



Quad 8-Bit CMOS D/A Converter with Internal 10 V Reference

DAC-8426

1.1 Scope.

This specification covers the detail requirement for a quad 8-bit CMOS digital-to-analog converter with output voltage amplifiers and internal 10 V voltage reference. The internal latches provide direct interface for most microprocessors. The DAC-8426 operates with either a dual or single power supply.

It is highly recommended that this data sheet be used as a baseline for new military or aerospace specification control drawings.

1.2 Part Number.

The complete part numbers per Table 1 of this specification is as follows:

Device	Part Number	Package
-1	DAC-8426AR/883	R
-2	DAC-8426BR/883	R

1.2.3 Case Outline.

Letter	Case Outline (Lead Finish per MIL-M-38510)
R	20-Lead Ceramic Dual-in-Line Package (Cerdip)

1.3 Absolute Maximum Ratings. ($T_A = +25^\circ\text{C}$ unless otherwise noted)

V_{DD} to AGND or DGND	-0.3 V, +17 V
V_{SS} to AGND or DGND	-7 V, V_{DD}
V_{DD} to V_{SS}	-0.3 V, +24 V
AGND to DGND	-0.3 V, +5 V
Digital Input Voltage to DGND	-0.3 V, V_{DD}
V_{REFOUT} to AGND	-0.3 V, V_{DD}
V_{OUT} to AGND	V_{SS} , V_{DD}
Power Dissipation to $+75^\circ\text{C}$	500 mW
Derate above 75°C by	6.4 mW/ $^\circ\text{C}$
Operating Temperature Range	-55°C to $+125^\circ\text{C}$
Junction Temperature Range (T_J)	-65°C to $+150^\circ\text{C}$
Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Lead Temperature (Soldering 60 sec)	$+300^\circ\text{C}$

1.5 Thermal Characteristics.

Thermal Resistance θ_{JC}	$= 7^\circ\text{C}/\text{W}$
θ_{JA}	$= 70^\circ\text{C}/\text{W}$ max

REV. A

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DAC-8426—SPECIFICATIONS

Table 1.

Test	Symbol	Device Types	Limits		Group A Subgroups	Conditions ¹	Units
			Min	Max			
Resolution	N	All	8		1, 2, 3	T _A = +25°C, -55°C & +125°C	Bits
Total Unadjusted Error	TUE	All	-1	±1	1, 2, 3	Includes Reference ² T _A = +25°C, -55°C & +125°C	LSB
			-2	±2	1, 2, 3		
Relative Accuracy	INL	All	-1	±1/2	1, 2, 3	T _A = +25°C, -55°C & +125°C	LSB
			-2	±1	1, 2, 3		
Differential Nonlinearity	DNL	All		±1	1, 2, 3	Note 3; T _A = +25°C, -55°C & +125°C	LSB
Zero Scale Error	V _{ZSE}	All		20	1, 2, 3	V _{SS} = -5 V; T _A = +25°C, -55°C & +125°C	mV
Reference Output Voltage	V _{REFOUT}	All	9.96	10.02	1, 2, 3	No Load; T _A = +25°C, -55°C & +125°C	V
			-2	9.92			
Reference Load Regulation	LD _{REG}	All		0.1	1, 2, 3	ΔI _L = 10 mA; T _A = +25°C, -55°C & +125°C	%/mA
Reference Line Regulation	LN _{REG}	All		0.04	1, 2, 3	ΔV _{DD} = ±10%; T _A = +25°C, -55°C & +125°C	%/mA
Reference Output Current	I _{REFOUT}	All	5		1, 2, 3	ΔV _{REFOUT} < 40 mV; T _A = +25°C, -55°C & +125°C	mA
Logic Input "0"	V _{INL}	All		0.8	1, 2, 3	T _A = +25°C, -55°C & +125°C	V
Logic Input "1"	V _{INH}	All	2.4		1, 2, 3	T _A = +25°C, -55°C & +125°C	V
Logic Input Current	I _{IN}	All		10	1, 2, 3	V _{IN} = 0 V or V _{DD} ; T _A = +25°C, -55°C & +125°C	μA
Positive Supply Current ³	I _{DD}	All		14	1, 2, 3	T _A = +25°C, -55°C & +125°C	mA
Negative Supply Current ³	I _{SS}	All		10	1, 2, 3	Dual Supply, V _{SS} = -5 V; T _A = +25°C, -55°C & +125°C	mA
Power Supply Sensitivity	PSS	All		0.01	1, 2, 3	ΔV _{DD} = ±10%; T _A = +25°C, -55°C & +125°C	%/%
Output Source Current	I _{OUT}	All	10		1, 2, 3	Digital Inputs All Ones; T _A = +25°C, -55°C & +125°C	mA
Output Sink Current	I _{OUT-}	All	0.35		1, 2, 3	Digital Inputs All Zeros	mA
V _{OUT} Settling Time (Positive or Negative)	t _S	All		5	9	T _O ±1/2 LSB; T _A = +25°C	μs
Address to Write Setup Time	t _{AS}	All	0		9, 10, 11	T _A = +25°C, -55°C & +125°C	ns
Address to Write Hold Time	t _{AH}	All	0		9, 10, 11	T _A = +25°C, -55°C & +125°C	ns
Data Valid to Write Setup Time	t _{DS}	All	70		9, 10, 11	T _A = +25°C, -55°C & +125°C	ns
Data Valid to Write Hold Time	t _{DH}	All	10		9, 10, 11	T _A = +25°C, -55°C & +125°C	ns
Write Pulse Width	t _{WR}	All	50		9, 10, 11	T _A = +25°C, -55°C & +125°C	ns
Minimum Load Resistance	R _{L(MIN)}	All	2		1, 2, 3	Digital Inputs All Ones; T _A = +25°C, -55°C & +125°C	kΩ
V _{OUT} Slew Rate	SR	All	2.5		7	T _A = +25°C	V/μs

