MN6557A, MN6557AS

Low-Power-Consumption CMOS 10-Bit D/A Converters for Image Processing

■ Overview

The MN6557A and MN6557AS are CMOS 10-bit D/A converters with a maximum conversion rate of 30 MSPS. High precision has been achieved by the combined use of a matrix cell system and weighted current system. They also feature low power consumption owing to the use of a CMOS process, and operate on a single power supply of 5V, and have a TTL input level.

These devices are suitable for digitalization of image processing in video, TV, and similar applications.

■ Features

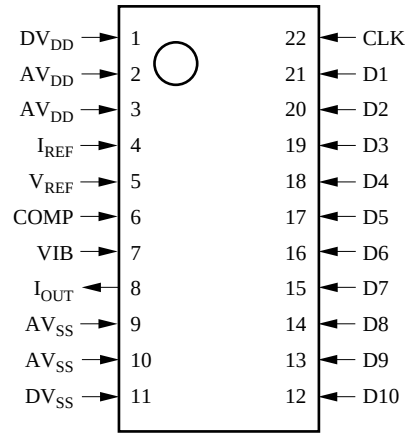
- Maximum conversion rate: 30 MSPS (min.)
- Linearity error: ±0.5 LSB (typ.)
- Differential linearity error: ±0.3 LSB (typ.)
- Power supply voltage: 5.0 ±0.5 V
- Power consumption: 125 mW (typ.)
- Full-scale current: 13 mA (typ.)

■ Applications

- Digital TV
- Digital video
- Digital signal processing equipment

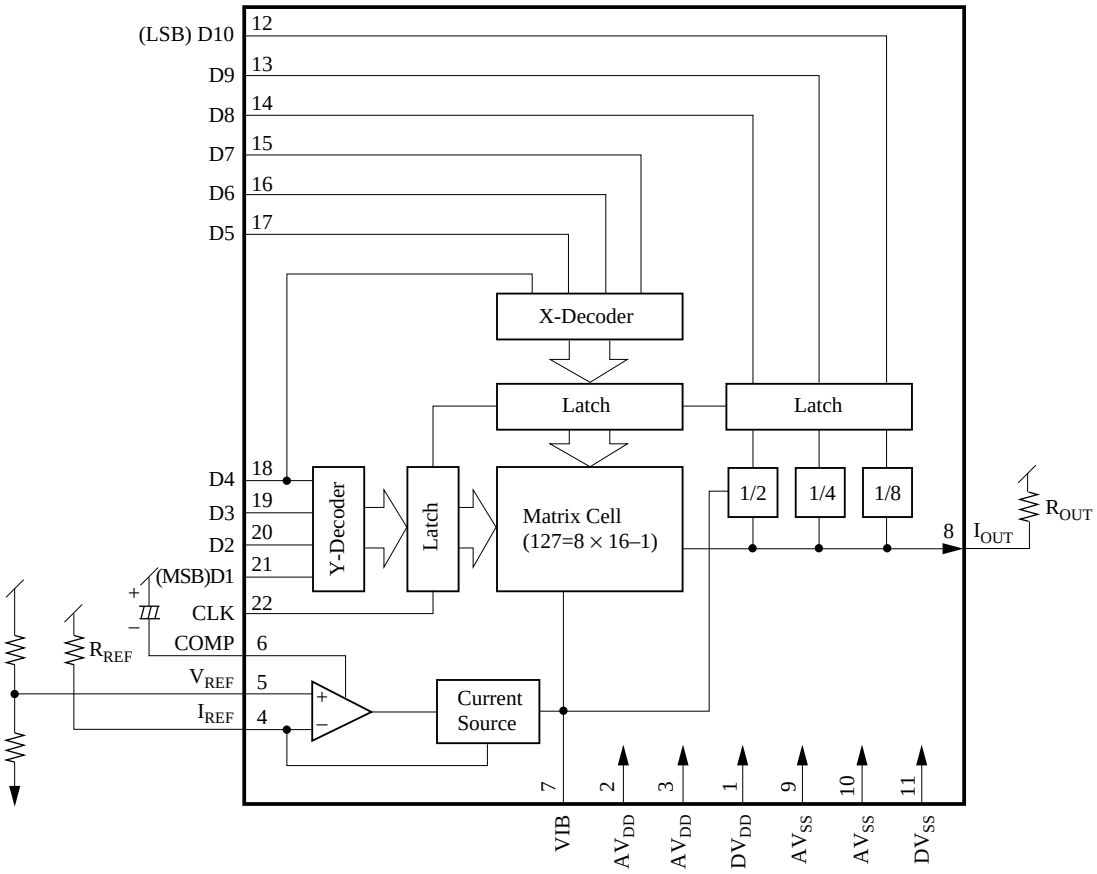
■ Pin Assignment

MN6557A DIP022-P-0400
MN6557AS SOP022-P-0375



(TOP VIEW)

