MV Series
Low ON-Resistance CMOS Analog Multiplexers

FEATURES

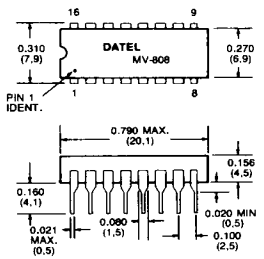
- **0.01% Accuracy**
- **Low "ON" resistance**
- **Break-before-make switching**
- **Dielectrically isolated CMOS**
- **Single-ended or differential**
- **Fast settling time**
- **DTL/TTL/CMOS-compatible**
- **350 KHz Sampling rate**

GENERAL DESCRIPTION

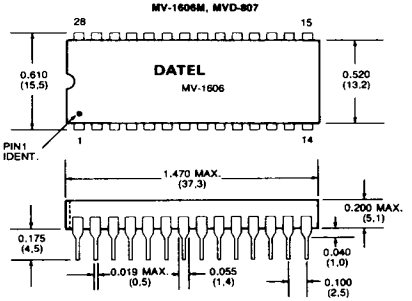
The MV Series analog multiplexers are 4-, 8-, and 16-channel monolithic devices featuring a low ON resistance of 270 ohms. These units are manufactured with CMOS technology using a dielectric isolation process. There are 8- and 16-channel single-ended models and 4- and 8-channel differential models in this series. Channel addressing is done by a 2-, 3-, or 4-bit binary code; an inhibit input enables or disables the entire device to permit expansion of the number of channels by using several devices together. Another important feature is break-before-make switching, which insures that no two channels are ever momentarily shorted together. With a high impedance load, transfer accuracies of 0.01% can be achieved at channel sampling rates up to 350 KHz.

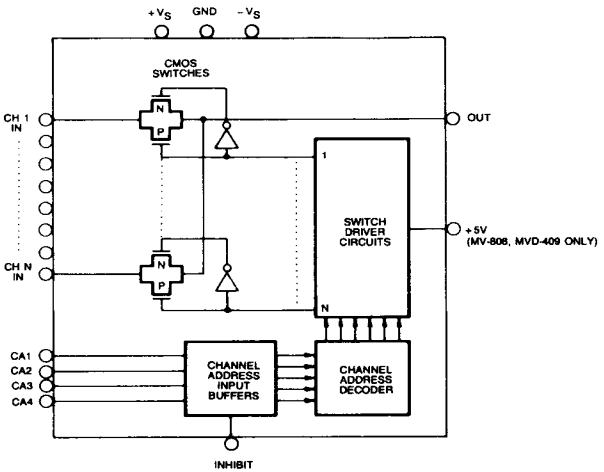
MECHANICAL DIMENSIONS INCHES (MM)

MV-808, MVD-409

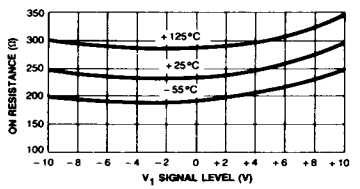


MV-1606M, MVD-807





ON RESISTANCE VS. TEMPERATURE



ABSOLUTE MAXIMUM RATINGS	MV-808	MV-1606 MV-1606M	MVD-409	MVD-807
Power Supply, analog	±20V	±20V	±20V	±20V
Power Supply, digital	+30V	–	+30V	–
Analog Input Voltage	±|Vs +2V|	±|Vs +2V|	±|Vs +2V|	±|Vs +2V|
Digital Input Voltage	±Vs	±|Vs +4V|	±Vs	±|Vs +4V|
Package Dissipation, max.	780 mW	1200 mW	780 mW	1200 mW

FUNCTIONAL SPECIFICATIONS

Typical at +15V supplies (and +5V supply for MV-808 & MVD-409), unless otherwise noted.

ANALOG INPUTS	MV-808	MV-1606/1606M	MVD-409	MVD-807
Number of Channels	8	16	4	8
Type	Single-ended	Single-ended	Differential	Differential
Input Voltage Range	±15V	±15V	±15V	±15V
Channel ON Resistance [1]	250Ω	270Ω	250Ω	270Ω
Channel ON Resistance [2], max. over temp.	500Ω	500Ω	500Ω	500Ω
Channel OFF Input Leakage	20 pA	30 pA	20 pA	30 pA
Channel OFF Output Leakage	100 pA	1.0 nA	50 pA	1.0 nA
Channel ON Leakage	100 pA	1.0 nA	50 pA	1.0 nA
Channel OFF Input Capacitance	4 pF	4 pF	4 pF	4 pF
Channel OFF Output Capacitance	20 pF	44 pF	10 pF	22 pF
DIGITAL INPUTS [3]				
Logic 0 Threshold, max.	+0.4V	+0.8V	+0.4V	+0.8V
Logic 1 Threshold [4], min.	+4.0V	+2.4V	+4.0V	+2.4V
Input Current, max., High or Low	1 µA	5 µA	1 µA	5 µA
Channel Address Coding	3 Bits	4 Bits	2 Bits	3 Bits
Channel Inhibit, all channels OFF	Logic 1	Logic 0	Logic 1	Logic 0
PERFORMANCE				
Transfer Error, max.	0.01%	0.01%	0.01%	0.01%
Crosstalk, 10 KHz	-86 dB	-86 dB	-86 dB	-86 dB
Common Mode Rejection	–	–	120 dB	120 dB
Settling Time, 20V to 0.1%	1.1 µS	1.2 µS	1.1 µS	1.2 µS
Settling Time, 20V to 0.01%	2.8 µS	2.4 µS	2.8 µS	2.4 µS
Turn ON Time	350 nS	300 nS	350 nS	300 nS
Turn OFF Time	250 nS	220 nS	250 nS	220 nS
Inhibit/Enable Delay	300 nS	300 nS	300 nS	300 nS
Break-Before-Make Delay	100 nS	80 nS	100 nS	80 nS
POWER REQUIREMENTS				
Power Supply Voltage	±15V dc	±15V dc	±15V dc	±15V dc
Power Supply Current [5], max.	+1, -2 mA	+3, -1 mA	+1, -1 mA	+3, -1 mA
Digital Supply Voltage	+5V dc	–	+5V dc	–
Digital Supply Current, max.	2 mA	–	2mA	–
PHYSICAL/ENVIRONMENTAL				
Operating Temperature Range	0 to +70 °C	0 to +70 °C	0 to +70 °C	0 to +70 °C
MV-1606M Oper. Temp. Range		-55 to +125 °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

