

ELECTRONIC TUBE REFERENCE

7038

Specialized - Photo Tube electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CAMERAPICKUP

Vidicon television camera tube for live-scene and film pickup using a uniform photoconductive target.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 CameraPickup
No fixed ratings recorded.
Source-derived section; promoted values populated where applicable.

Vidicon television camera tube for live-scene and film pickup. Its uniform photoconductive surface provides uniform dark current across the scanned area.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1940 RCA

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

1940 RCA

Section 1 · CameraPickup

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
The 7038 utilizes a unique a modulating voltage of suitable waveform to the	7038 V	The 7038 utilizes a unique a modulating voltage of suitable waveform to the
—m—m— voltage (AC or DC) P 6.3 +	109 V	—m—m— voltage (AC or DC) P 6.3 + 109 volts
Current	600 mA	Current. 0.6 amp
other electrodes	4.6 pF	other electrodes 4.6 uuf
a condition necessary for driving the surface to GRID-NO.3 & GRID-No.4 VOLTAGE. 350 max. vol	350 V	a condition necessary for driving the surface to GRID-NO.3 & GRID-No.4 VOLTAGE. 350 max. volts
cathode potential. The beam electrons approach GRID-NO.2 VOLTAGE . . « « « « 350 max. volts	350 V	cathode potential. The beam electrons approach GRID-NO.2 VOLTAGE . . « « « « 350 max. volts
the layer at low velocity because of the low GRID-No	1 V	the layer at low velocity because of the low GRID-No.1 VOLTAGE:
operating potential of the signal electrode. Negative bias value. 125 max. volts	125 V	operating potential of the signal electrode. Negative bias value. 125 max. volts
Positive bias value. 0 V 0 max. volts	0 V	Positive bias value. 0 max. volts
to cathode, . . 125 max. volts	125 V	to cathode, . . 125 max. volts
posited from the beam until the surface potential to cathode. . . 10 max. volts	10 V	posited from the beam until the surface potential to cathode. . . 10 max. volts

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 (Accelerator) voltage. 300 volts T Indicated range for each type of service serves only	300 V	Grid-No.2 (Accelerator) voltage. 300 volts T Indicated range for each type of service serves only
Grid-No. 1 Voltage for Picture to illustrate the operating target-voltage range	1 V	Grid-No. 1 Voltage for Picture to illustrate the operating target-voltage range
Cutoff® - -45 to --100 volts normally encountered	-100 V	Cutoff® - -45 to ---100 volts normally encountered.
Average "Gamma" of Transfer The target voltage for each 7038 must be adjusted to that	7038 V	Average "Gamma" of Transfer The target voltage for each 7038 must be adjusted to that
when applied to grid No.1. . . 75 volts Video amplifiers must be designed properly to handle	75 V	when applied to grid No.1. . . . 75 volts Video amplifiers must be designed properly to handle
When applied to cathode. . . . 20 volts target currents of this magnitude to avoid amplifier	20 V	When applied to cathode. . . . 20 volts target currents of this magnitude to avoid amplifier
in Any Tube®, . . 110 volts limiting values above which its serviceability	110 V	in Any Tube®, . . 110 volts limiting values above which its serviceability
Target voltageT 60 to	100 V	Target voltageT 60 to 100 volts
in Any Tube**	60 V	in Any Tube** . . 60 volts
Target Voltagef.e e e 30 to	50 V	Target Voltagef.e e e 30 to 50 volts
Max. Target voltage Required to The base pins of the 7038 fit the ditetrar	7038 V	Max. Target voltage Required to The base pins of the 7038 fit the ditetrar
in Any Tube	30 V	in Any Tube . . . 30 volts
Target VoltageT. 15 to	25 V	Target VoltageT. 15 to 25 volts
ance of the 7038, is increased when the tube is mounted the tube and by a clamping mechanism near th	7038	ance of the 7038, is increased when the tube is mounted the tube and by a clamping mechanism near the
the order of 100 megohms. should be such that the horizontal scan is	100 ohm	the order of 100 megohms. should be such that the horizontal scan is
crease with decreasnng grid-No.4 and grid-No	3 V	crease with decreasnng grid-No.4 and grid-No.3 voltage.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
above 250 volts. should be of high quality and provide depth of	250 V	above 250 volts. should be of high quality and provide depth of
amplifier having bandwidth of 5Mc. Because the noise	5 A	amplifier having bandwidth of 5Mc. Because the noise
HIGHLIGHT SIGNAL - OUTPUT MICROAMPERES =	200 mA	HIGHLIGHT SIGNAL - OUTPUT MICROAMPERES = 0.2
DARK CURRENT (MICROAMPERES)= 0.2 v o The alignment coil should be located on the	200 mA	DARK CURRENT (MICROAMPERES)= 0.2 v o The alignment coil should be located on the
Fig.3. The target voltage must be adjusted to The focusing-electrode (grid No.3) voltage	3 V	Fig.3. The target voltage must be adjusted to The focusing-electrode (grid No.3) voltage
produce the desired value of dark current depend- may be fixed at a value of about 280 volts when	280 V	produce the desired value of dark current depend- may be fixed at a value of about 280 volts when
voltage. Operation at a grid-No.3 voltage below	3 V	voltage. Operation at a grid-No.3 voltage below
260 volts is not recommended. The necessary	260 V	260 volts is not recommended. The necessary
focusing device, the grid-No.3 voltage should be	3 V	focusing device, the grid-No.3 voltage should be
adjustable over a range from 250 to	300 V	adjustable over a range from 250 to 300 volts.
grid-No.3 voltage. in general, grid No	4 V	grid-No.3 voltage. in general, grid No.4 and
grid No.3 should be operated above	250 V	grid No.3 should be operated above 250 volts.
The grid-No.1 voltage should be adjustable	1 V	The grid-No.1 voltage should be adjustable
from 0 to –	-110 V	from 0 to —110 volts.
The dc voltages required by the 7038 can be	7038 V	The dc voltages required by the 7038 can be
R3 N23 AND N24 AMPLIFIER factory operation of the	7038	R3 N23 AND N24 AMPLIFIER factory operation of the 7038
It that the target voltage be	1 V	It that the target voltage be

