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 +225ºC temperature range. Typically, parts will operate up to +300ºC for a year, with derated performance. All parts are burned in at 250ºC. 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

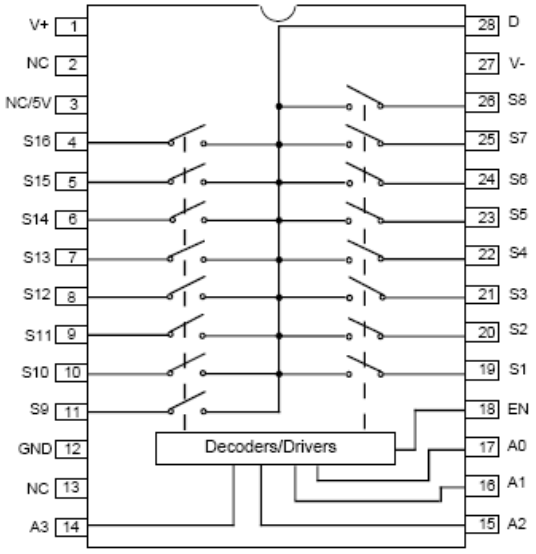


FEATURES AND BENEFITS

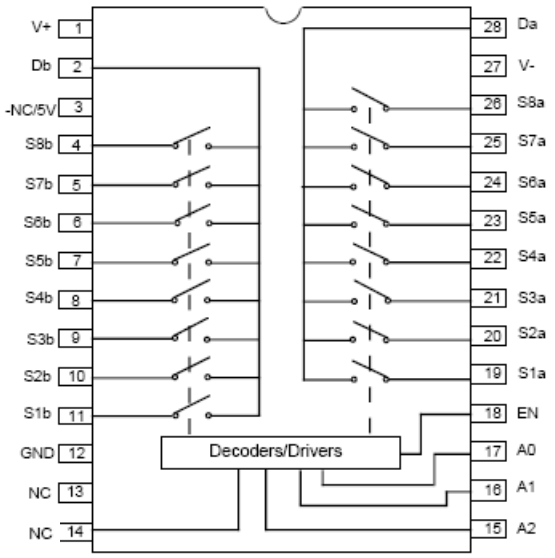
- Specified over -55 to +225°C
- 16:1 Single-Ended or 8:1 Differential Configuration
- No latch-up
- On resistance 400Ω at 225ºC
- Output leakage less than 2.5µA at 225ºC
- Designed to continuously operate for at least 5 years at 225°C
- Enable and address inputs compatible with TTL and/or 5V CMOS logic
- 10V analog input/output range (±5V or 0 to 10V)
- Split and single supply capability
- 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
$\Delta r_{DS(ON)}$	$r_{DS(ON)}$ 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, TA= 25°C.
(2) Worst case operating conditions: V+ = +5V ±10%, V- = -5V ±10%, TA = -55 to 125°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		11			V
$r_{DS(ON)}$	Drain-Source On-Resistance	V_D = 3V, 10V, I_S= 1mA	80		400	Ω
$\Delta r_{DS(ON)}$	$r_{DS(ON)}$ Matching between Channels	Sequence Each Switch On	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

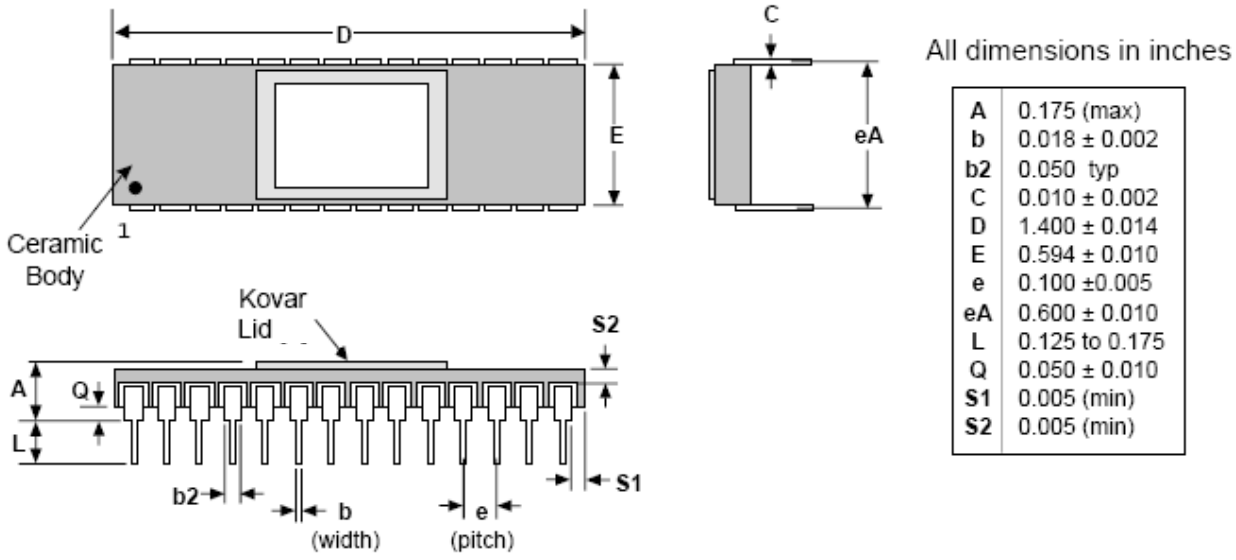
A2	A1	A0	EN	On Switch
X	X	X	0	None
0	0	0	1	1
0	0	1	1	2
0	1	0	1	3
0	1	1	1	4
1	0	0	1	5
1	0	1	1	6
1	1	0	1	7
1	1	1	1	8

Logic “0” = VAL ≤ 0.8V
Logic “1” = VAH ≥ 2.4V
X =Irrelevent

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



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

H — **Source**: H = Honeywell

T — **Process**: T = Hi Temp SOI

506 — **Part Type**: 506 = 16:1 Single-Ended; 507 = 8:1 Differential

D — **Package**: D = Standard

C — **Screening Level**: C= Commercial

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.

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