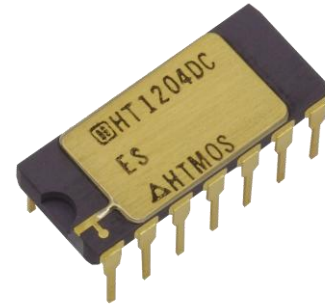


# High Temperature Quad Analog Switch HT1204

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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.



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.

## APPLICATIONS

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

## FEATURES

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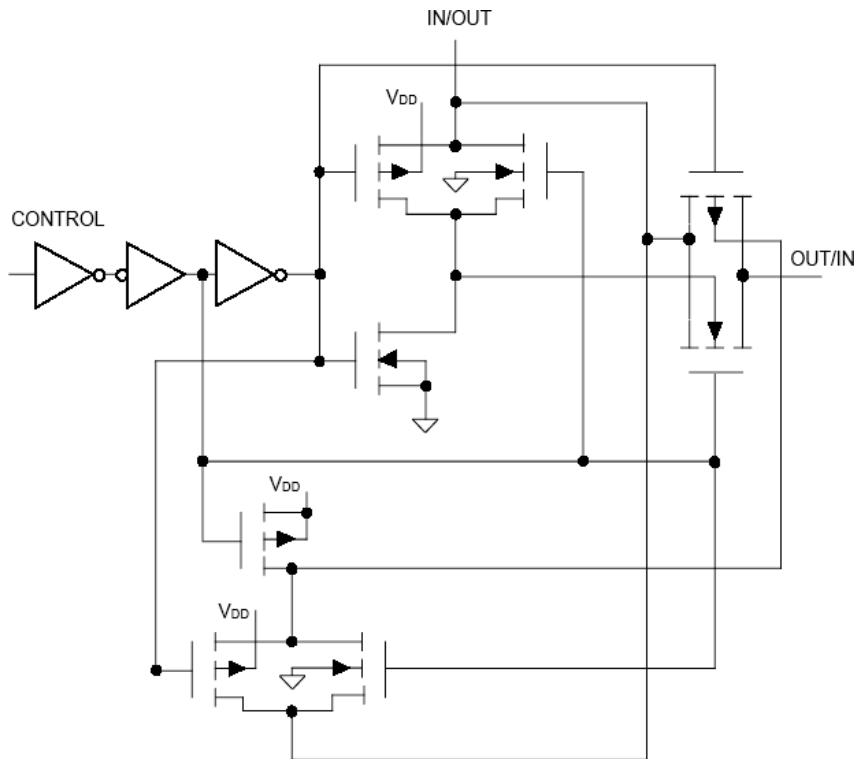
- ▶ Specified Over -55 to +225°C
- ▶ Worst Case Leakage 500nA at 225°C
- ▶ Low Control Input Current
- ▶ High Degree of Linearity
- ▶ Low Crosstalk Between Switches
- ▶ Hermetic 14-Lead Ceramic DIP
- ▶ Latch-up Free Design with Dielectric Isolation
- ▶ Individual Switch Controls
- ▶ CMOS Logic Levels

## ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions <sup>(1)</sup>	Typ	Min	Max	Units
$V_{DD}$	Supply Voltage			5.0	11	V
$I_{DD}$	Supply Current		1		5	$\mu$ A
$V_A$	Analog Voltage Range			$V_{SS}$	$V_{DD}$	
$I_I$	Control Input Current <sup>(2)</sup>				$\pm 1$	$\mu$ A
$V_{IH}$	High Level Input Voltage			$0.6 \times V_{DD}$		V
$V_{IL}$	Low Level Input Voltage				$0.4 \times V_{DD}$	V
$R_{ON}$	ON Resistance	$I_S = 1\text{mA}, V_A = V_{SS} \text{ to } V_{DD}$			100	$\Omega$
$\Delta R_{ON}$	ON Resistance Matching	$I_S = 1\text{mA}, V_A = V_{SS} \text{ to } V_{DD}$			15	$\Omega$
$I_{L(ON)}$	ON Leakage Current	$V_A = V_{SS} \text{ to } V_{DD}$		-Vs	+Vs -2.2	nA
$I_{L(OFF)}$	Open Loop Gain	$V_A = V_{SS} \text{ to } V_{DD}$	115	100		nA
$C_I$	Input Capacitance <sup>(3)</sup>					pF
$C_F$	Feedthrough Capacitance <sup>(3)</sup>					pF
$T_{PD}$	Propagation Delay	$C_L = 50\text{pF}$				ns
$T_{ON}$	Switch Turn-on Time ( $T_{PHZ}, T_{PZL}$ )	$C_L = 50\text{pF}, R_L = 1\text{K}\Omega$	<sup>(4)</sup>		100	ns
$T_{OFF}$	Switch Turn-off Time ( $T_{PHZ}, T_{PLZ}$ )	$C_L = 50\text{pF}, R_L = 1\text{K}\Omega$	<sup>(4)</sup>		200	ns

- (1) Specifications apply for 0-10V  $\pm$  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.

