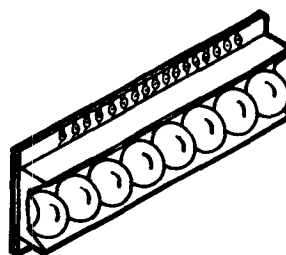


# Monolithic Multidigit Array Displays

## Features:

National's LED numeric arrays are PC board mounted, magnified, monolithic, 7 or 14 segment red digits arranged in various combinations of up to 14 digits per array. These arrays, with digit heights of 100, 110 and 140 mils (2.54, 2.794 and 3.556 mm) are intended for applications requiring small, low cost numeric indication.



## Applications:

- Calculator sticks
- Industrial controls
- Data terminals
- Instrumentation
- Timers
- Hand-held instruments
- Event counters

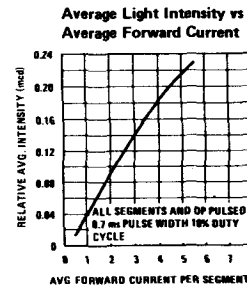
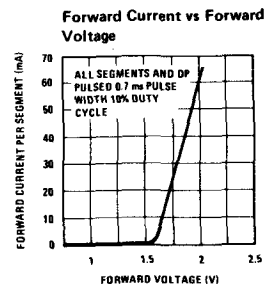
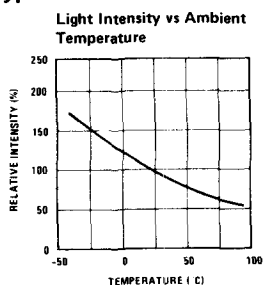
Device No.	No. of Digits	Apparent Digit Height	Spacing of Digit Centers	Lens/Magnification	Viewing Angle Off Axis		Typical Segment Luminous Intensity	Typical Segment Forward Voltage	PCB Length	Package Code
					Horiz	Vert				
NSA0038	3	0.100" (2.54 mm)	0.220" (5.59 mm)	clear, bubble, 2.5 x	21°	23°	0.37 mcd @ 2.5 mA	1.65V @ 5 mA	1.10" (27.94 mm)	NF
NSA598	9	0.100" (2.54 mm)	0.200" (5.08 mm)	red, flat, 1 x	60°	60°	0.2 mcd @ 7.0 mA	1.65V @ 7 mA	2.00" (50.80 mm)	NG
NSA1166	6	0.100" (2.54 mm)	0.200" (5.08 mm)	clear, bubble, 2 x	25°	32°	0.40 mcd @ 5 mA	1.65V @ 5 mA	2.00" (5.80 mm)	NH
NSA1188	8	0.100" (2.54 mm)	0.200" (5.08 mm)	clear, bubble, 2.5 x	19°	19°	0.37 mcd @ 2.5 mA	1.65V @ 5 mA	2.00" (50.80 mm)	NH
NSA1198	9	0.100" (2.794 mm)	0.200" (5.08 mm)	clear, bubble, 2.5 x	19°	19°	0.37 mcd @ 2.5 mA	1.65V @ 5 mA	2.00" (50.80 mm)	NH
NSA1541A	4	0.140" (3.556 mm)	0.260" (6.604 mm)	clear, bubble, 2 x	25°	32°	0.40 mcd @ 5 mA	1.65V @ 5 mA	2.08" (52.83 mm)	NI
NSA1588A	8	0.140" (3.556 mm)	0.260" (6.604 mm)	clear, bubble, 2 x	25°	32°	0.40 mcd @ 5 mA	1.65V @ 5 mA	2.08" (52.83 mm)	NI
NSA1605*	8	0.140" (3.556 mm)	0.260" (6.604 mm)	clear, bubble, 2 x	25°	32°	0.45 mcd @ 7 mA	1.8V @ 7 mA	2.08" (52.83 mm)	NJ
NSA5120A	12	0.110" (2.794 mm)	0.150" (3.81 mm)	clear, bubble, 1.5 x	25°	34°	0.45 mcd @ 7 mA	1.8V @ 7 mA	2.38" (60.45 mm)	NK
NSA5140A	14	0.110" (2.794 mm)	0.150" (3.81 mm)	clear, bubble, 1.5 x	25°	34°	0.45 mcd @ 7 mA	1.8V @ 7 mA	2.38" (60.45 mm)	NK
NSA7120	12	0.110" (2.794 mm)	0.175" (4.445 mm)	clear, bubble, 2 x	20°	20°	0.35 mcd @ 5 mA	1.8V @ 5 mA	2.375" (60.32 mm)	NL

