

**SCOPE: QUAD SPST CMOS ANALOG SWITCHES**

<u>Device Type</u>	<u>Generic Number</u>	<u>SMD Number</u>
01	DG201AA(x)/883B	7705301
02	HI(x)-201A/883B	7705302

**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>
SMD (x for 01) (x for 02)			
X L	CDFP4-F16	16 LEAD FLATPACK	F16
E K 1	GDIP1-T16 or CDIP2-T16	16 LEAD CERDIP	J16
2 Z 4	CQCC1-N20	20-Pin Ceramic LCC	L20

**Absolute Maximum Ratings**

Supply Voltage (Between $V^+$ and $V^-$ ) for 01 .....	44V
Supply Voltage (Between $V^+$ and $V^-$ ) for 02 .....	40V
Digital Input Voltage ( $V_{IN}$ ) for 01 $\frac{1}{2}$ .....	$V^- - 0.3V$ dc to $V^+$
Digital Input Voltage ( $V_{IN}$ ) for 02 $\frac{1}{2}$ .....	$V^- - 4V$ dc to $V^+ + 4V$
Analog Input Voltage ( $V_S$ ) .....	$V^- - 2V$ dc to $V^+ + 2V$
Current, Any terminal except S or D for 01 .....	30mA
Current, Any terminal except S or D for 02 .....	25mA
Continuous Current, S or D for 01 .....	20mA
Continuous Current, S or D for 02 .....	25mA
Peak Current S or D(Pulsed at 1ms, 10% duty cycle max) for 01 .....	70mA
Peak Current S or D(Pulsed at 1ms, 10% duty cycle max) for 02 .....	40mA
Lead Temperature (soldering, 10 seconds) .....	+300°C
Storage Temperature .....	-65°C to +150°C

Continuous Power Dissipation .....	$T_A = +70^\circ C$
16 lead Flatpack (derate 6.1mW/°C above +70°C) .....	485mW
16 lead CERDIP(derate 10mW/°C above +70°C) .....	800mW
20-Pin LCC (derate 9.1mW/°C above +70°C) .....	727mW
Junction Temperature $T_J$ .....	+150°C
Thermal Resistance, Junction to Case, $\theta_{JC}$ :	
Case Outline 16 lead Flatpack .....	65°C/W
Case Outline 16 lead CERDIP .....	50°C/W
Case Outline 20-Pin LCC .....	20°C/W
Thermal Resistance, Junction to Ambient, $\theta_{JA}$ :	
Case Outline 16 lead Flatpack .....	165°C/W
Case Outline 16 lead CERDIP .....	100°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 -55 °C ≤ T <sub>A</sub> ≤ +125 °C V <sub>+</sub> =+15V, V <sub>-</sub> =-15V, GND=0V Unless otherwise specified	Group A Subgroup	Device type	Limits Min 1/	Limits Max 1/	Units
<b>SWITCH</b>							
Analog-Signal Range	V <sub>ANALOG</sub>	V <sub>S</sub> =±15V NOTE 2	1,2,3	All	-15	15	V
Drain-Source ON Resistance	r <sub>DS(ON)</sub>	I <sub>D</sub> =±1mA, V <sub>D</sub> =±10V, V <sub>IN</sub> =0.8V	1,3 2	01		175 250	Ω
Drain-Source ON Resistance	r <sub>DS(ON)</sub>	I <sub>D</sub> =±1mA, V <sub>S</sub> =±10V, V <sub>IN</sub> =0.8V All unused channels V <sub>A</sub> =2.4V	1 2,3	02		70 100	Ω
Source OFF Leakage Current	I <sub>S(OFF)</sub>	V <sub>S</sub> =+/-14V, V <sub>D</sub> =-/+14V, V <sub>IN</sub> =2.4V	1 2,3	All	-2 -100	2 100	nA
Drain OFF Leakage Current	I <sub>D(OFF)</sub>	V <sub>S</sub> =+/-14V, V <sub>D</sub> =-/+14V, V <sub>IN</sub> =2.4V	1 2,3	01	-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> =2.4V	1 2,3	02	-2 -100	2 100	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	1 2,3	01	-1 -200	1 200	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	1 2,3	02	-2 -200	2 200	nA
<b>INPUT</b>							
Low Level Input Voltage	V <sub>IL</sub>		1,2,3	All		0.8	V
High Level Input Voltage	V <sub>IH</sub>		1,2,3	All	2.4		V
Input Leakage Current High	I <sub>IH</sub>	V <sub>IN</sub> =2.4V, 15V	1 2	01		±1 ±10	μA
			1 2,3	02		±0.5 ±1.0	
Input Leakage Current Low	I <sub>IL</sub>	V <sub>IN</sub> = 0V	1 2	01		±1 ±10	μA
		V <sub>IN</sub> =0.8V	1 2,3	02		±0.5 ±1.0	
<b>SUPPLY</b>							
Positive Supply Current	I+	V <sub>IN</sub> =0V	1,2 3	01		4 6.5	mA
		V <sub>IN</sub> =5V	1,2 3			3 4.5	
Negative Supply Current	I-	V <sub>IN</sub> =0.8V or 2.4V	1,2 3	02		1.5 2.0	mA

