

**SCOPE: CALIBRATED QUAD 12-BIT VOLTAGE-OUTPUT D/A CONVERTER**

<u>Device Type</u>	<u>Generic Number</u>
01	MAX526CM(x)/883B
02	MAX526DM(x)/883B
03	MAX527CM(x)/883B
04	MAX527DM(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>
YG	GDIP3-T24 or CDIP4-T24	24 LEAD Sidebrazed	Y24

**Absolute Maximum Ratings:**

$V_{DD}$ to AGND or DGND .....	-0.3V, +17V
$V_{SS}$ to AGND or DGND .....	-7V, +0.3V
Digital Input Voltage to AGND or DGND .....	-0.3V, $V_{DD}+0.3V$
VREF to AGND or DGND .....	-0.3V, $V_{DD}+0.3V$
$V_{OUT}$ to AGND or DGND .....	$V_{DD}$ , $V_{SS}$
Maximum Current into Any Pin .....	50mA
Lead Temperature (soldering, 10 seconds) .....	+300°C
Storage Temperature .....	-65°C to +150°C
Continuous Power Dissipation .....	$T_A=+70^\circ\text{C}$
24 pin Sidebrazed(derate 14.3mW/°C above +70°C) .....	1143mW
Junction Temperature $T_J$ .....	+150°C
Thermal Resistance, Junction to Case, $\theta_{JC}$	
24 pin Sidebrazed .....	25°C/W
Thermal Resistance, Junction to Ambient, $\theta_{JA}$ :	
24 pin Sidebrazed .....	70°C/W

**Recommended Operating Conditions**

Ambient Operating Range ( $T_A$ ) .....	-55°C to +125°C
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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		Limits Min	Limits Max	Units	
		-55 °C ≤ T <sub>A</sub> ≤ +125 °C V <sub>DD</sub> =+15V, V <sub>SS</sub> =-5V, V <sub>REF</sub> =10V, AGND=DGND=0V Unless otherwise specified	Group A Subgroup				Device type
<b>STATIC PERFORMANCE</b>							
Resolution	N	Analog Section (R <sub>L</sub> =5kΩ, C <sub>L</sub> =100pF)	1,2,3	All	12.0	Bits	
Total Unadjusted Error	TUE		1,2,3	01 02	-3.0 -4.0	+3.0 +4.0	LSB
Integral Nonlinearity	INL		1,2,3	01,03 02,04	-0.5 -1.0	+0.5 +1.0	LSB
Differential Nonlinearity	DNL	Guaranteed monotonic	1,2,3	All	-1.0	+1.0	LSB
Offset Error			1 2,3	01	-1.0 -3.0	+1.0 +3.0	LSB
Offset Error			1 2,3	02	-2.0 -4.0	+2.0 +4.0	LSB
Offset Error			1 2,3	03	-3.0 -9.0	+3.0 +9.0	mV
Offset Error			1 2,3	04	-6.0 -15.0	+6.0 +15.0	mV
Gain Error			1,2,3	01,02 03,04	-2.0 -4.0	+2.0 +4.0	LSB
Power Supply Rejection	ΔGain/ΔV <sub>DD</sub> ΔGain/ΔV <sub>SS</sub> ΔOffset/ΔV <sub>DD</sub> ΔOffset/ΔV <sub>SS</sub>	V <sub>DD</sub> from +10.8V to +16.5V V <sub>SS</sub> from -4.5 to -5.5V V <sub>DD</sub> from +10.8V to +16.5V V <sub>SS</sub> from -4.5V to -5.5V	1	01,02 01,02 01,02 01,02	-0.01 -0.01 -0.075 -0.03	+0.01 +0.01 +0.075 +0.03	LSB/%
Power Supply Rejection	ΔGain/ΔV <sub>DD</sub> ΔGain/ΔV <sub>SS</sub> ΔOffset/ΔV <sub>DD</sub> ΔOffset/ΔV <sub>SS</sub>	V <sub>DD</sub> from +4.5V to +5.5V V <sub>SS</sub> from -4.5 to 5.5V V <sub>DD</sub> from +4.5V to +5.5V V <sub>SS</sub> from -4.5V to -5.5V	1	03,04 03,04 03,04 03,04	-0.02 -0.02 -0.05 -0.05	+0.02 +0.02 +0.05 +0.05	LSB/%
<b>MATCHING PERFORMANCE</b>							
Gain Error			1	All	-1.0	+1.0	LSB
<b>REFERENCE INPUT</b>							
Reference Input Range	REF		1,2,3	01,02 03,04	0 0	V <sub>DD</sub> -4 V <sub>DD</sub> -2.2	V
Reference Input Resistance	RREF		1,2,3	All	5.0		kΩ
<b>DIGITAL INPUTS</b>							
Input High Voltage	V <sub>IH</sub>		1,2,3	All	2.4		V
Input Low Voltage	V <sub>IL</sub>		1,2,3	All		0.8	V
Input Leakage Current	I <sub>IN</sub>	V <sub>IN</sub> =0V or V <sub>DD</sub>	1,2,3	All		+1.0	μA
Input Capacitance	C <sub>IN</sub>	NOTE 1		All		10.0	pF

