HTMOS™ High Temperature Products

HIGH TEMPERATURE QUAD ANALOG SWITCH HT1204

FEATURES

- Specified Over -55 to +225°C
- Worst Case Leakage 500 nA at 225°C
- Low Control Input Current
- High Degree of Linearity
- Low Crosstalk Between Switches
- Hermetic 14-Lead Ceramic DIP
- Latchup Free Design with Dielectric Isolation
- Individual Switch Controls
- CMOS Logic Levels

APPLICATIONS

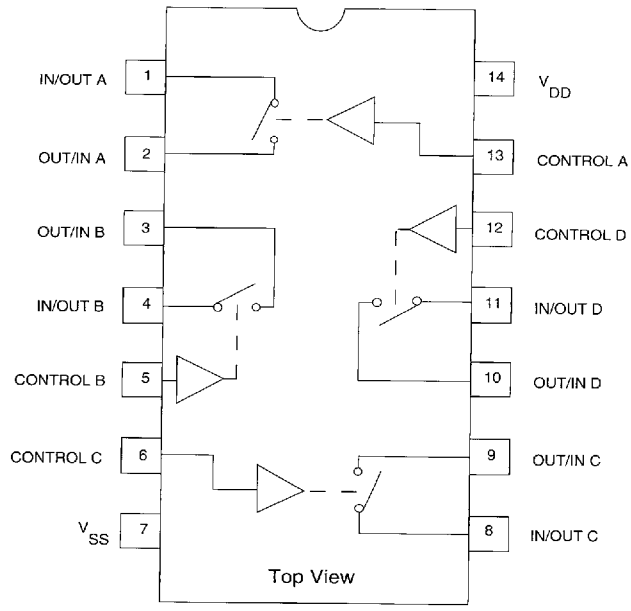
- Down-Hole Oil Well
- Avionics
- Turbine Engine Control
- Industrial Process Control
- Nuclear Reactor
- Electric Power Conversion
- Heavy Duty Internal Combustion Engines

GENERAL DESCRIPTION

The HT1204 monolithic quad analog switch consists of four independently controlled switches capable of switching either analog or digital signals over an extremely wide temperature range. It is fabricated with Honeywell's dielectrically isolated high temperature (HTMOS™) linear process, and is designed specifically for use in systems operating in severe high temperature environments. All parts are burned in at 250°C to eliminate infant mortality.

These switches provide guaranteed performance over the full -55 to +225°C temperature range. Typically, parts will operate up to +300°C for a year, with derated performance. High temperature applications such as signal gating, chopping, modulation, demodulation and multiplexing are all possible with the HT1204.

PACKAGE PINOUT



14-Lead Cerdip
θjc = 9°C/W

ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions (1)	Typ	Min	Max	Units
V_{DD}	Supply Voltage			5	11	V
I_{DD}	Supply Current		1		5	µA
V_A	Analog Voltage Range			V_{SS}	V_{DD}	
I_I	Control Input Current (2)				±1	µA
V_{IH}	High Level Input Voltage			0.6 x V_{DD}		V
V_{IL}	Low Level Input Voltage				0.4 x V_{DD}	V
R_{ON}	ON Resistance	I_S = 1mA, V_A = V_{SS} to V_{DD}			100	Ω
ΔR_{ON}	ON Resistance Matching	I_S = 1mA, V_A = V_{SS} to V_{DD}			10	Ω
$I_{L(ON)}$	ON Leakage Current	V_A = V_{SS} to V_{DD}	(4)		500	nA
$I_{L(OFF)}$	OFF Leakage Current	V_A = V_{SS} to V_{DD}	(4)		500	nA
C_I	Input Capacitance (3)		12			pF
C_F	Feedthrough Capacitance (3)		2			pF
T_{PD}	Propagation Delay	C_L = 50pF			25	ns
T_{ON}	Switch Turn-on Time (T_{PZH}, T_{PZL})	C_L = 50pF, R_L = 1KΩ	(4)		100	ns
T_{OFF}	Switch Turn-off Time (T_{PHZ}, T_{PLZ})	C_L = 50pF, R_L = 1KΩ	(4)		200	ns

