

# AN6869

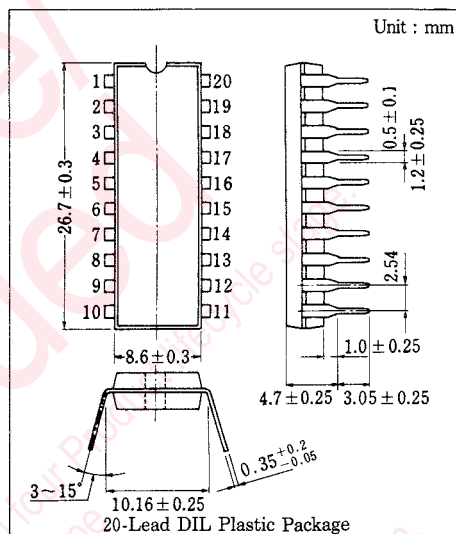
## High Speed 10-bit DA Converter

### ■ Outline

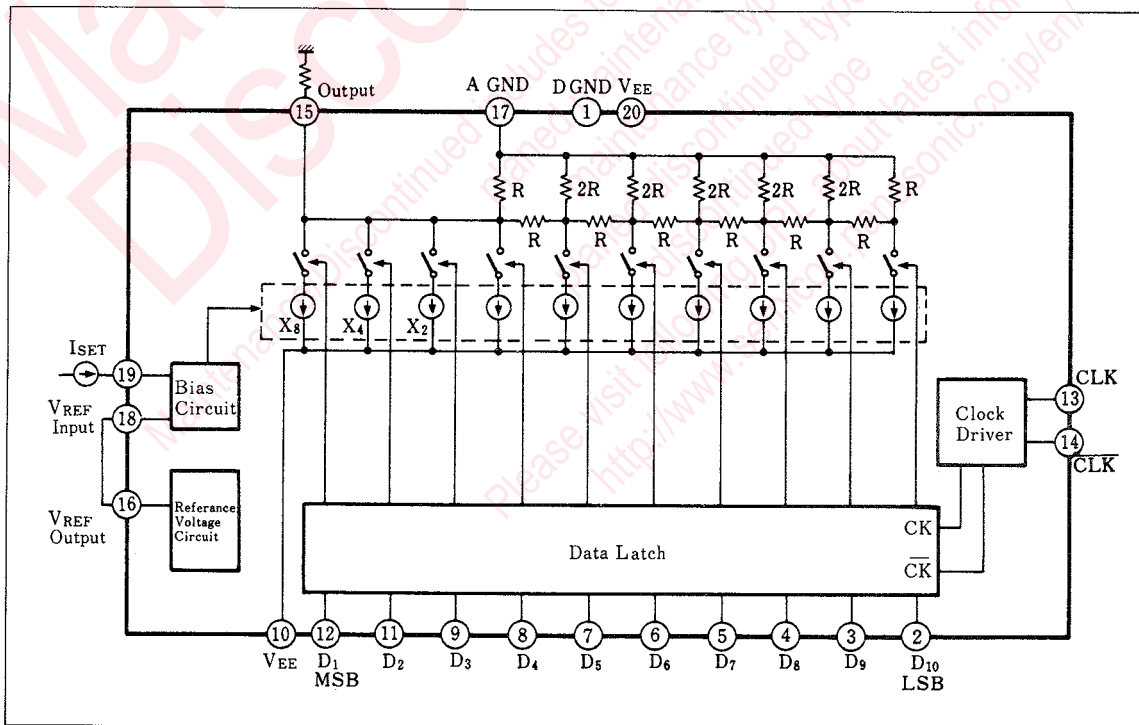
The AN6869 is a D/A-converting parallel 10-bit monolithic bipolar IC. It is suitable for D/A conversion of up to a video signal band.

### ■ Features

- 10-bit resolution
- High speed : maximum conversion speed 35MSPS
- Low power dissipation : 260mW (typ.)
- Digital inputs ECL compatible
- Fullscale output voltage :  $1.0V_{P-P}$  (typ.)