■ Block Diagram



■ Pin Descriptions

Pin No.	Symbol	Function Description
1	DV_{DD}	Power supply for digital section
2	AV_{DD}	Power supply for analog section
3	AV_{DD}	Power supply for analog section
4	I_{REF}	Full-scale adjustment resistor
5	V_{REF}	Reference voltage input
6	COMP	Phase compensation
7	VIB	Capacitor connection
8	I_{OUT}	Analog current output
9	AV_{SS}	Analog GND
10	AV_{SS}	Analog GND
11	DV_{SS}	Digital GND
12	D10	Digital input (LSB)
13	D9	Digital input
14	D8	Digital input
15	D7	Digital input
16	D6	Digital input
17	D5	Digital input
18	D4	Digital input
19	D3	Digital input
20	D2	Digital input
21	D1	Digital input (MSB)
22	CLK	Sampling clock

■ Absolute Maximum Ratings Ta=25˚C

Parameter	Symbol	Rating	Unit
Digital-section power supply voltage	DV_{DD}	– 0.3 to +7.0	V
Analog-section power supply voltage	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	˚C
Storage temperature	T_{stg}	–55 to +125	˚C

■ Recommended Operating Conditions

V_{DD}=AV_{DD}=DV_{DD}=5.0V, V_{SS}=AV_{SS}=DV_{SS}=0V, Ta=25˚C

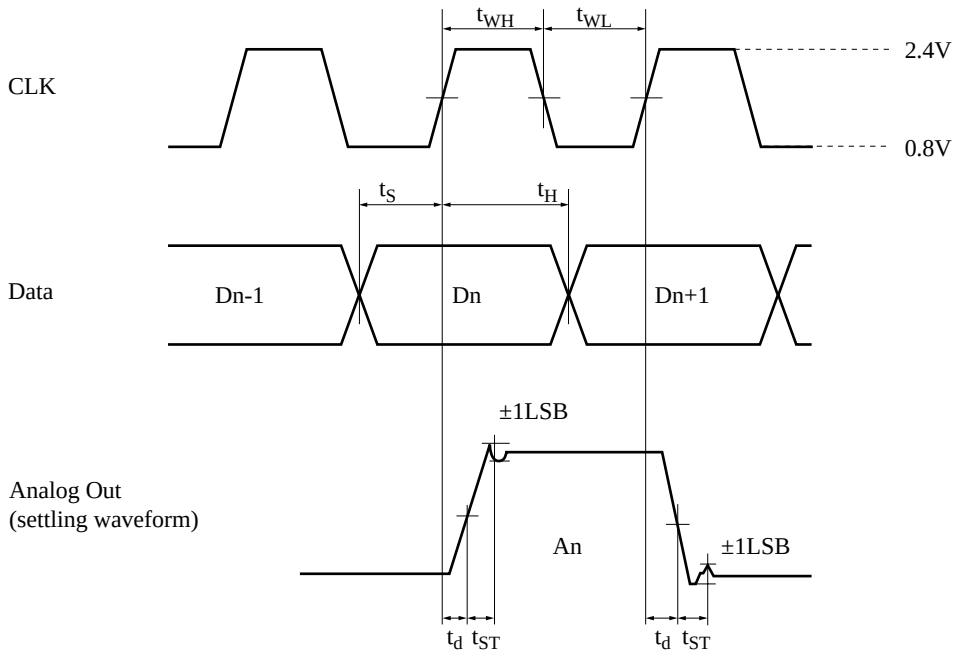
Parameter		Symbol	min	typ	max	Unit
Power supply voltage		V_{DD}	4.5	5.0	5.5	V
Reference voltage		V_{REF}		2.95		V
Reference resistance		R_{REF}		680		Ω
External compensating capacitance		C_{COMP}		1		µF
Output load resistance		R_{OUT}		75		Ω
Digital input voltage	"H" level	V_{IH}	2.4		V_{DD}	V
	"L" level	V_{IL}	V_{SS}		0.8	V
Clock	"H" pulse width	t_{WH}	13			ns
	"L" pulse width	t_{WL}	13			ns

