



MATSUSHITA

NEWVICON

2/3 INCH TYPE S4092

Newvicon, employing new photoconductive materials, provides 20times higher sensitivity than vidicon, and 2times than Silicon-vidicon.

The S4092 is a 2/3 inch diameter Newvicon camera tube with electrostatic focusing, magnetic deflection and separate mesh connection.

Applications:

Low light level cameras for security and surveillance.

Ultra compact TV cameras with very light weight and very low power consumption.

Hand-held TV camera, TV phone, door camera, warehouse, car parking area, night security, etc.



General Data:

Heater for unipotential cathode:

Voltage (AC or DC) $6.3 \pm 10\%V$

Current at 6.3 volts:

Typical value 95 mA

Maximum value 105 mA

Minimum value 85 mA

Direct interelectrode capacitance:

Target to all other electrodes 2.0 pF (1)

Spectral response See Fig. 1

Photoconductive layer:

Maximum useful diagonal of rectangular image

(aspect ratio 3:4) 11 mm

Orientation of quality rectangle: Proper orientation is obtained when the horizontal scan is essentially parallel to the plane passing through the tube axis and pin No. 4.

Focusing method Electro static

Deflection method Magnetic

Overall length Max. 108 mm

Greatest diameter 19.6 ± 0.2 mm

Bulb T-18

Base Special miniature 7-pin (JEDEC No. E7-1)

Yoke assembly. CHUOMUSEN No. KV 19B or equivalent

Operating position Any

Weight Approx. 25g

Maximum Ratings (Absolute-Maximum values) (2)

For scanned area of 6.6×8.8 mm²

Grid No. 6 voltage Max. 600 V

Grid No. 4 voltage Max. 350 V

Grid Nos, 2+3+5 voltage Max. 350 V

Grid No. 1 voltage :

Negative bias value Max. 300 V

Positive bias value Max. 0 V

Peak heater-cathode voltage:

Heater negative with respect to cathode. . . Max. 125 V

Heater positive with respect to cathode. Max. 10 V

Target voltage. Max. 50 V (3)

Peak output current Max. $0.8 \mu A$ (4)

Faceplate:

Illumination Max. 10,000 lx (5)

Temperature Max. 70°C

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Typical Operation and Performance:

For scanned area of 6.6x8.8 mm²; faceplate temperature of 25 ~ 35°C and standard TV scanning rate.

Grid No. 6 (Decelerator) voltage 500 V (6)
 Grid No. 4 (Beam focus electrode) voltage 35 ~ 55 V
 Grid Nos. 2+3+5 voltage 300 V (7)
 Grid No. 1 voltage for picture cutoff -30 ~ -80 V (8)
 Average "Gamma" of transfer characteristic for signal
 current between 0.02μA and 0.2μA Approx. 1.0
 Visual equivalent signal-to-noise ratio Approx. 300 : 1

Minimum peak-to-peak blanking voltage:

When applied to grid No. 1 75 V
 When applied to cathode 20 V

Field strength of adjustable alignment

coil or magnet 0 ~ 4 G

Faceplate illumination 1 lx

Target voltage 10 ~ 25 V (9)

Dark current:

Typical value at 25°C 5 nA

Signal current:

Typical value 260 nA

Minimum value 200 nA

Lag: Percent of initial value of signal current 1/20

second after illumination is removed:

Typical value 12 % (10)

Limiting resolution:

At center of picture:

Typical value 600 TV lines (11)

Minimum value 500 TV lines (11)

At corner of picture:

Typical value 450 TV lines (11)

Minimum value 350 TV lines (11)

Spurious Signal Specification (12)

This test is performed using an uniformly diffused white test chart that is separated into three zones as shown below.