NOTES

¹V_{DD} = +15 V ± 10%, AGND = 0 V, DGND = 0 V, V_{SS} = 0 V unless otherwise specified.

²Includes full-scale error, relative accuracy, and zero code error.

³Digital inputs V_{IN} = V_{INL} or V_{INH}; V_{OUT} and V_{REFOUT} unloaded.

Table 2. Electrical Test Requirements for Class B Devices

MIL-STD-883 Test Requirements	Subgroups (See Table 3)
Interim Electrical Parameters (Pre Burn-In)	1
Final Electrical Test Parameters	1,* 2, 3
Group A Test Requirements	1, 2, 3, 7, 9, 10, 11

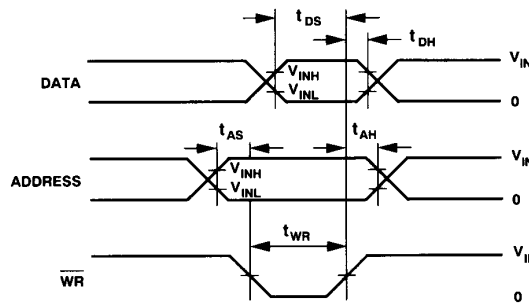
NOTE

*PDA applies to Subgroup 1 only. No other subgroups are included in PDA.

Table 3. Control Table

Logic Control			DAC-8426
WR	A1	A0	Operation
H	X	X	No Operation Device Not Selected
L	L	L	DAC A Transparent
\overline{L}	L	L	DAC A Latched
L	L	H	DAC B Transparent
\overline{L}	L	H	DAC B Latched
L	H	L	DAC C Transparent
\overline{L}	H	L	DAC C Latched
L	H	H	DAC D Transparent
\overline{L}	H	H	DAC D Latched

L = Low State, H = High State, X = Don't Care.



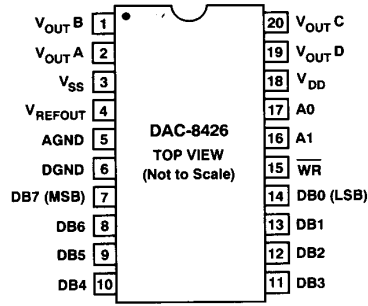
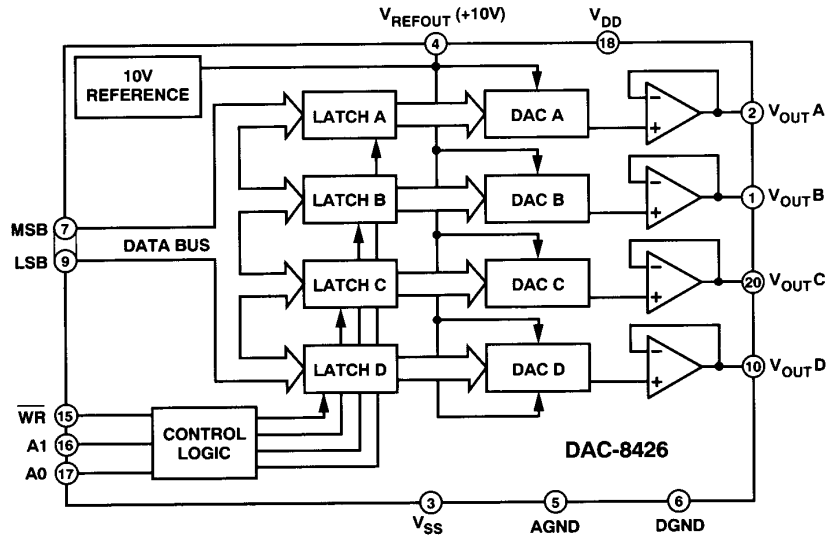
NOTES:

