

Low Power, 12-Bit CMOS DACs

FEATURES

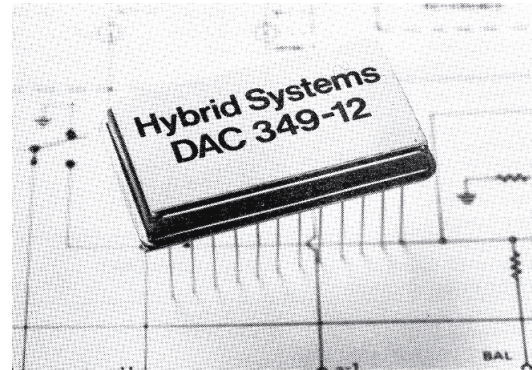
- 12-bits binary or 3-decades BDC
- Low power: 300mW
- Commercial, industrial and MIL-STD-883 models
- 5 pin selectable output ranges

DESCRIPTION

The DAC349 Series are versatile, low power 12-bit D/A converters that are intended for fixed reference applications. These units combine a novel CMOS switching technique with a precision, ultra-stable thin-film ladder to achieve accurate conversion with low power drain; improved reliability and near-instantaneous warmup are major advantages of reduced power consumption. All models include an internal precision reference and a gain-selectable output amplifier.

The DAC349 Series offers a choice of either 12-bit binary coding (-12 models) or 3 decade BCD coding (-3D models).

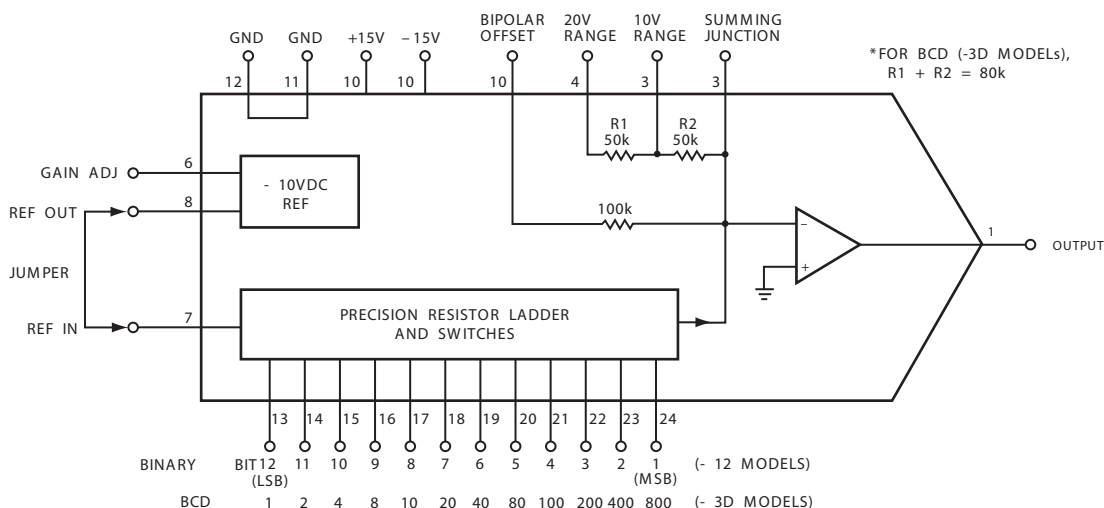
By external pin jumpering, the binary models can be connected for unipolar output ranges of 0 to



-5V or 0 to -10V and for offset binary coded bipolar outputs of $\pm 2.5V$, $\pm 5V$ and $\pm 10V$. For ratiometric applications, the units operate from an external fixed DC reference of $-10V \pm 10\%$.

Both binary and BCD models are available in commercial/industrial and MIL-STD-883 Rev. C, Level B versions. The DAC349B is specified over a temperature range of $-55^{\circ}C$ to $+125^{\circ}C$. Both versions operate $-55^{\circ}C$ to $+125^{\circ}C$.

FUNCTIONAL DIAGRAM

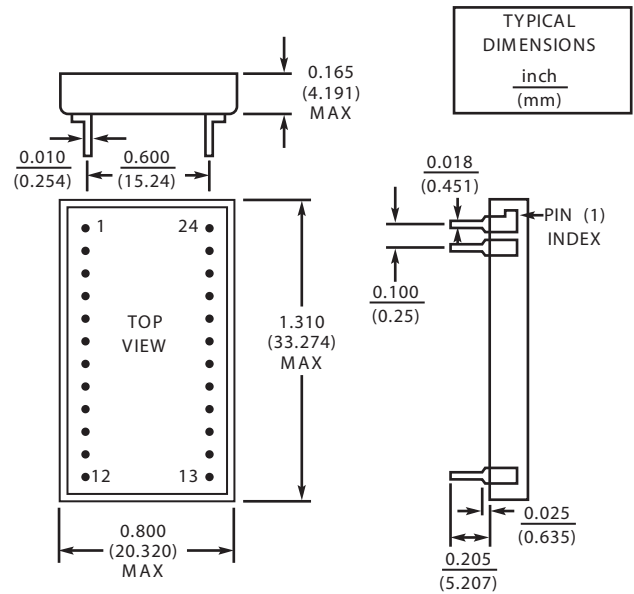


DAC349

SPECIFICATIONS

(Typical @+25°C and nominal power supplies unless otherwise noted)

