钍地半导体
Tudi Semiconductor

Product Specification

TUDI-DAC0800LCMX/DAC0800LCN

8-Bit Digital-to-Analog Converters

网址 www.sztdbdt.com

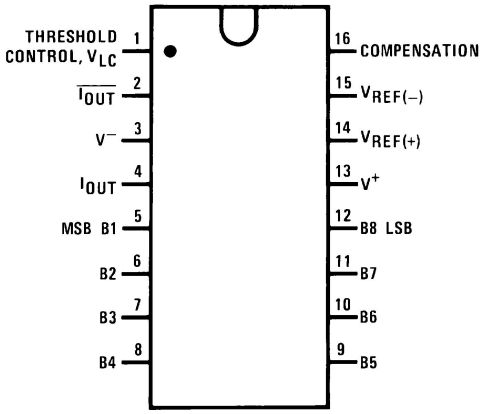
用芯智造·卓越品质

semiconductor device manufacturer

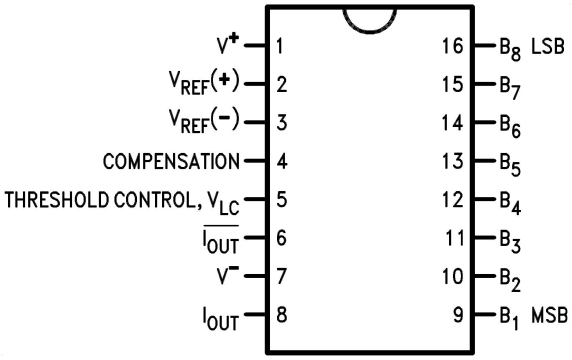
- Design
- research and development
- production
- and sales

FEATURES

- Fast Settling Output Current: 100 ns
- Full Scale Error: ±1 LSB
- Nonlinearity Over Temperature: ±0.1%
- Full Scale Current Drift: ±10 ppm/°C
- High Output Compliance: −10V to +18V
- Complementary Current Outputs
- Interface Directly with TTL, CMOS, PMOS and Others
- 2 Quadrant Wide Range Multiplying Capability
- Wide Power Supply Range: ±4.5V to ±18V
- Low Power Consumption: 33 mW at ±5V
- Low Cost



DIP16



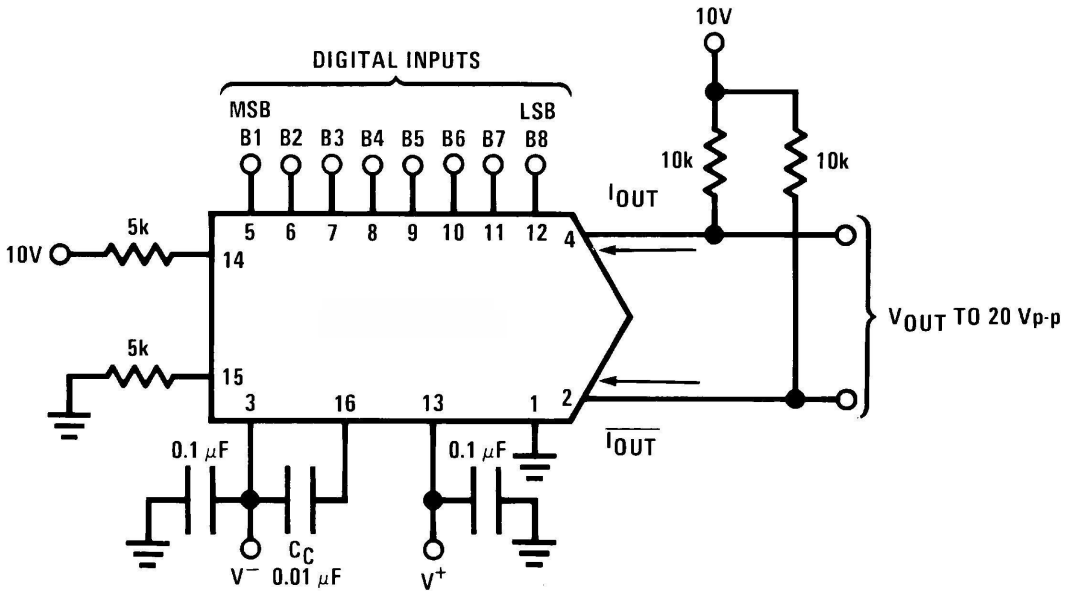
SOP16

DESCRIPTION

The DAC0800 series are monolithic 8-bit high-speed current-output digital-to-analog converters (DAC) featuring typical settling times of 100 ns. When used as a multiplying DAC, monotonic performance over a 40 to 1 reference current range is possible. The DAC0800 series also features high compliance complementary current outputs to allow differential output voltages of 20 Vp-p with simple resistor loads. The reference-to-full-scale current matching of better than ±1 LSB eliminates the need for full-scale trims in most applications, while the nonlinearities of better than ±0.1% over temperature minimizes system error accumulations.

