



CMOS, TTL-Compatible Analog Multiplexers

1.0 SCOPE

- 1.1** This specification covers the detail requirements for two CMOS multiplexers with two configurations—16-channel and dual 8-channel. These circuits are processed in accordance with MIL-STD-883 and are fully compliant to paragraph 1.2.1.

It is highly recommended that this data sheet be used as a baseline for new military or aerospace source control drawings.

For typical applications and operating characteristics, consult Maxim's data books.

1.2 Part Numbers

Device	Part Number
-1	DG506AA(X)/883B
-2	DG507AA(X)/883B

1.3 Package

(X)	Package	Description
K	K-28	28-Pin Ceramic Dual-In-Line Package (CERDIP)
R	R-28	28-Pin Ceramic Sidebrazed (Ceramic SB)
Z	Z-28	28-Pin Leadless Chip Carrier (LCC)

Note: See *Package Information* section for package drawings and dimensions.

1.4 Absolute Maximum Ratings

($T_A = +25^\circ\text{C}$, unless otherwise noted.)

V+ to V-	44V
V+ to GND	25V
Digital Input Overvoltage Range	-2V to ($V_+ + 2V$)
Current (any terminal except S or D)	30mA
Continuous Current (S or D)	20mA
Peak Current (pulsed at 1ms, 10% duty cycle max)	40mA
Power Dissipation ($T_A = +70^\circ\text{C}$, $T_j = +150^\circ\text{C}$)	
CERDIP (derate 16.67mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$)	1333mW
Ceramic SB (derate 20.00mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$)	1600mW
LCC (derate 10.02mW/ $^\circ\text{C}$ above $+70^\circ\text{C}$)	802mW
Operating Temperature Range	-55°C to $+125^\circ\text{C}$
Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Lead Temperature (soldering, 10 sec)	$+300^\circ\text{C}$



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- 1.5 Thermal Resistance** $\theta_{JC} = 25^{\circ}\text{C/W}$ for K-28
 $\theta_{JC} = 15^{\circ}\text{C/W}$ for R-28
 $\theta_{JC} = 50^{\circ}\text{C/W}$ for Z-28
 $\theta_{JA} = 60^{\circ}\text{C/W}$ for K-28
 $\theta_{JA} = 50^{\circ}\text{C/W}$ for R-28
 $\theta_{JA} = 98^{\circ}\text{C/W}$ for Z-28

2.0 REQUIREMENTS

- 2.1** Electrical performance characteristics are specified in Table 1 and apply over the full ambient operating temperature range, unless otherwise specified.

TABLE 1. ELECTRICAL PERFORMANCE CHARACTERISTICS (Note 1)

CHARACTERISTICS	SYMBOL	CONDITIONS		DEVICE TYPES	GROUP A SUB-GROUPS	LIMITS		UNITS
						MIN	MAX	
Analog-Signal Range	V _{ANALOG}	V _S = ±15V		All	1, 2, 3	-15	15	V
Drain-Source On Resistance	r _{DS(ON)}	V _D = ±10V, V _{AL} = 0.8V, V _{AH} = 2.4V, I _S = -200μA		All	1, 3	400		Ω
					2	500		
Source-Off Leakage Current	I _{S(OFF)}	V _{EN} = 0V	V _S = 10V, V _D = -10V	All	1	-1	1	μA
					2	-50	50	
			V _S = -10V, V _D = 10V		1	-1	1	
					2	-50	50	
Drain-Off Leakage Current	I _{D(OFF)}	V _{EN} = 0V	V _S = 10V, V _D = -10V	-1	1	-10	10	μA
					2	-300	300	
				-2	1	-5	5	
					2	-200	200	
			V _S = -10V, V _D = 10V	-1	1	-10	10	
					2	-300	300	
				-2	1	-10	10	
					2	-200	200	
Drain-On Leakage Current	I _{D(ON)}	Sequence each channel on, V _{AL} = 0.8V, V _{AH} = 2.4V	V _S = V _D = 10V	-1	1	-10	10	μA
					2	-300	300	
				-2	1	-5	5	
					2	-200	200	
			V _S = V _D = -10V	-1	1	-10	10	
					2	-300	300	
				-2	1	-5	5	
					2	-200	200	
Input Current with Voltage High	I _{AH}	V _{IN} = 2.4V		All	1, 3	-10	μA	
		V _{IN} = 15V			2	-30		
					1, 3	10		
		2	30					

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TABLE 1. ELECTRICAL PERFORMANCE CHARACTERISTICS (Note 1) (continued)

CHARACTERISTICS	SYMBOL	CONDITIONS	DEVICE TYPES	GROUP A SUB-GROUPS	LIMITS		UNITS
					MIN	MAX	
Input Current With Voltage Low	I_{AL}	$V_{EN} = 0V, 2.4V; V_A = 0V$	All	1, 3	-10		μA
				2	-30		
Positive Supply Current	I_+	$V_{EN} = V_A = 0V$	All	1		2.4	mA
Negative Supply Current	I_-	$V_{EN} = V_A = 0V$	All	1	-1.5		mA
DYNAMIC							
Transition Time	t_{TRANS}	Figure 1	All	9		1	μs
				10, 11		1.5	

Note 1: $V_+ = 15V, V_- = -15V, GND = 0V, V_{AH} = 2.4V, V_{AL} = 0.8V$, unless otherwise noted.

