HA19508A/AMP

6-Bit D/A Converter

HITACHI

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Description

The HA19508A/AMP consists of high-speed, low-power 6-bit D/A converters. The digital and clocks inputs of these monolithic bipolar LSIs are TTL/CMOS compatible.

These devices are suitable for high-speed video processing.

Features

- High-precision 6-bit D/A conversion
- Single power supply: +5 V
- TTL/CMOS compatible clock and digital inputs.

Applications

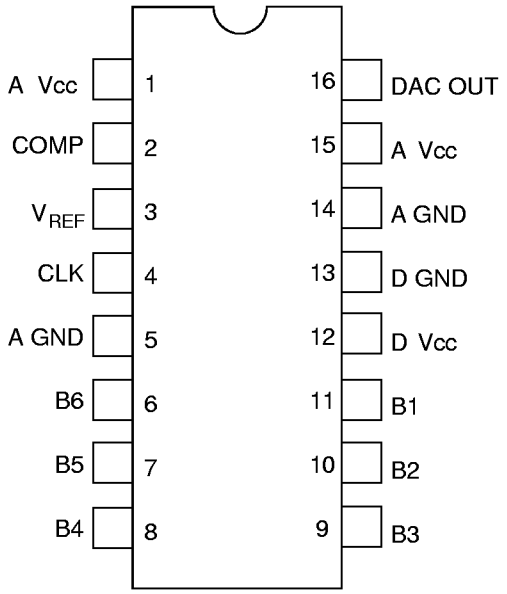
- Secondary storage devices, etc.

Ordering Information

Type No.	Package
HA19508A	300mil 16-pin plastic DIP (DP-16C)
HA19508AMP	18-pin plastic QFI (MP-18)

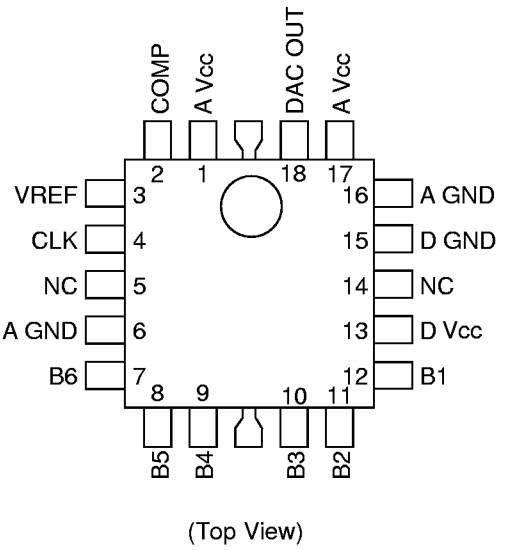
Pin Arrangement

• HA19508A



(Top View)