1. For MV-1606M typical value is 170 ohms.
2. For MV-1606M maximum value is 400 ohms.
3. Channel address and inhibit inputs.
4. For MV-808 and MVD-409; to drive from DTL/TTL logic 1K pull-up resistors to +5V should be used.
5. For MV-1606M maximum current is +3, -1 mA.

TECHNICAL NOTES

1. The transfer accuracy of the MV series multiplexers depends on both the source resistance and load resistance. For example, with zero source resistance and assuming 500 ohms maximum channel ON resistance, the load impedance must be at least 5 megohms to achieve 0.01% accuracy. In practice it is recommended that a load impedance of 10^8 ohms or more be used. Source resistance should be kept as low as possible so that accuracy or settling time are not degraded. Less than 250 ohms is recommended.

2. Channel expansion is accomplished by use of the inhibit input of the multiplexers. To expand the number of channels, use multiple multiplexers with the inhibit inputs connected to a decoder.

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CONNECTION AND APPLICATION

CHANNEL ADDRESSING

MV-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

MV-808, MVD-807

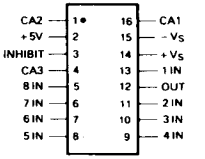
4	2	1	MVD-807 INHIB.	MV-808 INHIB.	ON CHANNEL
X	X	X	0	1	NONE
0	0	0	1	0	1
0	0	1	1	0	2
0	1	0	1	0	3
0	1	1	1	0	4
1	0	0	1	0	5
1	0	1	1	0	6
1	1	0	1	0	7
1	1	1	1	0	8

MVD-409

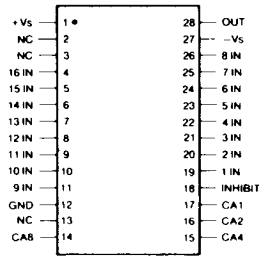
2	1	INHIB.	ON CHANNEL
X	X	1	NONE
0	0	0	1
0	1	0	2
1	0	0	3
1	1	0	4

PIN CONNECTIONS

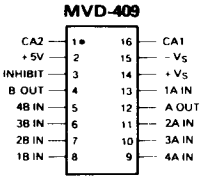
MV-808



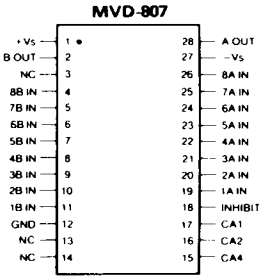
MV-1606



MVD-409



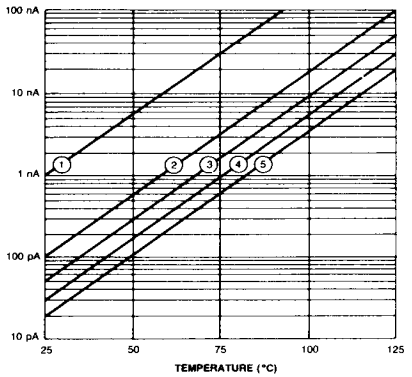
MVD-807



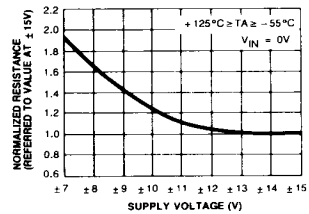
NOTES:
CA = CHANNEL ADDRESS
Vs = SUPPLY VOLTAGE
NC = NO CONNECTIONS

TOP VIEW SHOWN

LEAKAGE CURRENT VS. TEMPERATURE



1. MV-1606, MVD-807 CHANNEL OFF OUTPUT LEAKAGE
2. MV-808 CHANNEL OFF OUTPUT LEAKAGE
3. MVD-409 CHANNEL OFF OUTPUT LEAKAGE
4. MV-1606, MVD-807 CHANNEL OFF INPUT LEAKAGE
5. MV-808, MVD-409 CHANNEL OFF INPUT LEAKAGE



ORDERING INFORMATION

MODEL NO.	CHANNELS	OPERATING TEMP. RANGE
MV-808	8 S.E.	0 to 70°C
MV-1606	16 S.E.	0 to 70°C
MV-1606M	16 S.E.	−55 to +125°C
MVD-409	4 Diff.	0 to 70°C
MVD-807	8 Diff.	0 to 70°C