

# 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.

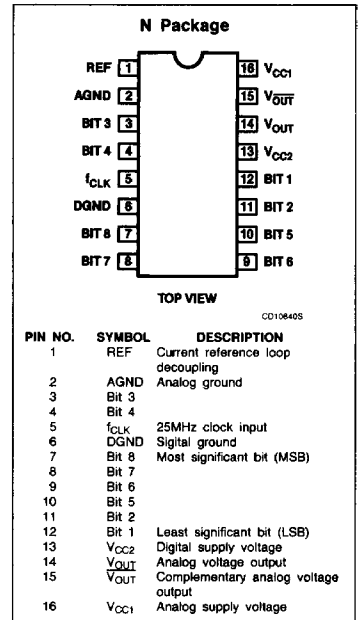
#### FEATURES

- 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

#### PIN CONFIGURATION



#### ORDERING INFORMATION

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

#### ABSOLUTE MAXIMUM RATINGS

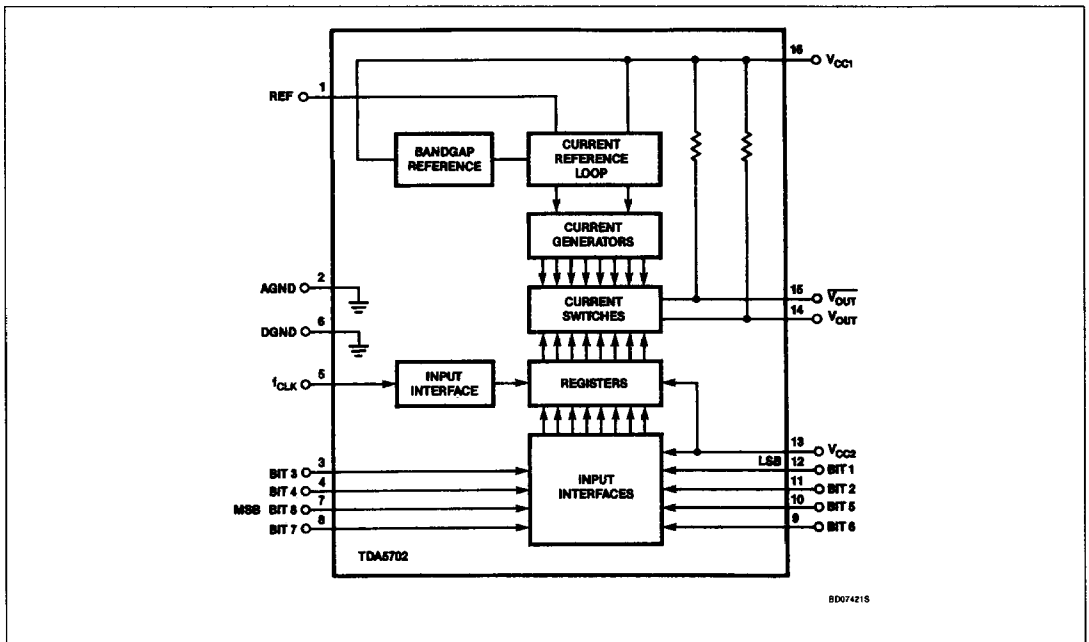
SYMBOL	PARAMETER	RATING	UNIT
V <sub>CC2</sub>	Supply voltage at Pin 13	8	V
V <sub>CC1</sub>	Supply voltage at Pin 16	8	V
V <sub>IN</sub>	Input voltage at Pins 3, 4, 5, 7, 8, 9, 10, 11 and 12	8	V
T <sub>STG</sub>	Storage temperature range	-65 to +150	°C
T <sub>J</sub>	Junction temperature	+125	°C
T <sub>A</sub>	Operating ambient temperature range	0 to +70	°C

*Binary = input code*

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## BLOCK DIAGRAM



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**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	
<b>Supply</b>						
$V_{CC2}$	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
<b>Digital input levels</b>						
$V_{IH}$	Input voltage HIGH		2.2			V
$V_{IL}$	Input voltage LOW				0.8	V
$I_{IH}$	Input current HIGH				10	$\mu A$
$I_{IL}$	Input current LOW		-1.5			mA
$I_{iL}$	Clock input current LOW		-1.0			mA
<b>Outputs<sup>2</sup></b>						
$V_{FS}$	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		$\Omega$
$C_1$	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	
<b>Timing</b>						
$f_C$	Maximum conversion rate		25			MHz
$t_{DS}$	Data turn-on delay <sup>1</sup>			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 <sup>3</sup>		10			ns
$t_{SU}$	Data setup time		4			ns
$t_H$	Data hold time		6			ns

**NOTE:**

- See Figure 1.