• HA19508AMP

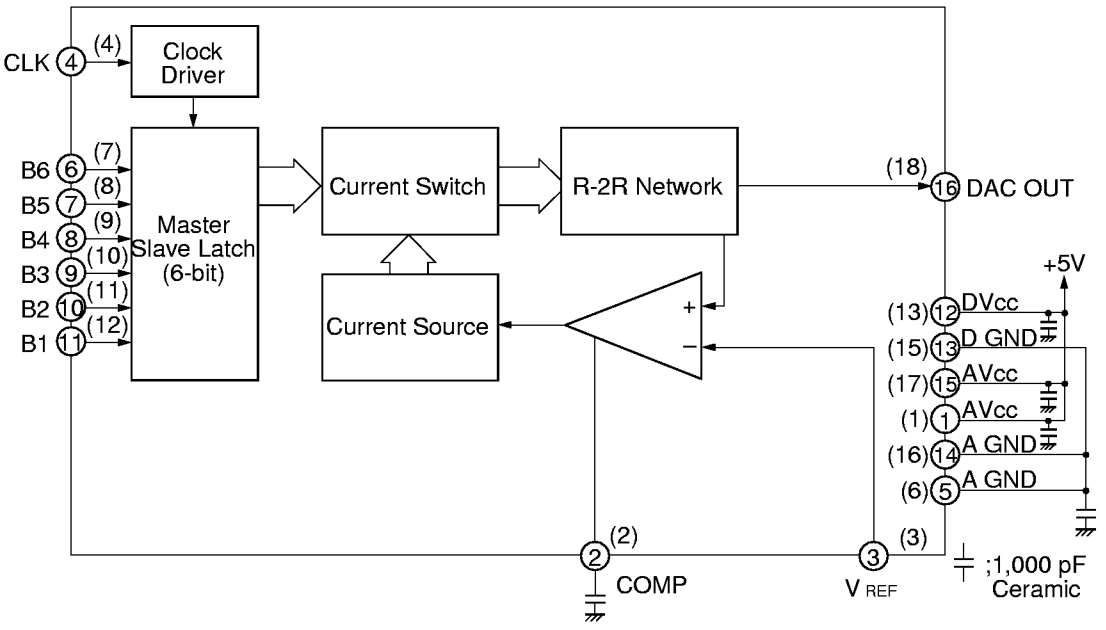


(Top View)

Pin Descriptions

Pin No.			
HA19508A	**HA19508AMP**	**Symbol**	**Function**
1	1	A V_{CC}	Analog power supply (+5 V)
2	2	COMP	Op amp phase compensation
3	3	V_{REF}	Reference voltage input
4	4	CLK	Clock input
5	6	AGND	Analog ground
6	7	B6	Digital input (MSB)
7	8	B5	Digital input
8	9	B4	Digital input
9	10	B3	Digital input
10	11	B2	Digital input
11	12	B1	Digital input (LSB)
12	13	D V_{CC}	Digital power supply (+5 V)
13	15	DGND	Digital ground
14	16	AGND	Analog ground
15	17	A V_{CC}	Analog power supply (+5 V)
16	18	DACOUT	DAC output

Block Diagram



Note: Pin numbers in parentheses are for the HA19508AMP.

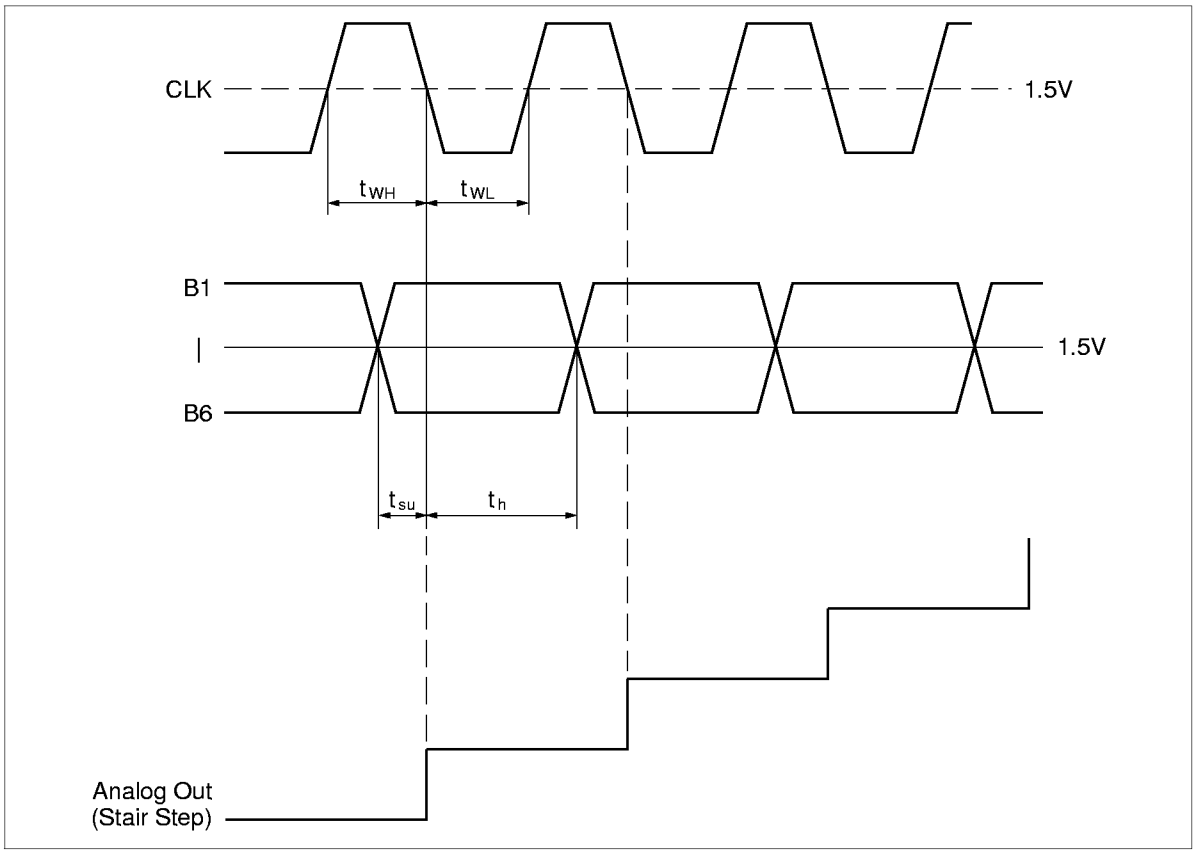
Absolute Maximum Ratings (Ta = 25°C, unless otherwise specified)

