

Ten-stage dormer-window photomultiplier optimized for detecting low-contrast light signals in relatively high background illumination.

GENERAL CHARACTERISTICS

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

SECTION RATINGS

SECTION1 Photomultiplier

No fixed ratings recorded.

Source-derived section; promoted values populated where applicable.

7029 MULTIPLIER PHOTOTUBE Semitransparent Cathode 10-Stage, Dormer-Window Type 3.75" Max. Length On Reflective Substrate S-17 Response | .56" Max. Diameter TENTATIVE DATA RCA-7029 is a sturdy, dormer—window type of cathode, Semitransparent onReflective Substrate: Shape. .Rectangular on concave spherical surface multiplier phototube intended for use in the Minimum prOjected 1engthon plane detection of low-level light signals in the of window, . . . 0.65 in. Minimum projected W|dth on plane presence of reftatively of window. . . 0.5 in high background [Direct Intere]electrode CapaC|tances (Approx) Anode to dynode No.10. 4 it fumination. It is, Anode to all other electrodes. 7 pupf therefore, especially Maximum Overall Length . 3.75" Max imum Scated Length. e 30750 suited for low-contrast Length From Base Seat to centerof W|ndow Area 2.69" + 0.19" applications. Diameter 1.50" t 0.06" Bulb . . T—lz With Special End Contour Outstanding fea- Base

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 · Photomultiplier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
microamperes per For Altitudes wp to	60000 A	microamperes per For Altitudes wp to 60,000 Feet
lumen and its stabi- ANODE-SUPPLY VOLTAGE (DC or Peak AC) 1250 max. volts	1250 V	lumen and its stabi- ANODE-SUPPLY VOLTAGE (DC or Peak AC) 1250 max. volts
SUPPLY VOLTAGE BETWEEN DYNODE No	10 V	SUPPLY VOLTAGE BETWEEN DYNODE No. 10
l'ized sensitivity. AND ANODE (DC or Peak AC). « v « « v « . . 250 max. volts	250 V	l'ized sensitivity. AND ANODE (DC or Peak AC). « v « « v « . . 250 max. volts
Other distinguishing DYNODE-No. 1 SUPPLY VOLTAGE	1 V	Other distinguishing DYNODE-No. 1 SUPPLY VOLTAGE
DC or Peak AC)e v v v v v v v v v v v v . 300 max. volts	300 V	DC or Peak AC)e v v v v v v v v v v v v . 300 max. volts
photocathode located With E = 1000 volts (except as noted)	1000 V	photocathode located With E = 1000 volts (except as noted)
Radiant, at 2900 angstroms - 27200 - a/	27200	Radiant, at 2900 angstroms - 27200 - a/
staticalty focused Luminous! 10 40	300 A	staticalty focused Luminous! 10 40 300 amp/lumen
range from about 2900 to 6200 angstroms as shown current Amp]nf catnon PR	320000 A	range from about 2900 to 6200 angstroms as shown current Amp]nf catnon PR - 320000 -
mately	4900	mately 4900 angstroms.
¢ Averaged over any interval of 30 seconds maximum	30 s	¢ Averaged over any interval of 30 seconds maximum.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
of millimicrosecond or iess, the time spread filament Yamp operated at acolor temperatureof	28700 s	of millimicrosecond or iess, the time spread filament Yamp operated at acolor temperatureof 28700 k.
of the pulse at the anode is less than 5 milli- sistor has a value of	0.01 ohm	of the pulse at the anode is less than 5 milli- sistor has a value of 0.01 megohm.
microseconds measured at 50 per cent of the maxi- the value of light flux is 0.001 tumen and 100 vol	100 V	microseconds measured at 50 per cent of the maxi- the value of light flux is 0.001 tumen and 100 volts are
wavelength of Maximum Response . u900 t 500 angstroms filter is0.001 Yumen. The load resistor has a	1	wavelength of Maximum Response . u900 t 500 angstroms filter is0.001 Yumen. The load resistor has a value of
0.01 megohm, and 100 volts are applied between cathode the anode and constitute the current utilized	100 V	0.01 megohm, and 100 volts are applied between cathode the anode and constitute the current utilized in
supply voltage (E) adjusted to give a luminous sensi- Dynode No. 10 is so shaped as to enclose	10 V	supply voltage (E) adjusted to give a luminous sensi- Dynode No. 10 is so shaped as to enclose
tivity of 20 amperes per lumen. Dark current caused by	20 A	tivity of 20 amperes per lumen. Dark current caused by
supply voltage [E) below 1000 volts is recommended	1000 V	supply voltage [E) below 1000 volts is recommended.
1000 volts, 25° ¢ tube temperature, ac-amplifier band— anode consists of a grating which allows the	25 V	1000 volts, 25° ¢ tube temperature, ac-amplifier band— anode consists of a grating which allows the
width of 1 cycle per second, tungsten light source at electrons from dynode No.9 to pass through it	9 s	width of 1 cycle per second, tungsten light source at electrons from dynode No.9 to pass through it to
Under conditions with supply voltage E of 1000 volts, tube	1000 V	Under conditions with supply voltage E of 1000 volts, tube
anode current of 10 microamperes within 1 minute after >	1 A	anode current of 10 microamperes within 1 minute after >