The noise immune inputs will accept a variety of logic levels. The performance and characteristics of the device are essentially unchanged over the ±4.5V to ±18V power supply range and power consumption at only 33 mW with ±5V supplies is independent of logic input levels.

Typical Application



Pin numbers represent the PDIP package. The SOIC package pin numbers differ from that of the PDIP package

Figure 1. ±20 V_{P-P} Output Digital-to-Analog Converter

Operating Conditions(1)

	Min	Max	Units
Temperature (TA) DAC0800L	-55	+125	℃
DAC0800LC	0	+70	℃
DAC0802LC	0	+70	℃
V+	(V-)+10	(V-)+30	V
V-	-15	-5	V
I_{REF}(V-=-5V)	1	2	mA
I_{REF}(V =-15V)	1	4	mA

(1) Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. DC and AC electrical specifications do not apply when operating the device beyond its specified operating conditions

Absolute Maximum Ratings (1)

Supply Voltage (V+-V)	±18V or 36V
Power Dissipation (2)	500 mW
Reference Input Differential Voltage (V14 to V15)	V- to V+
Reference Input Common-Mode Range (V14,V15)	V- to V+
Reference Input Current	5 mA
Logic Inputs	V- to V- plus 36V
Analog Current Outputs(V_{S}- =-15V)	4.25 mA
ESD Susceptibility (3)	TBD V
Storage Temperature	-65℃ to+150℃
Lead Temp. (Soldering,10 seconds) PDIP Package(plastic)	260℃
CDIP Package (ceramic)	300℃
Surface Mount Package Vapor Phase(60 seconds)	215℃
Infrared (15 seconds)	220℃

(1) Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. DC and AC electrical specifications do not apply when operating the device beyond its specified operating conditions.
(2) The maximum junction temperature of the DAC0800 is 125°C. junction-to-ambient, 175°C/W for the molded PDIP package and 100°C/W for the SOIC package.
(3) Human body model, 100 pF discharged through a 1.5 kΩ resistor.

Electrical Characteristics

The following specifications apply for V_S = ±15V, I_{REF} = 2 mA and $T_{MIN} \leq T_A \leq T_{MAX}$ unless otherwise specified. Output characteristics refer to both I_{OUT} and I_{OUT}.

