

CMOS 8-CHANNEL ANALOG MULTIPLEXERS

FEATURES

- DTL/TTL/CMOS Direct Interface
- Power Dissipation: 30 μ W
- R_{ON}: 170 Ω
- Output "Enable" Control
- MP7503 Replaces HI-1818

GENERAL DESCRIPTION

The MP7501 and MP7503 are monolithic CMOS, 8 channel analog multiplexers which switch one of eight inputs to a common output depending on the state of three binary address lines and an "enable" input. The MP7503 is identical to the MP7501 except its "enable" logic is inverted. All digital inputs are TTL, DTL, and CMOS logic compatible.

ABSOLUTE MAXIMUM RATINGS

(T_A = +25°C unless otherwise noted.)

- V_{DD} to GND +17V
- V_{SS} to GND -17V
- V Between Any Switch Terminals 25V
- Switch Current (I_s, Continuous) 35mA
- Switch Current (I_s, Surge) 50mA
- 1 mS duration, 10% duty cycle
- Digital Input Voltage Range V_{DD} to GND

Power Dissipation (Package)*

- 16 Pin Ceramic DIP** 900mW
- 16 Pin Plastic DIP*** 470mW

* Device mounted with all leads soldered or welded to PC board
 ** Derate 12mW/°C above +75°C
 *** Derate 6.5mW/°C above +25°C

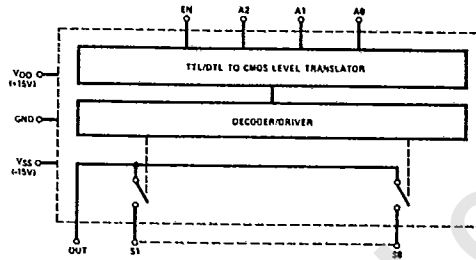
Operating Temperature

- Plastic 0°C to +70°C
- Ceramic (J, K versions) -25°C to +85°C
- Ceramic (S version) -55°C to +125°C
- Storage Temperature -65°C to +150°C

CAUTION:

1. Do not apply voltages higher than V_{DD} and V_{SS} to any other terminal, especially when V_{SS} = V_{CO} = 0V all other pins should be set at 0V.
2. 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.

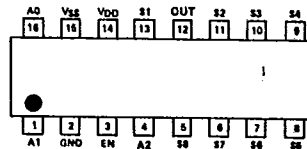
FUNCTIONAL DIAGRAM



TRUTH TABLES

MP7501					MP7503				
A ₂	A ₁	A ₀	E _N	"ON"	A ₂	A ₁	A ₀	E _N	"ON"
0	0	0	1	1	0	0	0	0	1
0	0	1	1	2	0	0	1	0	2
0	1	0	1	3	0	1	0	0	3
0	1	1	1	4	0	1	1	0	4
1	0	0	1	5	1	0	0	0	5
1	0	1	1	6	1	0	1	0	6
1	1	0	1	7	1	1	0	0	7
1	1	1	1	8	1	1	1	0	8
X	X	X	0	None	X	X	X	1	None

PIN CONFIGURATION (Top View)



See Section 7 for Ordering Information

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SPECIFICATIONS $V_{DD} = +15\text{ V}$, $V_{SS} = -15\text{ V}$ unless otherwise noted.

PARAMETER Note 1	VERSION Note 2	SWITCH CONDITION	25°C			UNITS	TEST CONDITIONS
			TYP	MIN	MAX		
ANALOG SWITCH							
R_{ON}	All	ON	300		375	Ω	$-10\text{ V} < V_S < +10\text{ V}$ $I_S = 1.0\text{ mA}$
R_{ON} vs. V_S	All	ON	20			%	
R_{ON} vs Temperature	All	ON	0.5			%/°C	
ΔR_{ON} Between Switches	All	ON	4			%	$V_S = 0\text{ V}$, $I_S = 1.0\text{ mA}$
R_{ON} vs. Temperature Between Switches	All	ON	± 0.01			%/°C	
I_S	J, K	OFF	2		50	nA	$V_S = -10\text{ V}$, $V_{OUT} = +10\text{ V}$ and $V_S = +10\text{ V}$, $V_{OUT} = -10\text{ V}$
	S	OFF	0.5		50	nA	
I_{OUT}	J, K	OFF	10		250	nA	$V_S = -10\text{ V}$, $V_{OUT} = +10\text{ V}$ and $V_S = +10\text{ V}$, $V_{OUT} = -10\text{ V}$ MP7501: Enable LOW MP7503: Enable HIGH
	S	OFF	5		250	nA	
$I_{OUT} - I_S$	J, K	ON	12		300	nA	$V_S = 0$
	S	ON	5.5		300	nA	
DIGITAL CONTROL							
V_{INL}	All				0.8	V	
V_{INH}	J		3.0	3.0		V	Note 3
	K, S		2.4	2.4		V	
I_{INL} or I_{INH}	All		10			nA	
C_{IN}	All		3			pF	
DYNAMIC CHARACTERISTICS							
t_{ON}	All		0.8			μs	$V_{IN} = 0$ to $+5.0\text{ V}$ (See Test Circuit 2, Page 19)
t_{OFF}	All		0.8			μs	
C_S	All	OFF	5			pF	
C_{OUT}	All	OFF	30			pF	
C_{S-OUT}	All	OFF	0.5			pF	
C_{SS} Between Any Two Switches	All	OFF	0.5			pF	
POWER SUPPLY							
I_{DD}	J, K		100			μA	All Digital Inputs Low
I_{SS}	J, K		100			μA	
I_{DD}	S		500		500	μA	
I_{SS}	S		500		500	μA	
I_{DD}	J, K		500			μA	All Digital Inputs High
I_{SS}	J, K		100			μA	
I_{DD}	S		800		800	μA	
I_{SS}	S		800		800	μA	

NOTES:

- Specifications subject to change without notice.
- JN, KN versions specified for 0°C to +70°C; JD, KD versions for -25°C to +85°C; and SD versions for -55°C to +125°C.
- A pullup resistor, typically 1-2 k Ω is required to make the MP7501J and MP7503J compatible with TTL/DTL levels. The maximum value is determined by the output leakage current of the driver gate when in the high state.