



UM62342

Advance

CMOS IC

8-BIT D/A CONVERTER (BUFFERED)

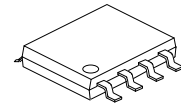
DESCRIPTION

The UM62342 is D/A CMOS-structure semiconductor integrated circuits incorporating two 8-bit channels.

Serial data transfer type input through a combination of three lines: DI, CLK, and LD.

It's operate over the entire voltage range from almost ground to V_{CC} (0 to 5 V), making peripheral elements unnecessary and enabling configuration of a system with few component parts.

Outputs incorporate buffer op-amps that have a drive capacity of 1 mA or above for both sink and source.



SOP-8

FEATURES

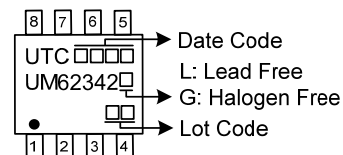
- * Output buffer op-amps Operable over entire voltage range from almost ground to V_{CC} (0 to 5 V)
- * Data transfer format 10-bit serial data input type
- * High output current capacity ± 1 mA or higher

ORDERING INFORMATION

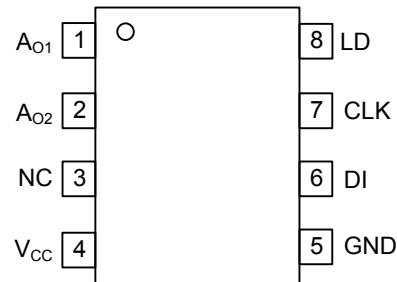
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UM62342L-S08-R	UM62342G-S08-R	SOP-8	Tape Reel

