

TDA5702

8-Bit Digital-to-Analog Converter

Preliminary Specification

Linear Products

DESCRIPTION

The TDA5702 is an 8-bit digital-to-analog converter (DAC) designed for video and professional applications. The TDA5702 converts the 8-bit binary-coded digital words into an analog output signal at a sampling rate of 25MHz. The design of the TDA5702 has eliminated the need for an operational amplifier, buffer and deglitching circuit at the analog output.

FEATURES

- 8-bit accuracy
- Internal input register
- TTL compatible digital signals
- Two voltage supply connections:
 - analog +5V
 - digital +5V
- Two complementary outputs (V_{OUT} , $\overline{V_{OUT}}$)
- No deglitching circuit required
- Low power consumption; typically 300mW
- 16-lead plastic DIP

APPLICATIONS

- Video data conversion
- Color/black-and-white graphics
- CRT displays
- Waveform/test signal generation

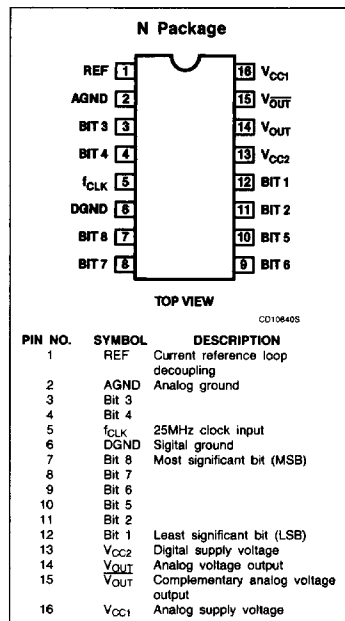
ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE
16-Pin Plastic DIP (SOT-38)	0 to +70°C	TDA5702N

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V_{CC2}	Supply voltage at Pin 13	8	V
V_{CC1}	Supply voltage at Pin 16	8	V
V_{IN}	Input voltage at Pins -3, -4, 5, 7, 8, 9, 10, 11 and 12	8	V
T_{STG}	Storage temperature range	-65 to +150	°C
T_J	Junction temperature	+125	°C
T_A	Operating ambient temperature range	0 to +70	°C

PIN CONFIGURATION

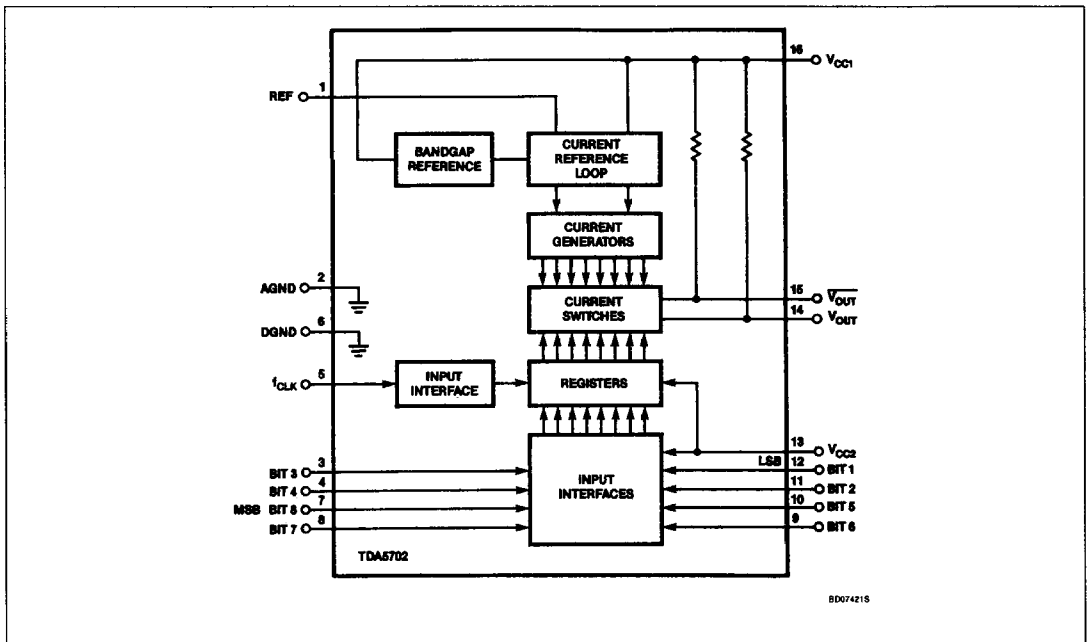


Binary = input code

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TDA5702

BLOCK DIAGRAM



8-Bit Digital-to-Analog Converter

TDA5702

DC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = 4.75$ to $5.25V$, $T_A = 0$ to $+70^\circ C$, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
Supply						
V_{CC2}	Digital supply voltage	Pin 13	4.75	5.0	5.25	V
V_{CC1}	Analog supply voltage	Pin 16	4.75	5.0	5.25	V
I_{CC2}	Digital supply current	Pin 13	25	34	43	mA
I_{CC1}	Analog supply current	Pin 16	20	27	34	mA
Res	Resolution			8	77	bits
Digital input levels						
V_{IH}	Input voltage HIGH		2.2			V
V_{IL}	Input voltage LOW				0.8	V
I_{IH}	Input current HIGH				10	μA
I_{IL}	Input current LOW		-1.5			mA
I_{iL}	Clock input current LOW		-1.0			mA
Outputs²						
V_{FS}	Full-scale voltage	with respect to V_{CC}	1.43	1.6	1.75	V
V_{ZS}	Zero offset voltage	with respect to V_{CC}		10	25	mV
	Absolute linearity	V_{14}, V_{15}	-0.5	0.1953	+0.5	LSB
	Differential linearity	V_{14}, V_{15}	-0.5		+0.5	LSB
R_{16-14}	Output resistance			75		Ω
C_1	External capacitance			100		nF

NOTES:

- See Figure 3.
- See Figure 2.
- See Figure 1.