### ■ Block Diagram



### ■ Quick Reference Data ( $V_{EE} = -5.2V$ , $T_a = 0 \sim 70^\circ C$ )

Item	Symbol	Condition	Value	Unit
Resolution	RES		10	bit
Linearity error	LE		1	LSB
Max. conversion speed	$f_{MSPS(max.)}$		35	MSPS

### ■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	Digital GND	11	2nd bit
2	10th bit (LSB)	12	1st bit (MSB)
3	9th bit	13	Clock Input (Positive)
4	8th bit	14	Clock Input (Negative)
5	7th bit	15	Analog Output
6	6th bit	16	Reference Voltage
7	5th bit	17	Analog GND
8	4th bit	18	Buffer Amp. Input
9	3rd bit	19	Reference Current
10	$V_{EE}$	20	$V_{EE}$

### ■ Absolute Maximum Ratings ( $T_a = 25^\circ C$ )

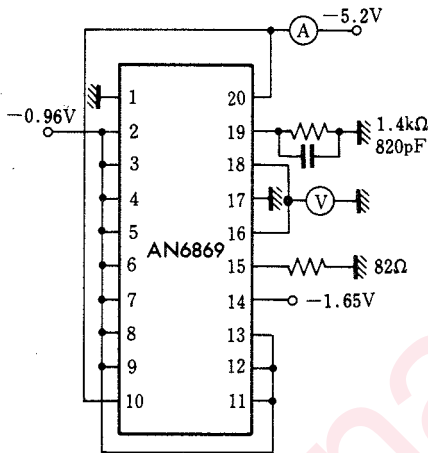
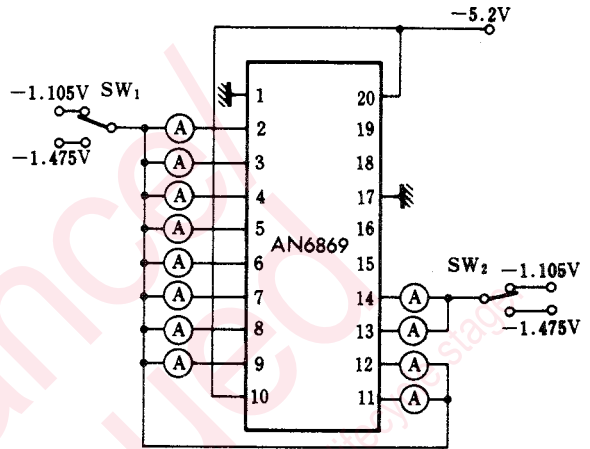
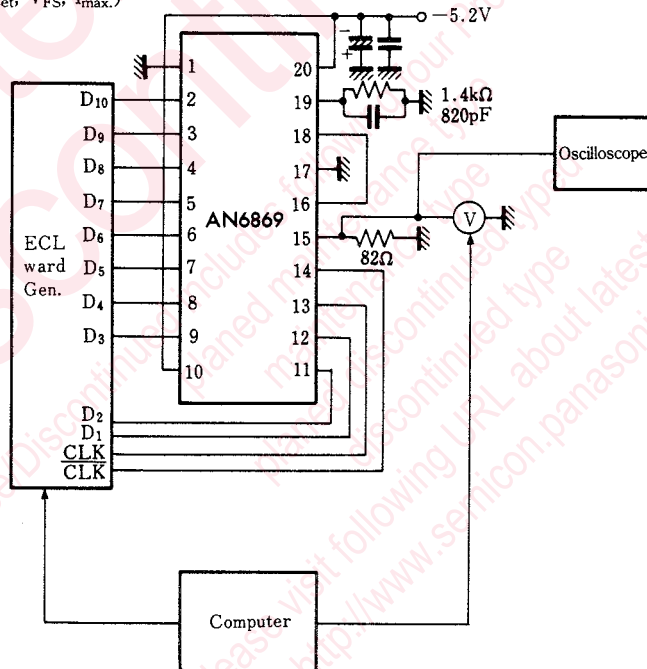
Item	Symbol	Rating	Unit
Supply voltage	$V_{EE}$	$-7 \sim +0.5$	V
Digital input voltage	$V_{id}$	$V_{EE} \sim +0.5$	V
Power consumption	$P_D$	560	mW
Operating ambient temperature	$T_{opr}$	$0 \sim +70$	$^\circ C$
Storage temperature	$T_{stg}$	$-50 \sim +150$	$^\circ C$