1. ALL INPUT SIGNAL RISE AND FALL TIMES ARE MEASURED FROM THE 10% TO 90% OF V_{DD} ($t_r = t_f = 20ns$ OVER THE V_{DD} RANGE)
2. TIMING REFERENCE LEVEL IS FROM $\frac{V_{INH} + V_{INL}}{2}$
3. $V_{IN} = 5V$

Write Timing Diagram

DAC-8426

3.2.1 Functional Block Diagram and Terminal Assignments.

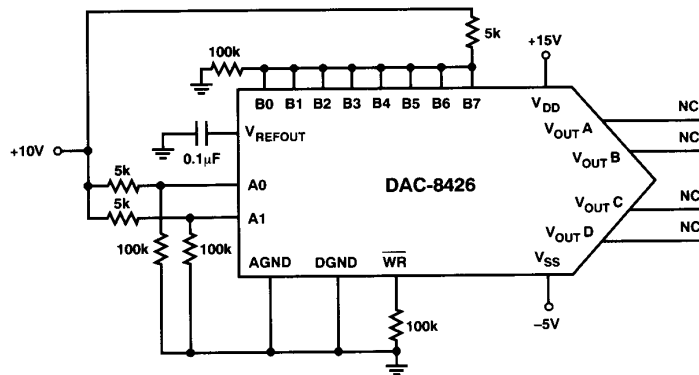


3.2.4 Microcircuit Technology Group.

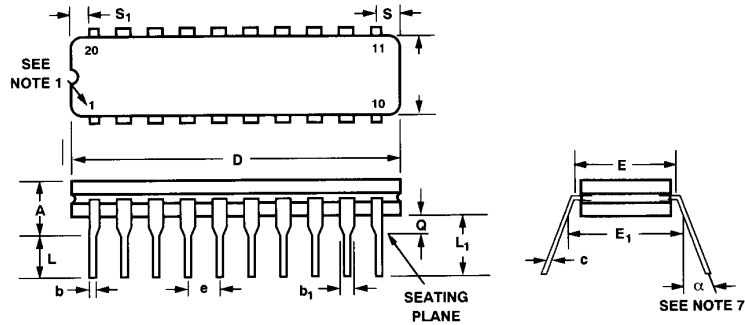
This microcircuit is covered by technology group 80.

4.2.1 Life Test/Burn-In Circuit.

Steady state life test is per MIL-STD-883 Method 1005. Burn-in is per MIL-STD-883 Method 1015 test condition (B).



20-Lead Ceramic DIP
(R Suffix)



20-Lead Ceramic DIP
(R Suffix)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A		0.200		5.08	
b	0.014	0.023	0.36	0.58	
b ₁	0.030	0.070	0.76	1.78	2
c	0.008	0.015	0.20	0.38	
D		1.060		26.92	4
E	0.220	0.310	5.59	7.87	4
E ₁	0.290	0.320	7.37	8.13	7
e	0.100 BSC		2.54 BSC		5
L	0.125	0.200	3.18	5.08	
L ₁	0.150		3.81		
Q	0.015	0.060	0.38	1.52	3
S		0.080		2.03	6
S ₁	0.005		0.13		6
α	0°	15°	0°	15°	

NOTES

1. Index area; a notch or a lead one identification mark is located adjacent to lead one.
2. The minimum limit for dimension b₁ may be 0.023" (0.58 mm) for all four corner leads only.
3. Dimension Q shall be measured from the seating plane to the base plane.
4. This dimension allows for off-center lid, meniscus and glass overrun.
5. The basic lead spacing is 0.100" (2.54 mm) between centerlines.
6. Applies to all four corners.
7. Leads center when α is 0°. E₁ shall be measured at the centerline of the leads.



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