

SCOPE: MONOLITHIC CMOS, ANALOG MULTIPLEXER

<u>Device Type</u>	<u>Generic Number</u>
01	DG508AA(x)/883B
02	DG509AA(x)/883B

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>
K	GDIP1-T16 or CDIP2-T16	16 LEAD CERDIP	J16
L	CDFP4-16	16 LEAD FLATPACK	F16
P	GDIP1-T16 or CDIP2-T16	16 LEAD Sidebrazed	R16
Z	CQCC1-N20	20-Pin Ceramic LCC	L20

Absolute Maximum Ratings

Voltage Referenced to V⁻

V ⁺ to V ⁻	44V
V ⁺ to GND	25V
Digital Inputs, Overvoltage Range $\frac{1}{2}$	-2V to (V ⁺ +2V) or 20mA (whichever occurs first)
Continuous Current, Any terminal except S or D	30mA
Continuous Current, S or D	20mA
Peak Current (Pulsed at 1ms, 10% duty cycle max)	40mA
Lead Temperature (soldering, 10 seconds)	+300°C
Storage Temperature	-65°C to +150°C

Continuous Power Dissipation	T _A =+70°C
16 lead FLATPACK (derate 6.1mW/°C above +70°C)	485mW
16 lead CERDIP(derate 10.0mW/°C above +70°C)	800mW
16 lead Side Braze(derate 10.5mW/°C above +70°C)	842mW
20 lead LCC (derate 9.1mW/°C above +70°C)	727mW
Junction Temperature T _J	+150°C
Thermal Resistance, Junction to Case, θ_{JC} :	
Case Outline 16 lead FLATPACK	65°C/W
Case Outline 16 lead CERDIP.....	50°C/W
Case Outline 16 lead Side Braze.....	45°C/W
Case Outline 20 lead LCC	20°C/W
Thermal Resistance, Junction to Ambient, θ_{JA} :	
Case Outline 16 lead FLATPACK	165°C/W
Case Outline 16 lead CERDIP.....	100°C/W
Case Outline 16 lead Side Braze.....	95°C/W
Case Outline 20 lead LCC	110°C/W

Recommended Operating Conditions.

Ambient Operating Range (T _A)	-55°C to +125°C
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NOTE 1: Signals on S, D, IN exceeding V⁺ or V⁻ will be clamped by internal diodes. Limit forward diode current to maximum current ratings.

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		Group A Subgroup	Device type	Limits Min	Limits Max	Units
		-55 °C ≤ T _A ≤ +125°C V _S =+15V, V _D =-15V, GND=0V V _{AH} =2.4V, V _{AL} =0.8V Unless otherwise specified						
SWITCH								
Analog-Signal Range	V _{ANALOG}	V _S =±15V		1,2,3	All	-15	15	V
Drain-Source ON Resistance <u>3/</u>	r _{DS(ON)}	I _S =-200μA, V _D =±10V, V _{AL} =0.8V, V _{AH} =2.4V, Sequence each switch on		1, 2,3	All		300 400	Ω
Source-OFF Leakage Current	I _{S(OFF)}	V _S =10V, V _D =-10V, V _{EN} =0V		1, 2,3	All		0.5 50	nA
Source-OFF Leakage Current	I _{S(OFF)}	V _S =-10V, V _D =10V, V _{EN} =0V		1, 2,3	All	-0.5 -50		nA
Drain-OFF Leakage Current	I _{D(OFF)}	V _S =10V, V _D =-10V, V _{EN} =0V		1, 2,3	01	-2 -200		nA
Drain-OFF Leakage Current	I _{D(OFF)}	V _S =-10V, V _D =10V, V _{EN} =0V		1, 2,3	01		2 200	nA
Drain-OFF Leakage Current	I _{D(OFF)}	V _S =10V, V _D =-10V, V _{EN} =0V		1, 2,3	02	-2 -100		nA
Drain-OFF Leakage Current	I _{D(OFF)}	V _S =-10V, V _D =10V, V _{IN} =0V		1, 2,3	02		2 100	nA
Drain-ON Leakage Current NOTE 2	I _{D(ON)}	V _{S(ALL)} =V _D =10V, V _{AL} =0.8V, V _{AH} =2.4V Sequence each channel on		1, 2,3	01		2 200	nA
Drain-ON Leakage Current NOTE 2	I _{D(ON)}	V _{S(ALL)} =V _D =-10V, V _{AL} =0.8, V _{AH} =2.4V Sequence each channel on		1, 2,3	01	-2 -200		nA
Drain-ON Leakage Current NOTE 2	I _{D(ON)}	V _{S(ALL)} =V _D =10V, V _{AL} =0.8V, V _{AH} =2.4V Sequence each channel on		1, 2,3	02		2 100	nA
Drain-ON Leakage Current NOTE 2	I _{D(ON)}	V _{S(ALL)} =V _D =-10V, V _{AL} =0.8V, V _{AH} =2.4V Sequence each channel on		1, 2,3	02	-2 -100		nA
INPUT								
Input Current/Voltage High	I _{AH}	V _A = 2.4V		1, 2,3	All	-10 -30		μA
		V _A =15V		1, 2,3	All		10 30	
Input Current/Voltage Low	I _{AL}	V _{EN} =0V or 2.4V; All V _A =0V		1, 2,3	All	-10 -30		μA
SUPPLY								
Positive Supply Range for Continuous Operation	V-, V+	NOTES 3, 4		1	All	±4.5	±18	V
Positive Supply Current	I+	V _{EN} =2.4V, All V _A =0V or 2.4V		1	All		0.2	mA