## SIMPLIFIED SCHEMATIC (one switch)

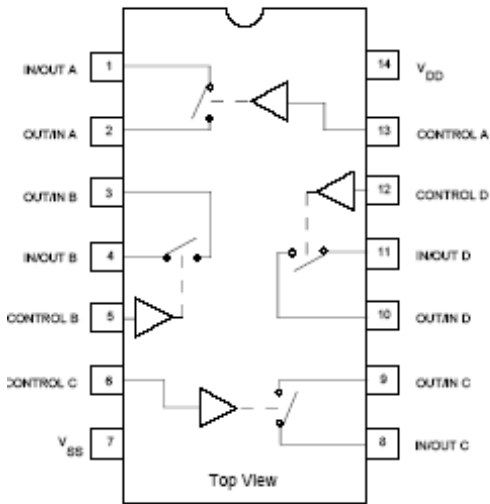


**ABSOLUTE MAXIMUM RATING (1)**

Total Supply Voltage (V+ to V-)	13V
Input Voltage	-0.5 to $V_{DD}+0.5V$
Output Short Circuit Duration	Continuous
Input Current (each input)	$\pm 5$ mA
Output Current (each output)	$\pm 50$ mA
Storage Temperature	-65 to +325°C
Lead Temperature (attachment, 10 sec)	355°C

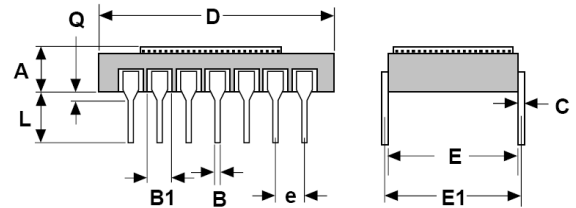
(1) Stresses in excess of those listed above may result in permanent damage. These are stress ratings only, and operation at these levels is not implied. Frequent or extended exposure to absolute maximum conditions may affect device reliability.