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
creaseby more than 1microampere nor decrease by more than z	1 A	creaseby more than 1microampere nor decrease by more than z
1.5 microcamperes	0 mA	1.5 microcamperes. 0
Current Amplification. Ratio of the output current to the 3000 5000 7000	11000	Current Amplification. Ratio of the output current to the 3000 5000 7000 9000 11000
amplify signals composed of electron streams. In the electrons emitted by dynode No. 0 are col	0	amplify signals composed of electron streams. In the electrons emitted by dynode No. 0 are col-
in order not to exceed these absolute ratings, 126 volts. The voltage between dynode No.	0 V	in order not to exceed these absolute ratings, 126 volts. The voltage between dynode No. 0 and
the approximate range of 50 to 100 volts. Low	100 V	the approximate range of 50 to 100 volts. Low
[T CURVE A: SPECTRAL CHARACTERISTIC OF LIGHT SOURCE ha operating voltage between dynode No. 10 and a	10 V	[T CURVE A: SPECTRAL CHARACTERISTIC OF LIGHT SOURCE ha operating voltage between dynode No. 10 and anode
H 2870°K SOURCE AFTER PASSING THROUGH BLUE 1] cated operating voltage between dynode No.	0 V	H 2870°K SOURCE AFTER PASSING THROUGH BLUE 1] cated operating voltage between dynode No. 0 and
1 ply voltage between these electrodes above the	1 V	1 ply voltage between these electrodes above the
92CM-7811I increased to the rated maximum valueof	300 V	92CM-7811I increased to the rated maximum valueof 300 volts.
voltage is applied to the electrodes of the	7029 V	voltage is applied to the electrodes of the 7029
that the basing arrangement is such that the voltage reference to the curve in Fig.5 which shows the	5 V	that the basing arrangement is such that the voltage reference to the curve in Fig.5 which shows the
than twice the voltage per stage. As a result, of fuminous sensitivity for the 7029, and the	7029 V	than twice the voltage per stage. As a result, of fuminous sensitivity for the 7029, and the
(E) in the range from 750 to 1000 volts. Within thereby lowers the detection threshold to give	1000 V	(E) in the range from 750 to 1000 volts. Within thereby lowers the detection threshold to give