3.0 QUALITY ASSURANCE

3.1 Sampling and inspection procedures shall be in accordance with MIL-M-38510 and, to the extent specified, with MIL-STD-883.

3.2 Screening shall be in accordance with Method 5004 of MIL-STD-883. Burn-in test (Method 1015):

- (1) Test condition A, B, C, or D.
- (2) $T_A = +125^\circ C$, minimum.
- (3) Interim and final electrical test requirements shall be as specified in Table 2.

3.3 Quality conformance inspection shall be in accordance with Method 5005 of MIL-STD-883 including Groups A, B, C, and D inspection.

Group A inspection:

- (1) Tests as specified in Table 2.
- (2) Selected subgroups in Table 1, Method 5005 of MIL-STD-883 shall be omitted.

3.4 Groups C and D inspections:

a. End-point electrical parameters shall be specified in Table 1.

b. Steady-state life test (Method 1005 of MIL-STD-883):

- (1) Test condition A, B, C, or D.
- (2) $T_A = +125^\circ C$, minimum.
- (3) Test duration, 1000 hours, except as permitted by Method 1005 of MIL-STD-883.

DG506A/DG507A/883B 1

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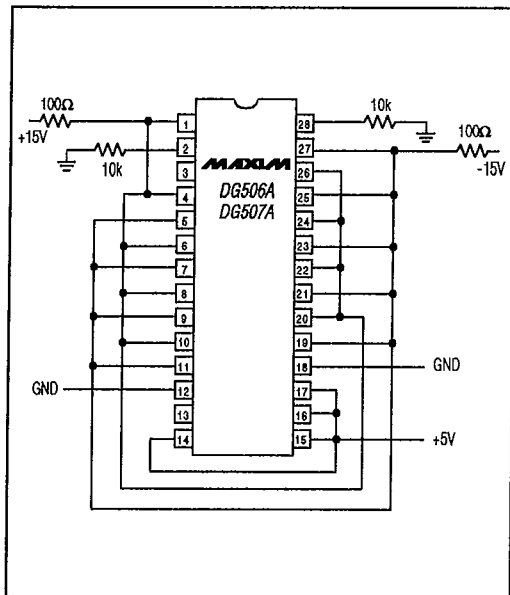
TABLE 2. ELECTRICAL TEST REQUIREMENTS

MIL-STD-883 Test Requirements	Subgroups (per Method 5005, Table 1)
Interim Electrical Parameters (Method 5004)	1
Final Electrical Parameters (Method 5004)	1, * 2, 3, 9
Group A Test Requirements (Method 5005)	1, 2, 3, 9, 10, ** 11**
Groups C and D End-Point Electrical Parameters (Method 5005)	1

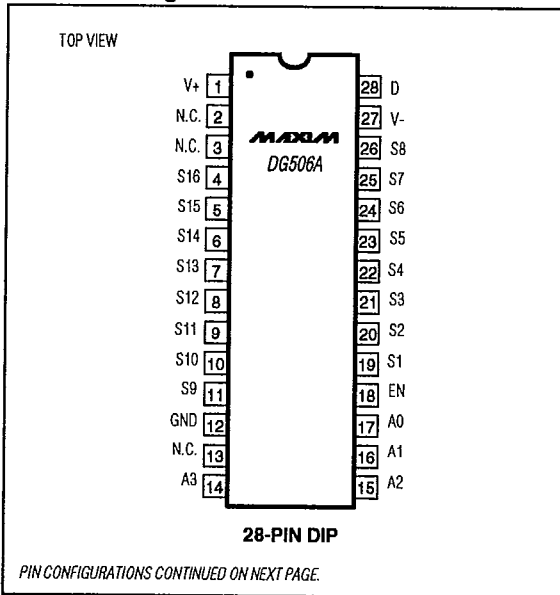
* PDA applies to Subgroup 1 only.

