19-0088; Rev 0; 11/92

MAXIM

8-Channel/Dual 4-Channel CMOS Analog Multiplexers

1.0 SCOPE

1.1 This specification covers the detail requirements for two CMOS multiplexers in two configurations (8-channel and dual 4-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	DG408A(X)/883B
-2	DG409A(X)/883B

1.3 Package

(X)	Package	Description
K	K-16	16-Pin Ceramic Dual-In-Line Package (CERDIP)
Z	L-20	20-Pin Ceramic Leadless Chip Carrier (LCC)

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

1.4 Absolute Maximum Ratings

(T_A = +25°C, unless otherwise noted.)

V+ to V- 44V
GND to V- 25V
Digital Input Overvoltage Range ..... (V- - 2V) to (V+ + 2V)
Continuous Current, Any Terminal (except S or D) 30mA
Continuous Current (S or D) 20mA
Current, S or D (pulsed at 1ms, 10% duty cycle max) 40mA
Power Dissipation (T_A = +70°C, Tj = +150°C)
16-Pin CERDIP (derate 10.00mW/°C above +70°C) 800mW
20-Pin LCC (derate 9.09mW/°C above +70°C) 727mW
Operating Temperature Range ..... -55°C to +125°C
Storage Temperature Range ..... -65°C to +150°C
Lead Temperature (soldering, 10 sec) ..... +300°C

1.5 Thermal Resistance

Θ_{JC} = 50°C/W for K-16
Θ_{JC} = 55°C/W for L-20
Θ_{JA} = 100°C/W for K-16
Θ_{JA} = 110°C/W for L-20

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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 MIN	LIMITS MAX	UNITS
Analog-Signal Range	V_{ANALOG}	(Note 2)	All	1, 2, 3	-15	15	V
Drain-Source On Resistance	$r_{DS(ON)}$	I_S = -10mA, V_D = ±10V	All	1		100	Ω
				2, 3		125	
$r_{DS(ON)}$ Matching Between Channels (Note 3)	$\Delta r_{DS(ON)}$	I_S = -10mA, V_D = ±10V	All	1		15	Ω
Source-Off Leakage Current	$I_{S(OFF)}$	V_D = ±10V, V_S = ∓10V, V_{EN} = 0V	All	1	-0.5	0.5	nA
				2, 3	-50	50	
Drain-Off Leakage Current	$I_{D(OFF)}$	V_D = ±10V, V_S = ∓10V, V_{EN} = 0V	-1	1	-1	1	nA
				2, 3	-100	100	
			-2	1	-1	1	
				2, 3	-50	50	
Channel-On Leakage Current	$I_{D(ON)}$ + $I_{S(ON)}$	V_D = ±10V, V_S = ∓10V, sequence each switch on	-1	1	-1	1	nA
				2, 3	-100	100	
			-2	1	-1	1	
				2, 3	-50	50	
Input Current with Voltage Low	I_{AL}	V_{EN} = 0V, 2.4V; V_A = 0V	All	1, 2, 3	-10	10	µA
Input Current with Voltage High	I_{AH}	V_A = 2.4V, 15V	All	1, 2, 3	-10	10	µA
Positive Supply Current	I+	V_{EN} = V_A = 0V	All	1, 2, 3		75	µA
		V_{EN} = 2.4V, V_A = 0V		1		0.5	mA
				2, 3		2	
Negative Supply Current	I-	V_{EN} = V_A = 0V	All	1, 2, 3	-75		µA
		V_{EN} = 2.4V, V_A = 0V			-500		
DYNAMIC							
Transition Time	t_{TRANS}	Figure 1	All	9, 10, 11		250	ns
Break-Before-Make Interval	t_{OPEN}	Figure 2	All	9	10	---	ns
Enable Turn-On Time	$t_{ON(EN)}$	Figure 3	All	9		150	ns
				10, 11		225	
Enable Turn-Off Time	$t_{OFF(EN)}$	Figure 3	All	9, 10, 11		150	ns

Note 1: V+ = 15V, V- = -15V, GND = 0V, V_{AH} = 2.4V, V_{AL} = 0.8V, unless otherwise noted.
Note 2: Guaranteed by design.
Note 3: $\Delta r_{DS(ON)} = \Delta r_{DS(ON)}MAX - \Delta r_{DS(ON)}MIN$.

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°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°C, minimum.
(3) Test duration, 1000 hours, except as permitted by Method 1005 of MIL-STD-883.

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.