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
C1 Cy¥: 0.1 uf, 300 volts (working R1: 120000 ohms, 1/2 watt 3 foot-candles on the faceplate	3 V	C1 Cy¥: 0.1 uf, 300 volts (working R1: 120000 ohms, 1/2 watt 3 foot-candles on the faceplate
voltage) R2: 100000~ohm potentiometer, 2 watts of the 7038. Such a low	7038 V	voltage) R2: 100000~ohm potentiometer, 2 watts of the 7038. Such a low
C2: 0.1 uf, 300 volts (working R3: 50000~ohm potentiometer, 2 watts . . . i	2 V	C2: 0.1 uf, 300 volts (working R3: 50000~ohm potentiometer, 2 watts . . . i
voltage) RL: 70000 ohms, 1/2 watt iflumination fevel, however,	2 V	voltage) RL: 70000 ohms, 1/2 watt iflumination fevel, however,
€3 €5: 0.1 uf, 200 volts (working R5: 5000 ohms, 1/2 watt requires maximum-sensitivity	2 V	€3 €5: 0.1 uf, 200 volts (working R5: 5000 ohms, 1/2 watt requires maximum-sensitivity
voltage) R6: 10000 ohms, 1/2 watt A	2 V	voltage) R6: 10000 ohms, 1/2 watt A .
C6: 4 uf, electrolytic, 300 volts R7: 200000 ohms, 1/2 watt operationof the 7038. For this	7038 V	C6: 4 uf, electrolytic, 300 volts R7: 200000 ohms, 1/2 watt operationof the 7038. For this
(working voltage) R8: 50000 ohms, 1/2watt, non~inductive type of operation, adark current	2 V	(working voltage) R8: 50000 ohms, 1/2watt, non~inductive type of operation, adark current
M: Target-Current Meter, RCA Ultra- R9: 100000 ohms, 1/2 watt . . A	2 W	M: Target-Current Meter, RCA Ultra- R9: 100000 ohms, 1/2 watt . . A
sensitive Microammeter wv-guB, or RI0: 500000-0hm potentiometer,2 watts of 0.2 microampere is requir	200 mA	sensitive Microammeter wv-guB, or RI0: 500000-0hm potentiometer,2 watts of 0.2 microampere is required.
equrvalent Ri1: 1000 ohms, 1/2 watt, non-inductive This value will be obtained for	2 W	equrvalent Ri1: 1000 ohms, 1/2 watt, non-inductive This value will be obtained for
Fig.q4 - Typical Voltage Dividers for Supplying rangeof 60 to 00 volts. Under	0 V	Fig.q4 - Typical Voltage Dividers for Supplying rangeof 60 to 00 volts. Under
DC Electrode Voltages to Type 7038. such low~level illumination	7038 V	DC Electrode Voltages to Type 7038. such low~level illumination