### ■ Recommended Operating Conditions

Item	Symbol	min.	typ.	max.	Unit
Supply voltage	$V_{EE}$	-5.4	-5.2	-5.0	V
Digital input voltage	$V_{IH}$	-0.96			V
	$V_{IL}$			-1.65	V

### ■ Electrical Characteristics ( $V_{cc} = -5.2V$ , $T_a = 25^\circ C$ )

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Supply current	$I_{EE}$	1	$V_{EE} = -5.2V$	-70	-50		mA
Reference voltage	$V_{REF}$	1		-1.65	-1.40	-1.15	V
Digital input current	$I_{IH}$	2	SW1 : 1, SW2 : 1		1	2	$\mu A$
	$I_{IL}$	2	SW1 : 2, SW2 : 1		1	2	$\mu A$
Clock input current	$I_{\phi H}$	2	SW1 : 1, SW2 : 1		1	2	$\mu A$
	$I_{\phi L}$	2	SW1 : 1, SW2 : 2		1	2	$\mu A$
Resolution	RES	3			10		bit
Non-linearity error	LE	3		-1		1	LSB
Output zero offset voltage	$V_{offset}$	3	$R_{out} = 82\Omega$ , $R_{ref} = 1.4k\Omega$	-02	4	0	mV
Full-scale output voltage	$V_{FS}$	3	$R_{out} = 82\Omega$ , $R_{ref} = 1.4k\Omega$	0.85	1.0	1.15	$V_{p-p}$
Max. conversion speed	$f_{max.}$	3		35			MSPS

Test Circuit 1 ( $I_{EE}$ ,  $V_{REF}$ )Test Circuit 2 ( $I_{IH}$ ,  $I_{IL}$ ,  $I_{\phi H}$ ,  $I_{\phi L}$ )Test Circuit 3 (RES, LE,  $V_{offset}$ ,  $V_{FS}$ ,  $f_{max}$ )

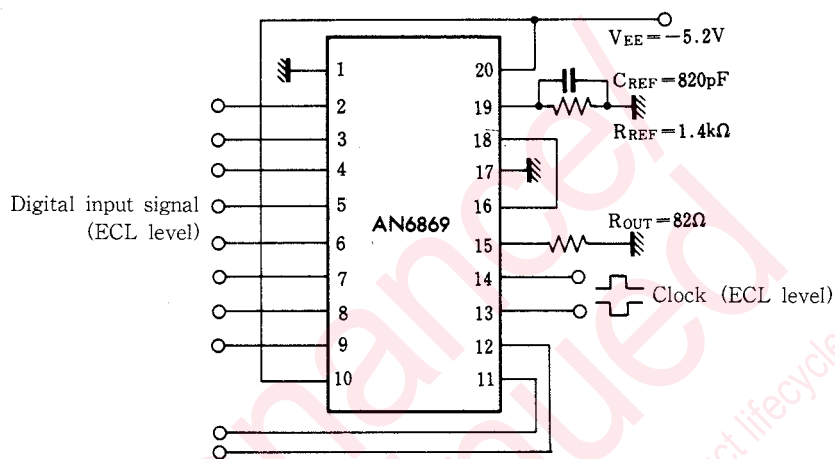
## 1) Non-linearity error :

Give a digital signal to input to generate a step wave and obtain a non-linearity error. However, a grid is no target for measurement.

## 2) Max. clock frequency 1MHz :

Max. conversion selectivity within a range when no error is caused by eliminating the grid when a step wave is generated by giving a digital signal to input.

### External Connection Diagram



(Reference)

Item	Symbol	Min.	Typ.	Max.	Unit.
Grid energy	—		50	100	PVS
Settling time $\pm \frac{1}{2}$ LSB FOR FULL SCALE	—		30		ns

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