UM62342G-S08-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



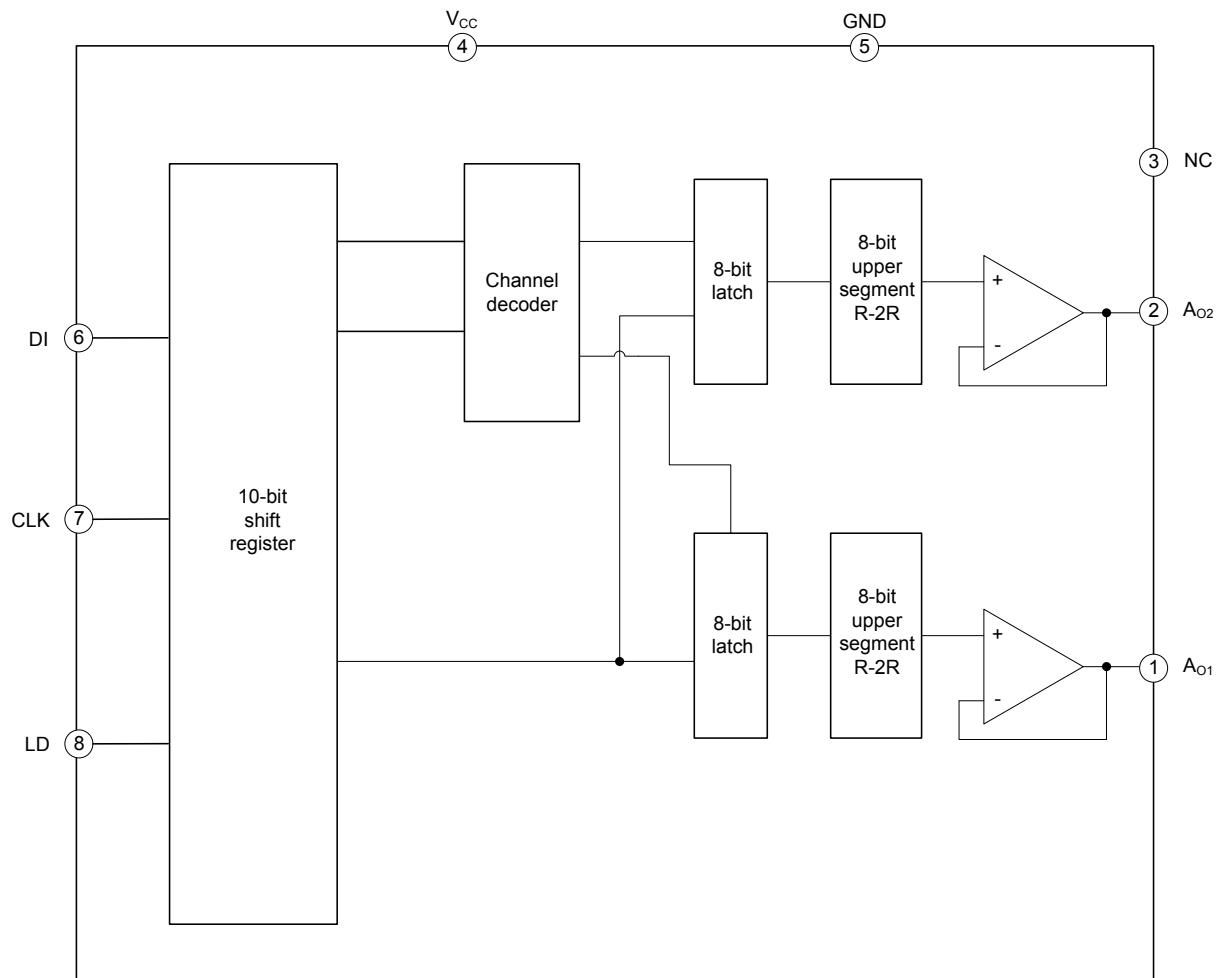
■ PIN CONFIGURATION



■ PIN DISCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	A ₀₁	8-bit resolution D/A converter output pins (After power-on, all channels are reset and DAC data 00h is output.)
2	A ₀₂	
3	NC	No connect
4	V _{CC}	Power supply
5	GND	Ground
6	DI	Serial data input pin. Inputs serial data with a 10-bit data length.
7	CLK	Serial clock input pin. Input signal from DI pin is input to 10-bit shift register at rise of shift clock.
8	LD	Load pin. When "H" level is input to LD pin, value in 10-bit shift register is loaded into decoder and D/A output register.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Supply Voltage	V_{CC}	7.0	V
All Other Pins Voltage		7.0	V
Storage Temperature	T_S	-40 ~ + 125	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Supply Voltage	V_{DD}	Operating	2.7	5	5.5	V
Operating Temperature Range	T_{OPR}		-20		+85	°C

■ ELECTRICAL CHARACTERISTICS ($V_{DD}=5V \pm 10\%$, $T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input voltage range	V_{CC}		2.7	5	5.5	V
V_{DD} Supply Current	I_{CC}	DI=CLK=LD=GND, $I_{AO}=0\mu\text{A}$	0	0.5	1.6	mA
		At CLK=1MHz operation, $I_{AO}=0\mu\text{A}$, D/A data: 6Ah (at maximum current)	0	0.7	2.5	
Input leakage current	I_{ILK}	$V_{IN}=0$ to V_{CC}	-10		10	μA
Input voltage L	V_{IL}		0		$0.2V_{CC}$	V
Input voltage H	V_{IH}		$0.5V_{CC}$		V_{CC}	V
Buffer amp output voltage range	V_{AO}	$I_{AO}=\pm 100\mu\text{A}$	0.1		$V_{CC}-0.1$	V
		$I_{AO}=\pm 500\mu\text{A}$	0.2		$V_{CC}-0.2$	
Buffer amp output drive range	I_{AO}	Upper saturation voltage=0.3V Lower saturation voltage=0.2V	-1.0		1.0	mA
Differential nonlinearity error	S_{DL}	$V_{CC}=5.12\text{V}$ (20mV/LSB) No load ($I_{AO}=0$)	-1.0		1.0	LSB
Nonlinearity error	S_L		-1.5		1.5	LSB
Zero point error	S_{ZERO}		-2.0		2.0	LSB
Full-scale error	S_{FULL}		-2.0		2.0	LSB