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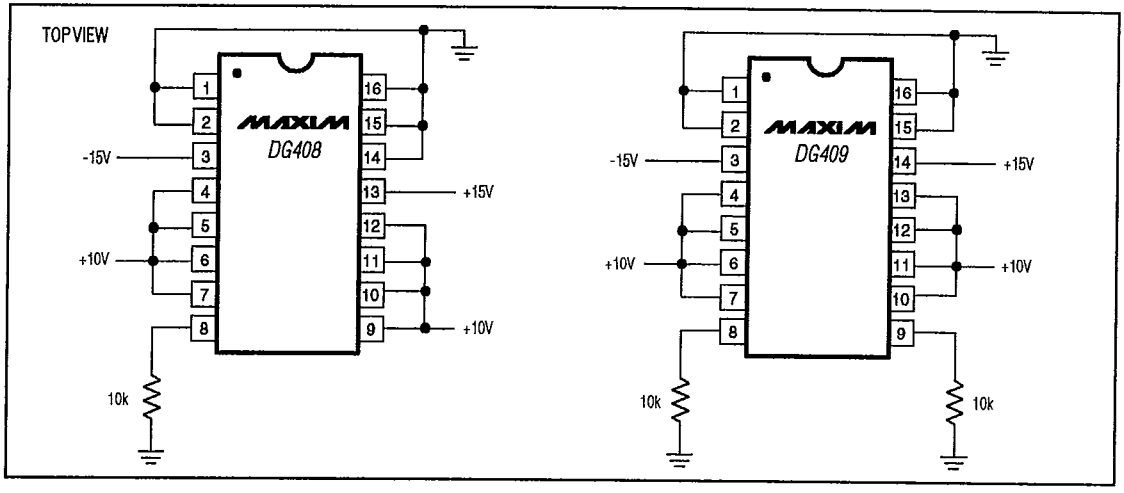
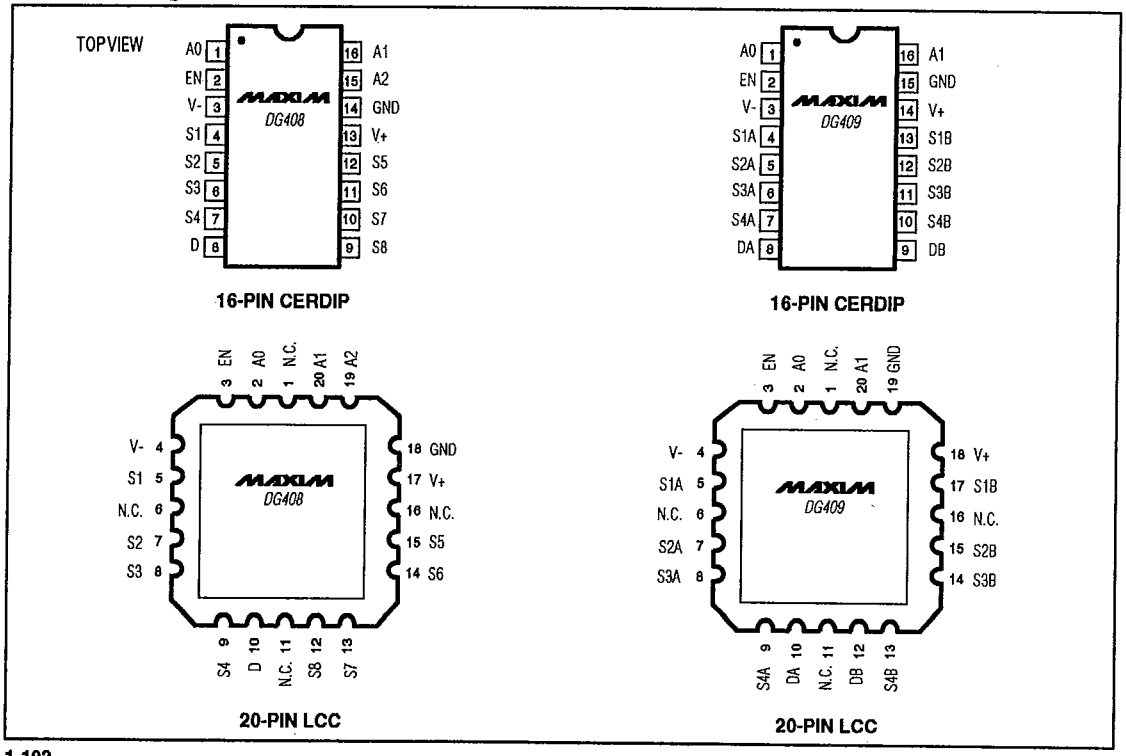
4.0 Life Test/Burn-In Circuits



4.1 Pin Configurations



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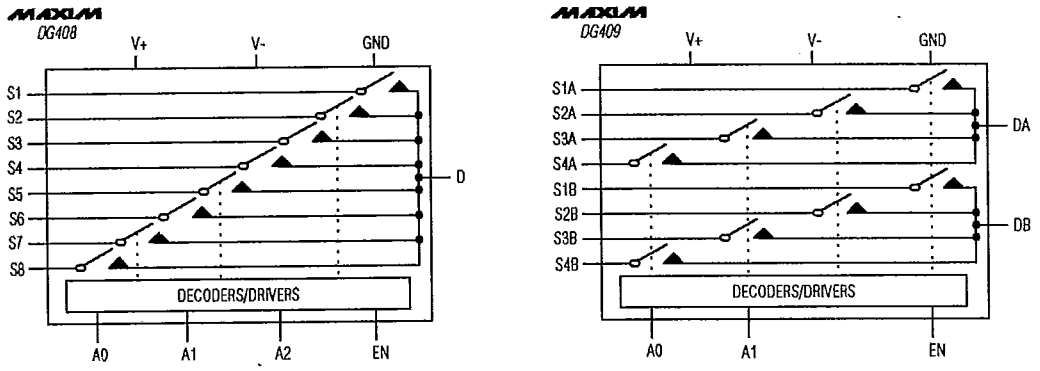
4.2 Functional Diagrams



4.3 Truth Tables

DG408				
LOGIC				ON SWITCH
EN	A0	A1	A2	
0	X	X	X	None
1	0	0	0	1
1	1	0	0	2
1	0	1	0	3
1	1	1	0	4
1	0	0	1	5
1	1	0	1	6
1	0	1	1	7
1	1	1	1	8

DG409			
LOGIC			ON SWITCH
EN	A0	A1	
0	X	X	None
1	0	0	1
1	1	0	2
1	0	1	3
1	1	1	4