SCOPE: 8-CHANNEL/DUAL 4-CHANNEL MONOLITHIC CMOS, ANALOG MULTIPLEXER

Device Type	Generic Number
01	MAX358M(x)/883B
02	MAX359M(x)/883B

Case Outline(s). The case outlines shall be designated in Mil-Std-1835 and as follows:

Outline Letter	Mil-Std-1835	Case Outline	Package Code
JE	GDIP1-T16 or CDIP2-T16	16 LEAD CERDIP	J16
FE	CDFP4-F16	16 LEAD Flatpack	F16
LP	CQCC1-N20	20-Pin Ceramic LCC	L20

Absolute Maximum Ratings

Voltage Referenced to V^-

- V^+ to V^- 44V
- V^+ to GND ..... +22V
- V^- to GND ..... -22V
- Digital Inputs, Overvoltage
  - V_{EN}, V_A to V^+ ..... +4V
  - V_{EN}, V_A to V^- ..... -4V
- Analog Input Overvoltage with Multiplexer Power On:
  - V_S to V^+ .....+20V
  - V_S to V^- ..... -20V
- Analog Input Overvoltage with Multiplexer Power Off:
  - V_S to V^+ .....+35V
  - V_S to V^- ..... -35V
- Continuous Current, S or D 20mA
- Peak Current, S or D (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 CERDIP(derate 10.0mW/°C above +70°C) 800mW

16 lead Flatpack(derate 6.06mW/°C above +70°C) 485mW

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

Junction Temperature T_J ..... +150°C

Thermal Resistance, Junction to Case, ΘJC:

- Case Outline 16 lead CERDIP..... 50°C/W
- Case Outline 16 lead Flatpack ..... 65°C/W
- Case Outline 20 lead LCC ..... 20°C/W

Thermal Resistance, Junction to Ambient, ΘJA:

- Case Outline 16 lead CERDIP..... 100°C/W
- Case Outline 16 lead Flatpack..... 165°C/W
- Case Outline 20 lead LCC ..... 110°C/W

Recommended Operating Conditions.

Ambient Operating Range (T_A) ..... -55°C to +125°C

Positive Supply Voltage (V+) .....+15V

Negative Supply Voltage (V-) ..... -15V

Logic Low Level Address Input Voltage (V_{IL}) ..... 0V to 0.8V

Logic High Level Address Input Voltage (V_{IH}) ..... 2.4V to (V+)-0.7V

Enable Voltage (V_{EN}) ..... 2.4V to (V+)-0.7V

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_A≤+125°C V^+=+15V, V^-=-15V, V_{AH}=+2.4V, V_{AL}=+0.8V Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
STATIC							
ON Resistance	$r_{DS(ON)}$	V_D=±10V, I_S=100µA	1 2,3	All		1.5 1.8	kΩ
OFF Input Leakage Current	$I_{S(OFF)}$	V_S=+/-10V, V_D=-/+10V, V_{EN}=0.8V	1 2,3	All		0.5 50	nA
OFF Output Leakage Current	$I_{D(OFF)}$	V_S=+/-10V, V_D=-/+10V, V_{EN}=0.8V	1 2,3 2,3	All 01 02		1.0 200 100	nA
ON Channel Leakage Current	$I_{D(ON)}$	$V_{S(ALL)}$=V_D=±10V, NOTE 2 V_{AH}=V_{EN}=2.4V V_{AL}=0.8V	1 2,3 2,3	All 01 02		2.0 200 100	nA
Analog Signal Range	V_{AN}	NOTE 1	1,2,3	All	-15	+15	V
Differential, OFF Output Leakage Current	I_{DIFF}		1,2,3	02		50	nA
FAULT							
Output Leakage Current (with Overvoltage)	$I_{D(OFF)}$	V_D=0V, NOTE 2 Analog Overvoltage=±33V	2,3	All		2.0	µA
Input Leakage Current (with Overvoltage)	$I_{S(OFF)}$	V_{IN}=±25V, V_O=±10V NOTE 2	1	All		5.0	µA
Input Leakage Current (with Power Supplies Off)	$I_{S(OFF)}$	V_{IN} =±25V, V_{EN}=V_O=0V A_0=A_1=A_2=0V or 5V	1	All		2.0	µA
INPUT							
Input Low Threshold	V_{AL}		1,2,3	All		0.8	V
Input High Threshold	V_{AH}		1,2,3	All	2.4		V
Input Leakage Current (High or Low)	I_A	V_A=4V or 0V, NOTE 4	1,2,3	All		1.0	µA
DYNAMIC							
Access Time	t_A	Figure 1 in Commercial Datasheet	1	All		1.0	µs
Break-Before-Make Delay	t_{ON}-t_{OFF}	V_{EN}=+5V, V_{IN}=±10V A_0, A_1, A_2 Strobed Figure 2 in Commercial Datasheet	1	All	25		ns
Enable Delay (ON)	$t_{ON(EN)}$	Figure 3 in Commercial Datasheet	1 2,3	All		500 1000	ns
Enable Delay (OFF)	$t_{OFF(EN)}$	Figure 3 in Commercial Datasheet	1 2,3	All		500 1000	ns
"OFF Isolation"	$OFF_{(ISO)}$	V_{EN}=0.8V, R_L=1kΩ, C_L=15pF, V=7V_{RMS}, f=100kHz.	1	All	50		dB

