

**SCOPE: CMOS, TTL-COMPATIBLE ANALOG SWITCHES**

<u>Device Type</u>	<u>Generic Number</u>
01	DG381AA(x)/883B
02	DG384AA(x)/883B
03	DG387AA(x)/883B
04	DG390AA(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
K	GDIP1-T16 or CDIP2-T16	16 LEAD CERDIP	J16

**Absolute Maximum Ratings**

V+ to V- .....	44V
V+ to GND .....	25V
Digital Input Overage Range $\frac{1}{2}$ .....	(V <sup>-</sup> -4V) to (V <sup>+</sup> +4V) or 30mA whichever occurs first
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 <sub>A</sub> =+70°C
10 lead Can (derate 6.7mW/°C above +70°C) .....	533mW
14 lead CERDIP (derate 9.1mW/°C above +70°C) .....	727mW
16 lead CERDIP (derate 10.0mW/°C above +70°C) .....	800mW
Junction Temperature T <sub>J</sub> .....	+150°C
Thermal Resistance, Junction to Case, $\Theta_{JC}$ :	
Case Outline TO-100 Can .....	45°C/W
Case Outline 14 lead CERDIP.....	55°C/W
Case Outline 16 lead CERDIP .....	50°C/W
Thermal Resistance, Junction to Ambient, $\Theta_{JA}$ :	
Case Outline TO-100 Can .....	150°C/W
Case Outline 14 lead CERDIP.....	110°C/W
Case Outline 16 lead CERDIP.....	100°C/W

