

MN6556A, MN6556AS

Low Power 8-Bit CMOS D/A Converters for Image Processing

■ Overview

The MN6556A and MN6556AS are 8-bit CMOS digital-to-analog converters with a maximum conversion rate of 20 MSPS.

They use both a matrix cell and weighted current technology to achieve a low power consumption of only 50 mW. Output has an amplitude of one volt above the ground level.

■ Features

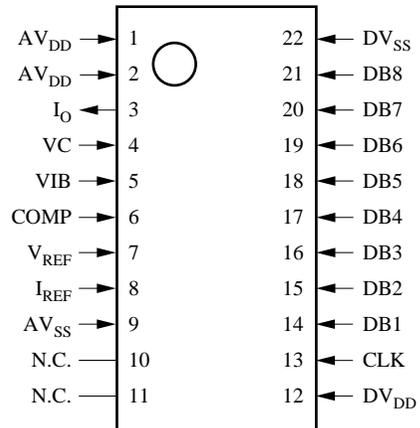
- Maximum conversion rate: 20 MSPS (min.)
- Linearity error: ± 0.3 LSB (typ.)
- Differential linearity error: ± 0.3 LSB (typ.)
- Power supply voltage: 5.0 ± 0.5 V
- Power consumption: 50 mW (typ.)
- Full scale current: 5 mA (typ.)

■ Applications

- Digital television
- Digital video equipment
- Digital image processing equipment
- Measuring instrument

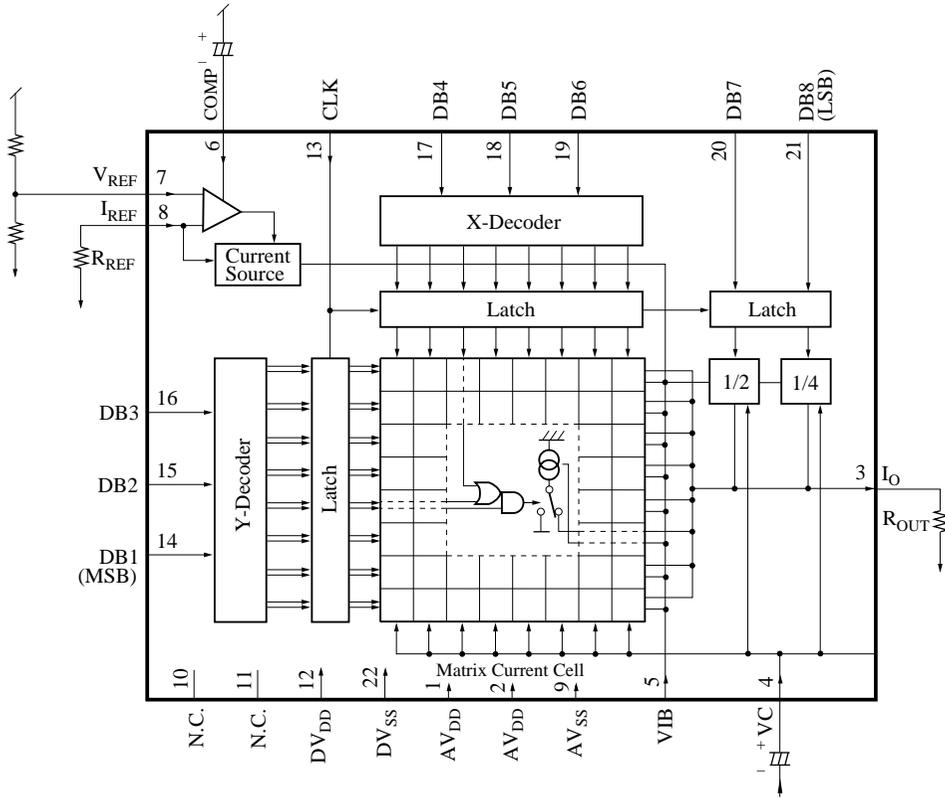
■ Pin Assignment

MN6556A : DIP022-P-0400
MN6556AS : SOP022-P-0375



(TOP VIEW)

■ Block Diagram



■ Pin Descriptions

Pin No.	Symbol	Function Description
1	AV_{DD}	Power supply for analog circuits
2	AV_{DD}	Power supply for analog circuits
3	I_O	Analog current output
4	VC	Capacitor connection
5	VIB	Capacitor connection
6	COMP	Phase compensation
7	V_{REF}	Reference voltage input pin
8	I_{REF}	Reference resistor
9	AV_{SS}	Ground for analog circuits
10	N.C.	No connection
11	N.C.	No connection
12	DV_{DD}	Ground for digital circuits
13	CLK	Sampling clock
14	DB1	Digital input (MSB)
15	DB2	Digital input
16	DB3	Digital input
17	DB4	Digital input
18	DB5	Digital input
19	DB6	Digital input
20	DB7	Digital input
21	DB8	Digital input (LSB)
22	DV_{SS}	Power supply for digital circuits