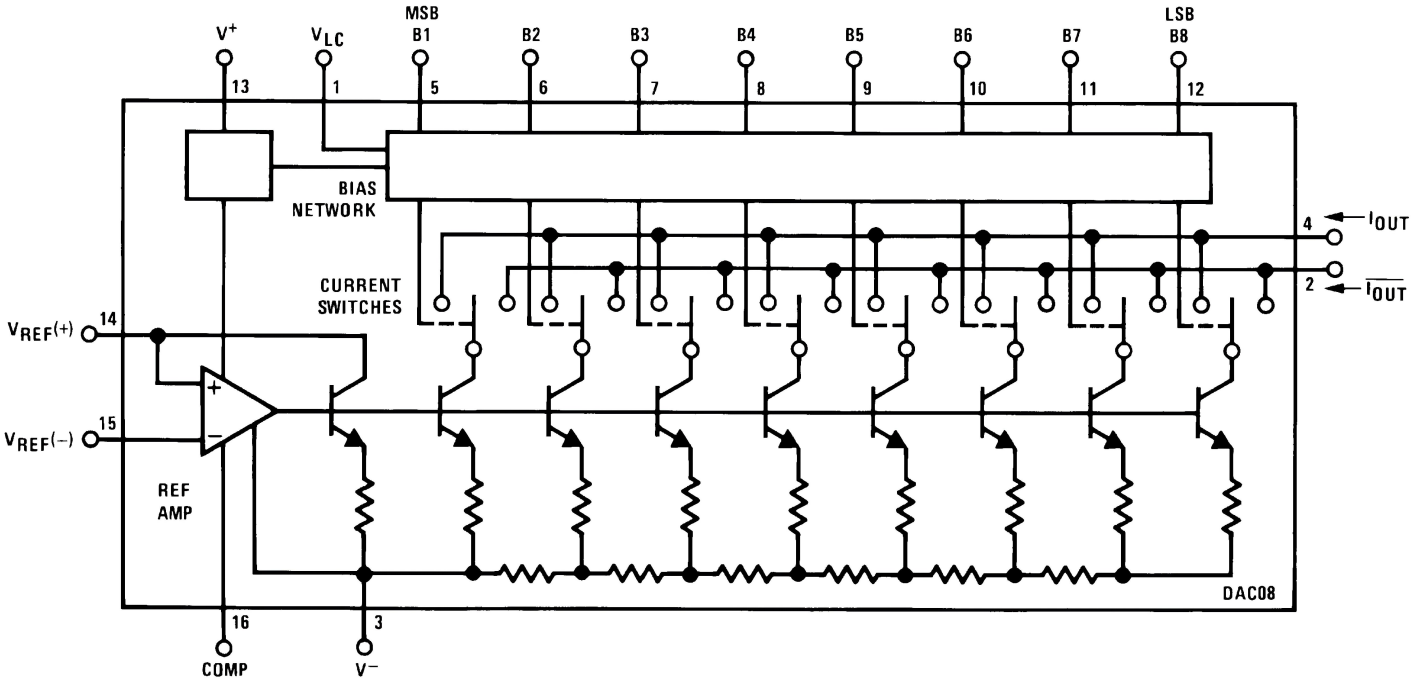
Parameter		Test Conditions	DAC0800L/ DAC0800LC			Units
			Min	Typ	Max	
	Resolution		8	8	8	Bits
	Monotonicity		8	8	8	Bits
	Nonlinearity				± 0.19	%FS
t_s	Settling Time	T_O±½ LSB,AllBits Switched “ ON ” or “ OFF ” ,T_A=25℃				ns
		DAC0800L		100	135	ns
		DAC0800LC		100	150	ns
t_{pLH},t_{PHL}	Propagation Delay Each Bit All Bits Switched	T_A=25°C		35 35	60 60	ns ns
TCI_{FS}	Full Scale Tempco			±10	±50	ppm/°C
V_{oc}	Output Voltage Compliance	Full Scale Current Change<½ LSB,R_{OUT}>20 MΩ,Typical	-10		18	V
I_{FS4}	Full Scale Current	V_{REF}=10.000V, R14=R15=5.000 kΩ, T_A=25℃	1.94	1.99	2.04	mA
I_{FSS}	Full Scale Symmetry	I_{FS4}-I_{FS2}		±1	±8.0	μA
I_{zs}	Zero Scale Current			0.2	2.0	μA
I_{FSR}	Output Current Range	V-=-5V V-=-8V to-18V	0 0	2.0 2.0	2.1 4.2	mA
V_{IL} V_{IH}	Logic Input LevelsLogic “ 0 ” Logic “ 1 ”	V_{Lc}=0V	2.0		0.8	V V
I_{IL} I_{IH}	Logic Input CurrentLogic “ 0 ” Logic “ 1 ”	V_{Lc}=0V -10V≤V_{IN}≤+0.8V 2V≤V_{IIN}≤+18V		-2.0 0.002	-10 10	μA μA
V_{Is}	Logic Input Swing	V-=-15V	-10		18	V
V_{THR}	Logic Threshold Range	V_s=±15V	-10		13.5	V

Electrical Characteristics(continued)

The following specifications apply for V_S = ±15V, I_{REF} = 2 mA and $T_{MIN} \leq T_A \leq T_{MAX}$ unless otherwise specified. Output characteristics refer to both I_{OUT} and I_{OUT}.

Parameter		Test Conditions	DAC0800LI DAC0800LC			Units
			Min	Typ	Max	
dI/dt	Reference Input Slew Rate		4.0	8.0		mA/us
$PSSI_{FS+}$	Positive Power Supply Sensitivity	4.5V≤V+≤18V		0.0001	0.01	%1%
$PSSI_{FS-}$	Negative Power Supply Sensitivity	-4.5V≤V≤18V,I_{REF}=1mA		0.0001	0.01	%1%
I+	Power Supply Current	V_S=±5V,I_{REF}=1 mA		2.3	3.8	mA
I-				-4.3	-5.8	mA
I+	Power Supply Current	V_S=+5V,-15V,I_{REF}=2 mA		2.4	3.8	mA
I-				-6.4	-7.8	mA
I+	Power Supply Current	V_S=±15V,I_{REF}=2 mA		2.5	3.8	mA
I-				-6.5	-7.8	mA
P_D	Power Consumption	±5V,I_{REF}=1 mA		33	48	mW
		+5V,-15V,I_{REF}=2 mA		108	136	mW
		±15V,I_{REF}=2 mA		135	174	mW

Block Diagram



Pin numbers represent the PDIP package. The SOIC package pin numbers differ from that of the PDIP package

Figure 2.

