MX-826

Precision, High-Speed 8-Channel, Analog Multiplexers

INNOVATION and EXCELLENCE

FEATURES

- **170ns maximum settling time to ±0.1%**
- **225ns maximum settling time to ±0.01%**
- **400ns maximum settling time to ±0.003%**
- **8 Channels single-ended inputs**
- **395mW power dissipation**
- **Small, 24-pin DDIP package**

GENERAL DESCRIPTION

The MX-826 is a precision, high-speed multiplexer characterized for 10, 12 and 14-bit applications. The performance benchmarks are its 225 nanoseconds maximum settling time to ±0.01% accuracy and its unprecedented specification of accuracy to ±0.003%.

The MX-826 provides eight single-ended inputs. Channel addressing is done by a three-bit binary code and break-before-make switching assures that no two channels are ever momentarily shorted together.

The MX-826 operates from ±15V and +5V power supplies. Models are available in two operating temperature ranges: 0 to +70°C and –55 to +125°C. MIL-STD-883 screening is optional.

INPUT/OUTPUT CONNECTIONS

PIN	FUNCTION	PIN	FUNCTION
1	A0	24	+5V SUPPLY
2	A1	23	GROUND
3	A2	22	N.C.
4	IN1	21	N.C.
5	IN2	20	N.C.
6	IN3	19	–15V SUPPLY
7	IN4	18	GROUND
8	IN5	17	GROUND
9	IN6	16	+15V SUPPLY
10	IN7	15	N.C.
11	IN8	14	N.C.
12	GROUND	13	OUTPUT

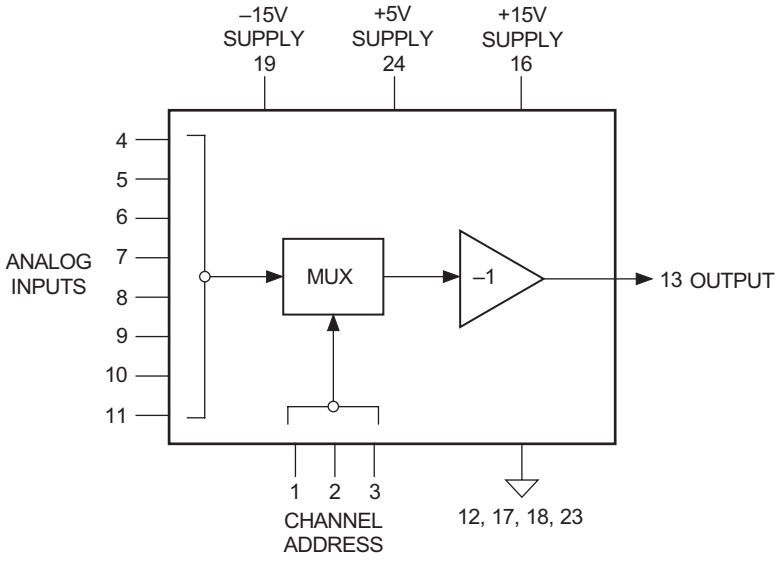


Figure 1. Functional Block Diagram

ABSOLUTE MAXIMUM RATINGS

PARAMETERS	LIMITS
+15V Supply, Pin 16	0 to +18V
–15V Supply, Pin 19	0 to –18V
+5V Supply, Pin 24	–0.5 to +7V
Digital Inputs, Pins 1, 2, 3	–0.3 to +5.5V
Analog Inputs, Pins 4-11	–15 to +15V
Lead Temperature (10s)	300°C
Short Circuit to Ground , Pin 13	Continuous

FUNCTIONAL SPECIFICATIONS

(Apply over the operating temperature range and over the operating power supply range unless otherwise specified.)

INPUTS	MIN.	TYP.	MAX.	UNITS
Input Voltage Range	±10	±10.5	—	Volts
Digital Input, Logic Levels				
Logic 1	+2.0	—	—	Volts
Logic 0	—	—	+0.8	Volts
Logic Loading				
Logic 1	—	—	+10	µA
Logic 0	—	—	–10	µA
OUTPUTS				
Output Range	±10.0	±10.5	—	Volts
Output Current	±15	—	—	mA
Stable Capacitive Load	100	—	—	pF
Output Impedance DC	—	0.1	—	Ohms
PERFORMANCE				
Gain	—	–1	—	V/V
Gain Error, 25°C	—	—	±0.03	%FS
Gain Tempco				
–55 to +125°C	—	±0.5	±5	ppm/°C
Offset, 25°C	—	±0.1	±0.5	mV
Offset Voltage Drift	—	<5	±15	µV/°C
Slew Rate	±250	±300	—	V/µs
Cross Talk				
100kHz	—	–90	–83	dB
1MHz	—	–80	–75	dB
Bandwidth				
3dB Small Signal	8	8.5	—	MHz
Full Power	3	4.5	—	MHz
Input Impedance	2.45	2.5	2.55	kΩ
Output Settling Time				
(10V step, +25°C) 500Ω Load				
±0.1% 10 Bits	—	100	170	ns
±0.01% 12 Bits	—	150	225	ns
±0.003% 14 Bits	—	300	400	ns
(20V step, + 25°C) 1kΩ Load				
±0.1% 10 Bits	—	150	200	ns
±0.01% 12 Bits	—	200	300	ns
±0.003% 14 Bits	—	600	720	ns
Switching Characteristics				
Break-Before-Make Delay	8	15	25	ns
Turn On Time	—	20	50	ns
Turn Off Time	—	20	50	ns
Harmonic Distortion				
DC to 500kHz, 10Vp-p	—	–90	–80	dB
Signal-to-Noise Ratio				
With Distortion	—	72	69	dB
Without Distortion	—	80	75	dB