** Subgroups 10 and 11, if not tested, shall be guaranteed to the limits in Table 1.

4.0 Life Test/Burn-In Circuit

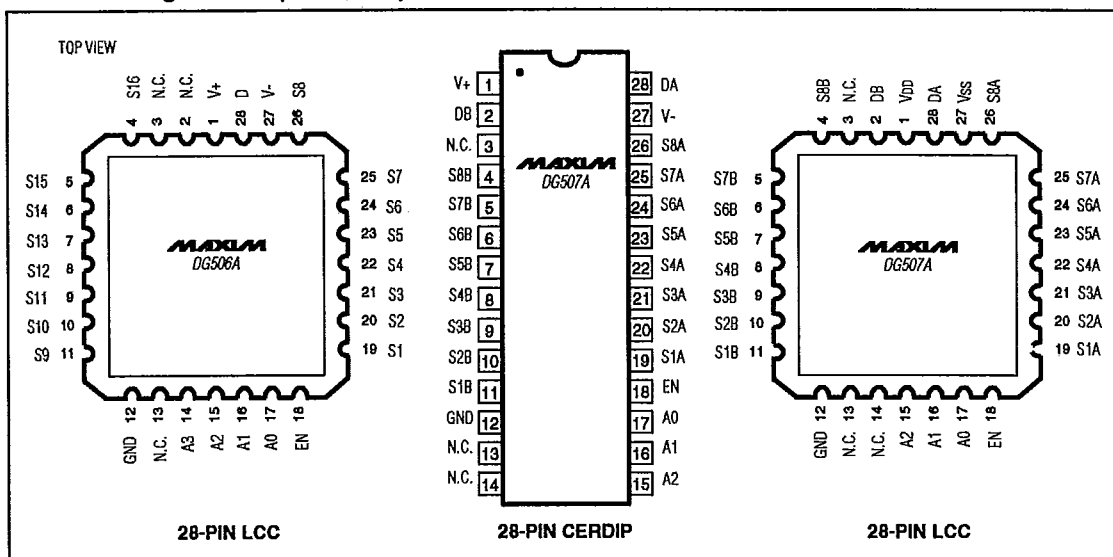


4.1 Pin Configurations

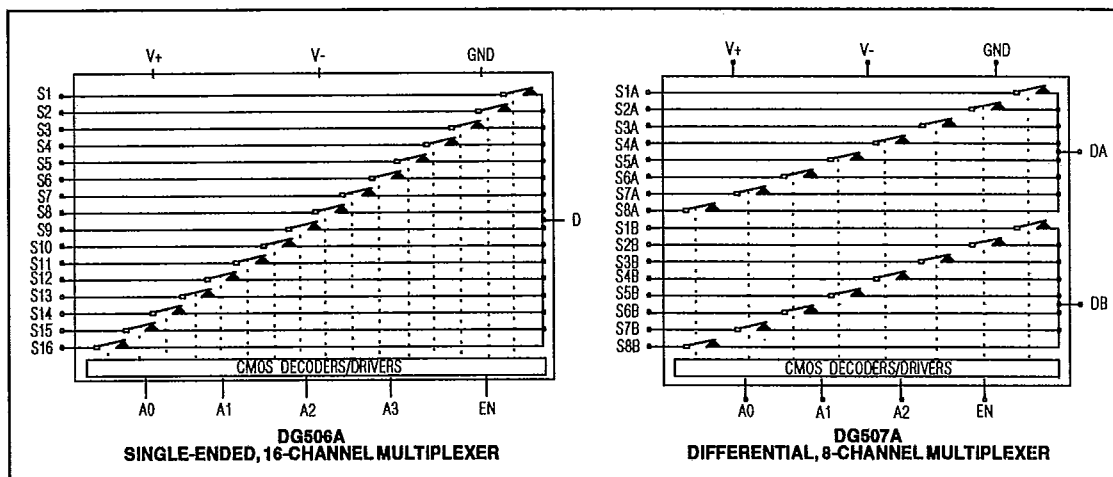


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4.1 Pin Configurations (continued)



4.2 Functional Diagrams



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4.3 Truth Tables

DG506A					
A3	A2	A1	A0	EN	On Switch
X	X	X	X	X	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

DG507A				
A2	A1	A0	EN	On Switch
X	X	X	X	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

4.4 Timing Diagram/Test Circuits

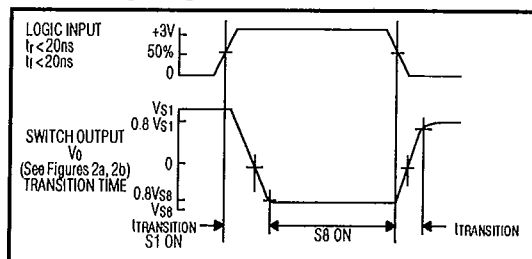


Figure 1. Timing Diagram

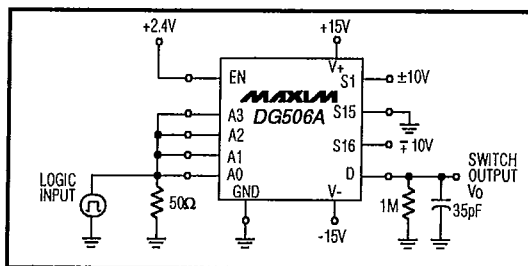


Figure 2a. DG506A Transition Switching Time

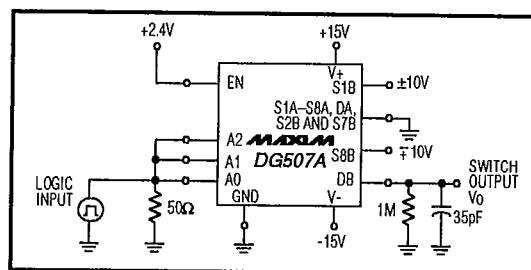


Figure 2b. DG507A Transition Switching Time

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