TEST	Symbol	CONDITIONS		Group A Subgroup	Device type	Limits Min 1/	Limits Max 1/	Units
		-55 °C ≤ T <sub>A</sub> ≤ +125 °C V <sub>+</sub> =+15V, V <sub>-</sub> =-15V, GND=0V Unless otherwise specified						
<b>DYNAMIC</b>								
Turn ON time	t <sub>ON</sub>	R <sub>L</sub> =1kΩ, CL=35pF, V <sub>IH</sub> =+3V, V <sub>IL</sub> =0V		9,10,11	01		1000	ns
		R <sub>L</sub> =1kΩ, CL=100pF, V <sub>IH</sub> =+4V, V <sub>IL</sub> =0V		9 10,11	02		600 800	
Turn OFF time	t <sub>OFF</sub>	R <sub>L</sub> =1kΩ, CL=35pF, V <sub>IH</sub> =+3V, V <sub>IL</sub> =0V		9 10,11	01		500 650	ns
		R <sub>L</sub> =1kΩ, CL=100pF, V <sub>IH</sub> =+4V, V <sub>IL</sub> =0V		9 10,11	02		500 650	

NOTE 1: The limiting terms “min” (minimum) and “max” (maximum) shall be considered to apply to magnitudes only. Negative current shall be defined as conventional current flow out of a device terminal.

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

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

**TRUTH TABLE**

**TERMINAL CONNECTION**

Device Type	Logic	Switch	Terminal NUMBER	DG201A & HIx-201	DG201A & HIx-201
01 & 02	0	ON		J16 & F16	L20
	1	OFF	1	IN <sub>1</sub>	NC
			2	D <sub>1</sub>	IN <sub>1</sub>
			3	S <sub>1</sub>	D <sub>1</sub>
			4	V-	S <sub>1</sub>
			5	GND	V-
			6	S <sub>4</sub>	NC
			7	D <sub>4</sub>	GND
			8	IN <sub>4</sub>	S <sub>4</sub>
			9	IN <sub>3</sub>	D <sub>4</sub>
			10	D <sub>3</sub>	IN <sub>4</sub>
			11	S <sub>3</sub>	NC
			12	NC (01)	IN <sub>3</sub>
			3/ 12	V <sub>REF</sub> (02)	IN <sub>3</sub>
<b>ORDERING INFORMATION</b>			13	V+	D <sub>3</sub>
SMD #	Maxim #	Pkg.	14	S <sub>2</sub>	S <sub>3</sub>
7705301EA	DG201AAK/883B	J16	15	D <sub>2</sub>	NC (01)
7705301XC	DG201AAL/883B	F16	3/ 15	D <sub>2</sub>	V <sub>REF</sub> (02)
77053012C	DG201AAZ/883B	L20	16	IN <sub>2</sub>	NC
7705302EA	HI1-201/883B	J16	17		V+
77053022C	HI4-201/883B	L20	18		S <sub>2</sub>
			19		D <sub>2</sub>
			20		IN <sub>2</sub>

NOTE 3: V<sub>REF</sub> is normally floating, but voltage up to 10V can be applied to raise the threshold voltage.

## 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.