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
second. At voltages above 1000 volts, regener—	1000 V	second. At voltages above 1000 volts, regener—
[VOLTS/STAGE = 9l and its duration. When the 7029 is operated at	7029 V	[VOLTS/STAGE = 9l and its duration. When the 7029 is operated at
w3 low the maximum rated value of	20 A	w3 low the maximum rated value of 20 microamperes
i T { anode current should not exceed	10 A	i T { anode current should not exceed 10 microamperes.
determined from Fig.6. For example, if a sensi- prevent this possibility, it is suggested that a	6	determined from Fig.6. For example, if a sensi- prevent this possibility, it is suggested that a
tivity of 10 amperes per lumen is desired, it shield be closely fitted over the uncoated area	10 A	tivity of 10 amperes per lumen is desired, it shield be closely fitted over the uncoated area
age of 1000 volts, and on the "maximum" sensitivity I0 megohms to a potential near that of the cath	1000 V	age of 1000 volts, and on the "maximum" sensitivity I0 megohms to a potential near that of the cath-
curve to a supply voltage of about700 volits. ode. The shield may consist of a conductive	0 V	curve to a supply voltage of about700 volits. ode. The shield may consist of a conductive
supply voltage over the range from 700 to	1000 V	supply voltage over the range from 700 to 1000 volts.
2 £ 43 EXTERNAL SHIELD VOLTS RELATIVE TO ANODE VOLTS	43 V	2 £ 43 EXTERNAL SHIELD VOLTS RELATIVE TO ANODE VOLTS
VOLTS/STAGE =	9 V	VOLTS/STAGE = 9l
the effect on anode current of variation inmagnetic pedance in the order of 10 megohms to the po	10 ohm	the effect on anode current of variation inmagnetic pedance in the order of 10 megohms to the po-
With increase in voltage above 100 volts between extreme care should be observed in providing	100 V	With increase in voltage above 100 volts between extreme care should be observed in providing
[* TOTAL VOLTAGE-DIVIDER CURRENT 4 part of the 7029. Although the metallic coating	7029 V	[* TOTAL VOLTAGE-DIVIDER CURRENT 4 part of the 7029. Although the metallic coating
N leads from the 7029 to the amplifier should be	7029	N leads from the 7029 to the amplifier should be

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
W 7 vacuum-tube rectifier. The voltage for each	7 V	W 7 vacuum-tube rectifier. The voltage for each
41 7 spaced taps on a voltage divider across the	7 V	41 7 spaced taps on a voltage divider across the
o 4 voltage divider will depend on the voltage regu	4 V	o 4 voltage divider will depend on the voltage regu-
€1 €2: 2 pf, 1000 volts (dc working)	1000 V	€1 €2: 2 pf, 1000 volts (dc working)
€3 C¥: 0.1 pf, 150 volts (dc working)	150 V	€3 C¥: 0.1 pf, 150 volts (dc working).
o 0.5 1.0 1.5 2.0 R1 R2 R3 R4 R5 R6 R7 R8 R9 R10: 18000 ohms,	1 W	o 0.5 1.0 1.5 2.0 R1 R2 R3 R4 R5 R6 R7 R8 R9 R10: 18000 ohms, 1 watt
INCIDENT LIGHT FLUX-ARBITRARY UNITS R11: 12000 ohms,	1 W	INCIDENT LIGHT FLUX-ARBITRARY UNITS R11: 12000 ohms, 1 watt
92CM -8673RI R12: 200000 ohms, 12 watts, adjustable, General Radio	12 W	92CM -8673RI R12: 200000 ohms, 12 watts, adjustable, General Radio
to critical dependence of the gain of the 7029 high-voltage power supply when access to the	7029 V	to critical dependence of the gain of the 7029 high-voltage power supply when access to the
the positive high-voltage terminal be grounded society of America, vol.37, pp. uzo 431, June,	1947 V	the positive high-voltage terminal be grounded society of America, vol.37, pp. uzo 431, June, 1947.
The high voltages at which the 7029 is oper	7029 V	The high voltages at which the 7029 is oper-

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
fields to the first dynode (secondary emitter). a result of this characteristic, the 7029 can be	7029 s	fields to the first dynode (secondary emitter). a result of this characteristic, the 7029 can be

TUBE TINKER

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