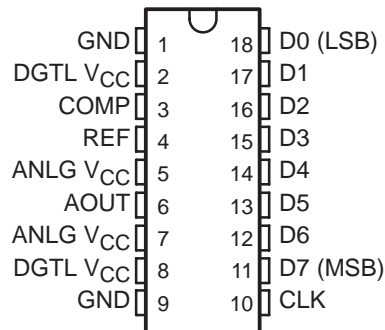


TL5602 8-BIT DIGITAL-TO-ANALOG CONVERTER

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- **8-Bit Resolution**
- **±0.2% Linearity**
- **Maximum Conversion Rate . . . 30 MHz Typ
20 MHz Min**
- **Analog Output Voltage Range
V_{CC} to V_{CC} – 1 V**
- **TTL Digital Input Voltage**
- **5-V Single-Supply Operation**
- **Low Power Consumption . . . 250 mW Typ**
- **Interchangeable With Fujitsu MB40778**

**N PACKAGE
(TOP VIEW)**

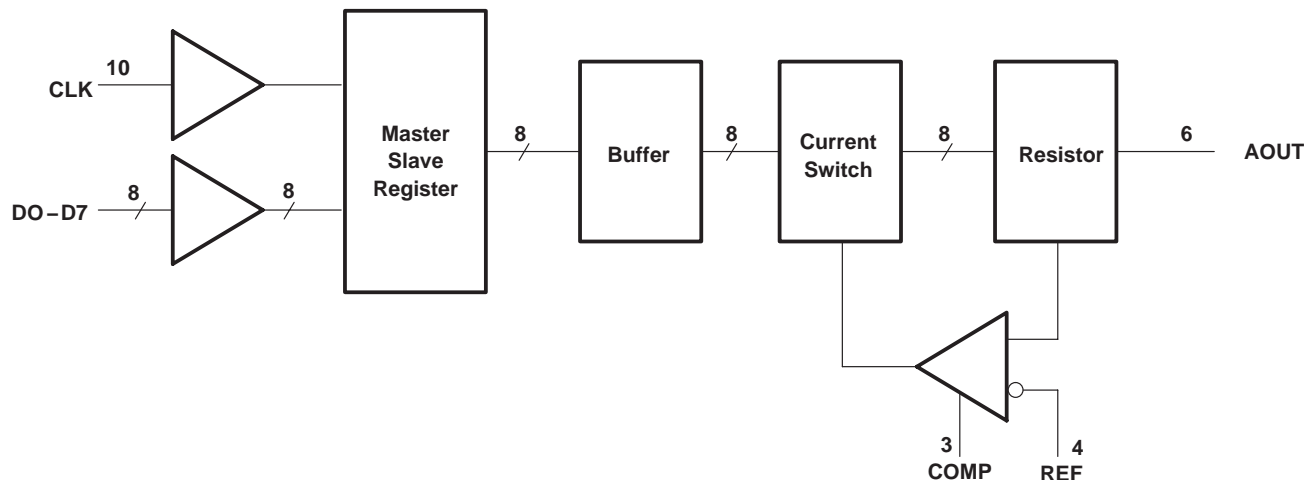


description

The TL5602 is a low-power ultra-high-speed video digital-to-analog converter that uses the Advanced Low-Power Schottky (ALS) process. It converts digital signals to analog signals at a sampling rate of dc to 20 MHz. Because of such high-speed capability, the TL5602 is suitable for digital video applications such as digital television, video processing with a computer, and radar signal processing.

The TL5602C is characterized for operation from 0°C to 70°C.

functional block diagram



PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



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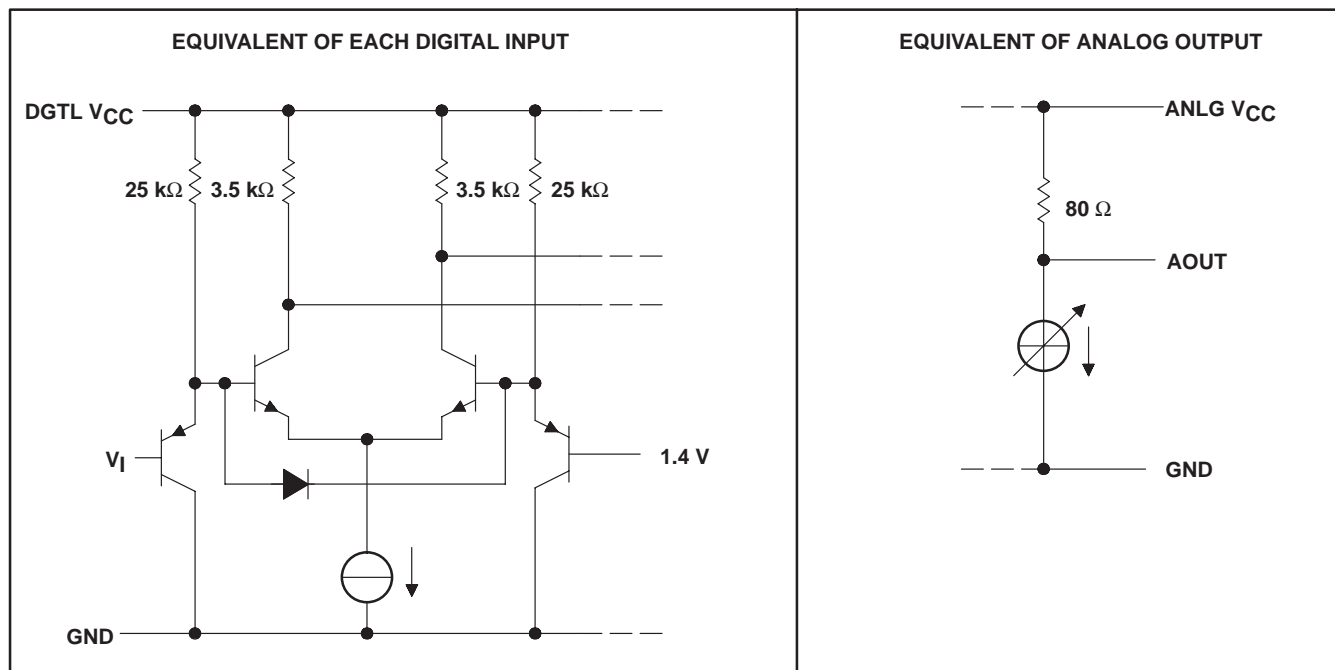
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FUNCTION TABLE

