Signetics

TDA5703
Analog-to-Digital Converter

Preliminary Specification

Linear Products

DESCRIPTION

The TDA5703 is an 8-bit analog-to-digital converter (ADC) designed for video and professional applications. The TDA5703 converts the analog input signal into 8-bit binary-coded digital words at a sampling rate of up to 25MHz.

FEATURES

- 8-bit binary coded resolution
- Digitizing rates up to 25MHz
- Internal reference
- Only 3 external capacitors required
- Two voltage supply connections:
  - analog +5V
  - digital +5V
- 1V full-scale analog input (75Ω external resistor tied to V_{CC1})
- Full-scale bandwidth; 10.5MHz at 3dB
- Low power consumption; typically 250mW
- 24-lead plastic DIP
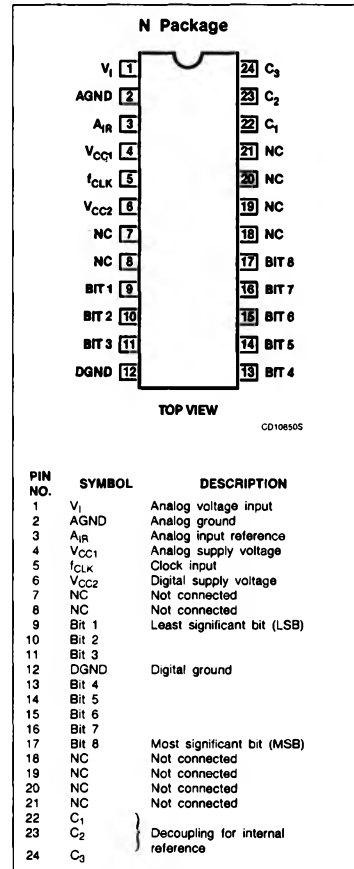
APPLICATION

- Video data conversion

PIN CONFIGURATION

N Package

PIN NO.	SYMBOL	DESCRIPTION
1	V_I	Analog voltage input
2	AGND	Analog ground
3	A_{IR}	Analog input reference
4	V_{CC1}	Analog supply voltage
5	f_{CLK}	Clock input
6	V_{CC2}	Digital supply voltage
7	NC	Not connected
8	NC	Not connected
9	Bit 1	Least significant bit (LSB)
10	Bit 2	
11	Bit 3	
12	DGND	Digital ground
13	Bit 4	
14	Bit 5	
15	Bit 6	
16	Bit 7	
17	Bit 8	Most significant bit (MSB)
18	NC	Not connected
19	NC	Not connected
20	NC	Not connected
21	NC	Not connected
22	C_1	
23	C_2	Decoupling for internal reference
24	C_3	

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE
24-Pin Plastic DIP (SOT-101 BE17)	0 to +70°C	TDA5703N

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V_{CC1} V_{CC2}	Supply voltages at Pin 4 at Pin 6	8 8	V V
V_{IN}	Input voltage at Pins 1 and 5	8	V
I_{OUT} I_O	Output current at Pins 9, 10, 11, 13, 14, 15, 16 and 17	10	mA
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

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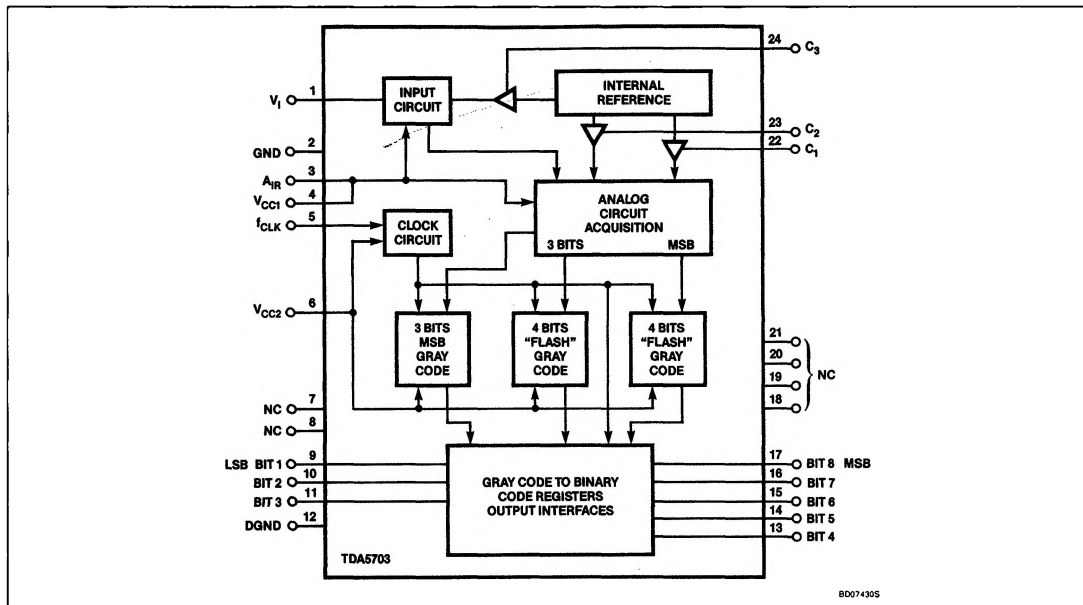
BLOCK DIAGRAM

Analog-to-Digital Converter   TDA5703

DC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = 4.75$ to 5.25V; $T_A = 25°C$, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
Supply						
V_{CC1}	Analog supply voltage	Pin 4	4.75	5.0	5.25	V
V_{CC2}	Digital supply voltage	Pin 6	4.75	5.0	5.25	V
I_{CC1}	Analog supply current	Pin 4		60		mA
I_{CC2}	Digital supply current	Pin 6		110		mA
Res	Resolution			8		bits
Digital input levels[1]						
V_{IH}	Input voltage HIGH		2.2			V
V_{IL}	Input voltage LOW				0.8	V
I_{IH}	Input current HIGH				70	μA
I_{IL}	Input current LOW		−7	−.35		A
	Analog input levels					
	Absolute linearity	V_1	−1.0		+1.0	LSB
	Differential linearity	V_1	−0.5		+0.5	LSB
BW	Bandwidth	1dB 3dB	6.0	6.0 10		mHz mHz
	Differential phase Differential gain	$F_0 = 25$MHz, measured with TDA5702		1 2.5		°C %
	Offset error			17		mV
R_{IN}	Input resistance			80		kΩ
C_{IN}	Input capacitance			5.5		pF
Digital output levels ($I_O = 10$mA)						
V_{OH}	Output voltage HIGH		2.4			V
V_{OL}	Output voltage LOW				0.45 0.40	V
C_O	External capacitance	C_1, C_2, C_3		100		nF
Temperature						
T_A	Operating ambient temperature range		0		+70	°C

AC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = 4.75$ to 5.25V; $T_A = 25°C$, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
Timing						
f_C	Maximum conversion rate		25			MHz
t_{DELAY}	Aperture delay[1]			19		ns
t_D	Digital output delay[1]			24		ns
t_{PWH}	Pulse width conversion HIGH[1]		20			ns
t_{PWL}	Pulse width conversion LOW[1]		20			ns

NOTE:
1. See Timing Diagram, Figure 1

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Figure 1. Timing Diagram