ELECTRONIC TUBE REFERENCE

ZM1023

Nixie electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
NIXIE

Cold-cathode symbol indicator for direct glow-discharge character display. Manufacturer documentation establishes its specialized symbol-readout role and provides the electrical operating, rating, mechanical, and display information required for instrumentation use.

General characteristics

BASE DESIGNATION	Special 13-pin	**BASE PINS**	13
NOMINAL HEATER	– / –	**PARALLEL HEATER**	– / –
HEATING	Indirect; cold cathode	**SERIES OPERATION**	Not specified
CATHODE ARRANGEMENT	Separate cathodes	**SECTION CONSTRUCTION**	Similar

Section ratings

SECTION1 Nixie	
MAXIMUM PLATE VOLTAGE	170 V
MAXIMUM CATHODE CURRENT	10 mA
MINIMUM REGULATOR CURRENT	1 A
MAXIMUM REGULATOR CURRENT	2.5 A
STARTING VOLTAGE	160 V
MAINTAINING VOLTAGE	140 V

Single indicator/counting section. Nixie-specific electrical ratings and operating data are retained in TUBE_SECTION_PARAMETER.

ZM1023 is a cold-cathode symbol indicator, classified as Nixie for this batch. The supplied datasheet provides cold-cathode display ratings, operating conditions, and mechanical/display information.

SOURCE OPERATING CONDITIONS

1965 Nixie Valvo

SOURCE PDF

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1965 NIXIE VALVO

Section 1 · Nixie

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage	160 V	Typical characteristic
Burning voltage	140 V	Typical glow voltage
Extinction voltage	120 V	Typical characteristic
Life with one digit continuously displayed	5000—— h	Recommended conditions
Life with changing display	30000 h	Digit changed at least every 100 h

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Continuous cathode current	1–2.5 mA	Absolute range
Pulse cathode current	4–10 mA	Pulse operation; max pulse 20 ms
Cathode-to-cathode voltage	——120 V	Absolute maximum
Pulse rise time	80—— us	Pulse operation
Pulse source internal resistance	——1 kOhm	Pulse operation
Envelope temperature	——70 degC	Absolute maximum
Recommended DC supply voltage	170 V	+/-3% example
Recommended DC operating voltage	140 V	At display electrodes
Recommended off-cathode bias	60—— V	DC operation with bias

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

1967 Nixie La Radiotechnique

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1967 NIXIE LA RADIOTECHNIQUE

Section 1 · Nixie

CHARACTERISTIC		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Ignition/Starting Voltage	**160 V**	Published ignition/start value
Extinction Voltage	**120 V**	Published extinction value
Maintaining Voltage	**140 V**	Published maintaining/burning value
Minimum Cathode Current	**1 mA**	Published minimum

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Recommended/Minimum Supply Voltage	**170 V**	Published operating condition
Maximum Cathode Current	**2.5 mA**	Published maximum/average maximum
Peak Cathode Current	**10 mA**	Published peak value

TUBE TINKER
ELECTRON TUBE DATABASE

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

1969 Nixie Mullard

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1969 NIXIE MULLARD

Section 1 · Nixie

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Numeral/Character Height	**15.5 mm**	Published mechanical/display data
Maximum Peak Cathode Current	**10 mA**	Published peak limit

CHARACTERISTIC		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Supply Voltage	**170 V**	Published operating data
Minimum Ignition Voltage	**170 V**	Minimum anode-to-cathode voltage necessary for ignition

SOURCE OPERATING CONDITIONS

SOURCE PDF

1969 Nixie Valvo

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1969 NIXIE VALVO

Section 1 · Nixie

CHARACTERISTICS		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Ignition voltage	**160 V**	Typical characteristic
Burning voltage	**140 V**	Typical glow voltage
Extinction voltage	**120 V**	Typical characteristic
Life with one digit continuously displayed	**5000–– h**	Recommended conditions
Life with changing display	**30000 h**	Digit changed at least every 100 h

