

SCOPE: CMOS, TTL-COMPATIBLE ANALOG SWITCHES

<u>Device Type</u>	<u>Generic Number</u>
01	DG304AA(x)/883B
02	DG305AA(x)/883B
03	DG306AA(x)/883B
04	DG307AA(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>
A	MACY1-X10	10 Pin TO-100	A10
K	GDIP1-T14 or CDIP2-T14	14 LEAD CERDIP	J14
Z	CQCC1-N20	20-Pin Ceramic LCC	L20

Absolute Maximum Ratings

V+ to V-	44V
V+ to GND	25V
Digital Input Overage Range	-2V to (V ⁺ +2V)
Current, Any terminal except S or D	30mA
Continuous Current, S or D	30mA
Peak Current (pulsed at 1ms, 10% duty cycle max)	100mA
Lead Temperature (soldering, 10 seconds)	+300°C
Storage Temperature	-65°C to +150°C

Continuous Power Dissipation	T _A =+70°C
10 lead Can (derate 6.7mW/°C above +70°C)	533mW
14 lead CERDIP(derate 9.1mW/°C above +70°C)	727mW
20-Pin LCC (derate 9.1mW/°C above +70°C)	727mW
Junction Temperature T _J	+150°C
Thermal Resistance, Junction to Case, Θ _{JC} :	
Case Outline TO-100 Can	45°C/W
Case Outline 14 lead CERDIP.....	55°C/W
Case Outline 20-Pin LCC	20°C/W
Thermal Resistance, Junction to Ambient, Θ _{JA} :	
Case Outline TO-100 Can	150°C/W
Case Outline 14 lead CERDIP.....	110°C/W
Case Outline 20-Pin 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_X, D_X, or IN_X exceeding V⁺ or V⁻ are clamped by internal diodes, and are also internally current limited to 25mA.

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 _{INH} =11.0V, V _{INL} =3.5V Unless otherwise specified						
SWITCH								
Analog-Signal Range	V _{ANALOG}	V _S =±15V		1,2,3	All	-15	15	V
Drain-Source ON Resistance	r _{DS(ON)}	I _S =-10mA, V _D =10V, V _{IN} =3.5V or V _{IN} =11V		1,3 2	All		50 75	Ω
Drain-Source ON Resistance	r _{DS(ON)}	I _S =10mA, V _D =-10V, V _{IN} =3.5V or V _{IN} =11V		1,3 2	All		50 75	Ω
Source OFF Leakage Current	I _{S(OFF)}	V _S =14V, V _D =-14V, V _{IN} =3.5V or V _{IN} =11V		1 2	All	-1 -100	1 100	nA
Source OFF Leakage Current	I _{S(OFF)}	V _S =-14V, V _D =14V, V _{IN} =3.5V or V _{IN} =11V		1 2	All	-1 -100	1 100	nA
Drain OFF Leakage Current	I _{D(OFF)}	V _S =14V, V _D =-14V, V _{IN} =3.5V or V _{IN} =11V		1 2	All	-1 -100	1 100	nA
Drain OFF Leakage Current	I _{D(OFF)}	V _S =-14V, V _D =14V, V _{IN} =3.5V or V _{IN} =11V		1 2	All	-1 -100	1 100	nA
Drain ON Leakage Current	I _{D(ON)}	V _D =V _S =14V, V _{IN} =3.5V or 11V		1 2	All	-2 -200	2 200	nA
Drain ON Leakage Current	I _{D(ON)}	V _D =V _S =-14V, V _{IN} =3.5V or 11V		1 2	All	-2 -200	2 200	nA
INPUT								
Input Current/Voltage High	I _{INH}	V _{IN} = 5.0V		1,2,3	All	-1	1	μA
		V _{IN} =15V						
Input Current/Voltage Low	I _{INL}	V _{IN} =0V		1,2,3	All	-1		μA
SUPPLY								
Positive Supply Current	I+	V _{IN} =15V, one input; all others =0V		1,3 2	All		10 100	mA
		V _{IN} =0V, all inputs		1,3 2	All		10 100	
Negative Supply Current	I-	V _{IN} =15V, one input; all others =0V		1,3 2	All	-10 -100		μA
		V _{IN} =0V, all inputs		1,3 2	All	-10 -100		
DYNAMIC								
Turn ON time	t _{ON}	Figure 1		9 10,11	All		250 450	ns
Turn OFF time	t _{OFF}	Figure 1		9 10,11	All		150 350	ns

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

TRUTH TABLE				TERMINAL CONNECTION				
Device Type	Logic	Switch		TERMINAL NUMBER	01	02	03	04
01/03	0	OFF			J14	J14	J14	J14
01/03	1	ON		1	NC	NC	NC	NC
02	0	OFF	Switch 1	2	D ₁	D ₂	S ₃	S ₃
02	1	ON	Switch 1	3	NC	NC	D ₃	D ₃
02	0	ON	Switch 2	4	S ₁	S ₁	D ₁	D ₁
02	1	OFF	Switch 2	5	NC	NC	S ₁	S ₁
04	0	OFF	Switch 1,2	6	IN ₁	IN	IN ₁	IN ₁
04	0	ON	Switch 3,4	7	GND	GND	GND	GND
04	1	ON	Switch 1,2	8	V-	V-	V-	V-
04	1	OFF	Switch 3,4	9	IN ₂	NC	IN ₂	IN ₂
				10	NC	NC	S ₂	S ₂
				11	S ₂	S ₂	D ₂	D ₂
				12	NC	NC	D ₄	D ₄
				13	D ₂	D ₂	S ₄	S ₄
				14	V+	V+	V+	V+
ORDERING	Information			TO-100				
01	DG304AAA	/883B		1	D ₁	D ₁		
01	DG304AAK	/883B		2	S ₁	S ₁		
02	DG305AAA	/883B		3	IN ₁	IN		
02	DG305AAK	/883B		4	NC	NC		
03	DG306AAK	/883B		5	GND	GND		
04	DG307AAK	/883B		6	V-	V-		
04	DG307AAZ	/883B		7	IN ₂	NC		
				8	S ₂	S ₂		
				9	D ₂	D ₂		
				10	V ⁺	V ⁺		

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.

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