
HD49307

Three-Channel 8-bit D/A Converter

HITACHI

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Description

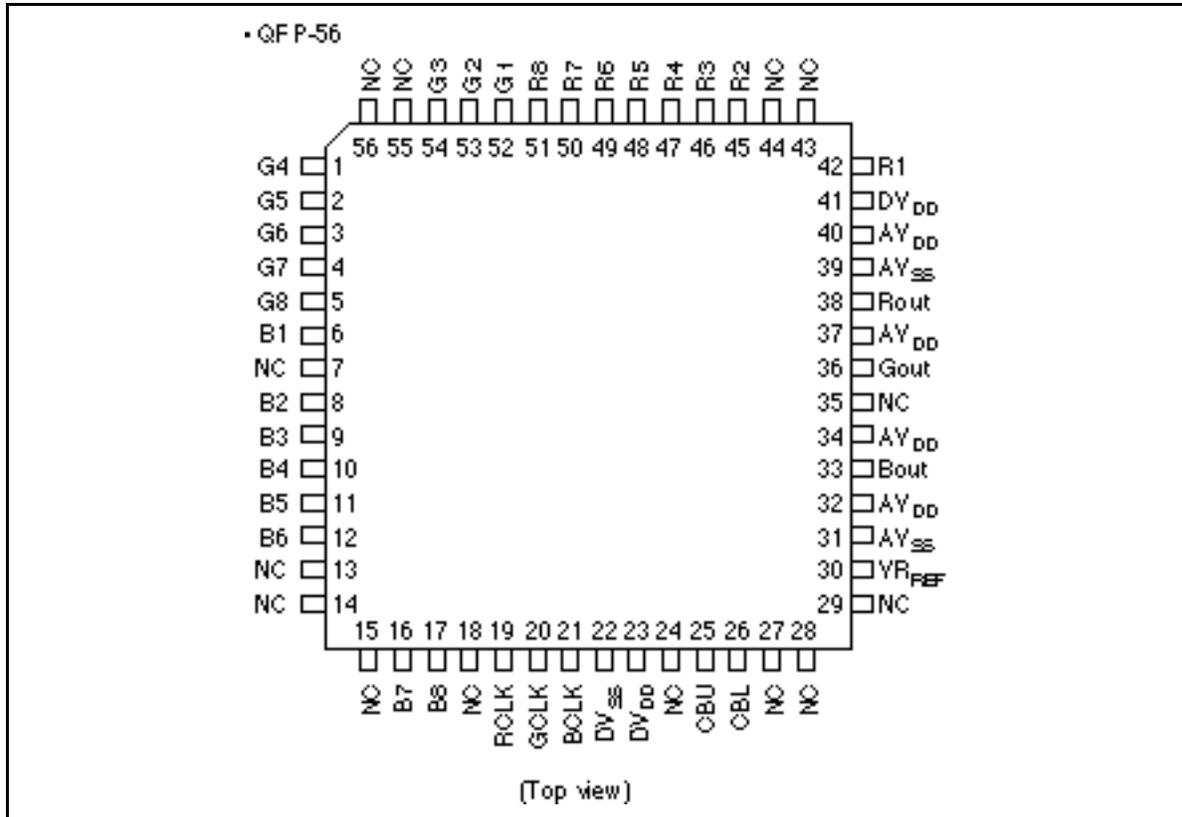
The HD49307 is a high-speed, low-power 8-bit D/A converter monolithic CMOS LSI which has three channels of clock and RGB data inputs. It is appropriate for applications which require three channel systems, such as digital TV and graphical displays.

Functions

- Resolution: 8 bits
- Linearity error: $\pm 0.2\%$
- Current output type: $13.3 \text{ mA} \times 3 \text{ channels}$
- Maximum conversion rate: 30 MHz (Min)
- Analogue output voltage range: V_{DD} to $V_{DD} - 1 \text{ V}$
- Digital input voltage: TTL and CMOS level
- Power supply voltage: +5.0 V single
- Power consumption: 300 mW (Typ)

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Pin Arrangement



Pin Functions

Pin No.	Symbol	Function
42, 45 to 51	R1 to R8	R channel digital signal input: R1 = MSB, R8 = LSB
52 to 54, 1 to 5	G1 to G8	G channel digital signal input: G1 = MSB, G8 = LSB
6, 8 to 12, 16, 17	B1 to B8	B channel digital signal input: B1 = MSB, B8 = LSB
38	Rout	R channel analog signal output
36	Gout	G channel analog signal output
33	Bout	B channel analog signal output
19	RCLK	R channel clock input
20	GCLK	G channel clock input
21	BCLK	B channel clock input
26	CBL	Bypass capacitor pin
25	CBU	Phase compensation capacitance pin
23, 41	DV _{DD}	Digital power supply
31, 39	AV _{SS}	Analog ground
32, 34, 37, 40	AV _{DD}	Analog power supply
22	DV _{SS}	Digital ground
30	V _{RREF}	Reference voltage input pin
7, 13 to 15, 18, 24, 27 to 29 35, 43, 44, 55, 56	NC	No connections* ¹