Fig. 1
Spurious Signal Test Chart

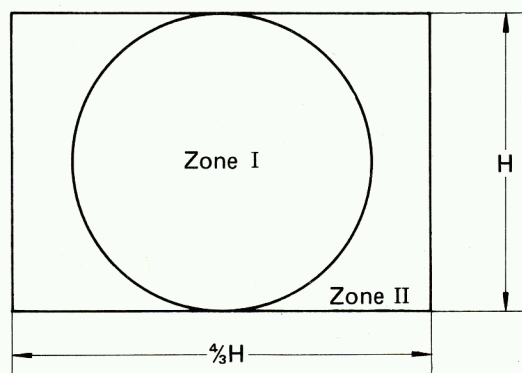


Table 1

Allowable Spot Size for each zone (based on 525 TV line system)

Spot Size (Equivalent TV Lines)	Zone I Allowed Spots	Zone II Allowed Spots
1 and under	*	*
2 to but not including 1	5	5
4 to but not including 2	4	5
7 to but not including 4	0	1
Total	6	8

*Spots of this size are allowed unless concentration causes a smudged appearance.

- a) In each zone, a spot having a contrast ratio greater than 2 : 1 shall be considered as a fault. In case number of the above mentioned fault exceeds the allowed number of spots shown in Table 1; the tube is rejected.
- b) In each zone, a spot having contrast ratio falling in between 1.5 : 1 and 2 : 1 shall be counted as $\frac{1}{2}$ of the spot having contrast greater than 2 : 1. In case number of the spots counted in accordance with the above calculation exceeds the number in Table 1, the tube is rejected.
- c) In each zone, any spot having contrast ratio below 1.5 : 1 shall not be considered as a fault.
- d) Tubes are rejected for smudge, lines, streaks, mottled background, grainy background, or uneven background having contrast ratio greater than 1.5 : 1.

Notes

- (1) This capacitance, which effectively is the output impedance of the S4092 is increased when the tube is mounted in the yoke assembly. The resistive component of the output impedance is in the order of 100 megohms.
- (2) The maximum ratings in the tabulated data are established in accordance with the following definition of the Absolute-Maximum Rating System for rating electron devices. Absolute-Maximum Rating are limiting values of operating and environmental conditions applicable to any electron device of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.
- (3) Newvicon tubes do not permit automatic sensitivity control by means of regulation of the signal electrode voltage. Adequate control is therefore to be achieved by other means (iris control and neutral density filters). If the tube is applied in cameras originally designed for vidicon tubes, the automatic sensitivity control circuitry should be made inoperative and the signal electrode voltage set to the value indicated in note(9).
- (4) Video amplifiers must be designed properly to handle output current of this magnitude to avoid amplifier overloaded or picture distortion.
- (5) For conditions where "white light" is uniformly diffused over entire tube face. Care must be taken not to focus the solar image on the target through a lens opening wider than F/11 to avoid instantaneous break down.
- (6) The geometry and uniformity of signal output depend upon the ratio of grid No. 6 to grid Nos. 2+3+5 voltage, and also depend upon the type of yoke assembly used.
The recommended voltage ratio is 5 : 3 for the yoke assemblies mentioned under "General Data."
- (7) Grids Nos. 2, 3 and 5 should be operated above 250 volts in order to provide sufficient beam current.
- (8) With no blanking voltage on grid No. 1.
- (9) The target voltage adjusted to the value indicated by the tube manufacturer on the test sheet as delivered with each tube.
- (10) For initial output current of $0.2\mu\text{A}$.
- (11) On RETMA resolution test chart, faceplate illumination adjusted for peak output current of $0.2\mu\text{A}$.
- (12) Adjust faceplate illumination to give $0.2\mu\text{A}$ output current. Adjust beam current to discharge highlights.