\*Fourteen Segment Alphanumeric Display

## Absolute Ratings

Average Current per Segment	0.25 mA min, 7.0 mA max
Peak Current per Segment	2.5 mA min, 70 mA max
Reverse Voltage	3.0V max
Digit Current Pulse Width	1 ms max
Operating and Storage Temperature	-20° to +70°C
Relative Humidity at 35°C	98% max
Terminal Temperature (Soldering, 5 seconds)	230°C max

## Typical Performance Characteristics (25°C)



## Electrical and Optical Characteristics $T_A = 25^\circ\text{C}$

Parameter	Conditions	Min	Typ	Max	Units
Segment Forward Voltage	5 mA/Segment DC		1.65	2.0	v
Reverse Voltage	100 $\mu\text{A}$ /Segment	3.0	8.0		v
Intensity Matching			$\pm 33$		%
Peak Wavelength			660		nm
Spectral Width, Half-Intensity			40		nm

See applications note page 64.

# Monolithic Multidigit Array Displays

## Custom Options: NSA XXXX Series

- Number of digits,
- Number of decimal points.
- Minus signs can be substituted in place of any digit. Address line will be segment g
- A decimal point can be substituted for any digit and placed in any segment position (will be electrically connected to that segment address line)
- For all variations from the standard products it is recommended the factory be contacted.

## Recommended Numeric Array Processing

The NSA Series array is constructed on a standard printed circuit board substrate and covered with a plastic lens.

The edge connector's tab will stand a temperature of 230°C for 5 seconds.

The display lens area must not be elevated in temperature above 70°C. To do so will result in permanent damage to the display.

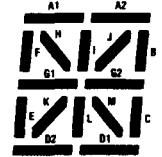
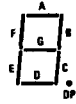
It is recommended that the back of the display be masked off with low tack masking tape during flux and clean operations, to prevent condensation of flux or cleaner on the underside of the lens.

It is also recommended that only localized cleaning with a cotton swab on external surfaces be performed after soldering.

Only rosin core solder, solid core solder and low temperature mildly activated flux are recommended. Recommended post solder cleaning solvents are Freon TF, Isopropanol, Methanol or Ethanol. These solvents are recommended only at room temperature and for short time periods.

The use of other solvents or elevated temperature use of the recommended solvents may cause permanent damage to the lens or the display.

Segment Designation



PINOUT Table NSA XXXX

PIN NO.	NSA 0038	NSA 598	NSA 1166	NSA 1188	NSA 1198	NSA 1541A	NSA 1588A	NSA 1605	NSA 5120A	NSA 5140A	NSA 7120
1	c1	NC	NC	NC	NC	NC	NC	c8	NC	c1	c1
2	c2	c1	NC	NC	c1	Ca	Ca	La	c2	c2	c2
3	Ea	Ca	Ca	Ca	Ca	NC	c1	c6	c3	c3	c3
4	Ca	c2	NC	c1	c2	DPa	DPa	Da	c4	c4	Ca
5	Da	DPa	DPa	DPa	DPa	NC	c2	Ca	Ca	Ca	c4
6	DPa	c3	c3	c2	c3	Aa	Aa	G1a	c5	c5	DPa
7	c3	Aa	Aa	Aa	Aa	c1	c3	Ma	DPa	DPa	c5
8	Ga	c4	c4	c3	c4	Ea	Ea	c4	c6	c6	Aa
9	Fa	Ea	Ea	Ea	Ea	c2	c4	Ea	Aa	Aa	c6
10	Ba	c5	c5	c4	c5	Da	Da	Na	c7	c7	Ea
11	Aa	Da	Da	Da	Da	c3	c5	c2	Ea	Ea	c7
12	—	c6	c6	c5	c6	Ga	Ga	c1	c8	c8	Da
13	—	Ga	Ga	Ga	Ga	c4	c6	Ha	Da	Da	c8
14	—	c7	c7	c6	c7	Ba	Ba	Aa	c9	c9	Ga
15	—	Ba	Ba	Ba	Ba	NC	c7	c3	Ga	Ga	c9
16	—	c8	c8	c7	c8	Fa	Fa	Ba	c10	c10	Ba
17	—	Fa	Fa	Fa	Fa	NC	c8	C2a	Ba	Ba	c10
18	—	c9	NC	c8	c9	—	—	Ka	c11	c11	Fa
19	—	—	—	—	—	—	—	c5	Fa	Fa	c11
20	—	—	—	—	—	—	—	Ja	c12	c12	c12
21	—	—	—	—	—	—	—	Fa	c13	c13	—
22	—	—	—	—	—	—	—	c7	NC	c14	—
PKG	NF	NG	NH	NH	NH	NI	NI	NJ	NK	NK	NL

Segment, Polarity, Digit

c=Cathode a=Anode