



7412

PHOTOCONDUCTIVE CELL

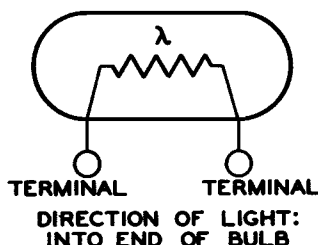
CADMIUM-SULFIDE, HEAD-ON TYPE

7412

DATA

General:

Spectral Response.	S-15
Wavelength of Maximum Response	5800 $\pm$ 500 angstroms
Sensitive Surface:	
Shape.	Rectangular
Length (Minimum)	0.20 in.
Width (Minimum)	0.02 in.
Area (Minimum)	0.004 sq. in.
Maximum Length (Excluding flexible leads)	1.35"
Diameter	0.29" $\pm$ 0.01"
Leads, Flexible.	2
Minimum length	1.4"
Diameter	0.018" $\pm$ 0.005"
Operating Position	Any
Weight (Approx.)	0.06 oz



λ indicates that the primary characteristic of the element within the envelope symbol is designed to vary under the influence of light.

Maximum Ratings, Absolute-Maximum Values:

VOLTAGE BETWEEN TERMINALS			
(DC or Peak AC)	200 max.	volts	
PHOTOCURRENT	1000 max.	μ a	
POWER DISSIPATION.	50 max.	mw	
AMBIENT TEMPERATURE.	60 max.	$^{\circ}$ C	

Characteristics:

With dc voltage of 12 volts between terminals and an ambient temperature of 25 $^{\circ}$ C

Min. Median Max.

Sensitivity:

Radiant [•] , at				
5800 angstroms	—	1580	—	μ a/ μ w
Luminous* [‡]	—	4.5	—	amp/lumen
Illumination* [‡]	100	300	800	μ a/fc
Photocurrent ^Δ	—	—	0.1	μ a
Rise	See Curves			
Decay.	See Curves			



PHOTOCONDUCTIVE CELL

- For conditions where the incident power is 2×10^{-9} watt.
- * For conditions where the light source is a tungsten-filament lamp operated at a color temperature of 2870° K.
- # Incident illumination on the sensitive surface is 0.01 footcandle.
- ▲ Measured approximately 20 seconds after removal of incident-illumination level of 0.01 footcandle.

OPERATING CONSIDERATIONS

The *flexible leads* of the 7412 are usually soldered to the circuit elements. Soldering of the leads may be made close to the seals provided care is taken to conduct excessive heat away from the seals. Otherwise, the heat of soldering will break the seals and damage the cell.

A *clamp* around the glass envelope may be used to hold the cell in position. However, care must be taken in clamping to avoid cracking the glass envelope or introducing strains in the envelope which could lead to eventual breakage.

The *voltage between terminals* of the 7412 may be applied without regard to polarity.

The *angle of view* of the 7412 may be narrowed by the use of a hood of the desired length placed in front of the cell.

If the source of radiation is some distance from the cell, the use of a lens system may be desirable to utilize more effectively the available radiation. *However, the radiation should not be focused onto such a small area that localized overheating of the sensitive surface may result with consequent adverse affects on its characteristics.* Exposure of the 7412 to radiation (even without voltage applied) so intense as to cause excessive heating of the cell may permanently damage it.

For a given illumination, the output current will have its highest value when the incident illumination is normal (angle of incidence is 90°) to the face of the cell. For smaller angles of incidence, the output current decreases. The decrease depends upon several factors including the angle of incidence of the illumination, the amount of illumination, and the area of sensitive surface illuminated.

