

SCOPE: CMOS, TTL-COMPATIBLE ANALOG MULTIPLEXER

<u>Device Type</u>	<u>Generic Number</u>	<u>SMD Number</u>	<u>Circuit Function</u>
01	DG506AA(x)/883B	5962-8513107	Single 16-channel MUX/DEMUX
02	DG507AA(x)/883B	5962-8513108	Differential 8-channel MUX/DEMUX
03	DG509AA(x)/883B	5962-8513109	Differential 4-channel MUX/DEMUX

Case Outline(s). The case outlines shall be designated in Mil-Std-1835 and as follows:

<u>Outline Letter</u>		<u>Mil-Std-1835</u>	<u>Case Outline</u>	<u>Package Code</u>
Maxim SMD				
Z	3	CQCC1-N28	28-Pin Ceramic LCC	L28
Z	2	CQCC1-N20	20-Pin Ceramic LCC	L20

Absolute Maximum Ratings

Voltage Referenced to V⁻

V ⁺ to V ⁻	44V
V ⁺ to GND	+22V
V ⁻ to GND	-25V
Digital Inputs, Overvoltage Range (V _A , V _{EN})	(V ⁻) -4V to (V ⁺) +4V or 20mA whichever comes first
Analog Inputs, Overvoltage Range (V _S)	(V ⁻) -2V to (V ⁺) +2V
Continuous Current, S or D	20mA
Peak Current (Pulsed at 1ms, 10% duty cycle max) S or D.....	40mA
Lead Temperature (soldering, 10 seconds)	+300°C
Storage Temperature	-65°C to +150°C

Continuous Power Dissipation	T _A = +70°C
20 lead LCC (derate 9.1mW/°C above +70°C)	727mW
28 lead LCC (derate 10.2mW/°C above +70°C)	816mW
Junction Temperature T _J	+150°C
Thermal Resistance, Junction to Case, Θ_{JC} :	
Case Outline 20 lead LCC	20°C/W
Case Outline 28 lead LCC	15°C/W
Thermal Resistance, Junction to Ambient, Θ_{JA} :	
Case Outline 20 lead LCC	110°C/W
Case Outline 28 lead LCC	98°C/W

Recommended Operating Conditions.

Ambient Operating Range (T _A)	-55°C to +125°C
Positive Supply Voltage (V ⁺)	+15V
Negative Supply Current (V ⁻)	-15V
V _{AL} (max)	0.8V
V _{AH} (min)	2.4V
V _{EN}	2.4V

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.

TABLE 1. ELECTRICAL TESTS

TEST	Symbol	CONDITIONS -55 °C ≤ T _A ≤ +125°C V ₊ =+15V, V ₋ =-15V, GND=0V V _{EN} =2.4V Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
SWITCH							
Input Leakage Current NOTE 1	I _{IH}	Measure address inputs sequentially, connect all unused address inputs to GND	1,2,3	All		1.0	μA
	I _{IL}					1.0	
Leakage Current into the source terminal of an “OFF” switch	+I _{S(OFF)}	V _S =+10V, V _{EN} =0.8V, All unused inputs=-10V, V _D =-10V	1,2,3	All	-10 -50	+10 +50	nA
	-I _{S(OFF)}	V _S =-10V, V _{EN} =0.8V, All unused inputs=+10V, V _D =+10V					
Leakage Current into the drain terminal of an “OFF” switch	+I _{D(OFF)}	V _D =+10V, V _{EN} =0.8V, All unused inputs=-10V	1 2,3 2,3 2,3	All 01 02 03	-10 -300 -200 -100	+10 +300 +200 +100	nA
	-I _{D(OFF)}	V _D =-10V, V _{EN} =0.8V, All unused inputs=+10V					
Leakage Current from an “ON” driver into the switch (drain)	+I _{D(ON)}	V _D =+10V, V _S =+10V, All unused inputs=-10V	1 2,3 2,3 2,3	All 01 02 03	-10 -300 -200 -100	+10 +300 +200 +100	nA
	-I _{D(ON)}	V _D =-10V, V _S =-10V, All unused inputs=+10V					
Switch “ON” Resistance	+I _{DS} (ON1)	V _S =+10V, I _D =-1mA	1 2,3	All		300 400	Ω
Switch ON Resistance	-I _{DS(ON2)}	V _S =-10V, I _D =+1mA	1 2,3	All		300 400	Ω
SUPPLY							
Positive Supply Current	I ₊	V _A =0V, V _{EN} =2.4V	1,2,3	01,02		3.0	mA
				03		2.4	
Negative Supply Current	I ₋	V _A =0V, V _{EN} =2.4V	1,2,3	All	-1.0		mA
Standby Positive Supply Current	+I _{SBY}	V _A =0V, V _{EN} =0V	1,2,3	01,02		3.0	mA
				03		2.4	
Standby Negative Supply Current	-I _{SBY}	V _A =0V, V _{EN} =0V	1,2,3	All	-1.0		mA
DYNAMIC							
Capacitance: Address	C _A	V ₊ =V ₋ =0V, f=1MHz, NOTE 2	4	01,02 03		12 10	pF
Capacitance: Output Switch	C _{OS}	V ₊ =V ₋ =0V, f=1MHz, NOTE 2	4	01 02 03		90 50 25	pF
Capacitance: Input Switch	C _{IS}	V ₊ =V ₋ =0V, f=1MHz, NOTE 2	4	All		12	pF
Charge Transfer Error	V _{CTE}	V _S =GND. V _{GEN} =0V to 5V, NOTE 2	7	All		10	mV
Off Isolation	V _{ISO}	V _{EN} =0.8V, R _L =1kΩ, f=100kHz, C _L =15pF, V _S =7Vrms	7	All		-50	dB
Break-before- make Time Delay	t _D	R _L =1000Ω, C _L =50pF, Figure 3	9	All	25		ns