STEP	DIGITAL INPUTS								OUTPUT VOLTAGE†
	D7	D6	D5	D4	D3	D2	D1	D0	
0	L	L	L	L	L	L	L	L	3.980 V
1	L	L	L	L	L	L	L	L	3.984 V
127	L	H	H	H	H	H	H	H	4.488 V
128	H	L	L	L	L	L	L	L	4.492 V
129	H	L	L	L	L	L	L	H	4.496 V
254	H	H	H	H	H	H	H	L	4.996 V
255	H	H	H	H	H	H	H	H	5.000 V

† For $V_{CC} = 5\text{ V}$, $V_{ref} = 3.976\text{ V}$

schematics of equivalent input and output circuits



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage range, ANALG V_{CC} , DGTL V_{CC}	-0.5 V to 7 V
Digital input voltage range, V_I	-0.5 V to 7 V
Analog reference voltage range, V_{ref}	3.8 V to $V_{CC} + 0.5\text{ V}$
Operating free-air temperature range	0°C to 70°C
Storage temperature range	-55°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C



TL5602

8-BIT DIGITAL-TO-ANALOG CONVERTER

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recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
Analog reference voltage, V_{ref} (see Note 1)	3.8	4	4.2	V
High-level input voltage, V_{IH}	2			V
Low-level input voltage, V_{IL}			0.8	V
Pulse duration, CLK high or low, t_w	25			ns
Setup time, data before $CLK\uparrow$, t_{su}	12.5			ns
Hold time, data after $CLK\downarrow$, t_h	12.5			ns
Phase compensation capacitance, C_{comp} (see Note 2)	1			μF
Operating free-air temperature, T_A	0		70	$^{\circ}C$

- NOTES: 1. $V_{CC} - V_{ref} \leq 1.2$ V
 2. This capacitor should be connected between COMP and GND.

electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP†	MAX	UNIT
I_I	Input current at maximum input voltage	$V_{CC} = 5.25$ V, $V_I = 7$ V		0	100	μA
I_{IH}	High-level input current	$V_{CC} = 5.25$ V, $V_I = 2.7$ V		0	20	μA
I_{IL}	Low-level input current	$V_{CC} = 5.25$ V, $V_I = 0.4$ V		-40	-400	μA
I_{ref}	Input reference current	$V_{Iref} = 4$ V			10	μA
V_{FS}	Full-scale analog output voltage	$V_{CC} = 5$ V, $V_{ref} = 3.976$ V,	$V_{CC}-15$	V_{CC}	$V_{CC}+15$	mV
V_{ZS}	Zero-scale analog output voltage	$I_O = 0$ (no load)	3.919	3.980	4.042	
z_o	Output impedance	$T_A = 25^{\circ}C$	70	80	90	Ω
I_{CC}	Supply current	$V_{ref} = 4.05$ V		50	75	mA

† All typical values are at $V_{CC} = 5$ V, $V_{ref} = 4$ V, $T_A = 25^{\circ}C$.

operating characteristics over recommended ranges of supply voltage and operating free-air temperature

PARAMETER		TEST CONDITIONS	MIN	TYP†	MAX	UNIT
E_L	Linearity error				± 0.2	%FSR
f_{max}	Maximum conversion rate		20	30		MHz



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PARAMETER MEASUREMENT INFORMATION