**PACKAGE PINOUT**



14-Lead Cerdip  
 $\theta_{jc} = 9^{\circ}C/W$

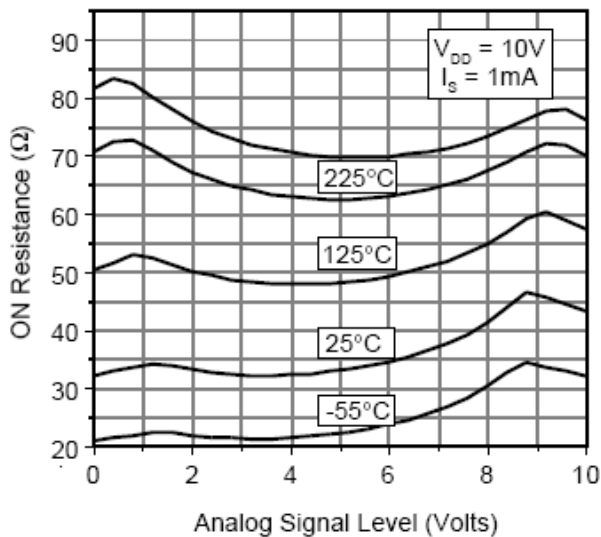
**PACKAGE DETAIL**



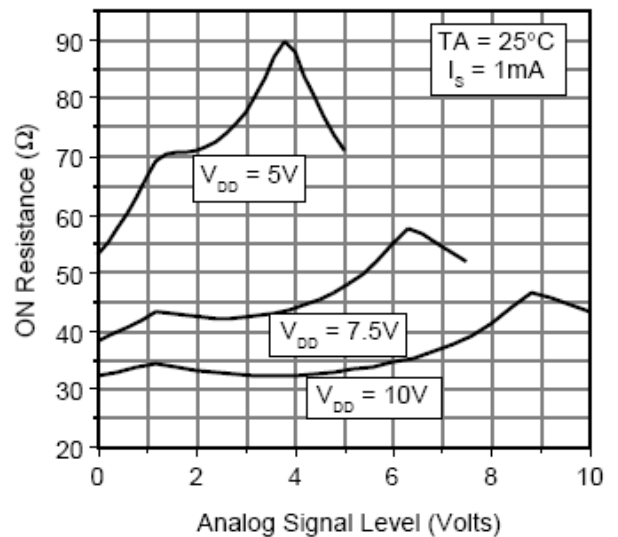
A	0.150 (max)	E1	$0.300 \pm 0.010$
B	$0.018 \pm 0.002$	B1	$0.047 \pm 0.002$
C	$0.010 \pm 0.002$	e	$0.100 \pm 0.005$
D	$0.700 \pm 0.010$	L	$0.125$ to $0.180$
E	0.295 REF	Q	$0.035 \pm 0.010$

All dimensions in inches  
 Leads are Gold Plated Nickel

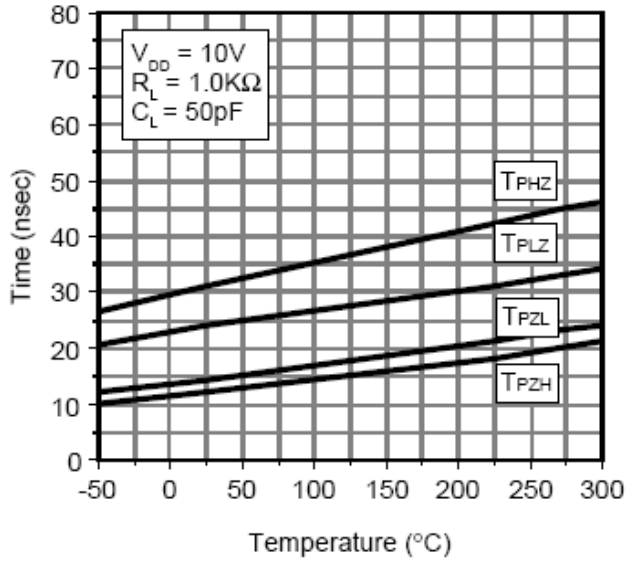
**“ON” RESISTANCE vs. ANALOG SIGNAL LEVEL and TEMPERATURE**



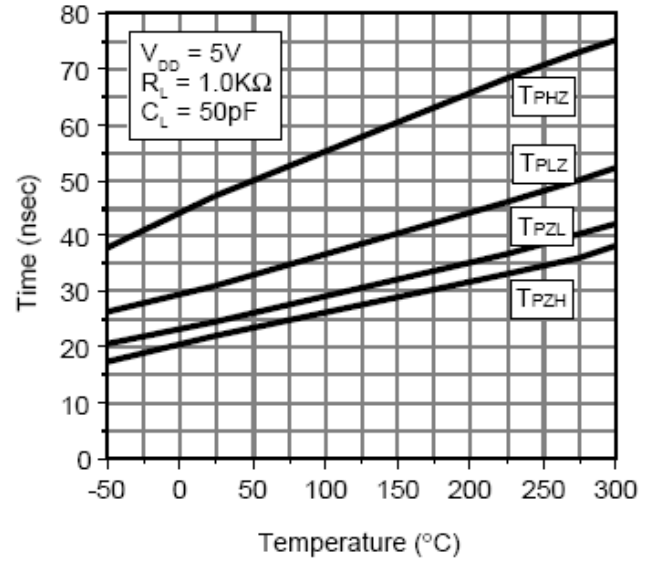
**“ON” RESISTANCE vs. ANALOG SIGNAL LEVEL and POWER SUPPLY VOLTAGE**



