

HA19503ANT

T-SI-10-07

6-Bit D/A Converter with Clock Generation Circuit

The HA19503ANT is a high-speed, low-power 6-bit D/A converter with a built-in clock generator. Its digital inputs and clock outputs of this monolithic bipolar LSI are fully TTL compatible.

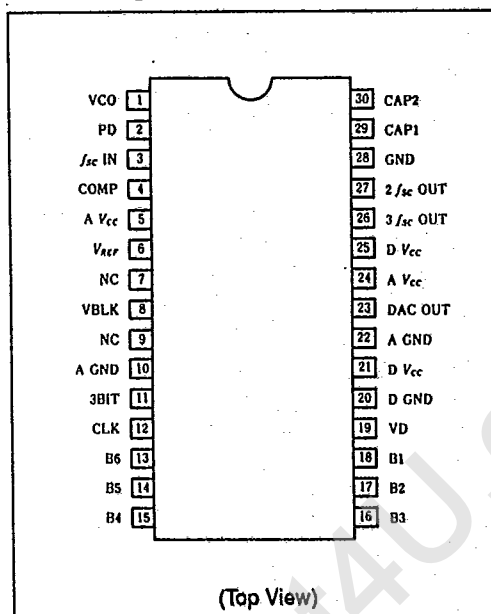
Features

- $3 \times f_{sc}$ VCO circuit can be synchronized with an external f_{sc} input
- $2 \times f_{sc}$ and $3 \times f_{sc}$ clocks are available for peripheral circuits
- High-precision 6-bit D/A conversion
- Single supply operation: 5V
- Clock outputs and digital inputs are TTL compatible

Applications

- Secondary storage devices, etc.

