

**SCOPE: CMOS RF/VIDEO ANALOG MULTIPLEXER**

<u>Device Type</u>	<u>Generic Number</u>
01	MAX310(x)/883B
02	MAX311(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>
Maxim SMD			
JE E	GDIP1-T16 or CDIP2-T16	16 LEAD CERDIP	J16
LP 2	CQCC1-N20	20-Pin Ceramic LCC	L20

**Absolute Maximum Ratings**

Voltage Referenced to V<sup>-</sup>

V <sup>+</sup> .....	+36V
V <sup>-</sup> .....	+24V
Digital Inputs .....	V <sup>-</sup> to V <sup>+</sup>

Input Current:

S and COMMON OUT .....	±50mA
All pins except S and COM OUT .....	±30mA

Lead Temperature (soldering, 10 seconds) ..... +300°C

Storage Temperature ..... -65°C to +150°C

Continuous Power Dissipation ..... T<sub>A</sub>=+70°C

16 lead CERDIP(derate 10.0mW/°C above +70°C) ..... 800mW

20 lead LCC (derate 9.1mW/°C above +70°C) ..... 727mW

Junction Temperature T<sub>J</sub> ..... +150°C

Thermal Resistance, Junction to Case, Θ<sub>JC</sub>:

Case Outline 16 lead CERDIP..... 50°C/W

Case Outline 20 lead LCC ..... 20°C/W

Thermal Resistance, Junction to Ambient, Θ<sub>JA</sub>:

Case Outline 16 lead CERDIP..... 100°C/W

Case Outline 20 lead LCC ..... 110°C/W

**Recommended Operating Conditions**

Ambient Operating Range (T<sub>A</sub>) ..... -55°C to +125°C

Supply Voltage Range ..... ±4V to +15V

V<sub>AL</sub> (max) ..... +0.8V

V<sub>AH</sub> (min) ..... + 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	Group A Subgroup	Device type	Limits Min	Limits Max	Units
		-55 °C ≤ T <sub>A</sub> ≤ +125°C V <sub>+</sub> =+15V, V <sub>-</sub> =-15V, GND=0V V <sub>AH</sub> =+2.4V, V <sub>AL</sub> =+0.8V Unless otherwise specified					
<b>SWITCH</b>							
Analog-Signal Range	V <sub>ANALOG</sub>	V <sub>+</sub> , V <sub>-</sub> =±15V V <sub>+</sub> , V <sub>-</sub> =±5V	1,2,3	All	-15 -5	+12 +2	V
Channel -ON Resistance	R <sub>ON</sub>	V <sub>IN</sub> =±5V, I <sub>OUT</sub> =10mA	1 2,3	All		250 300	Ω
OFF Input Leakage Current	I <sub>S(OFF)</sub>	V <sub>S</sub> = ±5V, V <sub>EN</sub> =2.4V, Figure 10 V <sub>IH</sub> =2.4V, V <sub>IL</sub> =0.8V	1 2,3	All	-10 -100	10 100	nA
OFF Output Leakage Current	I <sub>D(OFF)</sub>	V <sub>S</sub> =V <sub>D</sub> =±5V, V <sub>EN</sub> =V <sub>A</sub> =0.8V Figure 11	1 2,3	01	-10 -100	10 100	nA
			1 2,3	02	-10 -50	10 50	
ON Channel Leakage Current	I <sub>D(ON)</sub>	V <sub>S</sub> =V <sub>D</sub> =±5V, V <sub>IL</sub> =0.8V, V <sub>EN</sub> =2.4V Figure 12	1 2,3	01	-10 -200	10 200	nA
			1 2,3	02	-10 -100	10 100	
<b>INPUT</b>							
Input High Threshold	V <sub>AH</sub>	V <sub>+</sub> , V <sub>-</sub> =±15V, ±5V	1,2,3	All	2.4		V
Input Low Threshold	V <sub>AL</sub>	V <sub>+</sub> , V <sub>-</sub> =±15V, ±5V	1,2,3	All		0.8	V
Input Current (Logic)	I <sub>A</sub>	V <sub>A</sub> =0V or 5V	1,2,3	All		±10	μA
OFF Isolation Single Channel to OUT	ISO <sub>SC</sub>	V <sub>S1</sub> =3.2Vrms @ 5mhz Figure 3	1	All	-66		dB
<b>SUPPLY</b>							
Power Supply Range			1	All	±4.5	±16.5	V
Positive Supply Current	I <sub>+</sub>	E <sub>N</sub> , A <sub>0</sub> , A <sub>1</sub> , A <sub>2</sub> , =0V or +5V	1,2,3	All		200	μA
Negative Supply Current	I <sub>-</sub>	E <sub>N</sub> , A <sub>0</sub> , A <sub>1</sub> , A <sub>2</sub> , =0V or +5V	1,2,3	All		100	μA
<b>DYNAMIC</b>							
Access Time	t <sub>ACC</sub>	V <sub>IH</sub> =3V, V <sub>IL</sub> =0V, V <sub>EN</sub> =2.4V, V <sub>S1</sub> =-5V, V <sub>S8</sub> =+5V, R <sub>L</sub> =1kΩ, Figure 7	9 10,11	All		1.5 2.0	μs
Break-Before-Make Delay	t <sub>ON</sub> -t <sub>OFF</sub>	V <sub>S1</sub> =V <sub>S8</sub> =±5V, V <sub>AH</sub> =3V, V <sub>AL</sub> =0V, V <sub>EN</sub> =2.4V, R <sub>L</sub> =1kΩ, Figure 9	9,10,11	All	30		ns
Enable Delay ON or OFF	t <sub>EN</sub> (ON/OFF)	V <sub>ENH</sub> =3V, V <sub>ENL</sub> =0V, V <sub>A</sub> =0.8V, V <sub>S</sub> =±5V, R <sub>L</sub> =1kΩ, Figure 8	9 10,11	All		1.0 2.0	μs