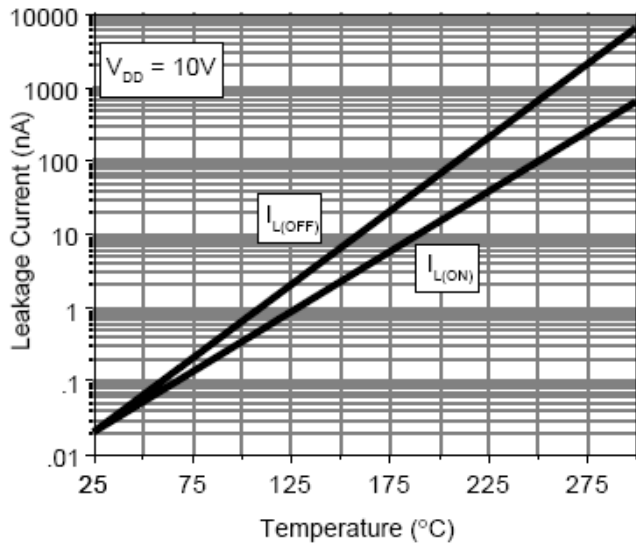
SWITCHING TIME vs. TEMPERATURE



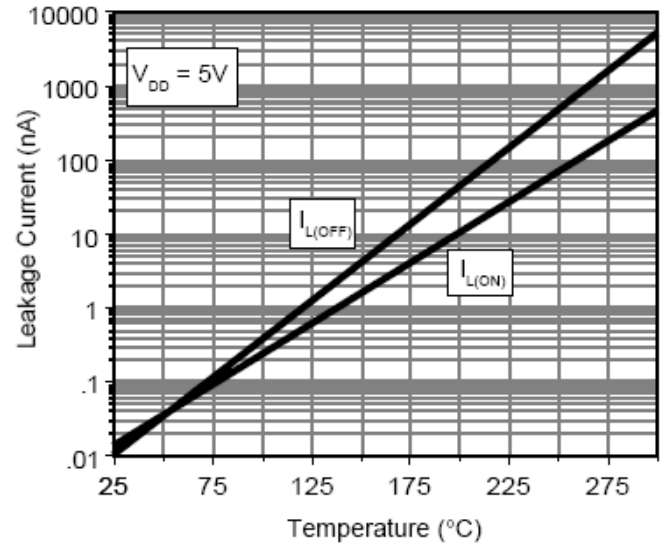
SWITCHING TIME vs. TEMPERATURE



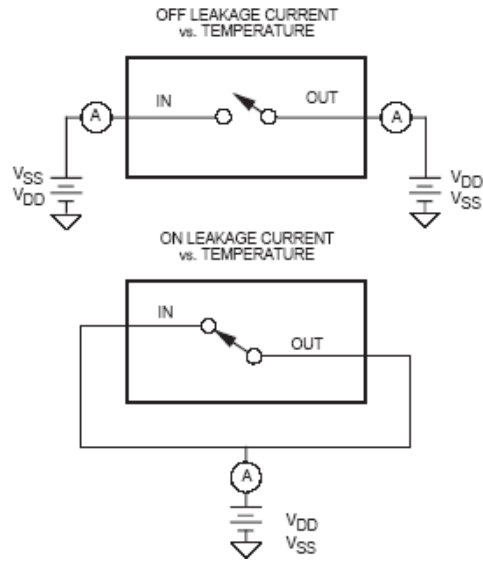
LEAKAGE vs. TEMPERATURE



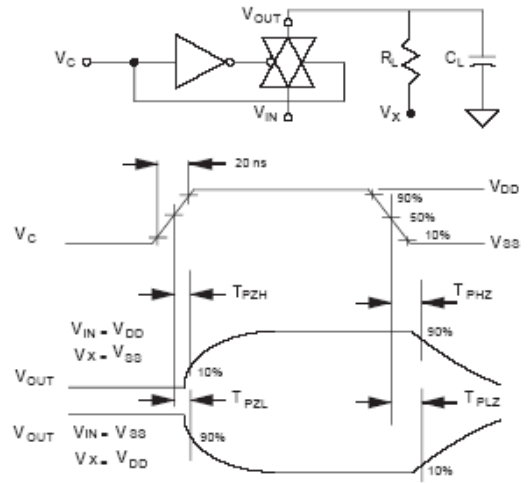
LEAKAGE vs. TEMPERATURE



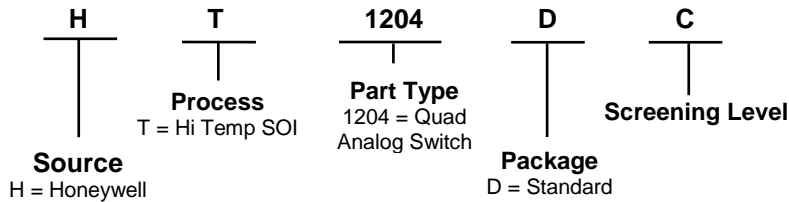
## LEAKAGE CURRENT TEST CIRCUITS



## TIMING TEST CIRCUIT and WAVEFORMS



## ORDERING INFORMATION



## Find out more

For more information on Honeywell's High Temperature Electronics visit us online at [www.hightempsolutions.com](http://www.hightempsolutions.com) or contact us at 1-800-323-8295. Customer Service Email: [ps.customer.support@honeywell.com](mailto:ps.customer.support@honeywell.com).

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