**Recommended Operating Conditions.**

Ambient Operating Range (T <sub>A</sub> ) .....	-55°C to +125°C
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NOTE 1: Signals on S<sub>X</sub>, D<sub>X</sub>, or IN<sub>X</sub> exceeding V<sup>+</sup> or V<sup>-</sup> 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 <sub>A</sub> ≤ +125 °C V <sub>S</sub> = +15V, V <sub>D</sub> = -15V, GND = 0V V <sub>INH</sub> = 4.0V, V <sub>INL</sub> = 0.8V Unless otherwise specified					
<b>SWITCH</b>							
Analog-Signal Range	V <sub>ANALOG</sub>	V <sub>S</sub> = ±15V	1,2,3	All	-15	15	V
Drain-Source ON Resistance	r <sub>D(S)(ON)</sub>	I <sub>S</sub> = -10mA, V <sub>D</sub> = 10V, V <sub>IN</sub> = 0.8V or V <sub>IN</sub> = 4.0V	1,3 2	All		50 75	Ω
Drain-Source ON Resistance	r <sub>D(S)(ON)</sub>	I <sub>S</sub> = 10mA, V <sub>D</sub> = -10V, V <sub>IN</sub> = 0.8V or V <sub>IN</sub> = 4.0V	1,3 2	All		50 75	Ω
Source OFF Leakage Current	I <sub>S(OFF)</sub>	V <sub>S</sub> = 14V, V <sub>D</sub> = -14V, V <sub>IN</sub> = 0.8V or V <sub>IN</sub> = 4.0V	1 2	All	-1 -100	1 100	nA
Source OFF Leakage Current	I <sub>S(OFF)</sub>	V <sub>S</sub> = -14V, V <sub>D</sub> = 14V, V <sub>IN</sub> = 0.8V or V <sub>IN</sub> = 4.0V	1 2	All	-1 -100	1 100	nA
Drain OFF Leakage Current	I <sub>D(OFF)</sub>	V <sub>S</sub> = 14V, V <sub>D</sub> = -14V, V <sub>IN</sub> = 0.8V or V <sub>IN</sub> = 4.0V	1 2	All	-1 -100	1 100	nA
Drain OFF Leakage Current	I <sub>D(OFF)</sub>	V <sub>S</sub> = -14V, V <sub>D</sub> = 14V, V <sub>IN</sub> = 0.8V or V <sub>IN</sub> = 4.0V	1 2	All	-1 -100	1 100	nA
Drain ON Leakage Current	I <sub>D(ON)</sub>	V <sub>D</sub> = V <sub>S</sub> = 14V, V <sub>IN</sub> = 0.8V or 4.0V	1 2	All	-2 -200	2 200	nA
Drain ON Leakage Current	I <sub>D(ON)</sub>	V <sub>D</sub> = V <sub>S</sub> = -14V, V <sub>IN</sub> = 0.8V or 4.0V	1 2	All	-2 -200	2 200	nA
<b>INPUT</b>							
Input Current/Voltage High	I <sub>INH</sub>	V <sub>IN</sub> = 5.0V	1,2,3	All	-1	1	μA
		V <sub>IN</sub> = 15V					
Input Current/Voltage Low	I <sub>INL</sub>	V <sub>IN</sub> = 0V	1,2,3	All	-1		μA
<b>SUPPLY</b>							
Positive Supply Current	I <sub>+</sub>	V <sub>IN</sub> = 4.0V, one input; all others = 0V	1 2,3	All		0.5 1.0	mA
		V <sub>IN</sub> = 0.8V, all inputs	1 2,3	All		10 100	μA
Negative Supply Current	I <sub>-</sub>	V <sub>IN</sub> = 15V, one input; all others = 0V	1 2,3	All	-10 -100		μA
		V <sub>IN</sub> = 0.8V, all inputs	1 2,3	All	-10 -100		
Turn ON time	t <sub>ON</sub>	Figure 1	9 10,11	All		300 500	ns
Turn OFF time	t <sub>OFF</sub>	Figure 1	9 10,11	All		250 450	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	0	ON			J14	J16	J14	J16
01	1	OFF		1	S <sub>1</sub>	D <sub>1</sub>	NC	D <sub>1</sub>
02	0	OFF		2	D <sub>1</sub>	NC	NC	NC
02	1	ON		3	NC	D <sub>3</sub>	D <sub>1</sub>	D <sub>3</sub>
03	0	OFF	Switch 1	4	NC	S <sub>3</sub>	S <sub>1</sub>	S <sub>3</sub>
03	1	ON	Switch 1	5	IN <sub>1</sub>	S <sub>4</sub>	IN	S <sub>4</sub>
03	0	ON	Switch 2	6	V+	D <sub>4</sub>	V+	D <sub>4</sub>
03	1	OFF	Switch 2	7	NC	NC	NC	NC
04	0	OFF	Switch 1,2	8	GND	D <sub>2</sub>	GND	D <sub>2</sub>
04	0	ON	Switch 3,4	9	V-	S <sub>2</sub>	V-	S <sub>2</sub>
04	1	ON	Switch 1,2	10	IN <sub>2</sub>	IN <sub>2</sub>	NC	IN <sub>2</sub>
04	1	OFF	Switch 3,4	11	NC	V+	S <sub>2</sub>	V+
				12	NC	NC	D <sub>2</sub>	NC
				13	D <sub>2</sub>	GND	NC	GND
				14	S <sub>2</sub>	V-	NC	V-
				15		IN <sub>1</sub>		IN <sub>1</sub>
				16		S <sub>1</sub>		S <sub>1</sub>
<b>ORDERING</b>	<b>Information</b>			<b>TO-100</b>				
01	DG381AAA	/883B		1	D <sub>1</sub>		S <sub>1</sub>	
01	DG381AAK	/883B		2	S <sub>1</sub>		D <sub>1</sub>	
02	DG384AAK	/883B		3	IN		IN <sub>1</sub>	
03	DG387AAA	/883B		4	V+		V+	
03	DG387AAK	/883B		5	NC		NC	
04	DG390AAK	/883B		6	GND		GND	
				7	V-		V-	
				8	NC		IN <sub>2</sub>	
				9	S <sub>2</sub>		D <sub>2</sub>	
				10	D <sub>2</sub>		S <sub>2</sub>	

## 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.

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