Pin Arrangement



Ordering Information

Type No.	Package
HA19503ANT	DP-30S



HA19503ANT

T-51-10-07

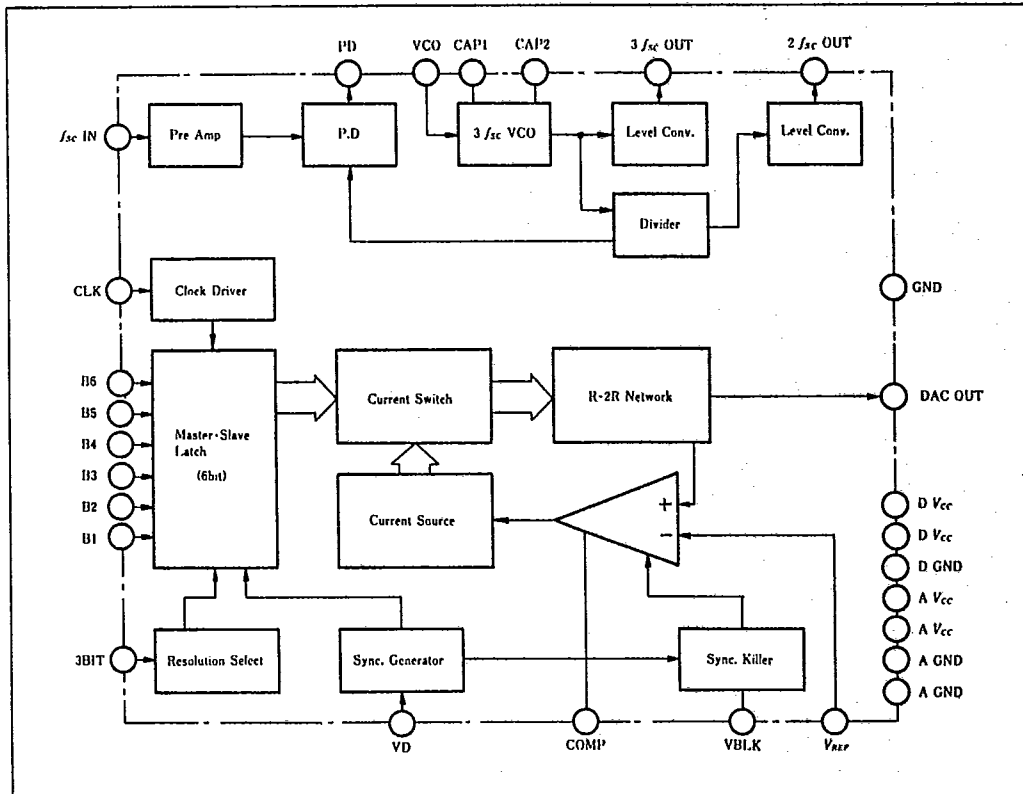
Pin Descriptions

Pin	Symbol	Function
1	VCO	$3 \times f_{sc}$ VCO frequency control input
2	PD	f_{sc} phase detector output
3	$f_{sc}IN$	Subcarrier (f_{sc}) input
4	COMP	OP AMP phase compensation
5	AVcc	Analog power supply (+5V)
6	VREF	Reference voltage input
7	NC	No connected
8	VBLK	Block synchronizing signal input
9	NC	No connected
10	AGND	Analog ground
11	3BIT	DAC resolution 3-bit/6-bit select
12	CLK	DAC clock input
13	B6	DAC digital input (MSB)
14	B5	DAC digital input
15	B4	DAC digital input
16	B3	DAC digital input
17	B2	DAC digital input
18	B1	DAC digital input (LSB)
19	VD	Add synchronizing signal input
20	DGND	Digital ground
21	DVcc	Digital power supply (+5V)
22	AGND	Analog ground
23	DACOUT	DAC output
24	AVcc	Analog power supply (+5V)
25	DVcc	Digital power supply (+5V)
26	$3 \times f_{sc} OUT$	$3 \times f_{sc}$ signal output
27	$2 \times f_{sc} OUT$	$2 \times f_{sc}$ signal output
28	GND	Ground
29	CAP1	$3 \times f_{sc}$ VCO capacitor
30	CAP2	$3 \times f_{sc}$ VCO capacitor



Block Diagram

T-51-10-07



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

Parameter	Symbol	Rating	Unit
Power supply voltage	Vcc	+7.0	V
Input signal voltage	VIN	0 to Vcc	V
Digital input voltage	Vi	0 to Vcc	V
Power dissipation	Pr	600	mW
Operating temperature	Topr	0 to +70	°C
Storage temperature	Tstg	-55 to +125	°C



HA19503ANT

T-51-10-07

Electrical Characteristics (Ta = 25°C, VCC = 5.0V)

• VCO Block

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Pin 3 input voltage	V _{in 3}	100	—	—	mV	Input voltage level required by the PLL
Pin 3 impedance	Z _{in 3}	—	10	—	kΩ	
Digital output voltage "H"	V _{OH}	3.2	3.5	—	V	I _{OH} = -0.4mA
Digital output voltage "L"	V _{OL}	—	0.3	0.55	V	I _{OL} = 2mA
Duty cycle, pin 26	DTY 26	—	50	—	%	
Duty cycle, pin 27	DTY 27	—	67	—	%	
VCO free run frequency	f _o	—	10.7	—	MHz	No input on pin 3
Lead-in range (top)	+Δf _o	—	+500	—	kHz	
Lead-in range (bottom)	-Δf _o	—	-500	—	kHz	

• DAC Block

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Resolution		—	6	—	bit	
Digital input voltage H-level	V _{IH}	2.0	—	V _{CC}	V	
Digital input voltage L-level	V _{IL}	0	—	0.8	V	
Digital input current H-level	I _{IH}	-0.4	—	0.4	mA	V _{IH} = 2.7V
Digital input current L-level	I _{IL}	-0.8	—	0.4	mA	V _{IL} = 0.4V
DAC output voltage	Full scale Zero scale	V _{FS 23} V _{ZS 23}	— 4.015	V _{CC} —	V	
DAC output impedance	Z _{o 23}	—	80	—	Ω	
Pin 6 reference voltage	V _{REF}	—	4.0	—	V	
Pin 6 input impedance	Z _{in 6}	—	100	—	kΩ	
Conversion rate	f _{SPL}	12	20	—	MSPS	