SERIES	DAC349
TYPE	Fixed Reference, Voltage Output
DIGITAL INPUT	
Resolution	12 Bits Binary (-12) or 3 Decades BCD (-3D)
Unipolar Coding	Binary or BCD
Bipolar Coding	Offset Binary
Logic Levels	
Binary	$V_{IH}=2.4V$ min, $V_{IL}=0.8V$ max,
BCD	$V_{IH}=3.5V$ min, $V_{IL}=1.5V$ max,
Input Current	$\pm 1\mu A$ max
ANALOG OUTPUT	
Voltage Range	0 to -5V, 0 to -10 $\pm 2.5V$, $\pm 5V$, $\pm 10V$
Current Compliance	$\pm 5mA$ (min)
Impedance	0.1
Scale Factor ¹	$\pm 0.1\%$ of F.S.R. (max)
Unipolar Offset ¹	$\pm 0.2\%$ of F.S.R. (max)
Bipolar Offset ¹	$\pm 0.1\%$ of F.S.R. (max)
REFERENCE	
Internal ²	-10V DC
External (D.C. only)	-10V DC $\pm 10\%$ @1mA
STATIC PERFORMANCE	
Linearity	$\pm 1/2$ LSB (max)
Differential Linearity	± 1 LSB (max)
DYNAMIC PERFORMANCE	
Settling Time	15 μS (max)
Slew Rate	1V/ μs
STABILITY	
Accuracy vs Temp. ³	30ppm/ $^{\circ}C$ (max)
Linearity vs Temp. Differential	5ppm/ $^{\circ}C$ (max)
Linearity vs Temp.	2ppm/ $^{\circ}C$ (max)
POWER SUPPLY	
Voltage @ Current	+15V @ 5mA (nom): 10mA (max) +13V to +18V; -15V @ 15mA (nom): 20mA (max) -13V to -18V;
Rejection Ratio	0.005% /%
Power Consumption	375mW (max)
TEMPERATURE RANGE	
Specified	
DAC349C	-25°C to +85°C
DAC349B	-55°C to +125°C
Operating, All models	-55°C to +125°C
Storage, All models	-65°C to +150°C
MECHANICAL	
Case Style	Ceramic



Pin 1 is marked by the dot on the top of the package

PIN NO.	FUNCTION NO.	PIN	FUNCTION	
			BINARY	BCD
1	OUTPUT	24	BIT 1 (MSB)	800
2	SUMMING JCT	23	BIT 2	400
3	10V RANGE	22	BIT 3	200
4	20 VOLT RANGE	21	BIT 4	100
5	BIPOLAR OFFSET	20	BIT 5	80
6	GAIN ADJ	19	BIT 6	40
7	REF IN	18	BIT 7	20
8	REF OUT	17	BIT 8	10
9	-15	16	BIT 9	8
10	+15V	15	BIT 10	4
11	GND	14	BIT 11	2
12	GND	13	BIT 1 (LSB)	1

NOTES:

- Offset and gain are externally adjustable. See APPLICATIONS INFORMATION.
- For specified overall performance, external loading of the reference output (Pin 8) must not exceed 1.0 mA.
- Total effect of linearity, offset and gain tempco's on the transfer characteristics of the unit.
- In case of discrepancy between package shown in photograph and package outline dimension, the mechanical outline is correct. Specifications subject to change without notice.

ORDERING INFORMATION

MODEL	DESCRIPTION
DAC349C-12	Comm. 12-Bit, -25° C to +85° C
DAC349C-3D	Comm, 3-Decade, -25°C to +85°C
DAC349B-12	MIL,12-Bit, -55°C to +125°C
DAC349B-3D	MIL,3-Decade, -55°C to +125°C

CAUTION: ESD (Electro-Static Discharge) sensitive device. Permanent damage may occur when unconnected devices are subjected to high energy electrostatic fields. Unless otherwise noted, the voltage at any digital input should never exceed the supply voltage by more than 0.5 volts or go below -0.5 volts.

Consult factory for application information.