■ Absolute Maximum Ratings $T_a=25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Power supply voltage for digital circuits	DV_{DD}	- 0.3 to +7.0	V
Power supply voltage for analog circuits	AV_{DD}	- 0.3 to +7.0	V
Input voltage	V_I	$DV_{SS} - 0.3$ to $DV_{DD} + 0.3$	V
Output voltage	V_O	$AV_{SS} - 0.3$ to $AV_{DD} + 0.3$	V
Operating ambient temperature	T_{opr}	-20 to +70	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +125	$^\circ\text{C}$

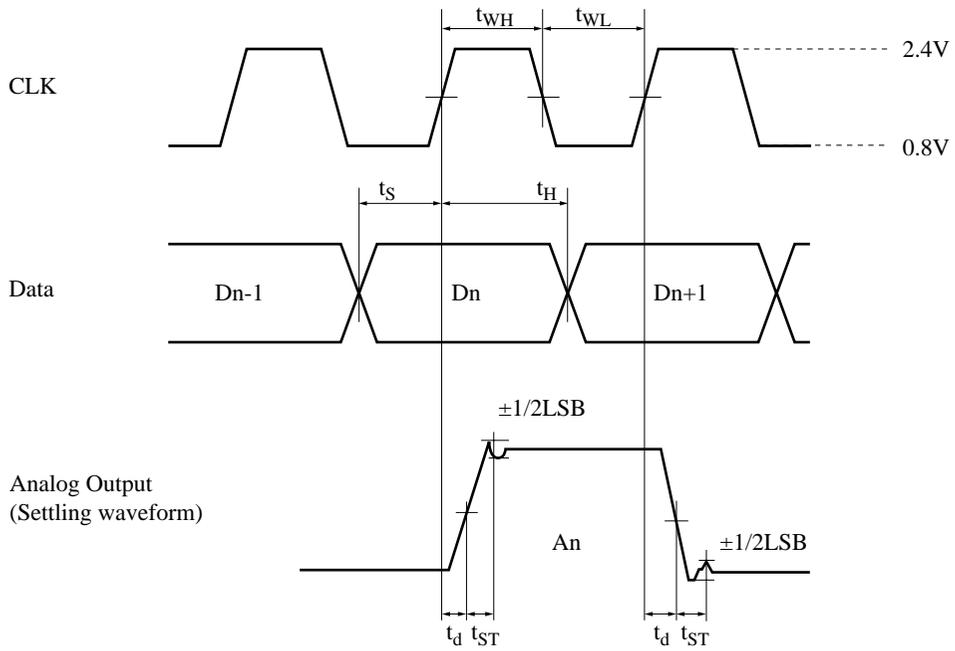
Recommended Operating Conditions $V_{DD}=AV_{DD}=DV_{DD}=5.0V$, $V_{SS}=AV_{SS}=DV_{SS}=0V$, $T_a=25^\circ C$

Parameter		Symbol	min	typ	max	Unit
Power supply voltage		V_{DD}	4.5	5.0	5.5	V
Reference voltage		V_{REF}		1.8		V
Reference resistance		R_{REF}	1.5			k Ω
External compensation capacitor		C_{COMP}		1		μF
Output load resistance		R_{OUT}		200		Ω
Digital input voltage	"H" level	V_{IH}	2.4		V_{DD}	V
	"L" level	V_{IL}	V_{SS}		0.8	V
Clock	"H" level pulse width	t_{WH}	20			ns
	"L" level pulse width	t_{WL}	20			ns