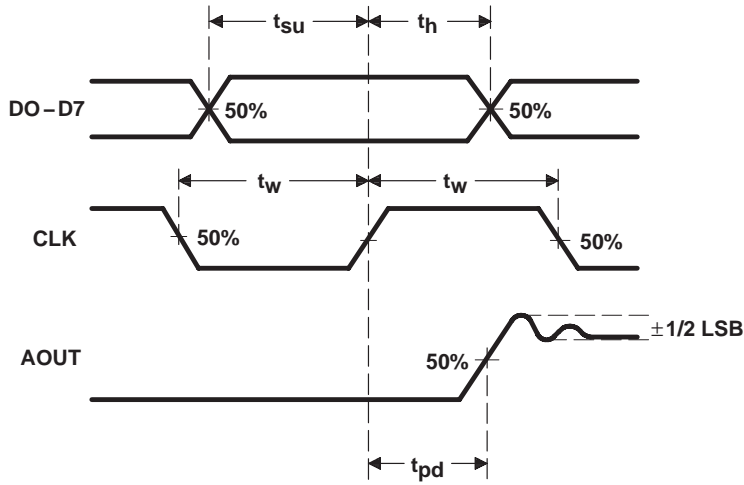


Figure 1. Voltage Waveforms

TYPICAL CHARACTERISTICS

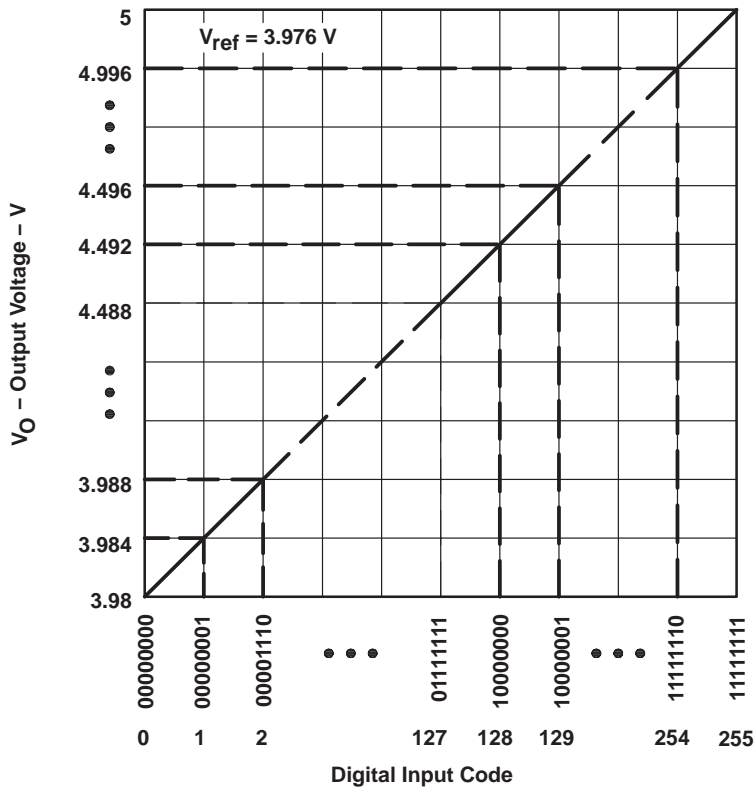


Figure 2. Ideal Conversion Characteristics



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TYPICAL CHARACTERISTICS

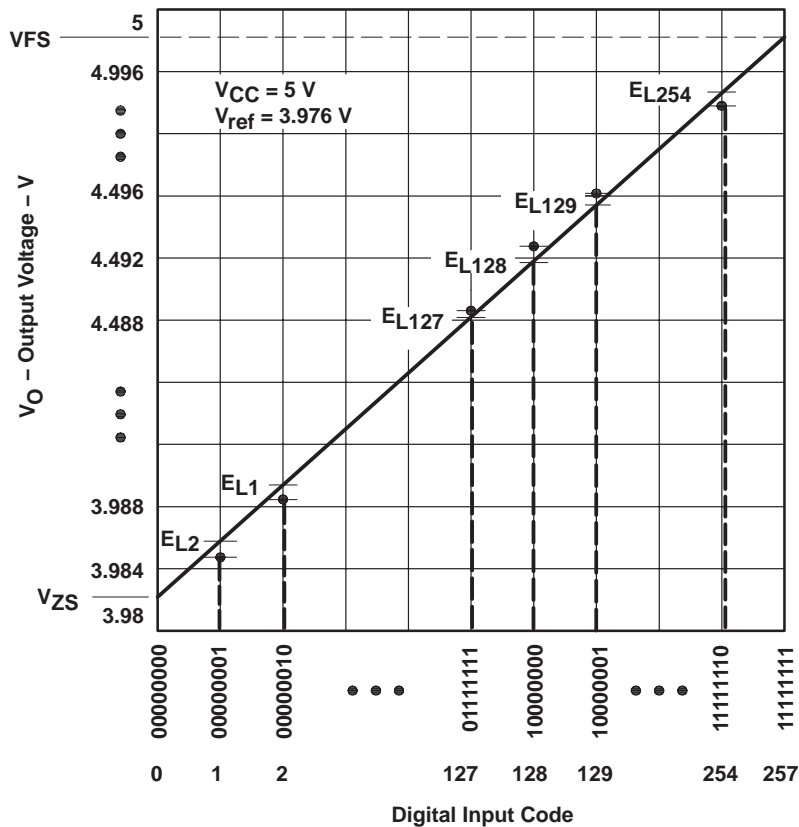


Figure 3. End-Point Linearity Error

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