

**1.1 Scope.**

This specification covers the detail requirements for a 8-bit resolution D/A converter (DACPORT<sup>®</sup>) complete with output amplifier, full microprocessor interface, precision reference and requiring only +5V.

**1.2 Part Number.**

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

Device	Part Number <sup>1</sup>
-1	AD558S(X)/883B
-2	AD558T(X)/883B

**NOTE**

<sup>1</sup>See paragraph 1.2.3 for package identifier.

**1.2.3 Case Outline.**

See Appendix 1 of General Specification ADI-M-1000: package outline:

(X)	Package	Description
D	D-16	16-Pin DIP (TO-116 Style)
E	E-20A	20-Terminal Leadless Chip Carrier

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

$V_{CC}$ to Ground	0 to +18V
Digital Inputs (Pins 1-10)	0 to +7.0V
$V_{OUT}$	Indefinite Short to Ground Momentary Short to $V_{CC}$
Power Dissipation	450mW
Storage Temperature Range	-65°C to +150°C
Lead Temperature Range (Soldering 10sec)	300°C

**1.5 Thermal Characteristics.**

Thermal Resistance  $\theta_{JC} = 30^\circ\text{C}/\text{W}$   
 $\theta_{JA} = 100^\circ\text{C}/\text{W}$

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# AD558—SPECIFICATIONS

Table 1.

Test	Symbol	Device	Design Limit @ +25°C	Sub Group 1	Sub Group 2, 3	Sub Group 4	Test Condition <sup>1</sup>	Units
Relative Accuracy	RA	-1	1/2	1/2	3/4		All Bits with Positive Errors On and All Bits with Negative Errors On	± LSB max
		-2	1/4	1/2	3/8	1/4		
Differential Nonlinearity	DNL	-1, 2	1	1	1		All Major Carriers	± LSB max
Zero Error	V <sub>OS</sub>	-1	1	1	2	1	All Bits Off	± LSB max
		-2	1/2	1	1	1/2		
Gain Error	A <sub>E</sub>	-1	1.5	1.5	2.5	1.5	No Load and 5mA Load	± LSB max
		-2	0.5	1.5	1.0	0.5	All Bits On	
Output Voltage Settling Time		-1, 2	3.0				0 to 10V Range <sup>2</sup>	μs max
			1.5				0 to 2.56V Range <sup>2</sup>	
Power Supply Rejection Ratio	PSRR	-1, 2	0.03	0.03	0.03		Note 3	%/% max
Power Supply Current	I <sub>CC</sub>	-1, 2	25	25	25		All Bits On	± mA max
Power Dissipation	PD	-1, 2	125	125	125		V <sub>CC</sub> = +5V All Bits On	mW max
			375	375	375		V <sub>CC</sub> = +15V All Bits On	
Digital Input High Voltage	V <sub>IH</sub>	-1, 2	2.0	2.0	2.0			+ V min
Digital Input Low Voltage	V <sub>IL</sub>	-1, 2	0.8	0.8	0.8			+ V max
Digital Input High Current	I <sub>IH</sub>	-1, 2	100	100	100		V <sub>IH</sub> = 7V	± μA max
Digital Input Low Current	I <sub>IL</sub>	-1, 2	100	100	100		V <sub>IL</sub> = 0V	± μA max
Write Pulse Width <sup>4</sup>	t <sub>WR</sub>	-1, 2	200		270			ns min
Data Setup Time <sup>4</sup>	t <sub>DS</sub>	-1, 2	200		270			ns min
Data Hold Time <sup>4</sup>	t <sub>DH</sub>	-1, 2	10		10			ns min