TABLE 1. ELECTRICAL TESTS

TEST	Symbol	CONDITIONS -55 °C ≤ T _A ≤ +125 °C V ₊ =+15V, V ₋ =-15V, GND=0V V _{AH} =2.4V, V _{AL} =0.8V Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
Propagation Delay Times: Address Inputs to I/O Channels	t _{ON(A)}	R _L =10kΩ, C _L =50pF	9	All		500	ns
	t _{OFF(A)}		10,11			1000	
Enable to I/O	t _{ON(EN)}	R _L =1000Ω, C _L =50pF	9	All		500	ns
	t _{OFF(EN)}		10,11			1000	

NOTE 1: Input current of one input mode.

NOTE 2: Guaranteed, if not tested, to the limits specified.

FIGURE 3: Break-Before-Make Interval: See Commercial Datasheet.

TRUTH TABLE

TERMINAL CONNECTION

A3	A2	A1	A0	EN	DG506A Selected Channel	TERMINAL NUMBER	01 DG506A	02 DG507A	03 DG509A
X	X	X	X	L	None		L28	L28	L20
L	L	L	L	H	1	1	V+	V+	NC
L	L	L	H	H	2	2	NC	DB	A0
L	L	H	L	H	3	3	NC	NC	EN
L	L	H	H	H	4	4	S16	S8B	V-
L	H	L	L	H	5	5	S15	S7B	IN 1A
L	H	L	H	H	6	6	S14	S6B	NC
L	H	H	L	H	7	7	S13	S5B	IN 2A
L	H	H	H	H	8	8	S12	S4B	IN 3A
H	L	L	L	H	9	9	S11	S3B	IN 4A
H	L	L	H	H	10	10	S10	S2B	OUT A
H	L	H	L	H	11	11	S9	S1B	NC
H	L	H	H	H	12	12	GND	GND	OUT B
H	H	L	L	H	13	13	NC	NC	IN 4B
H	H	L	H	H	14	14	A3	NC	IN 3B
H	H	H	L	H	15	15	A2	A2	IN 2B
H	H	H	H	H	16	16	A1	A1	NC
						17	A0	A0	IN 1B
					DG507A	18	EN	EN	V+
	A2	A1	A0	EN	Selected Channel	19	S1	S1A	GND
	X	X	X	L	None	20	S2	S2A	A1
	L	L	L	H	1A, 1B	21	S3	S3A	
	L	L	H	H	2A, 2B	22	S4	S4A	
	L	H	L	H	3A, 3B	23	S5	S5A	
	L	H	H	H	4A, 4B	24	S6	S6A	
	H	L	L	H	5A, 5B	25	S7	S7A	
	H	L	H	H	6A, 5B	26	S8	S8A	
	H	H	L	H	7A, 7B	27	V-	V-	
	H	H	H	H	8A, 8B	28	D	DA	

TRUTH TABLE: DG509A

A1	A0	EN	CHANNEL SELECTED
X	X	L	NONE
L	L	H	1A, 1B
L	H	H	2A, 2B
H	L	H	3A, 3B
H	H	H	4A, 4B

ORDERING INFORMATION:	SMD NUMBER	PACKAGE CODE
DG506AAZ/883B	5962-85131073C	28 LCC
DG507AAZ/883B	5962-85131083C	28LCC
DG509AAZ/883B	5962-85131092C	20 LCC

QUALITY ASSURANCE

Sampling and inspection procedures shall be in accordance with MIL-Prf-38535, Appendix A as specified in Mil-Std-883.

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. TA = +125°C minimum.
3. Interim and final electrical test requirements shall be specified in Table 2.

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.

Group 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, D.
 2. TA = +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 Electric Parameters Method 5004	1
Final Electrical Parameters Method 5005	1*, 2, 3, 9
Group A Test Requirements Method 5005	1, 2, 3, 4**, 7, 9, 10***, 11***
Group C and D End-Point Electrical Parameters Method 5005	1

* PDA applies to Subgroup 1 only.

** Subgroup 4 capacitance measurements shall be measured only for the initial test and after process or design changes which may affect capacitance.

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