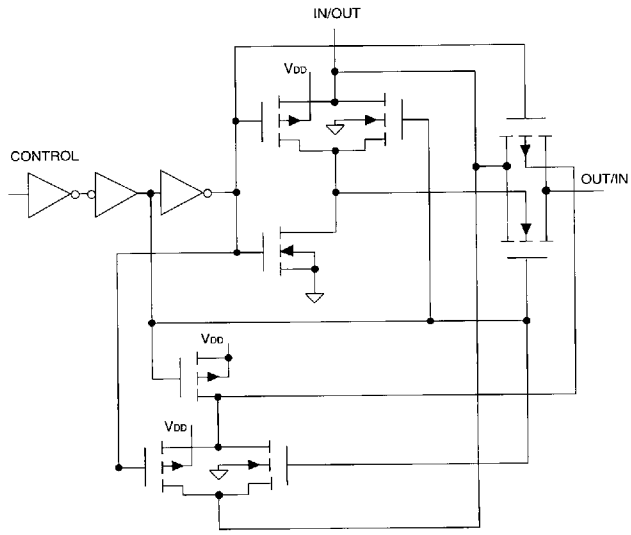
(1) Specifications apply for 0-10V ± 10% from -55 to +225°C.
(2) Rating for a single control pin of the quad.
(3) These parameters are guaranteed by design and not tested on each device.
(4) See graphs.

ABSOLUTE MAXIMUM RATINGS (1)

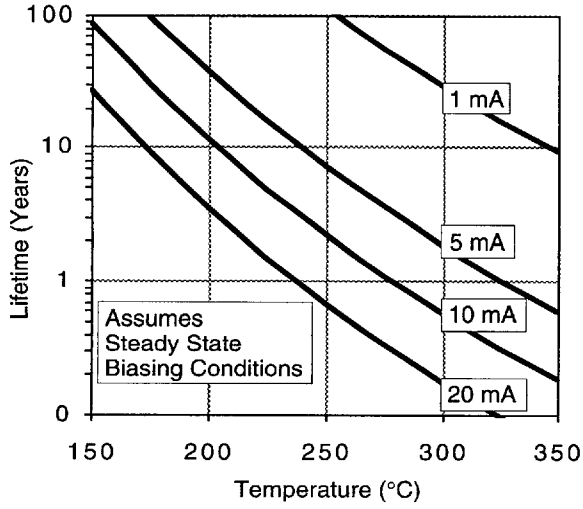
Total Supply Voltage ..... 13 V
Input Voltage ..... -0.5 to VDD +0.5 V
Switch Through Current (each switch) ..... ±20 mA
Package Dissipation ..... 500 mW
Storage Temperature ..... -65 to +325°C
Lead Temperature (soldering, 10 sec) ..... 355°C
Junction Temperature ..... 315°C
Thermal Resistance (Junction-to-Case) ..... 20°C/W
ESD Protection ..... 1000 V

(1) Stresses in excess of those listed above may result in permanent damage. These are stress ratings only, and operation at these levels is not implied. Frequent or extended exposure to absolute maximum conditions may effect device reliability.

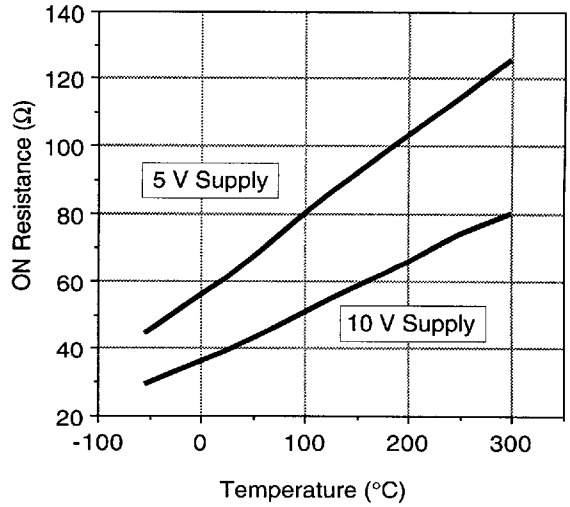
SIMPLIFIED SCHEMATIC (ONE SWITCH)