■ Electrical Characteristics

DV_{DD}=AV_{DD}=5.0V, DGND=AGND=0V, Ta=25˚C

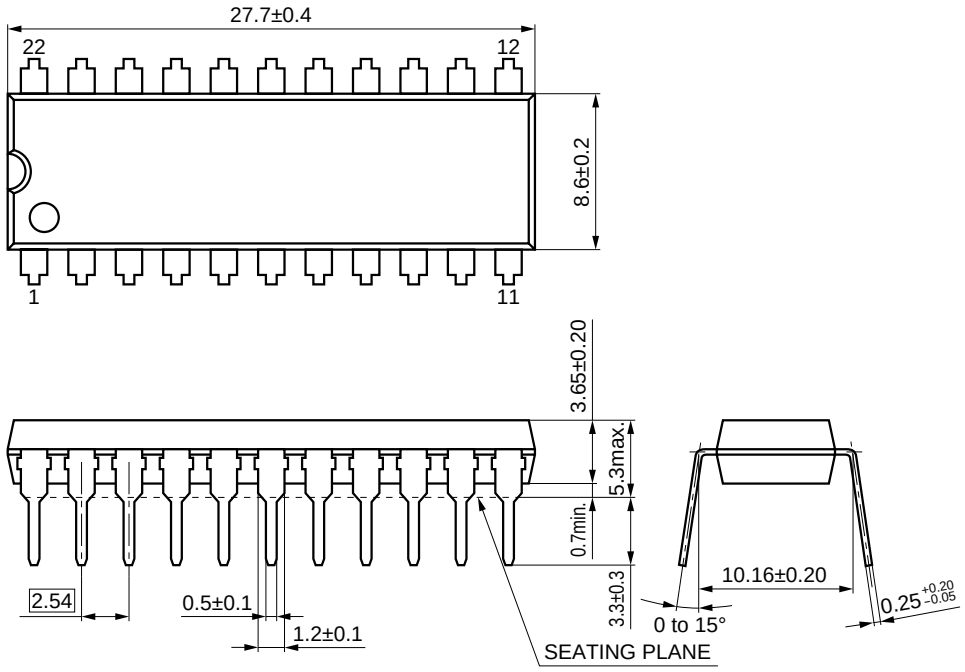
Parameter	Symbol	Condition	min	typ	max	Unit
Power supply current	I_{DD}	R_{REF}=680Ω, V_{REF}=2.95V		25	50	mA
Resolution	RES			10		bit
Linearity error	E_L	R_{OUT}=75Ω, R_{REF}=680Ω		±0.5	±1.0	LSB
Differential linearity error	E_D	V_{REF}=2.95V		±0.3	±1.0	LSB
Full-scale current	I_{FS}	R_{REF}=680Ω, V_{REF}=2.95V		13		mA
Hold time	t_H		10			ns
Setup time	t_S		10			ns
Settling time	t_{ST}	R_{OUT}=75Ω, R_{REF}=680Ω		20	33	ns
Maximum conversion rate	$F_{C(max.)}$	V_{REF}=2.95V	30	50		MSPS

■ Timing Chart

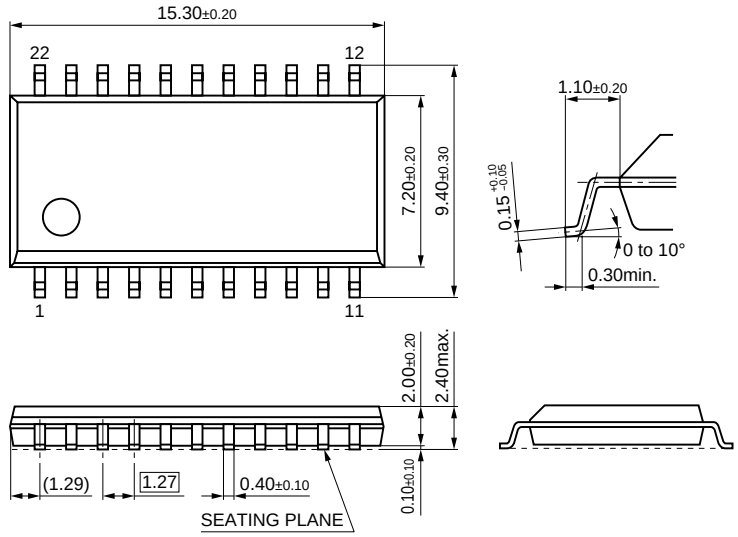


■ Package Dimensions (Unit: mm)

● MN6557A DIP022-P-0400



● MN6557AS SOP022-P-0375



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