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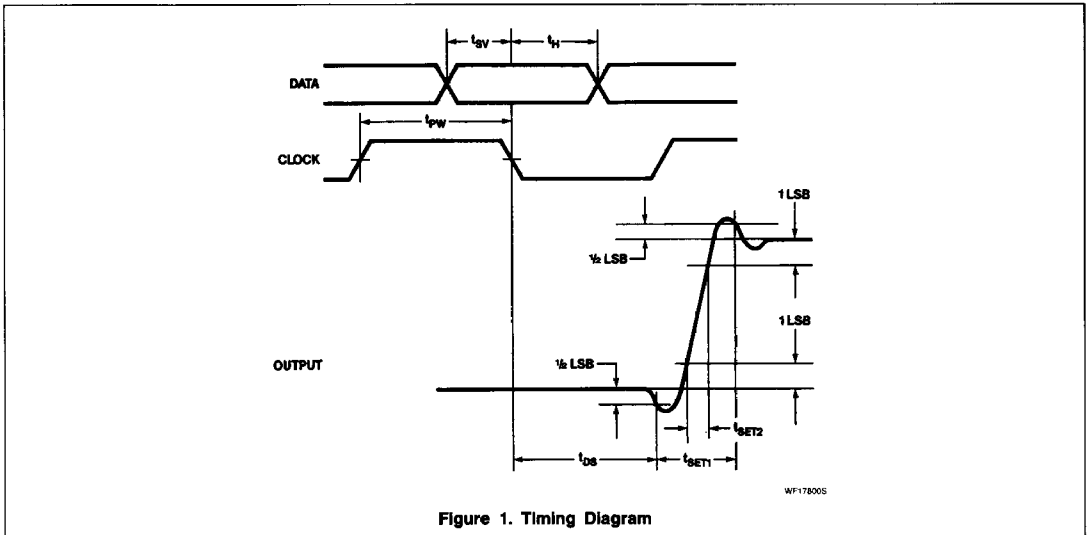


Figure 1. Timing Diagram

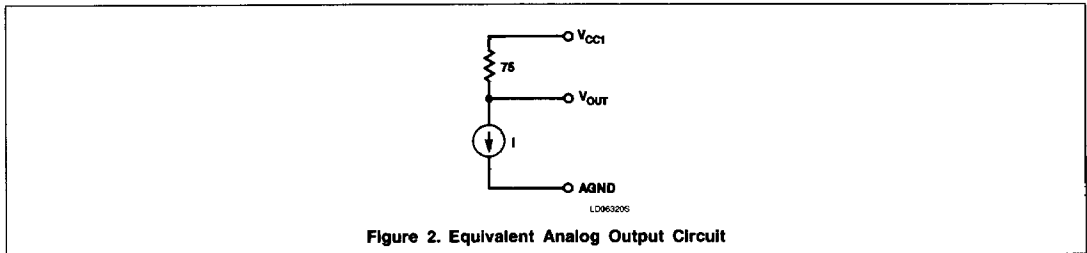


Figure 2. Equivalent Analog Output Circuit

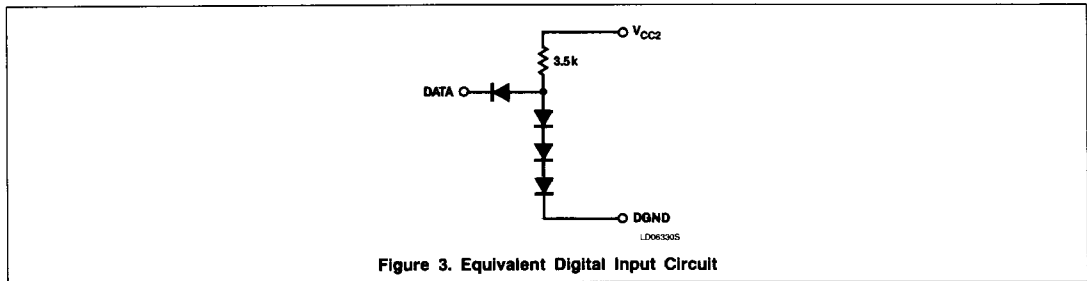


Figure 3. Equivalent Digital Input Circuit