AC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = 4.75$ to $5.25V$, $T_A = 0$ to $+70^\circ C$, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
Timing						
f_C	Maximum conversion rate		25			MHz
t_{DS}	Data turn-on delay ¹			10		ns
t_{SET1}	Transient settling time	$\frac{1}{2}$ LSB		30		ns
t_{SET2}	Transient settling time	1 LSB		20		ns
t_O	Transient output (glitch) energy				+50	LSB ns
t_{PW}	Pulse width ³		10			ns
t_{SU}	Data setup time		4			ns
t_H	Data hold time		6			ns

NOTE:

- See Figure 1.

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TDA5702

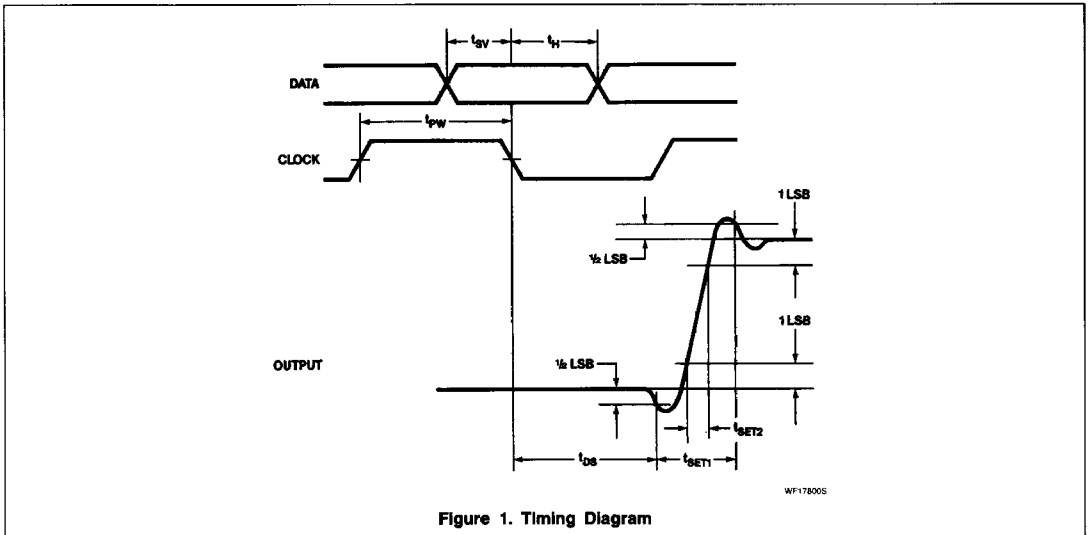


Figure 1. Timing Diagram

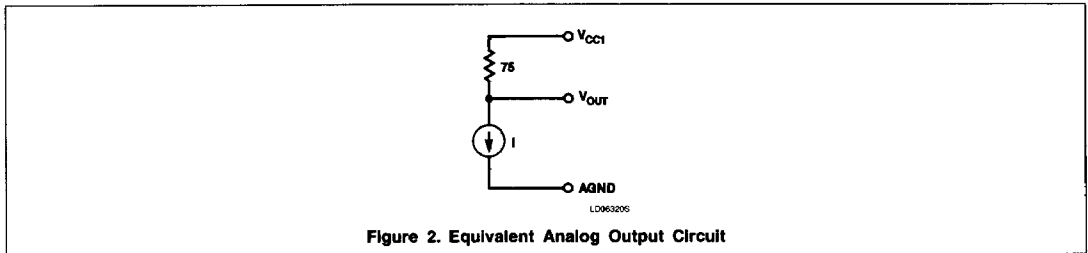


Figure 2. Equivalent Analog Output Circuit

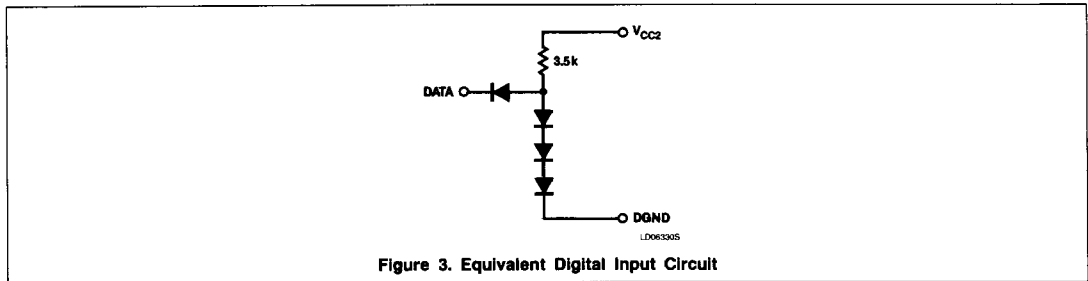


Figure 3. Equivalent Digital Input Circuit