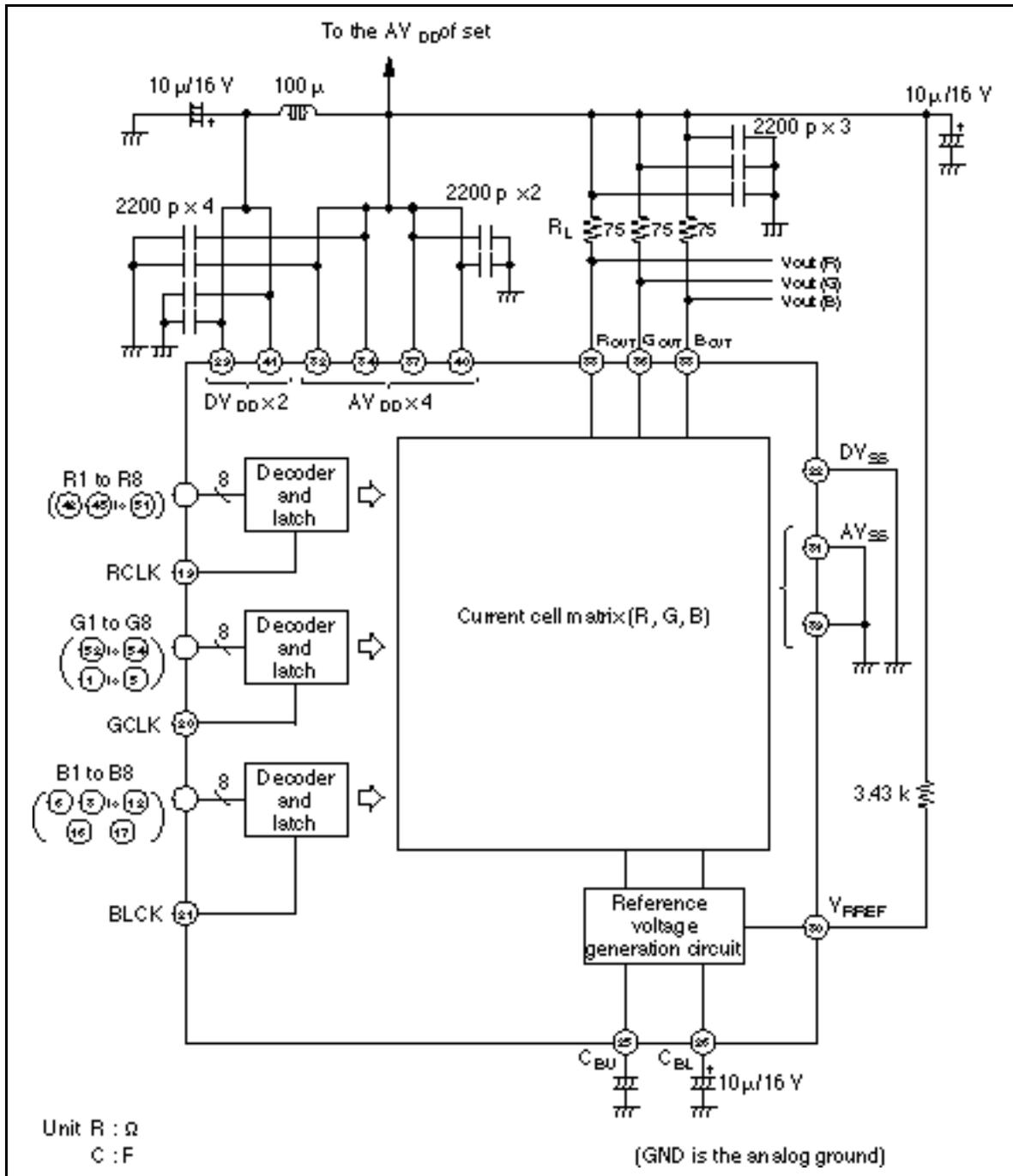
Note: 1. Do not connect anything to the NC pins.