SPECTRAL-SENSITIVITY CHARACTERISTIC
of Photoconductive Cell having S-15 Response
is shown at the front of this Section



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Technical drawing of a probe assembly. The drawing includes the following dimensions and labels:

- Top View:** A circular cross-section with a central vertical slot. The slot width is dimensioned as $.02'' \text{ MIN.}$. The distance from the centerline to the outer edge of the slot is dimensioned as $.20'' \text{ MIN.}$.
- Side View:**
 - The total length of the probe is dimensioned as $1.00'' \pm .19''$.
 - The distance from the top of the probe to the center of the sensitive surface is dimensioned as $.29'' \pm .01'' \text{ DIA.}$.
 - The distance from the center of the sensitive surface to the top of the main body is dimensioned as $.14'' \text{ MAX.}$.
 - The distance from the top of the main body to the bottom of the probe is dimensioned as $1.35'' \text{ MAX.}$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $1.4'' \text{ MIN.}$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $.16'' \text{ MAX.}$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $.10'' \text{ MAX. DIA.}$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $.38'' \text{ MAX. UNTINNED LENGTH EACH LEAD}$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $.12'' \text{ } \phi \text{ TO } \phi$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $.018'' \pm .005'' \text{ DIA. (SEE NOTE)}$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $.018'' \pm .005'' \text{ DIA. (SEE NOTE)}$.
 - The distance from the bottom of the probe to the center of the sensitive surface is dimensioned as $.018'' \pm .005'' \text{ DIA. (SEE NOTE)}$.

Labels:

- SENSITIVE SURFACE:** Points to the central vertical slot in the top view.
- 2 FLEXIBLE LEADS:** Points to the two leads at the bottom of the probe.

Part Number: 92CS-9986

NOTE: THE SPECIFIED LEAD DIAMETER IS MAINTAINED ONLY WITH-
IN THE UNTINNED LENGTH.

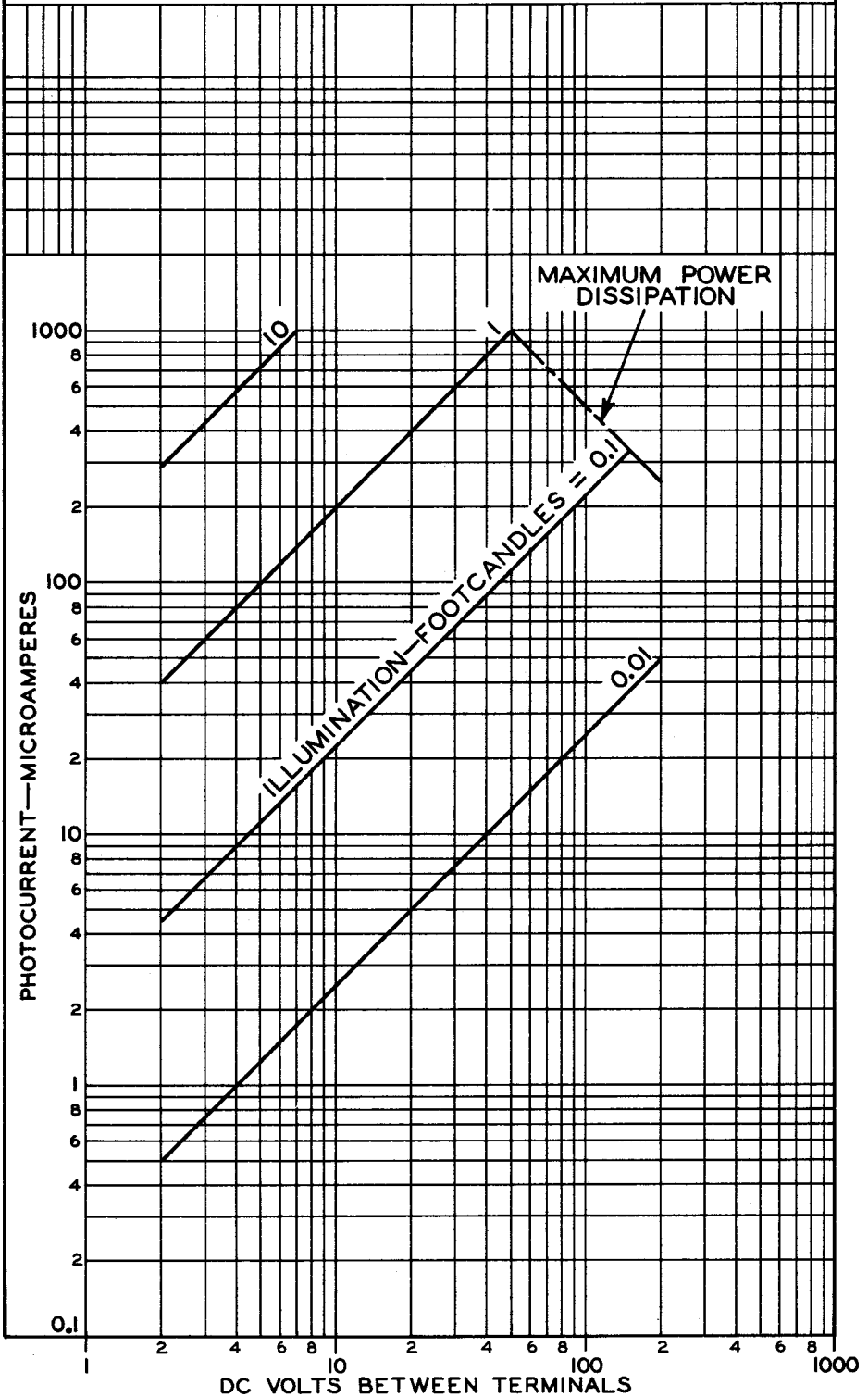
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AVERAGE CHARACTERISTICS