TABLE 1. ELECTRICAL TESTS

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SUPPLY							
Positive Supply Current	I+	V_{EN}=0.8 or 2.4V, All V_A=0V or 5V	1 2,3	All		0.6 0.7	mA
Negative Supply Current	I-	V_{EN}=0.8 or 2.4V, All V_A=0V or 5V	1 2,3	All		0.1 0.2	mA
Power Supply Range for Continuous Operation	V_{OP}	NOTE 3	1	All	±4.5	±18	V

NOTE 1: When the analog signal exceeds +13.5V or -12V the blocking action of Maxim's gate structure goes into operation. Only leakage currents flow and the channel on resistance rises to infinity.

NOTE 2: The value shown in the steady state value. The transient leakage is typically 10µA. See deatiled description in Commercial datasheet.

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

NOTE 4: Digital input leakage is primarily due to the clamp diodes. Typical leakage is less than 1nA at +25°C.

FIGURE 1: ACCESS TIME VS. LOGIC LEVEL (HIGH): See Commercial Datasheet.
FIGURE 2: BREAK-BEFORE-MAKE DELAY (t_{OPEN}): See Commercial Datasheet.
FIGURE 3: ENABLE DELAY ($t_{ON(EN)}$, $t_{OFF(EN)}$) : See Commercial Datasheet.

TRUTH TABLE

A_2	A_1	A_0	EN	MAX358 ON SWITCH
X	X	X	0	None
0	0	0	1	1
0	0	1	1	2
0	1	0	1	3
0	1	1	1	4
1	0	0	1	5
1	0	1	1	6
1	1	0	1	7
1	1	1	1	8
				MAX359
	A_1	**A_0**	**EN**	**ON SWITCH**
	X	X	0	None
	0	0	1	1
	0	1	1	2
	1	0	1	3
	1	1	1	4

TERMINAL CONNECTION

TERMINAL NUMBER	01 MAX358	02 MAX359	01 MAX358	02 MAX359
	J16, R16 & F16	J16, R16 &F16	L20	L20
1	A0	A0	NC	NC
2	EN	EN	A0	A0
3	V-	V-	EN	EN
4	IN1	IN1A	V-	V-
5	IN2	IN2A	IN1	IN1A
6	IN3	IN3A	NC	NC
7	IN4	IN4A	IN2	IN2A
8	OUT	OUTA	IN3	IN3A
9	IN8	OUTB	IN4	IN4A
10	IN7	IN4B	OUT	OUTA
11	IN6	IN3B	NC	NC
12	IN5	IN2B	IN8	OUTB
13	V+	IN1B	IN7	IN4B
14	GND	V+	IN6	IN3B
15	A2	GND	IN5	IN2B
16	A1	A1	NC	NC
17			V+	IN1B
18			GND	V+
19			A2	GND
20			A1	A1

ORDERING INFORMATION:					
01	MAX358MJE/883B	16 CDIP	02	MAX359MJE/883B	16 CDIP
01	MAX358MFE/883B	16 FLATPACK	02	MAX359MFE/883B	16 FLATPACK
01	MAX358MLP/883B	20 LCC	02	MAX359MLP/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.
** Subgroups 10 and 11, if not tested, shall be guaranteed to the limits in Table I.