

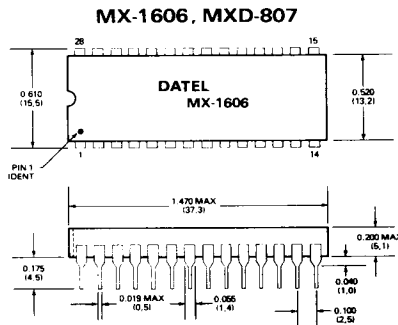
FEATURES

- 200 KHz Sampling rates
- 0.01% Accuracy
- Dielectrically isolated CMOS
- Break-before-make switching
- Single-ended and differential
- Overvoltage protection
- DTL/TTL/CMOS-compatible
- 7.5 mW Standby power

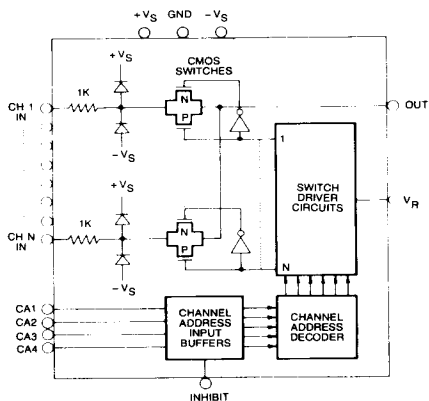
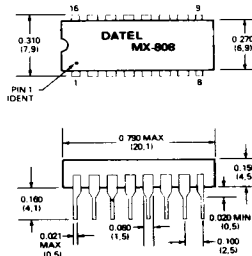
GENERAL DESCRIPTION

The MX Series analog multiplexers are 4-, 8-, and 16-channel monolithic devices manufactured with a dielectrically isolated complementary MOS process. The circuits incorporate analog and digital input protection which protects the units from both overvoltage and loss of power. The digital inputs are DTL/TTL/CMOS compatible and address the proper channel by means of a 2-, 3-, or 4-bit binary code. An inhibit input enables or disables the entire device and this permits expansion of the number of channels by using several devices together. Another important feature of these multiplexers is the use of break-before-make switching to insure that no two channels are ever momentarily shorted together. Transfer accuracies of 0.01% can be achieved at channel sampling rates up to 200 KHz and over $\pm 10V$ signal ranges.

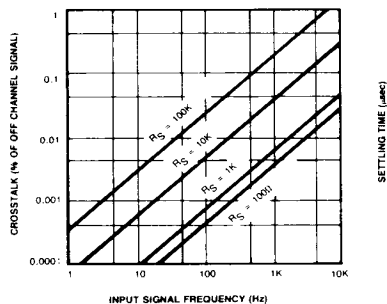
MECHANICAL DIMENSIONS — INCHES (MM)



MX-808, MXD-409



CROSSTALK VS. FREQUENCY OF INPUT SIGNAL



ABSOLUTE MAXIMUM RATINGS	MX-808	MX-1606	MXD-409	MXD-807
	40V +20V $\pm V_s + 4V $ $\pm V_s + 20V $ 725 mW	40V +20V $\pm V_s + 4V $ $\pm V_s + 20V $ 1200 mW	40V +20V $\pm V_s + 4V $ $\pm V_s + 20V $ 725 mW	40V +20V $\pm V_s + 4V $ $\pm V_s + 20V $ 1200 mW

FUNCTIONAL SPECIFICATIONS

Typical at 25 °C +15V supplies R source <1K, unless otherwise noted.

ANALOG INPUTS	MX-808	MX-1606	MXD-409	MXD-807
Number of Channels	8	16	4	8
Type	Single-ended	Single-ended	Differential	Differential
Input Voltage Range	$\pm 15V$	$\pm 15V$	$\pm 15V$	$\pm 15V$
Channel ON Resistance	1.5 K Ω	1.5 K Ω	1.5 K Ω	1.5 K Ω
Channel ON Resistance, Over Temp.	2.0 K Ω max.	2.0 K Ω max.	2.0 K Ω max.	2.0 K Ω max.
Channel OFF Input Leakage	30 pA	30 pA	30 pA	30 pA
Channel OFF Output Leakage	1.0 nA	1.0 nA	1.0 nA	1.0 nA
Channel ON Leakage	100 pA	100 pA	100 pA	100 pA
Channel OFF Input Capacitance	5 pF	5 pF	5 pF	5 pF
Channel OFF Output Capacitance	25 pF	50 pF	12 pF	25 pF
DIGITAL INPUTS ¹				
Logic 0 Threshold	+0.8V, max.	+0.8V, max.	+0.8V, max.	+0.8V, max.
Logic 1 Threshold, (TTL) ²	+4.0V min.	+4.0V min.	+4.0V min.	+4.0V min.
Logic 1 Threshold, (CMOS) ³	+6.0V min.	+6.0V min.	—	—
Input Current, High or Low	5 μ A max.	5 μ A max.	5 μ A max.	5 μ A max.
Channel Address Coding	3 Bits	4 Bits	2 Bits	3 Bits
Channel Inhibit, all channels OFF	Logic 0	Logic 0	Logic 0	Logic 0
PERFORMANCE				
Transfer Error, max.	0.01%	0.01%	0.01%	0.01%
Crosstalk, 1 KHz	0.005%	0.005%	0.005%	0.005%
Common Mode Rejection	—	—	120 dB	120 dB
Settling Time ⁴ , 20V to 0.1%	2 μ S	2 μ S	2 μ S	2 μ S
Settling Time ⁴ , 20V to 0.01%	3 μ S	3 μ S	3 μ S	3 μ S
Turn ON Time	500 nS	500 nS	500 nS	500 nS
Turn OFF Time	300 nS	300 nS	300 nS	300 nS
Break-Before-Make Delay	80 nS	80 nS	80 nS	80 nS
Inhibit/Enable Delay	300 nS	300 nS	300 nS	300 nS
POWER REQUIREMENTS				
Rated Power Supply Voltage	$\pm 15V$ dc	$\pm 15V$ dc	$\pm 15V$ dc	$\pm 15V$ dc
Power Supply Voltage Range	$\pm 5V$ to $\pm 20V$	$\pm 5V$ to $\pm 20V$	$\pm 5V$ to $\pm 20V$	$\pm 5V$ to $\pm 20V$
Quiescent Current, max.	+2, -1 mA	+2, -1 mA	+2, -1 mA	+2, -1 mA
Power Consumption, 10 KHz Sampling	7.5 mW	7.5 mW	7.5 mW	7.5 mW
PHYSICAL/ENVIRONMENTAL				
Operating Temperature Range	0 to +70 °C	0 to +70 °C	0 to +70 °C	0 to +70 °C
Storage Temperature Range	-65 to +150 °C	-65 to +150 °C	-65 to +150 °C	-65 to +150 °C
Package	16 pin DIP	28 pin DIP	16 pin DIP	28 pin DIP