EQUIVALENT CIRCUIT

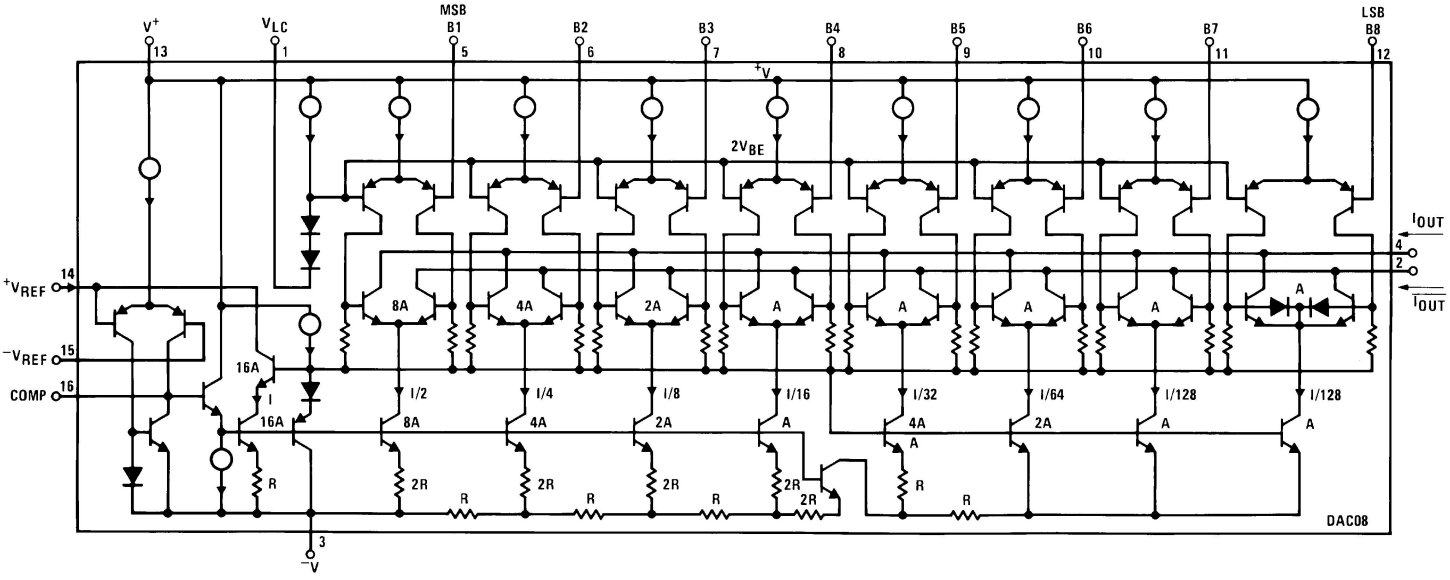


Figure 3. Equivalent Circuit

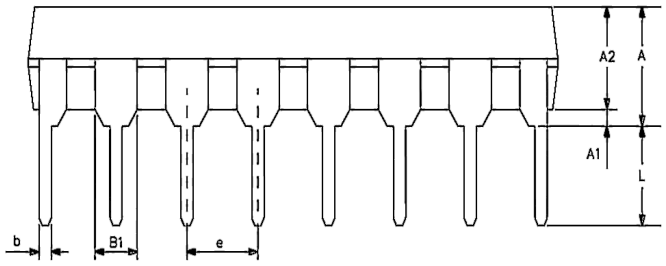
Order information

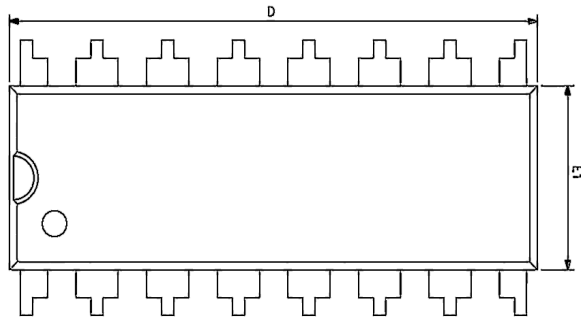
Order Number	Package	Package Quantity	Marking On The park	Temperature
DAC0800LCMX-TUDI	SOP16	Tape,Reel,4000	DAC0800LCM	0°C to 70C
DAC0800LCN-TUDI	DIP16	Tube,25,A box of 1000	DAC0800LCN	