- FIGURE 3: Single Channel OFF Isolation (ISO<sub>SC</sub>):** See Commercial Data Sheet  
**FIGURE 7: Access Time (t<sub>A</sub>) Test Circuit:** See Commercial Data Sheet  
**FIGURE 8: Enable Delay (t<sub>EN(ON/OFF)</sub>) Test Circuit:** See Commercial Data Sheet  
**FIGURE 9: Break-Before-Make Delay (t<sub>ON-tOFF</sub>):** See Commercial Data Sheet  
**FIGURE 10: OFF Input Leakage Current Test Circuit:** See Commercial Data Sheet  
**FIGURE 11: OFF Output Leakage Current Test Circuit:** See Commercial Data Sheet  
**FIGURE 12: ON Output Leakage Current Test Circuit:** See Commercial Data Sheet

	<b>ORDERING INFORMATION:</b>	<b>SMD Drawing #</b>	<b>Pkg Code</b>
01	MAX310MJE/883B	5962-9455601MEA	J16
01	MAX310MLP/883B	5962-9455601M2C	L20
02	MAX311MJE/883B	5962-9455602MEA	J16
02	MAX311MLP/883B	5962-9455602M2C	L20

**TRUTH TABLE**

**TERMINAL CONNECTION**

<b>A2</b>	<b>A1</b>	<b>A0</b>	<b>EN</b>	<b>MAX310 ON CHANNEL</b>	<b>PIN #</b>	<b>01 MAX310</b>	<b>01 MAX310</b>	<b>02 MAX311</b>	<b>02 MAX311</b>
X	X	X	0	ALL OFF					
0	0	0	1	1	1	S1	S1	S1A	S1A
0	0	1	1	2	2	S2	S2	S2A	S2A
0	1	0	1	3	3	S3	NC	S3A	NC
0	1	1	1	4	4	S4	S3	S4A	S3A
1	0	0	1	5	5	S5	S4	S1B	S4A
1	0	1	1	6	6	S6	S5	S2B	S1B
1	1	0	1	7	7	S7	S6	S3B	S2B
1	1	1	1	8	8	S8	S7	S4B	S3B
					9	V-	NC	V-	NC
				<b>MAX311 ON CHANNEL</b>	10	OUT	S8	OUTB	S4B
					11	V+	V-	V+	V-
	<b>A1</b>	<b>A0</b>	<b>EN</b>	<b>CHANNEL</b>	12	EN	NC	EN	NC
	X	X	0	ALL OFF	13	A0	OUT	A0	OUTB
	0	0	1	1A + 1B	14	A1	V+	A1	V+
	0	1	1	2A + 2B	15	A2	EN	GND	EN
	1	0	1	3A + 3B	16	GND	A0	OUTA	A0
	1	1	1	4A + 4B	17		A1		A1
					18		NC		NC
					19		A2		GND
					20		GND		OUTA

## 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.