TABLE 1. ELECTRICAL TESTS

TEST	Symbol	CONDITIONS	Group A Subgroup	Device type	Limits Min	Limits Max	Units
		-55 °C ≤ T _A ≤ +125 °C V ₊ =+15V, V ₋ =-15V, GND=0V V _{AH} =2.4V, V _{AL} =0.8V Unless otherwise specified					
Negative Supply Current	I-	V _{EN} =2.4V, All V _A =0V or 2.4V	1	All	-0.1		mA
Positive Supply Current in Standby	I+	V _{EN} =0V, all V _A =0V or 2.4V	1	All		0.2	mA
Negative Supply Current in Standby	I-	V _{EN} =0V, all V _A =0V or 2.4V	1	All	-0.1		mA
DYNAMIC							
Transition Time	t _{RANS}	Figure 1	9 10,11	All		1.0 1.5	μs
Break Before Make Time	t _{OPEN}	Figure 3	9	All	5		ns
Enable Turn-On Time	t _{ON(EN)}	Figure 2	9 10,11	All		1.0 2.0	μs
Enable Turn-Off Time	t _{OFF(EN)}	Figure 2	9 10,11	All		0.7 2.0	μs

NOTE 2: I_{D(ON)} is leakage from driver into “on” switch.

NOTE 3: Electrical Characteristics (such as on resistance) will change when power supplies other than ±15V are used.

NOTE 4: For designs requiring single 5V or dual ±5V operation, refer to Maxim’s improved MAX338 and MAX339. Minimum operating voltage for DG508ADY and DG509ADY is ±9V.

FIGURE 1: SWITCHING TIME TEST CIRCUIT: See Commercial Data Sheet

FIGURE 2: ENABLE TIME TEST CIRCUIT: See Commercial Data Sheet

FIGURE 3: BREAK-BEFORE-MAKE TEST CIRCUIT: See Commercial Data Sheet

TRUTH TABLE

TERMINAL CONNECTION

A2	A1	A0	EN	DG508A ON SWITCH	TERMINAL NUMBER	01 DG508A	02 DG509A	01 DG508A	02 DG509A
X	X	X	0	None		J16, R16 & F16	J16, R16 & F16	L20	L20
0	0	0	1	1	1	A0	A0	NC	NC
0	0	1	1	2	2	EN	EN	A0	A0
0	1	0	1	3	3	V-	V-	EN	EN
0	1	1	1	4	4	S1	S1A	V-	V-
1	0	0	1	5	5	S2	S2A	S1	S1A
1	0	1	1	6	6	S3	S3A	NC	NC
1	1	0	1	7	7	S4	S4A	S2	S2A
1	1	1	1	8	8	D	DA	S3	S3A
					9	S8	DB	S4	S4A
				DG509A	10	S7	S4B	D	DA
	A1	A0	EN	ON SWITCH	11	S6	S3B	NC	NC
	X	X	0	None	12	S5	S2B	S8	DB
	0	0	1	1	13	V+	S1B	S7	S4B
	0	1	1	2	14	GND	V+	S6	S3B
	1	0	1	3	15	A2	GND	S5	S2B
	1	1	1	4	16	A1	A1	NC	NC
					17			V+	S1B
					18			GND	V+
					19			A2	GND
					20			A1	A1

ORDERING INFORMATION:			
DG508AAK/883B	16 CDIP	DG509AAK/883B	16 CDIP
DG508AAL/883B	16 FLATPACK	DG509AAL/883B	16 FLATPACK
DG508AAP/883B	16 SIDE BRAZE	DG509AAP/883B	16 SIDE BRAZE
DG508AAZ/883B	20 LCC	DG509AAZ/883B	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, 9, 10, 11
Group C and D End-Point Electrical Parameters Method 5005	1

* PDA applies to Subgroup 1 only.