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Continuous cathode current	**1–2.5 mA**	Absolute range
Pulse cathode current	**4–10 mA**	Pulse operation; max pulse 20 ms
Cathode-to-cathode voltage	**––120 V**	Absolute maximum
Pulse rise time	**80–– us**	Pulse operation
Pulse source internal resistance	**––1 kOhm**	Pulse operation
Envelope temperature	**––70 degC**	Absolute maximum
Recommended DC supply voltage	**170 V**	+/-3% example
Recommended DC operating voltage	**140 V**	At display electrodes

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Recommended off-cathode bias	60–– V	DC operation with bias

SOURCE OPERATING CONDITIONS

SOURCE PDF

196X Nixie Random Datasheets

Published test conditions and operating points. Values on this page are preserved as reported by this source.

196X NIXIE RANDOM DATASHEETS

Section 1 · Nixie

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Supply Voltage Minimum	170 V	Published datasheet value
Extinguishing Voltage Minimum	120 V	Published datasheet value
Cathode/Anode Current Minimum	1 mA	Published datasheet value

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition Voltage Maximum	160 V	Published datasheet value
Cathode/Anode Current Maximum	2.5 mA	Published datasheet value

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

SOURCE PDF

1971 Nixie RFT

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1971 NIXIE RFT

CHARACTERISTICS		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Ignition voltage	**160 V**	Maximum/typical threshold shown in source table
Operating glow voltage	**140 V**	Approximate service voltage
Extinction voltage	**120 V**	Source table value
Nominal cathode current	**2 mA**	Main symbol/digit
Ignition voltage	**160 V**	Typical characteristic
Burning voltage	**140 V**	Typical glow voltage
Extinction voltage	**120 V**	Typical characteristic
Life with one digit continuously displayed	**5000—— h**	Recommended conditions
Life with changing display	**30000 h**	Digit changed at least every 100 h

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Maximum supply voltage	**160 V**	Absolute limit table
Cathode current	**1–2.5 mA**	Main symbol/digit continuous range
Maximum peak cathode current	**10 mA**	Main symbol/digit
Envelope temperature minimum	**-20 degC**	Operating envelope temperature range
Envelope temperature maximum	**70 degC**	Operating envelope temperature range
Display characters	**+, -, ~, A, V, ohm, %**	Translated from French source
Display orientation	**front**	Viewing orientation
Character height	**max 15.5 mm**	Display geometry
Maximum tube height	**26.5 mm**	Mechanical dimension
Maximum tube width/diameter	**30 mm**	Mechanical dimension as printed
Continuous cathode current	**1–2.5 mA**	Absolute range
Pulse cathode current	**4–10 mA**	Pulse operation; max pulse 20 ms
Cathode-to-cathode voltage	**——120 V**	Absolute maximum
Pulse rise time	**80—— us**	Pulse operation
Pulse source internal resistance	**——1 kOhm**	Pulse operation
Envelope temperature	**——70 degC**	Absolute maximum

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Recommended DC supply voltage	**170 V**	+/-3% example
Recommended DC operating voltage	**140 V**	At display electrodes
Recommended off-cathode bias	**60—— V**	DC operation with bias

SOURCE OPERATING CONDITIONS

SOURCE PDF

1973 Nixie Siemens

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1973 NIXIE SIEMENS

Section 1 · Nixie

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ignition voltage	**160 V**	Maximum/typical threshold shown in source table
Operating glow voltage	**140 V**	Approximate service voltage
Extinction voltage	**120 V**	Source table value
Nominal cathode current	**2 mA**	Main symbol/digit

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum supply voltage	**160 V**	Absolute limit table
Cathode current	**1–2.5 mA**	Main symbol/digit continuous range
Maximum peak cathode current	**10 mA**	Main symbol/digit
Envelope temperature minimum	**-20 degC**	Operating envelope temperature range
Envelope temperature maximum	**70 degC**	Operating envelope temperature range
Display characters	**+, -, ~, A, V, ohm, %**	Translated from French source
Display orientation	**front**	Viewing orientation
Character height	**max 15.5 mm**	Display geometry
Maximum tube height	**26.5 mm**	Mechanical dimension
Maximum tube width/diameter	**30 mm**	Mechanical dimension as printed

Tube Tinker

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