NOTES

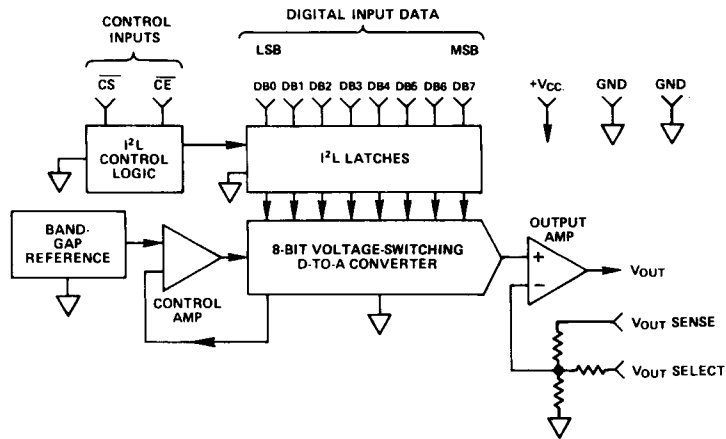
<sup>1</sup> V<sub>S</sub> = +5V for 0 to 2.56V range, V<sub>S</sub> = +15V for 0 to 10V range (unless otherwise noted).

<sup>2</sup> Settling time is specified for a positive full scale step to ± 1/2LSB.

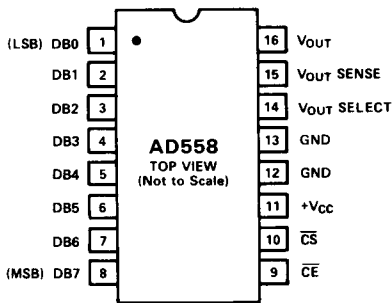
<sup>3</sup> V<sub>CC</sub> = 4.5V to 5.5V for 0 to 2.56V range, V<sub>CC</sub> = 11.4V to 16.5V for 0 to 10V range.

<sup>4</sup> Timing per Figure 1.

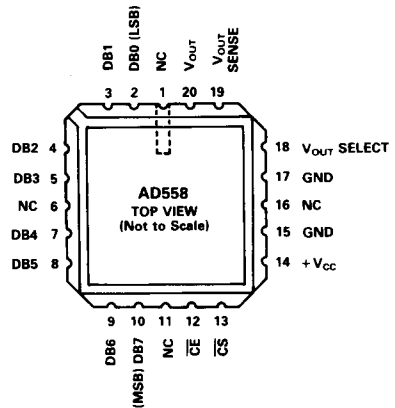
### 3.2.1 Functional Block Diagram and Terminal Assignments.



D Package (DIP)



E Package (LCC)

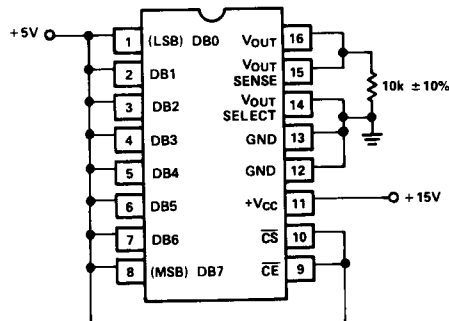


### 3.2.4 Microcircuit Technology Group.

This microcircuit is covered by technology group (56).

### 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).



# AD558

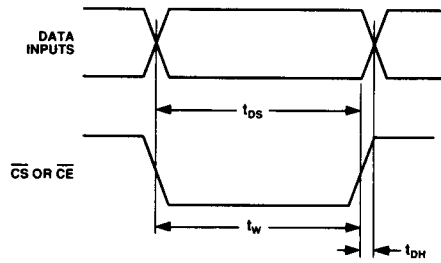


Figure 1. AD558 Timing Diagram

Table 2. AD558 Control Logic Truth Table

Input Data	$\overline{CE}$	$\overline{CS}$	DAC Data	Latch Condition
0	0	0	0	"transparent"
1	0	0	1	"transparent"
0	f	0	0	latching
1	f	0	1	latching
0	0	f	0	latching
1	0	f	1	latching
X	1	X	previous data	latched
X	X	1	previous data	latched

Notes: X = Does not matter  
 f = Logic Threshold at Positive-Going Transition