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
highlight target current of 0.5 microampere illumination and lower dark current	500 mA	highlight target current of 0.5 microampere illumination and lower dark current.
the faceplate, a dark current of	20 mA	the faceplate, a dark current of 0.02 microampere
having an 8-Mc bandwidth as shown in Fig	5 MHz	having an 8-Mc bandwidth as shown in Fig.5 (b).
Aperture correction compensates for the aperture target voltage within the range of 30 to B	30 V	Aperture correction compensates for the aperture target voltage within the range of 30 to B0 volts.
Over the entire broadcast bandwidth of 4.5 Mc, will range between 15 and	25 V	Over the entire broadcast bandwidth of 4.5 Mc, will range between 15 and 25 volts.
Fig.6. This compensation, however, does not The exact value of target voltage to give the	6 V	Fig.6. This compensation, however, does not The exact value of target voltage to give the
7038 CONTROL CORRECTION AMPLIFIER OUTPUT	7038	7038 CONTROL CORRECTION AMPLIFIER OUTPUT
NOTE: IT IS RECOMMENDED THAT THIS PREAMPLIFIER BE SHOCK-MOUNTED	1	NOTE: IT IS RECOMMENDED THAT THIS PREAMPLIFIER BE SHOCK-MOUNTED
C1 C3 C5: 0.01 uf, 100 volts R1 R4 R5 R6: 100 ohms, 1/	2 V	C1 C3 C5: 0.01 uf, 100 volts R1 R4 R5 R6: 100 ohms, 1/2 watt
C2: 2000 uf, electrolytic, 3 volts R2: 500000 ohms, 1/	2 V	C2: 2000 uf, electrolytic, 3 volts R2: 500000 ohms, 1/2 watt
Cy: 0.01 pf, 350 volts R3: 15 ohms, 1/	2 V	Cy: 0.01 pf, 350 volts R3: 15 ohms, 1/2 watt
C6: 90 uf, electrolytic, 350 volts R7: 12 ohms, 1/	2 V	C6: 90 uf, electrolytic, 350 volts R7: 12 ohms, 1/2 watt
C7: 0.1 uf, 350 volts R8: 100000 ohms, 1/	2 V	C7: 0.1 uf, 350 volts R8: 100000 ohms, 1/2 watt
C8: 0.1 pf, 300 volts R9: 1 megohm, 1/	2 V	C8: 0.1 pf, 300 volts R9: 1 megohm, 1/2 watt
Li: 12 wh peaking coil, adjustable R10 R11: 1800 ohms,	2 W	Li: 12 wh peaking coil, adjustable R10 R11: 1800 ohms, 2 watts
core to cover range from 9 to 15 uh R12: 470 ohms,	2 W	core to cover range from 9 to 15 uh R12: 470 ohms, 2 watts

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Fig.s (b) - Low-Noise Cascode Preamplifier Having 8-Mc Bandwidth	8 MHz	Fig.s (b) - Low-Noise Cascode Preamplifier Having 8-Mc Bandwidth.
the input of the video preamplifier to indicate approximately 0.65. This value is relatively	0.65	the input of the video preamplifier to indicate approximately 0.65. This value is relatively
The maximum amount of illumination on the target voltage, or 50 to in dark current,	50 V	The maximum amount of illumination on the target voltage, or 50 to in dark current,
temperature of the faceplate which should never and 0.3 microampere. Close uniformity in the	300 mA	temperature of the faceplate which should never and 0.3 microampere. Close uniformity in the
target voltage neededto give maximum sensitivity the 7038 can be achieved by compensating for the	7038 V	target voltage neededto give maximum sensitivity the 7038 can be achieved by compensating for the
at a dark current of 0.2 microampere may range beam landing errors that are introduced by the	200 mA	at a dark current of 0.2 microampere may range beam landing errors that are introduced by the
between 60 and 100 volts, it is essential that deflecting and focusing components used with the	100 V	between 60 and 100 volts, it is essential that deflecting and focusing components used with the
FHIGHLIGHT TARGET MICROAMPERES=0.35 w2 AMPERES =	300 mA	FHIGHLIGHT TARGET MICROAMPERES=0.35 w2 AMPERES =0.3
DARK CURRENT (MICROAMPERES)= 0.02 Q SCANNED AREA OF I? HOTOCONDUCTIVE	20 mA	DARK CURRENT (MICROAMPERES)= 0.02 Q SCANNED AREA OF I? HOTOCONDUCTIVE
FHIMc= 80 TV LINES (APPROX.) T	8	FHIMc= 80 TV LINES (APPROX.) T 8
; 4.5Mc BROADCAST____ T .] \\	4.5	; 4.5Mc BROADCAST____ T .] \\
waveform to the cathode of the 7038. The de— tional design. The modulating voltage is applied	7038 V	waveform to the cathode of the 7038. The de— tional design. The modulating voltage is applied
25 volts 450 volts Underscanning of the photoconductive layer	450 V	25 volts 450 volts Underscanning of the photoconductive layer

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
450 volts	400 V	450 volts 400 volts
400 volts , 450 volts condition which produces a larger-than-normal	450 V	400 volts , 450 volts condition which produces a larger-than-normal

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
circuit and the scanning beam, a capacitive Electrode™®) voltage. - 250 to	300 V	circuit and the scanning beam, a capacitive Electrode™®) voltage. - 250 to 300 volts
Fig.2 - Typical Characteristics of Type 7038. voltage to maintain the desired dark current, as	7038 V	Fig.2 - Typical Characteristics of Type 7038. voltage to maintain the desired dark current, as


SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1950 General Electric Transmitting Types

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

1950 GENERAL ELECTRIC TRANSMITTING TYPES

Section 1 · CameraPickup

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode voltage maximum	350 V	Published datasheet value
Grid No. 2 voltage maximum	750 V	Published datasheet value

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Signal-electrode capacitance	4 pF	Published datasheet value
Center resolution minimum	600 lines	Published datasheet value

TUBE TINKER

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