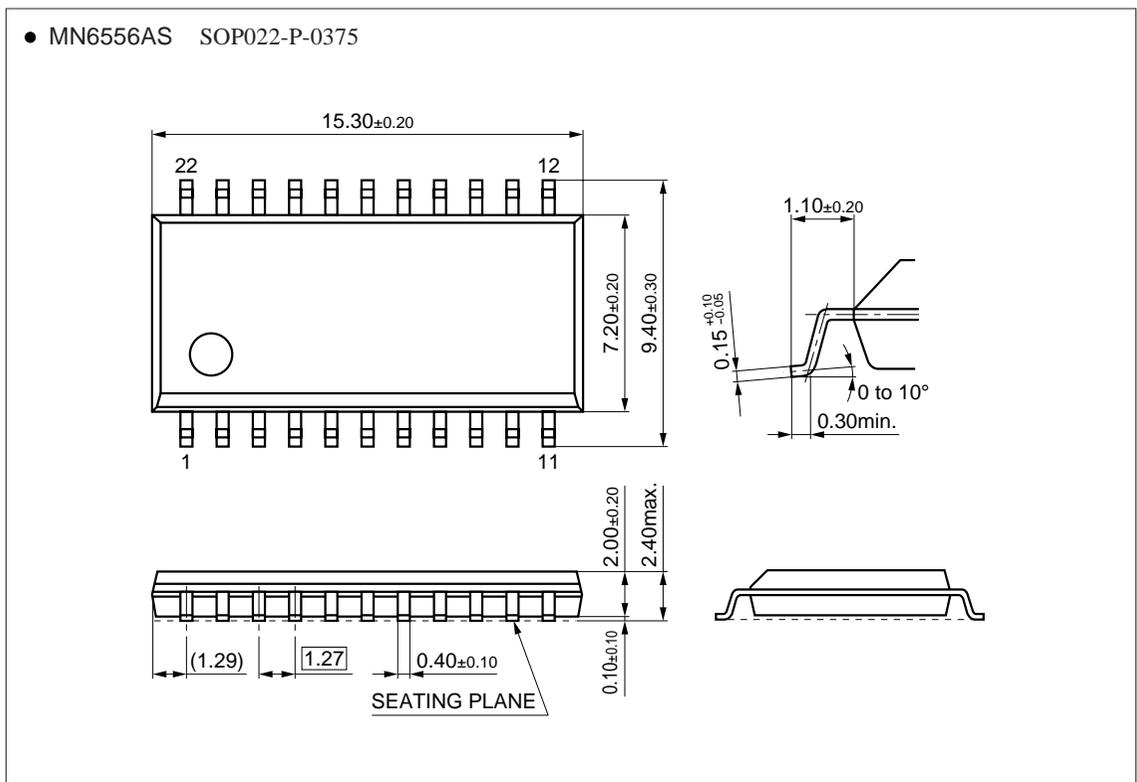
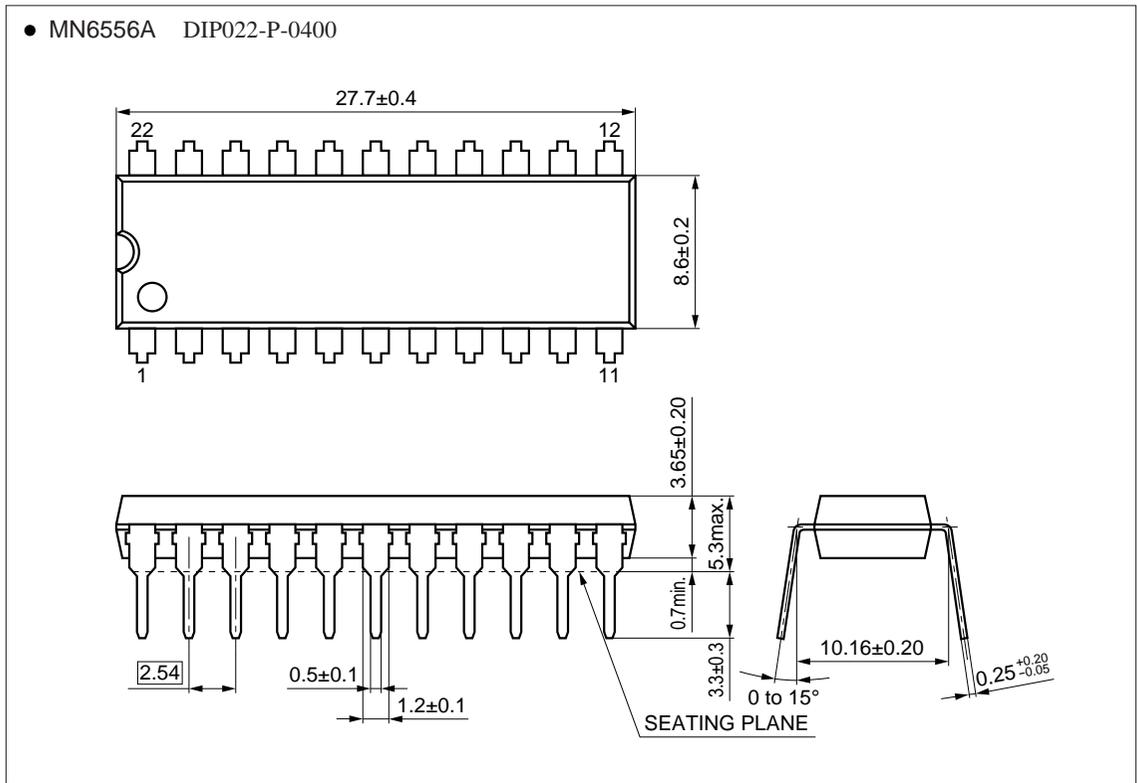
Electrical Characteristics $DV_{DD}=AV_{DD}=5.0V$, $DV_{SS}=AV_{SS}=0V$, $T_a=25^\circ C$

Parameter	Symbol	Conditions	min	typ	max	Unit
Power supply voltage	I_{DD}			10	20	mA
Resolution	RES			8		bit
Linearity error	E_L	$R_{REF}=1.5k\Omega$, $R_{OUT}=200\Omega$		± 0.3	± 0.5	LSB
Differential linearity error	E_D	$V_{REF}=1.8V$		± 0.3	± 0.5	LSB
Full scale current	I_{FS}	$R_{REF}=1.5k\Omega$, $V_{REF}=1.8V$	4.5	5.0	5.5	mA
Setup time	t_S		15			ns
Hold time	t_H		15			ns
Settling time	t_{ST}	$R_{REF}=1.5k\Omega$, $R_{OUT}=200\Omega$			50	ns
Maximum conversion speed	$F_{C(max.)}$	$V_{REF}=1.8V$	20			MSPS

■ Timing Chart



■ Package Dimensions (Unit:mm)



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