

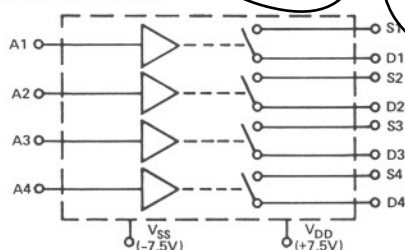
FEATURES

- Low "ON" Resistance: 100Ω
- R_{ON} Mismatch Between Switches: 1%
- Fast Switching: 20ns
- Low Power Dissipation: 10μW, max
- Superior Replacement for:
 - CD4016A (AD7516J, S)
 - CD4066A (AD7516K, T)

GENERAL DESCRIPTION

The AD7516 consists of four SPST switches on a monolithic CMOS chip. It is intended as a superior replacement for the CD4016A, and CD4066A offering improved R_{ON} characteristics. It is useful for fast switching of a wide range of digital or analog signal levels - digital or analog signals to 15V peak and analog signals to ±7.5V peak. It can be operated from balanced or unbalanced power supplies.

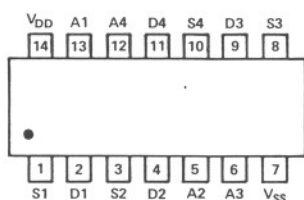
FUNCTIONAL DIAGRAM



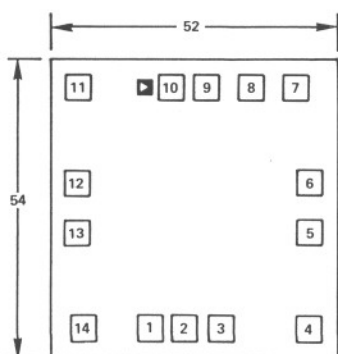
LOGIC

Switch "ON" For Address "HIGH".

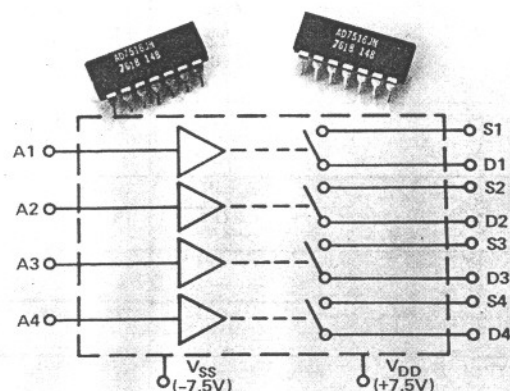
PIN CONFIGURATION (Top View)



BONDING DIAGRAM



All bonding pads are 4 x 4 MIL.
All pad numbers correspond with DIP package pin configuration.



FUNCTIONAL DIAGRAM

ABSOLUTE MAXIMUM RATINGS

(T_A = +25°C unless otherwise noted)

V _{DD} - V _{SS}	17V
Switch Voltage	V _{SS} to V _{DD}
Switch Current (I _{DS} , Continuous)	10mA
Switch Current (I _{DS} , Surge)	15mA
1ms duration, 10% duty cycle	
Digital Input Voltage Range	V _{SS} to V _{DD}
Power Dissipation (Package)	
14 pin Ceramic DIP	
Up to +75°C	450mW
Derates above +75°C by	6mW/°C
14 pin Plastic DIP	
Up to +70°C	670mW
Derates above +70°C by	8.3mW/°C
Operating Temperature	
Plastic	0 to +75°C
Ceramic (S, T versions)	-55°C to +125°C
Storage Temperature	-65°C to +150°C

CAUTION:

- Do not apply voltages higher than V_{DD} and V_{SS} to any other terminal, especially when V_{SS} = V_{DD} = 0V all other pins should be at 0V.
- The digital control inputs are zener protected; however, permanent damage may occur on unconnected units under high energy electrostatic fields. Keep unused units in conductive foam at all times.

ORDERING INFORMATION

Plastic Dip (Suffix N)	Ceramic Dip (Suffix D)	Operating Temperature Range
AD7516JN		0 to +75°C
AD7516KN		0 to +75°C
	AD7516SD	-55°C to +125°C
	AD7516TD	-55°C to +125°C

SPECIFICATIONS

($V_{DD} = +7.5V$, $V_{SS} = -7.5V$ unless otherwise noted)