■ AC CHARACTERISTICS ($V_{DD}=5V \pm 10\%$, $T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Clock "L" pulse width	t_{CKL}		200			ns
Clock "H" pulse width	t_{CKH}		200			ns
Clock rise time	t_{CR}				200	ns
Clock fall time	t_{CF}				200	ns
D-A output setting time	t_{LDD}	Until output reaches last 1/2 LSB			300	us

■ DIGITAL DATA FORMAT

Last LSB → First MSB

D0	D1	D2	D3	D4	D5	D6	D7	D8	D9
For D-A output								For channel address	

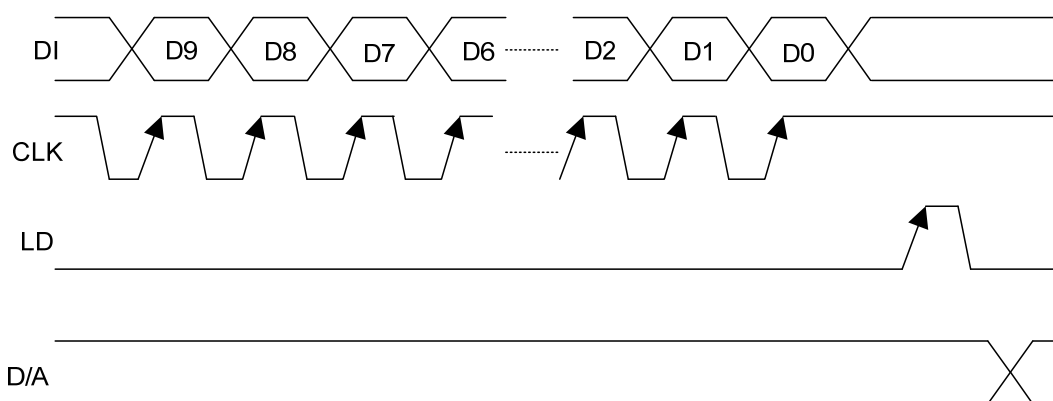
Channel Select Data

D8	D9	Channel Selection
0	0	A ₀₁ selected
1	0	A ₀₂ selected
0	1	Don't care
1	1	Don't care

DAC Data

D0	D1	D2	D3	D4	D5	D6	D7	DAC output
0	0	0	0	0	0	0	0	$V_{CC}/256 \times 1$
1	0	0	0	0	0	0	0	$V_{CC}/256 \times 2$
0	1	0	0	0	0	0	0	$V_{CC}/256 \times 3$
1	1	0	0	0	0	0	0	$V_{CC}/256 \times 4$
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.
0	1	1	1	1	1	1	1	$V_{CC}/256 \times 255$
1	1	1	1	1	1	1	1	$V_{CC}/256 \times 256$

Data Timing Chart (Model)

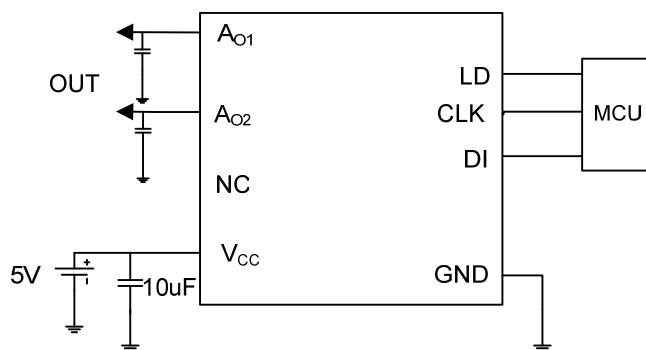


■ APPLICATION INFORMATION

1. With this IC, D/A converter upper reference voltage setting is performed by means of the power supply voltage. If ripples or spikes are imposed on this pin, conversion accuracy may fall. When using this IC, a capacitor must be inserted between the power supply pin and GND in order to ensure stable D/A conversion.

2. The output buffer amps of this IC are highly tolerant of capacitive loads. Therefore, connecting capacitors (0.1μF max.) between the output pins and ground in order to eliminate jitter or noise due to output line wiring presents no problems whatever in terms of operation.

■ APPLICATION CIRCUIT



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