

16-Channel/Dual 8-Channel High Performance CMOS Analog Multiplexers

General Description

The DG406/DG407 are monolithic CMOS analog multiplexers (muxes). The DG406 is a single-ended 1-of-16 device, and the DG407 is a differential 2-of-8 device. Both are pin and functionally compatible with the industry-standard DG506A/DG507A.

The DG406/DG407 are fabricated with Maxim's new improved silicon gate process. Both parts offer low on resistance (100Ω max), improved leakage over temperature, low power consumption ($I_{SUPPLY} = 75\mu A$ max) and fast switching speeds ($t_{TRANS} = 250ns$ max). The 44V maximum breakdown voltage allows switch-off blocking capability rail-to-rail.

These muxes can be used with a single positive supply (+12V to +30V) or split supplies ($\pm 4.5V$ to $\pm 20V$) while retaining CMOS logic input compatibility. CMOS inputs provide reduced input loading.

Applications

Sample-and-Hold Circuits
Test Equipment
Winchester Disk Drives
Heads-Up Displays
Guidance and Control Systems
Military Radios
Communications Systems
Battery-Operated Systems
PBX, PABX

Features

- ◆ $r_{DS(ON)}$: 100Ω Max, $\Delta r_{DS(ON)}$: 15Ω Max
- ◆ t_{TRANS} : 250ns Max
- ◆ Leakage - $T_A = T_{MIN}$ to T_{MAX}
 - $I_{S(OFF)}$: 50nA Max
 - $I_{D(OFF)}$: 100nA Max (DG407), 200nA Max (DG406)
 - $I_{L(ON)}$: 100nA Max (DG407), 200nA Max (DG406)
- ◆ Q: 20pC Typ
- ◆ I_{SUPPLY} : 75μA Max
- ◆ Single- or Bipolar-Supply Operation
- ◆ TTL/CMOS Logic Compatible

Ordering Information

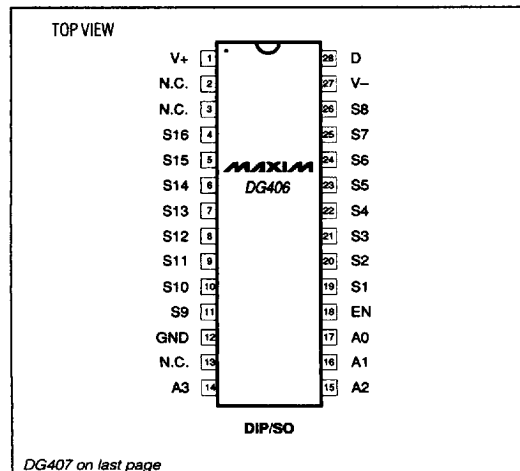
PART	TEMP. RANGE	PIN-PACKAGE
DG406CWI	0°C to +70°C	28 Wide SO
DG406C/D	0°C to +70°C	Dice*
DG406EWI	-40°C to +85°C	28 Wide SO
DG406DJ	-40°C to +85°C	28 Plastic DIP
DG406DN	-40°C to +85°C	28 PLCC
DG406DK	-40°C to +85°C	28 CERDIP
DG406AK	-55°C to +125°C	28 CERDIP**

Ordering information continued on last page.

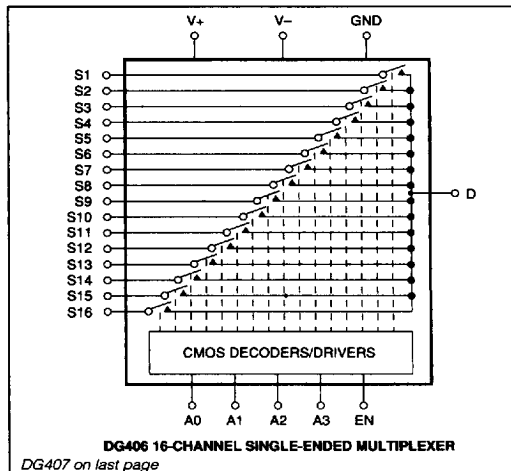
* Contact factory for dice specifications.

**Contact factory for availability and processing to MIL-STD-883.

Pin Configurations



Functional Diagrams



MAXIM

Maxim Integrated Products 1-129

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ABSOLUTE MAXIMUM RATINGS

Voltage Referenced to V-	
V+	44V
GND	25V
Digital Inputs Vs, Vd ... (Note 1) (V- - 2V) to (V+ + 2V) or 30mA (whichever occurs first)	30mA
Current (any terminal, except S or D)	30mA
Continuous Current, S or D	20mA
Peak Current, S or D (pulsed at 1ms, 10% duty cycle max)	40mA

Continuous Power Dissipation (TA = +25°C) (Note 2)	
28-Pin Plastic DIP (derate 9.09mW/°C above +70°C) ...	727mW
28-Pin Wide SO (derate 12.5mW/°C above +70°C) ...	1000mW
28-Pin PLCC (derate 10.53mW/°C above +70°C) ...	842mW
28-Pin CERDIP (derate 16.67mW/°C above +70°C) ...	1333mW
Operating Temperature Ranges:	
DG406/407C	0°C to +70°C
DG406/407D __/E__	-40°C to +85°C
DG406/407AK	-55°C to +125°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (soldering, 10 sec)	+300°C

Note 1: Signals on Sx, Dx, or INx exceeding V+ or V- are clamped by internal diodes. Limit forward current to maximum current ratings.

Note 2: All leads are soldered or welded to PC board.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS (Dual Supplies)

(V+ = 15V, V- = -15V, GND = 0V, V_{AH} = +2.4V, V_{AL} = +0.8V, T_A = T_{MIN} to T_{MAX}, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS			MIN	TYP (Note 3)	MAX	UNITS
SWITCH								
Analog Signal Range	V _{ANALOG}	(Note 4)			-15		15	V
Drain-Source On Resistance	r _{DS(ON)}	I _S = -10mA, V _D = ±10V		T _A = +25°C		50	100	Ω
				T _A = T _{MIN} to T _{MAX}			125	
r _{DS(ON)} Matching Between Channels	Δr _{DS(ON)}	V _D = ±10V (Note 5)		T _A = +25°C			15	Ω
Source-Off Leakage Current	I _{S(OFF)}	V _D = ±10V, V _S = ±10V, V _{EN} = 0V		T _A = +25°C	-0.5		0.5	nA
				T _A = T _{MIN} to T _{MAX}	-50		50	
Drain-Off Leakage Current	I _{D(OFF)}	V _S = ±10V, V _D = ±10V, V _{EN} = 0V	DG406	T _A = +25°C	-2		2	nA
				T _A = T _{MIN} to T _{MAX}	-200		200	
			DG407	T _A = +25°C	-2		2	nA
				T _A = T _{MIN} to T _{MAX}	-100		100	
Drain-On Leakage Current	I _{D(ON)} + I _{S(ON)}	V _D = ±10V, V _S = ±10V, sequence each switch on	DG406	T _A = +25°C	-2		2	nA
				T _A = T _{MIN} to T _{MAX}	-200		200	
			DG407	T _A = +25°C	-2		2	nA
				T _A = T _{MIN} to T _{MAX}	-100		100	