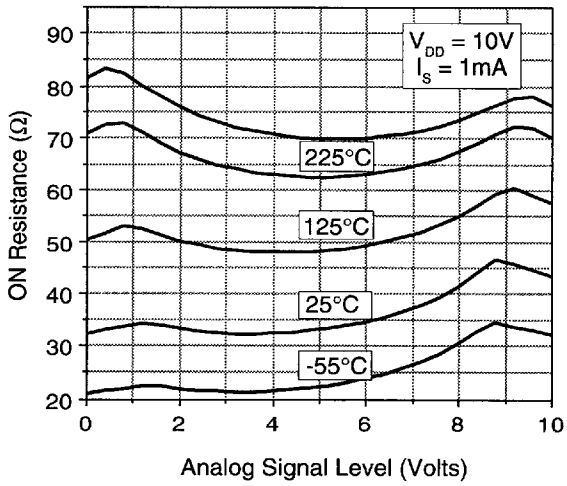
LIFETIME vs. TEMPERATURE and LOAD CURRENT



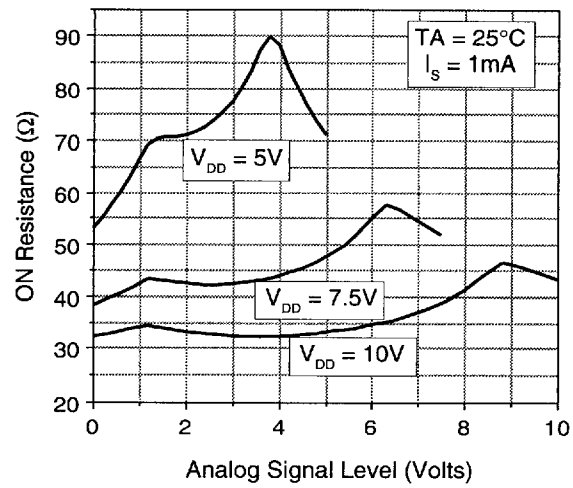
"ON" RESISTANCE vs. TEMPERATURE



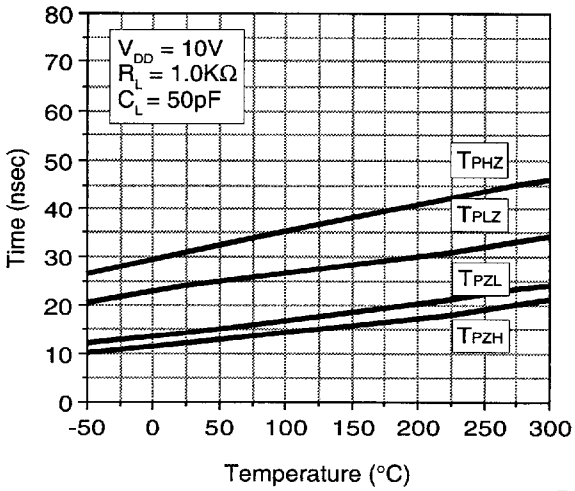
"ON" RESISTANCE vs. ANALOG SIGNAL LEVEL and TEMPERATURE



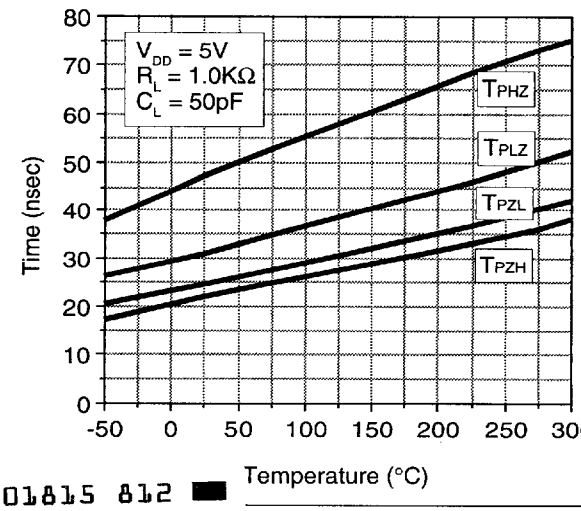
"ON" RESISTANCE vs. ANALOG SIGNAL LEVEL and POWER SUPPLY VOLTAGE