Footnotes

- The digital inputs are the channel address inputs and the inhibit input.
- To drive from DTL/TTL circuits, 1K pull-resistors to +5V are recommended. With models MX-1606 and MXD-807, pin 13 should be left open.
- For a +6.0V threshold with models MX-1606 and MXD-807, pin 13 is connected to +10V.
- With a load impedance of >100 megohms in parallel with 2 pF.

TECHNICAL NOTES

- The transfer accuracy of these multiplexers depends on both the source resistance and the load resistance. With zero source resistance, and assuming 2K ohms maximum channel ON resistance, the load impedance should be at least 20 megohms to achieve 0.01% accuracy. In practice, it is recommended that a load impedance of at least 100

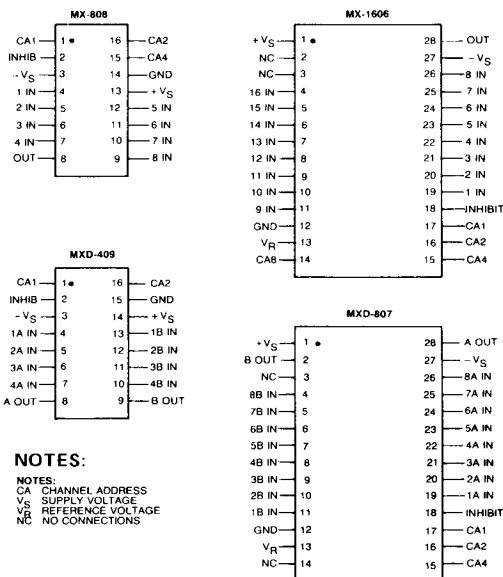
megohms be used to minimize errors. Source resistance should be kept as low as possible so that accuracy is not affected; less than 1 K ohms is recommended. Higher source resistance, in addition to affecting accuracy, will degrade the settling time of the multiplexer.

- Channel expansion uses the inhibit input of the multiplexer. A logic 0 on this input disables the multiplexer.

CONNECTION & APPLICATION

PIN CONNECTIONS

CHANNEL ADDRESSING



MX-1606

8	4	2	1	INHIB.	ON CHANNEL
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

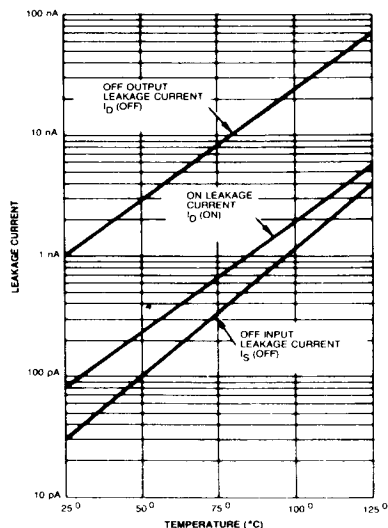
MX-808, MXD-807

4	2	1	INHIB.	ON CHANNEL
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

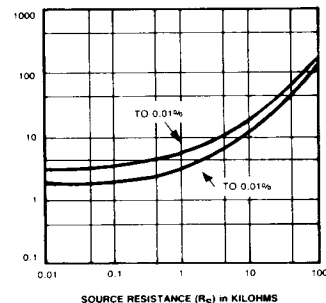
MXD-409

2	1	INHIB.	ON CHANNEL
X	X	0	NONE
0	0	1	1
0	1	1	2
1	0	1	3
1	1	1	4

LEAKAGE CURRENT VS. TEMP.



SETTLING TIME VS. SOURCE RESISTANCE (20V STEP)



ORDERING INFORMATION

MODEL NO.	CHANNELS	OPERATING TEMP. RANGE
MX-808	8 S.E.	0°C to +70°C
MX-1606	16 S.E.	0°C to +70°C
MXD-409	4 Diff.	0°C to +70°C
MXD-807	8 Diff.	0°C to +70°C