Fig. 2

Light Transfer Characteristic

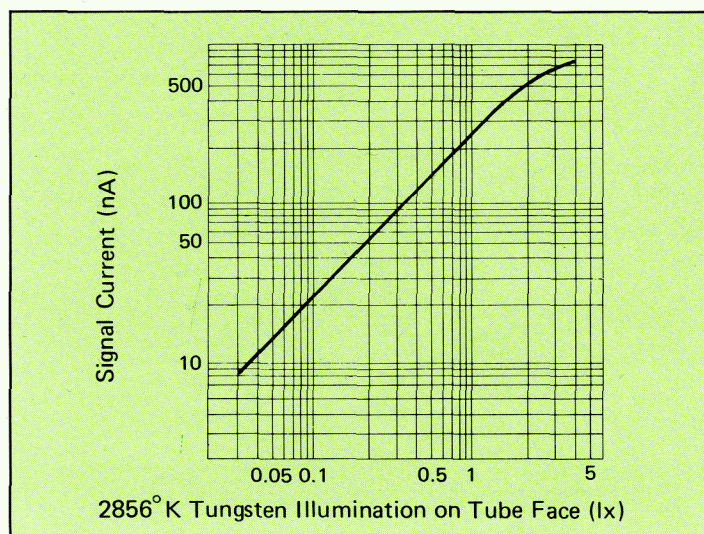


Fig. 3

Relative Spectral Response Characteristics

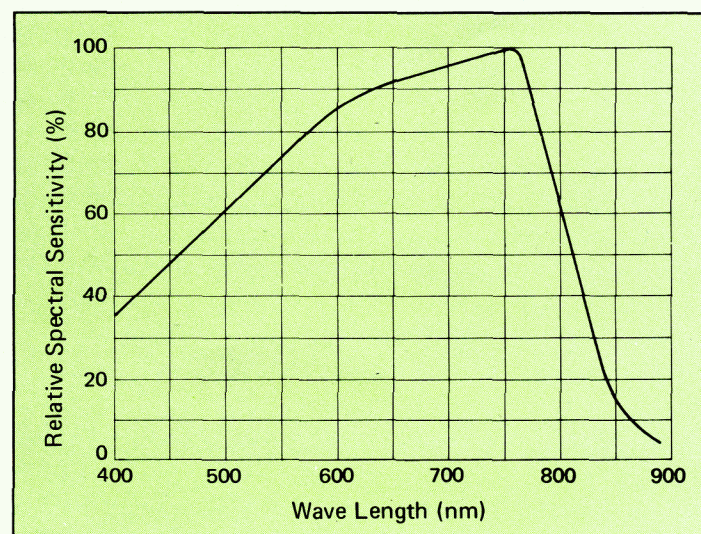


Fig. 4

Horizontal Square-Wave Response

S4092

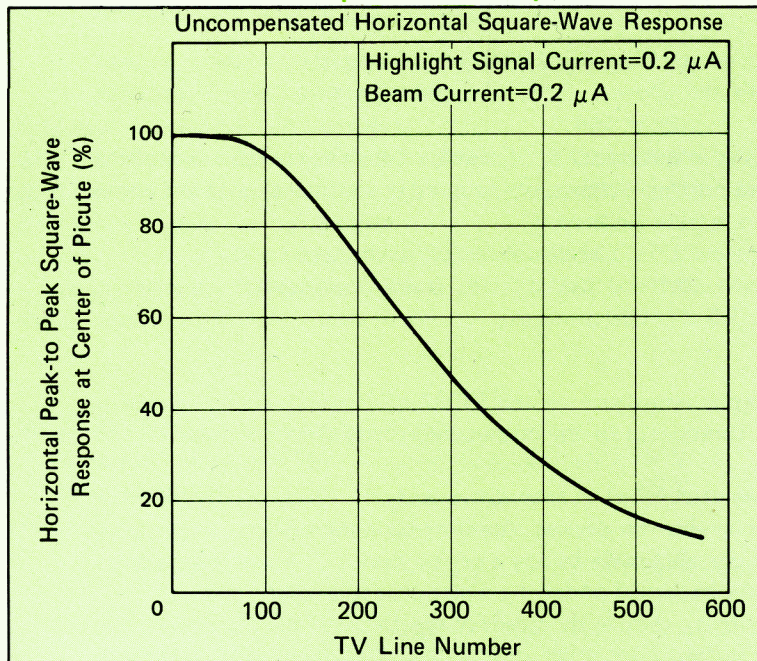


Fig. 5

Outline Drawings and Base Connections