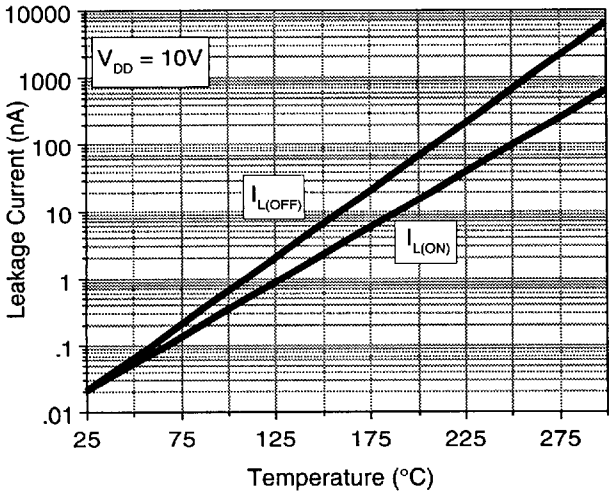
SWITCHING TIME vs. TEMPERATURE



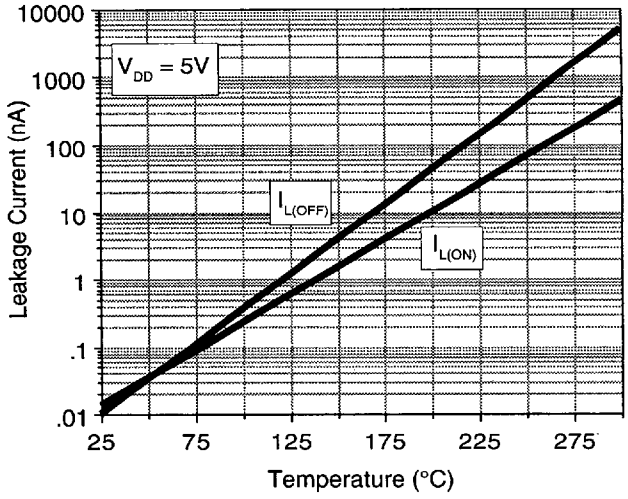
SWITCHING TIME vs. TEMPERATURE



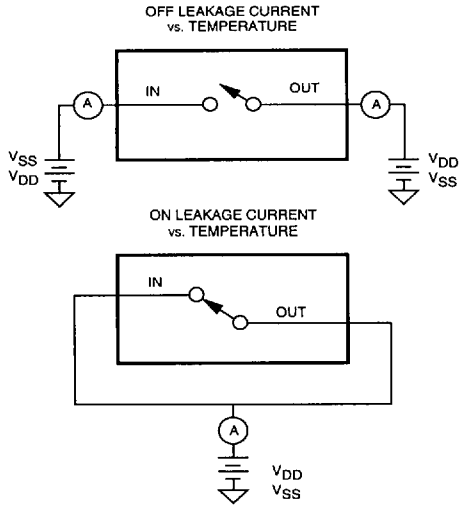
LEAKAGE vs. TEMPERATURE



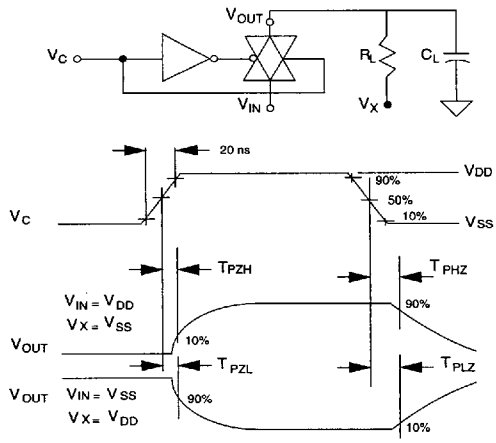
LEAKAGE vs. TEMPERATURE



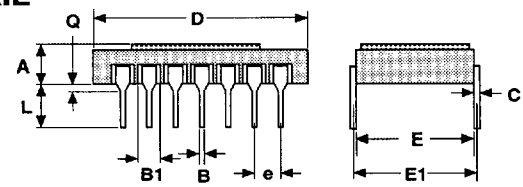
LEAKAGE CURRENT TEST CIRCUITS



TIMING TEST CIRCUIT and WAVEFORMS



PACKAGE DETAIL



A	0.150 (max)	E1	0.300 ± 0.010
B	0.018 ± 0.002	B1	0.047 ± 0.002
C	0.010 ± 0.002	e	0.100 ± 0.005
D	0.700 ± 0.010	L	0.125 to 0.180
E	0.295 REF	Q	0.035 ± 0.010

All dimensions in inches
Leads are Gold Plated Nickel

ORDERING INFORMATION

HT1204DC

D - Indicates package type
- D = Standard DIP
- For packaging options, call Honeywell

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