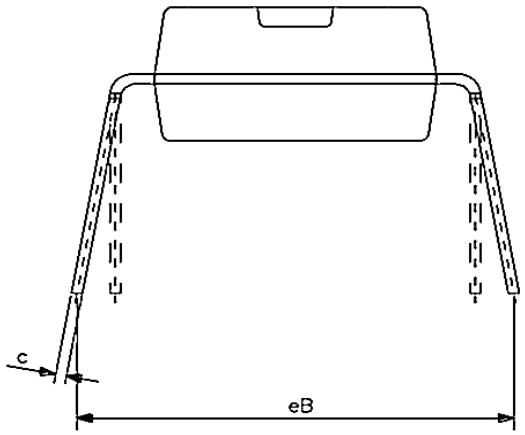
Revision history

	Date	Revision	Page
V1.0	2020/9	New	1-8
V1.1	2025-6	Update model and PDF template	1-11

Package DIP16

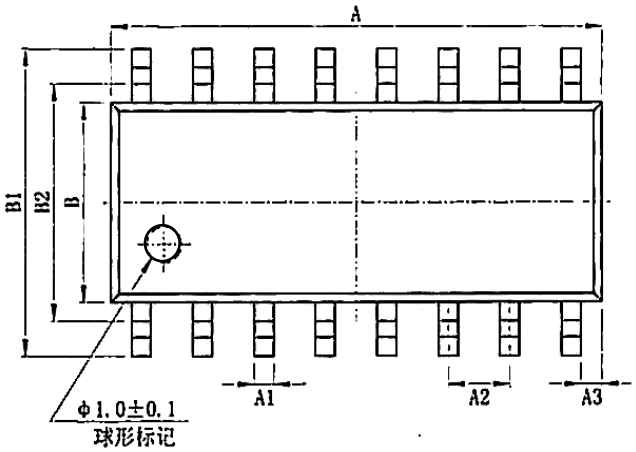


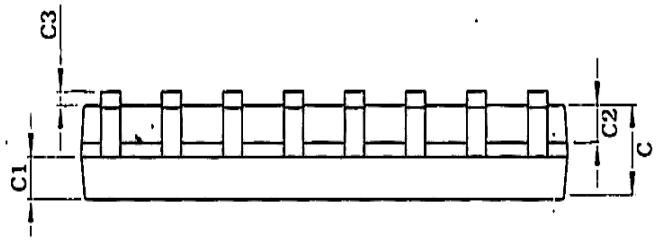


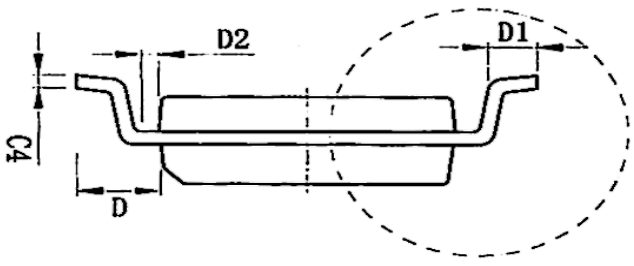


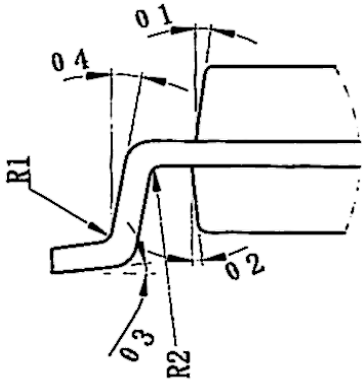
SIZE / SYMBOL	MIN./mm	MAX./mm
A2	3.20	3.60
A1	0.51	___
A	3.60	5.33
L	3.00	3.60
b	0.36	0.56
B1	1.52	
D	18.80	19.94
E1	6.20	6.60
e	2.54	
C	0.20	0.36
eB	7.62	9.30
R	0.20TYP	
R1	0.30TYP	
θ	0°	8°
θ1	45°TYP	
02	12°TYP	
03	0°	8°
04	0°	10°

Package SOP16









SIZE / SYMBOL	MIN./mm	MAX./mm
A	9.80	10.00
A1	0.356	0.456
A2	1.27TYP	
A3	0.302TYP	
B	3.85	3.95
B1	5.84	6.24
B2	5.00 TYP	
C	1.40	1.60
C1	0.61	0.71
C2	0.54	0.64
C3	0.05	0.25
C4	0.203	0.233
D	1.05 TYP	
D1	0.40	0.70
D2	0.15	0.25
R1	0.20TYP	
R2	0.20TYP	
01	8°~12°TYP4	
02	8°~12°TYP4	
03	0°~8°	
04	4°~12°	

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