POWER REQUIREMENTS	MIN	TYP	MAX	UNITS
Range				
+15V Supply	+14.5	+15	+15.5	Volts
–15V Supply	–14.5	–15	–15.5	Volts
+5V Supply	+4.75	+5	+5.25	Volts
Current (Quiescent)				
+15V Supply	—	+13	+21	mA
–15V Supply	—	–13	–21	mA
+5V Supply	—	<1	+1	mA
Power Supply Rejection Ratio	86	—	—	dB
Power Dissipation	—	395	575	mW
PHYSICAL/ENVIRONMMENTAL				
Operating Temp. Range, Case				
MC Model	0	—	+70	°C
MM Model	–55	—	+125	°C
Storage Temp. Range	–65	—	+150	°C
Package Type	24-pin, metal-sealed, ceramic DDIP			
Weight	0.42 oz. (12 grams)			

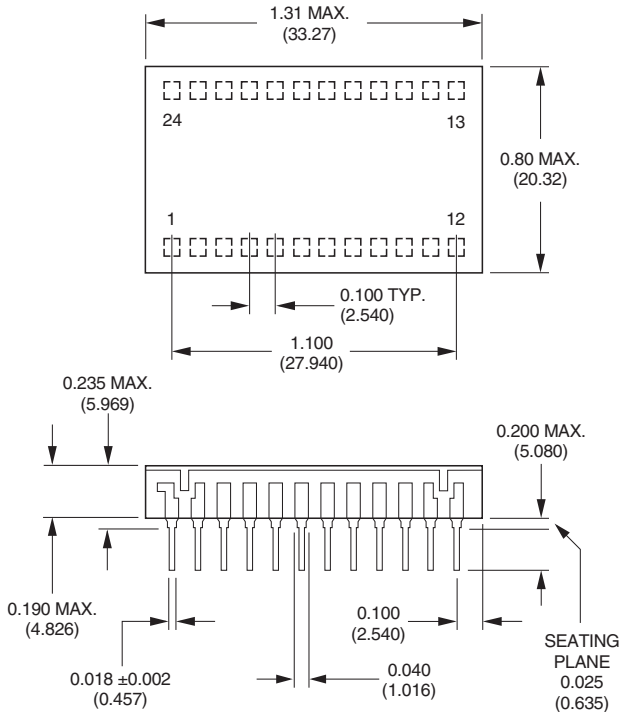
TECHNICAL NOTES

1. Bypass the ±15V and +5V power supplies with a 1µF, 25V tantalum electrolytic capacitors in parallel with a 0.1µF ceramic capacitors.
2. Analog signals up to ±15V may be present while the MUX power supplies are off.
3. The absence of an RON specification or output leakage specification is related to the architecture of the switching network. The inputs see a constant 2.5k Ohm input impedance whether the channel is on or off.
4. Typical recovery time from an overvoltage condition of >±3V is approximately 200 nanoseconds from a negative overdrive and 700 nanoseconds from a positive overdrive.
5. Double-level multiplexing may be used to provide up to 64 channels (nine MX-826's required).

Table 1. Channel Addressing

On Channel	MUX Address A2	A1	A0
1	0	0	0
2	0	0	1
3	0	1	0
4	0	1	1
5	1	0	0
6	1	0	1
7	1	1	0
8	1	1	1

MECHANICAL DIMENSIONS
INCHES (mm)



24-PIN DDIP

Dimension Tolerances (unless otherwise indicated):
2 place decimal (.XX) ±0.010 (±0.254)
3 place decimal (.XXX) ±0.005 (±0.127)

Lead Material: Kovar alloy

Lead Finish: 50 microinches (minimum) gold plating over 100 microinches (nominal) nickel plating

ORDERING INFORMATION

MODEL NO.	CHANNELS	OPER. TEMP. RANGE
MX-826MC	8SE	0 to +70°C
MX-826MM	8SE	–55 to +125°C
MX-826/883	8SE	–55 to +125°C

DESC drawing available: Drawing Number 5962-9450601.
For MIL-STD-883 product specifications, contact DATEL.

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