LIGHT SOURCE IS A TUNGSTEN-FILAMENT LAMP
OPERATED AT A COLOR TEMPERATURE OF 2870° K.
AMBIENT TEMPERATURE = 25° C



ELECTRON TUBE DIVISION

92CM-9989

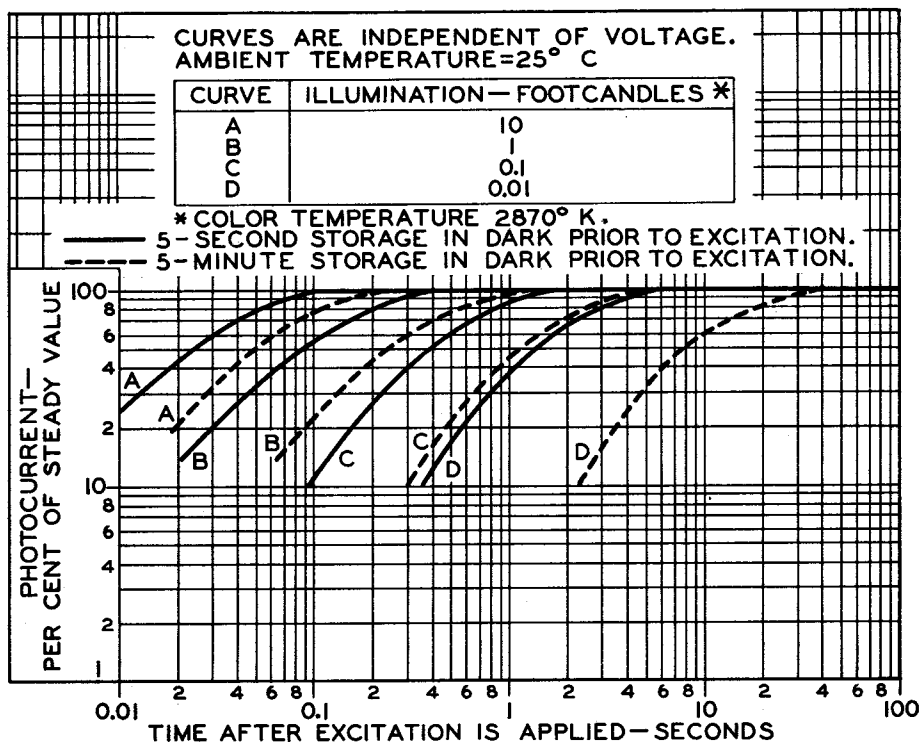
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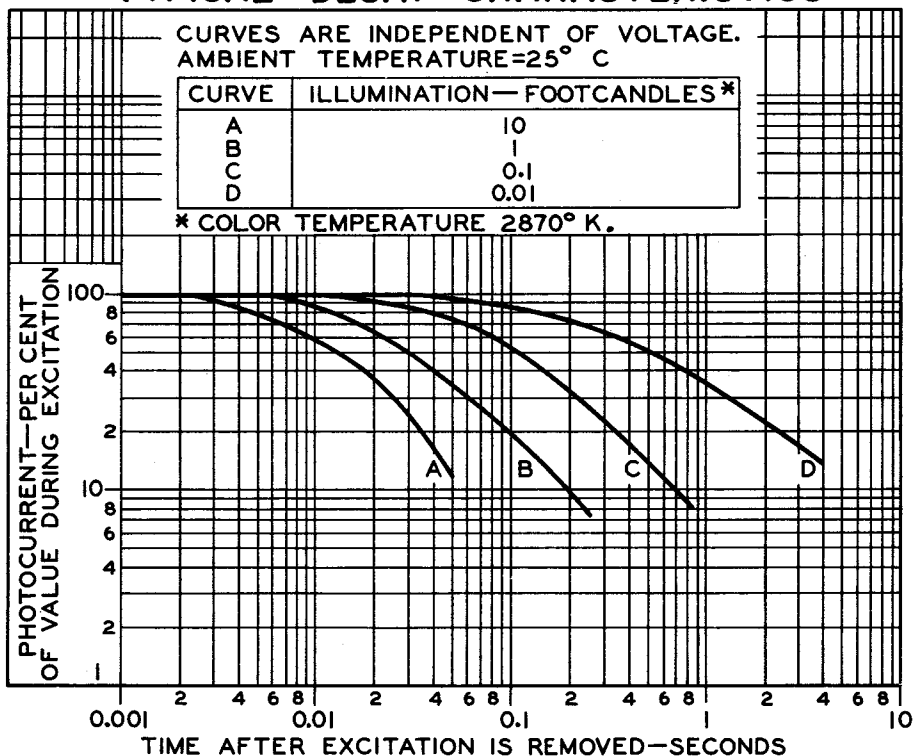
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TYPICAL RISE CHARACTERISTICS