TEST	Symbol	CONDITIONS		Group A Subgroup	Device type	Limits Min	Limits Max	Units
		-55 °C ≤ T <sub>A</sub> ≤ +125°C V <sub>DD</sub> =+15V, V <sub>SS</sub> =-5V, VREF=10V, AGND=DGND=0V Unless otherwise specified						
<b>TIMING CHARACTERISTICS</b>								
CS Pulse Width	t <sub>CS</sub>			9,10,11	01,02 03,04	100 200		ns
WR Pulse Width	t <sub>WS</sub>			9,10,11	01,02 03,04	100 200		ns
CS to WR Setup	t <sub>CWS</sub>			9,10,11	All	0		ns
CS to WR Hold	t <sub>CWH</sub>			9,10,11	All	0		ns
Data Valid to WR Setup Time	t <sub>DS</sub>			9,10,11	All	75		ns
Data Valid to WR Hold Time	t <sub>DH</sub>			9,10,11	01,02 03,04	10 0		ns
LDAC Pulse Width	t <sub>LDAC</sub>			9,10,11	01,02 03,04	120 150		ns
Address to WR Setup	t <sub>AS</sub>			9,10,11	All	25		ns
Address to WR Hold	t <sub>AH</sub>			9,10,11	All	0		ns
<b>POWER SUPPLIES</b>								
Positive Supply Range	V <sub>DD</sub>			1,2,3	01,02 03,04	10.8 4.75	16.5 5.5	V
Negative Supply Range	V <sub>SS</sub>			1,2,3	All	-4.5	-5.5	V
Positive Supply Current	I <sub>DD</sub>	NOTE 2		1 2,3	01,02		20 28	mA
				1 2,3	03,04		12 18	
Negative Supply Current	I <sub>SS</sub>	NOTE 2		1 2,3	01,02		18 26	mA
				1 2,3	03,04		10 16	

NOTE 1: Guaranteed by design. Not production tested.

NOTE 2: Digital inputs at 2.4V; with digital inputs at 0V, I<sub>DD</sub> decreases typically by 1.5mA at +25°C.

	Package	ORDERING INFORMATION:
01	24 pin Sidebrazed	MAX526CMYG/883B
02	24 pin Sidebrazed	MAX526DMYG/883B
03	24 pin Sidebrazed	MAX527CMYG/883B
04	24 pin Sidebrazed	MAX527DMYG/883B

**TERMINAL CONNECTIONS:**

Pin		Pin		Pin	
1	V <sub>OUTC</sub>	9	D7	17	A1
2	V <sub>OUTB</sub>	10	D6	18	A0
3	V <sub>OUTA</sub>	11	D5	19	VREFCD
4	V <sub>SS</sub>	12	D4	20	$\overline{\text{WR}}$
5	AGND	13	D11/D3	21	$\overline{\text{CSLSB}}$
6	VREFAB	14	D10/D2	22	$\overline{\text{CSMSB}}$
7	DGND	15	D9/D1	23	V <sub>DD</sub>
8	$\overline{\text{LDAC}}$	16	D8/D0	24	V <sub>OUTD</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, 10, 11
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.