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High Temperature Analog Multiplexers

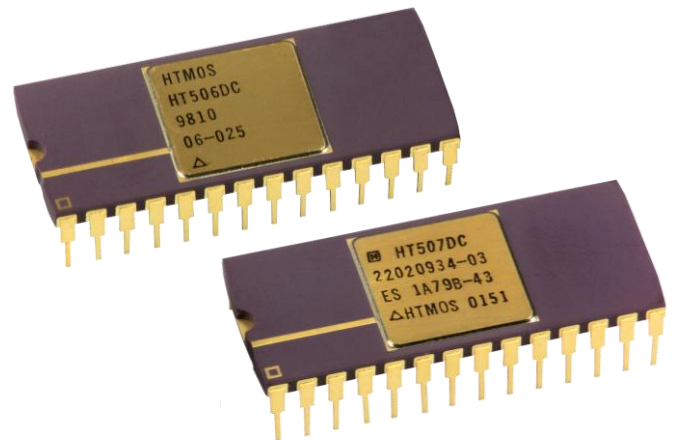
16-Channel Single-Ended / 8-Channel Differential

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

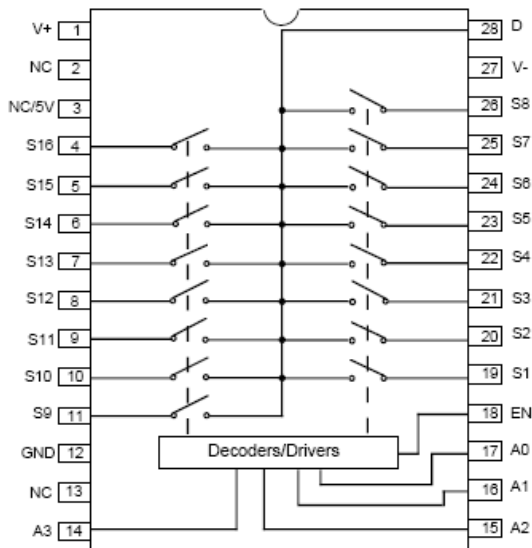


FEATURES AND BENEFITS

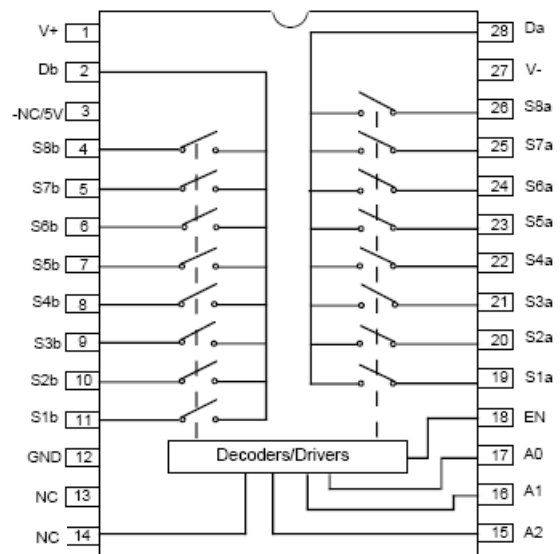
- ▶ Specified over -55 to +225°C
- ▶ 16:1 Single-Ended or 8:1 Differential Configuration
- ▶ No latch-up
- ▶ On resistance 400Ω at 225°C
- ▶ Output leakage less than 2.5μA at 225°C
- ▶ Designed to continuously operate for at least 5 years at 225°C
- ▶ Enable and address inputs compatible with TTL and/or 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
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, TA= 25°C.

(2) Worst case operating conditions: V+ = +5V ±10%, V- = -5V ±10%, TA = -55 to 125°C.

HT506/HT507

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 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} = 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

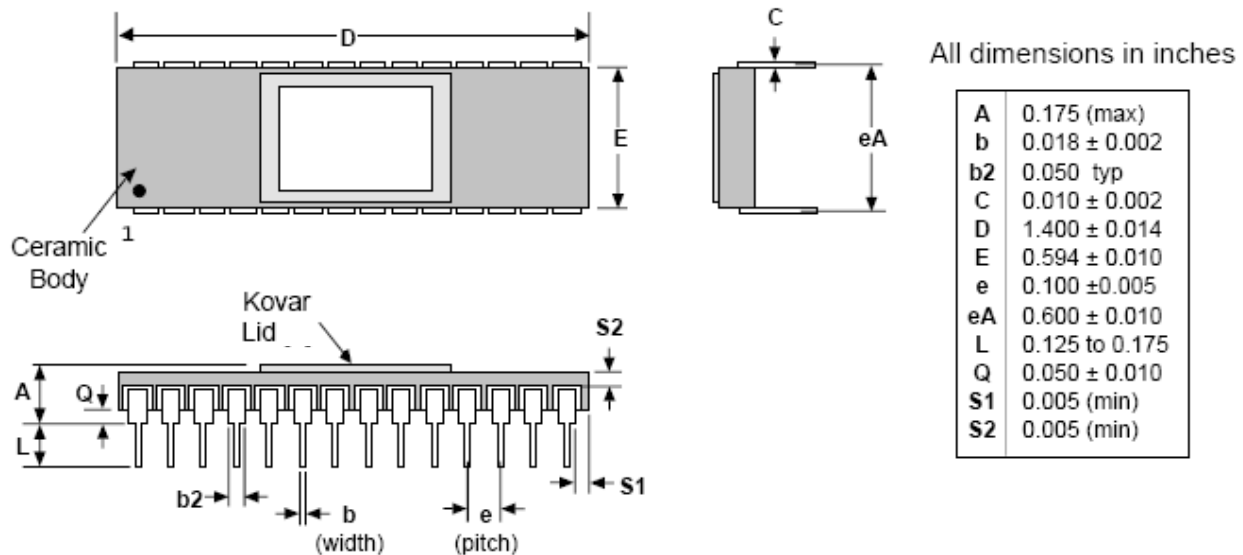
Logic "0" = V_{AL} ≤ 0.8V
 Logic "1" = V_{AH} ≥ 2.4V
 X = Irrelevant

HT506/HT507

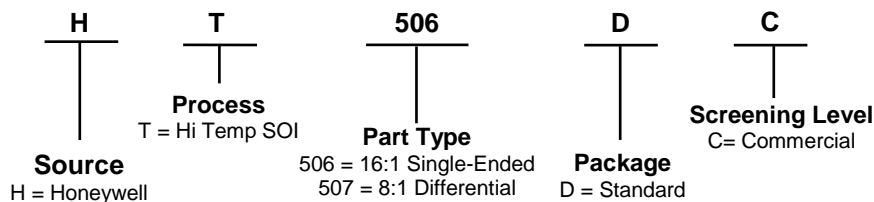
ABSOLUTE MAXIMUM RATINGS

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

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