

1.1 Scope.

This specification covers the detail requirements for a monolithic 10-bit CMOS multiplying digital-to-analog converter.

1.2 Part Number.

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

Device	Part Number ¹
-1	AD7533S(X)/883B
-2	AD7533T(X)/883B
-3	AD7533U(X)/883B

NOTE

¹See 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
Q	Q-16	16-Pin Cerdip
E	E-20A	20-Contact LCC

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

V_{DD} to GND		-0.3V, +17V
R_{FB} to GND		$\pm 25\text{V}$
V_{REF} to GND		$\pm 25\text{V}$
Digital Input Voltage Range		-0.3V to V_{DD}
Output Voltage (Pin 1, Pin 2)		-0.3V to V_{DD}
Power Dissipation		
Up to $+50^\circ\text{C}$		1000mW
Derates above $+50^\circ\text{C}$		10mW/ $^\circ\text{C}$
Operating Temperature Range		-55°C to $+125^\circ\text{C}$
Storage Temperature Range		-65°C to $+150^\circ\text{C}$

Note: "Pin numbers refer to DIP package ONLY"

1.5 Thermal Characteristics.

Thermal Resistance $\theta_{JC} = 35^\circ\text{C}/\text{W}$ for Q-16 and E-20A
 $\theta_{JA} = 120^\circ\text{C}/\text{W}$ for Q-16 and E-20A

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Table 1.

Test	Symbol	Device	Design Limit $T_{min}-T_{max}$	Sub Group 1	Sub Group 2, 3	Sub Group 4	Test Condition ¹	Units
Resolution	RES	-1, 2, 3	10					Bits
Relative Accuracy	RA	-1	2	2	2			± LSB max
		-2	1	2	1	1		
		-3	1/2	2	1/2	1/2		
Gain Error ²	AE	-1, 2, 3	15	14	15			± LSB max
Gain Tempco	TC _{AE}	-1, 2, 3	10					± ppm/°C max
Power Supply Rejection	PSRR	-1, 2, 3	0.008	0.005	0.008		Digital Inputs = V_{IH} ; V_{DD} = 14V to +17V	± %/% max
Output Leakage Current I_{OUT1} (Pin 1)	I_{OIL}	-1, 2, 3	200	50	200		Digital Inputs = V_{IL} ; (V_{REF} = +10V)	± nA max
I_{OUT2} (Pin 2)	I_{OIL}	-1, 2, 3	200	50	200		Digital Inputs = V_{IH} ; (V_{REF} = +10V)	± nA max
Output Current Settling Time	t_{SL}	-1, 2, 3	800				$T_O \pm 1/2LSB$; $R_{OUT1} = 100\Omega$ $C_{OUT1} = 13pF$; Digital Inputs = V_{IH} to V_{IL} or V_{IL} to V_{IH}	ns max
Feedthrough Error ³	FT	-1, 2, 3	15				Digital Inputs = V_{IL} ; $V_{REF} = \pm 10V$; 100kHz Sinewave	± mV p-p max
Reference Input Resistance	R_{IN}	-1, 2, 3	5	5	5			k Ω min
			20	20	20			k Ω max
Input High Voltage	V_{IH}	-1, 2, 3	2.4	2.4	2.4			V min
Input Low Voltage	V_{IL}	-1, 2, 3	0.8	0.8	0.8			V max
Input Leakage Current	I_{IN}	-1, 2, 3	1	1	1		$V_{IN} = 0V$ or V_{DD}	± μA max
Input Capacitance	C_{IN}	-1, 2, 3	5					pF max
Output Capacitance Pin 1	C_{OUT1}	-1, 2, 3	100				Digital Input = V_{IH}	pF max
Pin 2	C_{OUT2}	-1, 2, 3	35				Digital Input = V_{IH}	pF max
Pin 1	C_{OUT1}	-1, 2, 3	35				Digital Input = V_{IL}	pF max
Pin 2	C_{OUT2}	-1, 2, 3	100				Digital Input = V_{IL}	pF max
Supply Current	I_{DD}	-1, 2, 3	2	2			Digital Inputs = V_{IL} or V_{IH}	mA max

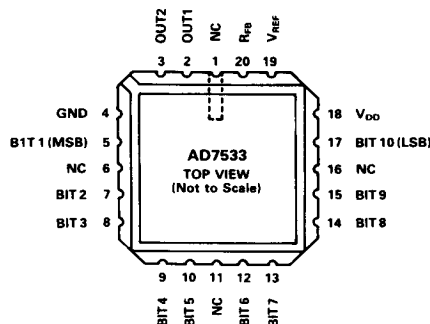
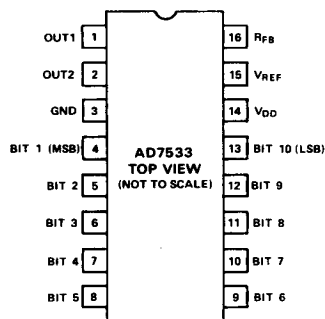
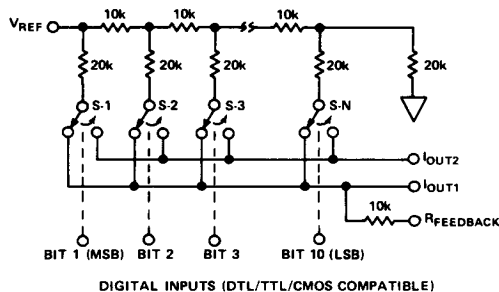
NOTES

¹ $V_{DD} = +15V$; $V_{OUT1} = V_{OUT2} = 0V$; $V_{REF} = +10V$ unless otherwise stated.

²Measured using internal feedback resistor and includes effect of leakage current and gain TC.

³Feedthrough error can be reduced by connecting the lid of the ceramic package to ground.

3.2.1 Functional Block Diagram and Terminal Assignments.

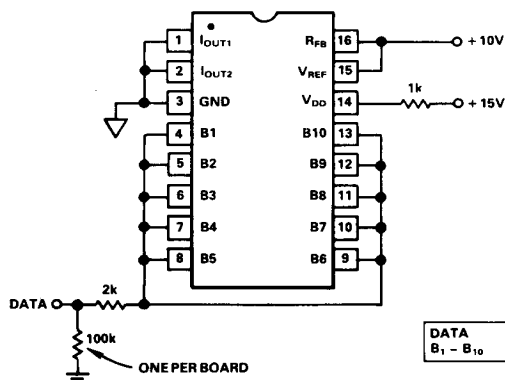


3.2.4 Microcircuit Technology Group.

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).



	STATIC	DYNAMIC
DATA B ₁ - B ₁₀	+15V	V _k = GND V _W = +15V

(a) 60Hz