Item	Symbol	Rating	Unit
Power supply voltage	V_{CC}	+7.0	V
Digital input voltage	V_I	0 to V_{CC}	V
Power dissipation	P_T	500	mW
Operating temperature	Topr	0 to +70	°C
Storage temperature	Tstg	–55 to +125	°C

Electrical Characteristics (V_{CC} = 5.0 V, Ta = 25°C, V_{REF} = 4.0 V, unless otherwise specified)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Power supply voltage		V_{CC}	4.75	5.0	5.25	V	
Analog reference voltage		V_{REF}	3.8	4.0	—	V	
Power supply current		I_{CC}	—	26	36	mA	
Conversion rate		f_{CLK}	20	—	—	MHz	
Clock pulsewidth H-level		t_{WH}	25	—	—	ns	f_{CLK} = 20 MHz
Clock pulsewidth L-level		t_{WL}	25	—	—	ns	f_{CLK} = 20 MHz
Data setup time		t_{su}	12.5	—	—	ns	f_{CLK} = 20 MHz
Data hold time		t_h	12.5	—	—	ns	f_{CLK} = 20 MHz
Digital input voltage high		V_{IH}	2.0	—	V_{CC}	V	
Digital input voltage low		V_{IL}	0	—	0.8	V	
Digital input current high		I_{IH}	–30	–5	20	µA	V_{IH} = 2.7 V
Digital input current low		I_{IL}	–120	–50	5	µA	V_{IL} = 0.4 V
DAC output	Full scale	V_{FS}	V_{CC} – 15 m	V_{CC}	V_{CC} + 15 m	V	
	Zero scale	V_{ZS}	3.956	4.016	4.076	V	
Reference input current		I_{REF}	–20	0.5	20	µA	
Output impedance		Zout	63	80	100	Ω	
Linearity error		LE	–0.5	—	0.5	LSB	

Timing Chart



Output Code Table

B6	B5	B4	B3	B2	B1	Aout (V)
0	0	0	0	0	0	V_{ZS}
0	0	0	0	0	1	V_{ZS} + 1 LSB
1	1	1	1	1	0	V_{FS} – 1 LSB
1	1	1	1	1	1	V_{FS}

Note: 1 LSB = $(V_{FS} - V_{ZS})/63$

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