PARAMETER	VERSION ¹	SWITCH	@ +25°C	OVER SPECIFIED TEMP. RANGE	TEST CONDITIONS
ANALOG SWITCH					
R_{DS}	J	ON	400Ω max	520Ω max	$V_{DD} - V_{SS} = 15V$ $V_{IN} = V_{DD}$ $V_D = V_{SS}$ to V_{DD} , $R_L = 10kΩ$
	K	ON	280Ω max	300Ω max	
	S	ON	400Ω max	600Ω max	
	T	ON	280Ω max	320Ω max	
	J	ON	150Ω typ, 660Ω max	840Ω max	$V_{DD} - V_{SS} = 10V$, $R_L = 10kΩ$ $V_{IN} = V_{DD}$, $V_D = V_{SS}$ to V_{DD}
	K	ON	500Ω max	520Ω max	
	S	ON	150Ω typ, 660Ω max	960Ω max	
	T	ON	500Ω max	850Ω max	
R_{DS} vs. V_D	All	ON	50% typ		$V_{DD} - V_{SS} = 15V$, $V_D = V_{SS}$ to V_{DD} $V_{IN} = V_{DD}$
R_{DS} vs. Temperature	All	ON	0.5%/°C typ		$V_{DD} - V_{SS} = 15V$, $V_{IN} = V_{DD}$ $I_{DS} = 1mA$, $V_D = \frac{V_{DD} - V_{SS}}{2}$
ΔR_{DS} Between Switches	All	ON	1% typ		$V_{DD} - V_{SS} = 15V$, $V_{IN} = V_{DD}$ $V_D = V_{SS}$ to V_{DD} $R_L = 10kΩ$
	All	ON	1% typ		$V_{DD} - V_{SS} = 10V$
I_S (I_D)	All	OFF	100pA typ		$V_{DD} = +7.5V$ $V_{SS} = -7.5V$ $V_{IN} = V_{SS}$ $V_D(V_S) = V_{SS}$ to V_{DD} $V_S(V_D) = 0V$
	All	OFF	125nA max		$V_{DD} = +5V$ $V_{SS} = -5V$
DIGITAL CONTROL					
V_{TH}	All	OFF	0.5V min, 1.5V typ, 2.7V max		$V_{SS} = 0V$, $V_{DD} = +15V$, $V_D = +15V$ $I_S = 10μA$, $V_S = 0V$
I_{INL} or I_{INH}	All		10pA typ		$V_{DD} - V_{SS} = 10V$
C_{IN}	All		5pF typ		
DYNAMIC CHARACTERISTICS²					
t_{ON}	All		20ns typ		$V_{DD} - V_{SS} = 10V$, $V_D \leq 10V$ $V_{INL} = V_S$, $C_L = 15pF$, $V_{INH} = V_{DD}$
t_{OFF}	All		20ns typ		
t_{PD} ³	All	ON	10ns typ		$V_{DD} = 10V$, $V_{SS} = 0V$ $V_D = 10V$ (Square Wave) $V_{IN} = V_{DD}$, $C_L = 15pF$
f_{3dB}	All	ON	40MHz typ		$V_{IN} = +5V$, $V_{DD} = +5V$, $V_{SS} = -5V$ $R_L = 1kΩ$ $V_D = 5V$ p-p sine wave $f = 1.25MHz$
"OFF" Isolation	All	OFF	-50dB typ		
Crosstalk — Digital Input to Signal Output	All		50mV typ		$V_{DD} - V_{SS} = 10V$, $V_{INH} = V_{DD}$ $V_{INL} = V_{SS}$, $R_L = 10kΩ$, $C_L = 15pF$
Maximum Control Repetition Rate	All		10MHz typ		$V_{DD} = 10V$, $R_L = 1kΩ$ $V_{SS} = 0V$, $V_{INH} = 10V$, $C_L = 15pF$, $V_{INH} = 0V$
C_S or C_D (OFF)	All	OFF	6pF typ		
C_S or C_D (ON)	All	ON	20pF typ		
C_{SD}	All	OFF	1pF typ		
C_{SS} or C_{DD} Between Any Two Switches	All	ON	0.5pF typ		
POWER SUPPLY					
I_{DD}	All	ON	0.5μA max	8μA max	$V_{DD} = +10V$, $V_{SS} = 0V$ $V_{IN} = +10V$
I_{SS}	All	ON	0.5μA max	8μA max	
I_{DD}	All	OFF	0.5μA max	8μA max	$V_{DD} = +10V$, $V_{SS} = 0V$ $V_{IN} = 0V$
I_{SS}	All	OFF	0.5μA max	8μA max	

NOTES:

¹ J version specified for 0 to +75°C; S version specified for -55°C to +125°C.

² AC parameters are sample tested to ensure conformance to specifications.

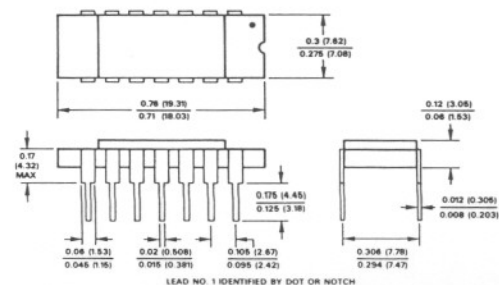
³ "t_{PD}" is analog input to output propagation delay.

Specifications subject to change without notice.

OUTLINE DIMENSIONS

Dimensions shown in inches and (mm)

14-PIN CERAMIC DIP (SUFFIX D)



14-PIN PLASTIC DIP (SUFFIX N)