92CS-9532

TYPICAL DECAY CHARACTERISTICS



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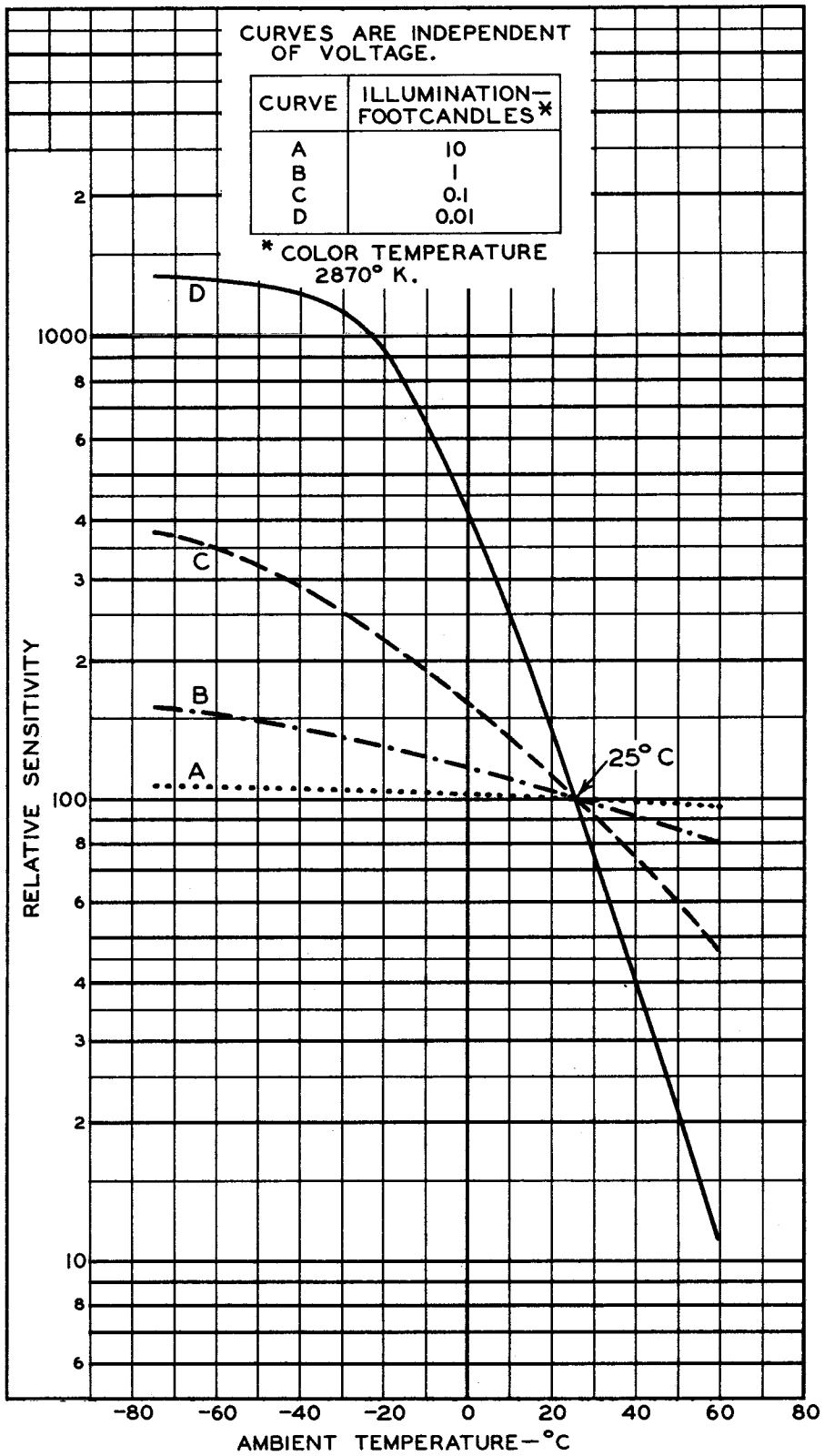
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TYPICAL CHARACTERISTICS



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92CM-9538

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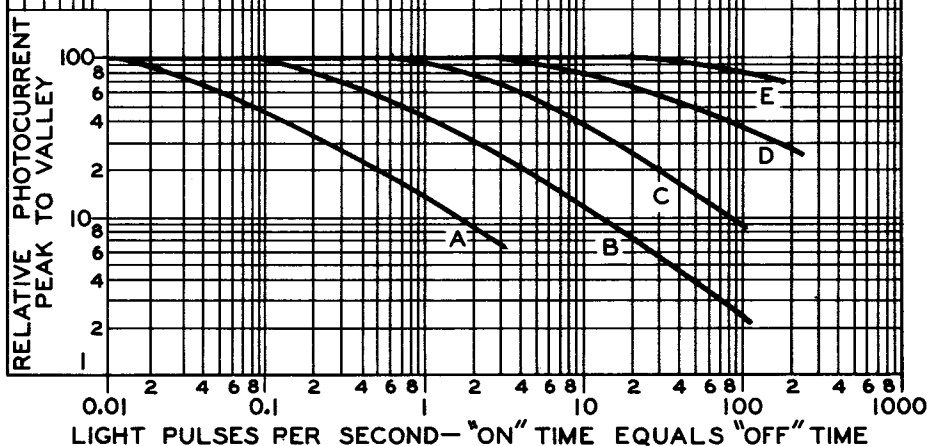
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RESPONSE CHARACTERISTICS

CURVES ARE INDEPENDENT OF VOLTAGE.
AMBIENT TEMPERATURE = 25° C

CURVE	ILLUMINATION — FOOTCANDLES *
A	0.01
B	0.1
C	1
D	10
E	100

* COLOR TEMPERATURE 2870° K.



92CS-9534

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