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Output Function Table ($V_{DD} = 5\text{ V}$, $R_L = 75\ \Omega$, $R_{EX} = 3.43\text{ k}\Omega$)

Step	B1 (MSB)	B2	B3	B4	B5	B6	B7	B8 (LSB)	Vout (V)
0	0	0	0	0	0	0	0	0	4.000
1	0	0	0	0	0	0	0	1	4.004
.
.
.
127	0	1	1	1	1	1	1	1	4.498
128	1	0	0	0	0	0	0	0	4.502
129	1	0	0	0	0	0	0	1	4.506
.
.
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254	1	1	1	1	1	1	1	0	4.996
255	1	1	1	1	1	1	1	1	5.000

Block Diagram



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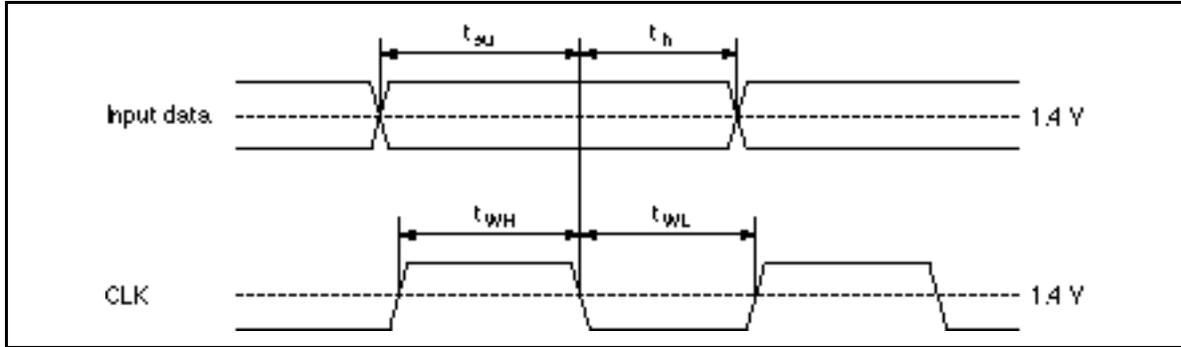
Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rated value	Unit
Power supply voltage	V _{DD}	+6.0	V
Digital input voltage	V _{IN}	-0.3 to V _{DD} + 0.3	V
Allowable dissipation	P _T	600	mW
Operating temperature	Topr	0 to +70	°C
Storage temperature	Tstg	-55 to +125	°C

Electrical Characteristics (Ta = 25°C, V_{DD} = 5.0 V, R_L = 75 Ω, R_{EX} = 3.43 kΩ)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Resolution		8	8	8	bits	
Maximum conversion speed	f _{CLK (Max)}	30	—	—	MHz	
Minimum conversion speed	f _{CLK (Min)}	—	—	0.5	MHz	
Linearity error	LE	-0.2	—	0.2	LSB	
High level clock pulse width	t _{WH}	15	—	—	ns	
Low level clock pulse width	t _{WL}	15	—	—	ns	
Data setup time	t _{SU}	15	—	—	ns	
Data hold time	t _H	15	—	—	ns	
Power supply voltage	V _{DD}	4.75	5.00	5.25	V	
Current dissipation	I _{DD}	—	60	70	mA	f _{CLK} = 30 MHz
Digital input voltage	V _{IH}	2	—	V _{DD}	V	
	V _{IL}	0	—	0.8	V	
Analog output voltage	Full scale	V _{A (Full)}	4.99	5.00	5.01	V
	Zero scale	V _{A (Zero)}	3.95	4.00	4.05	V

Timing Chart



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HITACHI

Hitachi, Ltd.

Semiconductor & IC Div.
Nippon Bldg, 2-6-2, Ohite-machi, Chiyoda-ku, Tokyo 100, Japan
Tel: Tokyo (03) 3270-2111
Fax: (03) 3270-5109

For further information write to:

Hitachi America, Ltd.
Semiconductor & IC Div.
2000 Sierra Point Parkway
Brisbane, CA. 94005-4935
U.S.A.
Tel: 415-589-8900
Fax: 415-589-4207

Hitachi Europe GmbH
Electronic Components Group
Continental Europe
Dannebergstrasse 3
D-85622 Feldkirchen
München
Tel: 089-9 29 30-0
Fax: 089-9 29 30-00

Hitachi Europe Ltd.
Electronic Components Div.
Northern Europe Headquarters
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YX
United Kingdom
Tel: 0628-585000
Fax: 0628-778322

Hitachi Asia Pte. Ltd.
15 Collyer Quay #20-00
Hitachi Tower
Singapore 0404
Tel: 535-2100
Fax: 535-1533

Hitachi Asia (Hong Kong) Ltd.
Unit 705, North Tower,
World Finance Centre
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon
Hong Kong
Tel: 27359218
Fax: 27306074