from JEDEC release #4582, Feb. 3, 1964

Toshiba

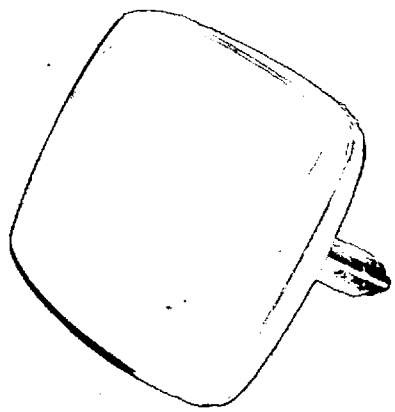
TOSHIBA ELECTRON TUBE 11EP4

PICTURE TUBE

Rectangular Glass Type
Low - Voltage Electrostatic focus

Aluminized Screen
Magnetic Deflection

Toshiba 11EP4 is a 11 inch, directly viewed, rectangular, glass picture tube of the low voltage electro-static focus and 114° magnetic deflection type.
The 11EP4 employs short neck, no ion trap gun featuring good focus over entire picture area.
11EP4 has a aluminized screen and it maximum overall length is only 215 mm or 8.5 inch thus very suitable for portable T.V. Set.



GENERAL DATA

Electrical :

Heater voltage	6.3	V
Heater current at 6.3 Volts	600±30	mA
Heater warm up time	11	second
Direct interelectrode capacitance		
Grid No. 1 to all other electrodes	6	PF
Cathode to all other electrodes	5	PF
External conductive coating to ultor	500 max. 300 min.	PF PF
Focusing method	Electrostatic	
Deflection method	Magnetic	

Deflection angles (approx)

Diagonal	114	deg
Horizontal	102	deg
Vertical	85	deg

Electron gun ..... Type requiring no ion-trap magnet

Optical :

Face plate ..... Filter glass

Light transmission at center (approx) 75%

Phosphor P4-Aluminized

Fluorescence ..... White

Phosphorescence ..... White

Persistence ..... Medium short

Mechanical :

Tube dimensions

Overall length	215±7mm	(8.46±0.28 inches)
Greatest width	243±3mm	(9.57±0.18 inches)
Greatest height	198±3mm	(7.80±0.18 inches)
Diagonal	278±3mm	(10.95±0.18 inches)
Neck length	105±5mm	(4.12±0.12 inches)

Screen dimension (minimum)

Greatest width	223 min mm	(8.78 min inches)
Greatest height	177 min mm	(6.97 min inches)
Diagonal	257 min mm	(10.12 min inches)
Projected area	38000 mm^2	(59 sq. inches)

Weight (approx) ..... 1.6 kg (3.5 Lbs)

Operating position ..... any

Cap ..... Recessed small cavity (JEDEC No. J1-21)

Base ..... Small-Button Neoeighter 7-pin (JEDEC B7-205)

Basing designation 8HR

GRID-DRIVE SERVICE

Unless otherwise specified, voltage values are positive with respect to cathode

Maximum and Minimum Ratings, Design - Maximum values:

Ultor voltage	14000	max.	Volts
	8000	min.	Volts
Grid No. 4 (focusing) voltage;			
Positive value	1100	max.	Volts
Negative value	550	max.	Volts
Grid No. 2 voltage	550	max.	Volts
	300	min.	Volts
Grid No. 1 voltage;			
Negative-peak value	220	max.	Volts
Negative-bias value	154	min.	Volts
Positive-bias value	0	max.	Volts
Positive-peak value	2	max.	Volts
Heater voltage	6.9	max.	Volts
	5.7	min.	Volts
Peak heater-cathode voltage;			
Heater negative with respect to cathode			
During equipment warm-up period not exceeding 15 second	450	max.	Volts
After equipment warm-up period	200	max.	Volts
Heater positive with respect to cathode ..	200	max.	Volts

Equipment Design Ranges;

With any ultor voltage① (Ec_5 k) between 8000 and 14000 volts and Grid - No. 2 voltage (Ec_2 k) between 200 and 550 volts.

Grid - No. 4 voltage for focus②	0 to 400	Volts
Grid - No. 1 voltage (Ec1k) for visual extinction of focused raster	See Raster - Cutoff - Range Chart for Grid - Drive Service	
Grid - No. 4 current	-25 to +25	μA
Grid - No. 2 current	-15 to +15	μA
Field strength of adjustable centering magnet③	0 to 8	gausses

Examples of Use of Design Ranges;

Ultor voltage①	10000	Volts
Grid - No. 2 voltage	400	Volts
Grid - No. 4 voltage for focus②	0 to 400	Volts
Grid - No. 1 voltage for visual extinction of focused raster④	-36 to -94	Volts

Maximum Circuit Values:

Grid - No. 1 circuit resistance	1.5 max.	megohms

CATHODE-DRIVE SERVICE

Unless otherwise specified, voltage values are positive with respect to grid - No. 1

Maximum and Minimum Ratings, Design - Maximum values:

Ultor to Grid - No. 1 voltage	14000 max.	Volts
	8000 min.	Volts

Grid - No. 4 to Grid - No. 1 (focusing) voltage		
Positive value	1100 max.	Volts
Negative value	550 max.	Volts
Grid - No. 2 to Grid No. 1 voltage	700 max. 350 min.	Volts Volts
Grid - No. 2 to cathode voltage	550 max.	Volts
Cathode to Grid - No. 1 voltage		
Positive - peak value	220 max.	Volts
Positive - bias value	154 max.	Volts
Negative - bias value	0 max.	Volts
Negative - peak value	2 max.	Volts
Heater voltage	6.9 max. 5.7 min.	Volts Volts
Peak heater - cathode voltage;		
Heater negative with respect to cathode		
During equipment warm-up period not exceeding 15 second	450 max.	Volts
After equipment warm-up period	200 max.	Volts
Heater positive with respect to cathode	200 max.	Volts

Equipment Design Ranges :

With any ultor to Grid - No. 1 voltage①(Ec_5 g_1) between 8000 and 14000 volts and Grid - No. 2 to Grid - No. 1 voltage (Ec_2 g_1) between 400 and 690 volts

Grid - No. 4 to Grid - No. 1 voltage for focus②	0 to 400	Volts
Cathode to Grid - No. 1 voltage (Ekg_1) for visual extinction of focused raster	See Raster - Cutoff - Range Chart for Cathode - Drive Service	
Grid - No. 4 current	-25 to +25	μA
Grid - No. 2 current	-15 to +15	μA

Field strength of adjustable centering magnet③	0 to 8	gausses

Examples of Use of Design Ranges :

Ultor voltage	10000	Volts
Grid - No. 2 voltage	400	Volts
Grid - No. 4 Grid - No. 1 voltage for focus②	0 to 400	Volts
Cathode to Grid - No. 1 voltage for visual extinction of focused raster	36 to 78	Volts

Maximum Circuit Values :

Grid - No. 1 circuit resistance	1.5 max.	megohms

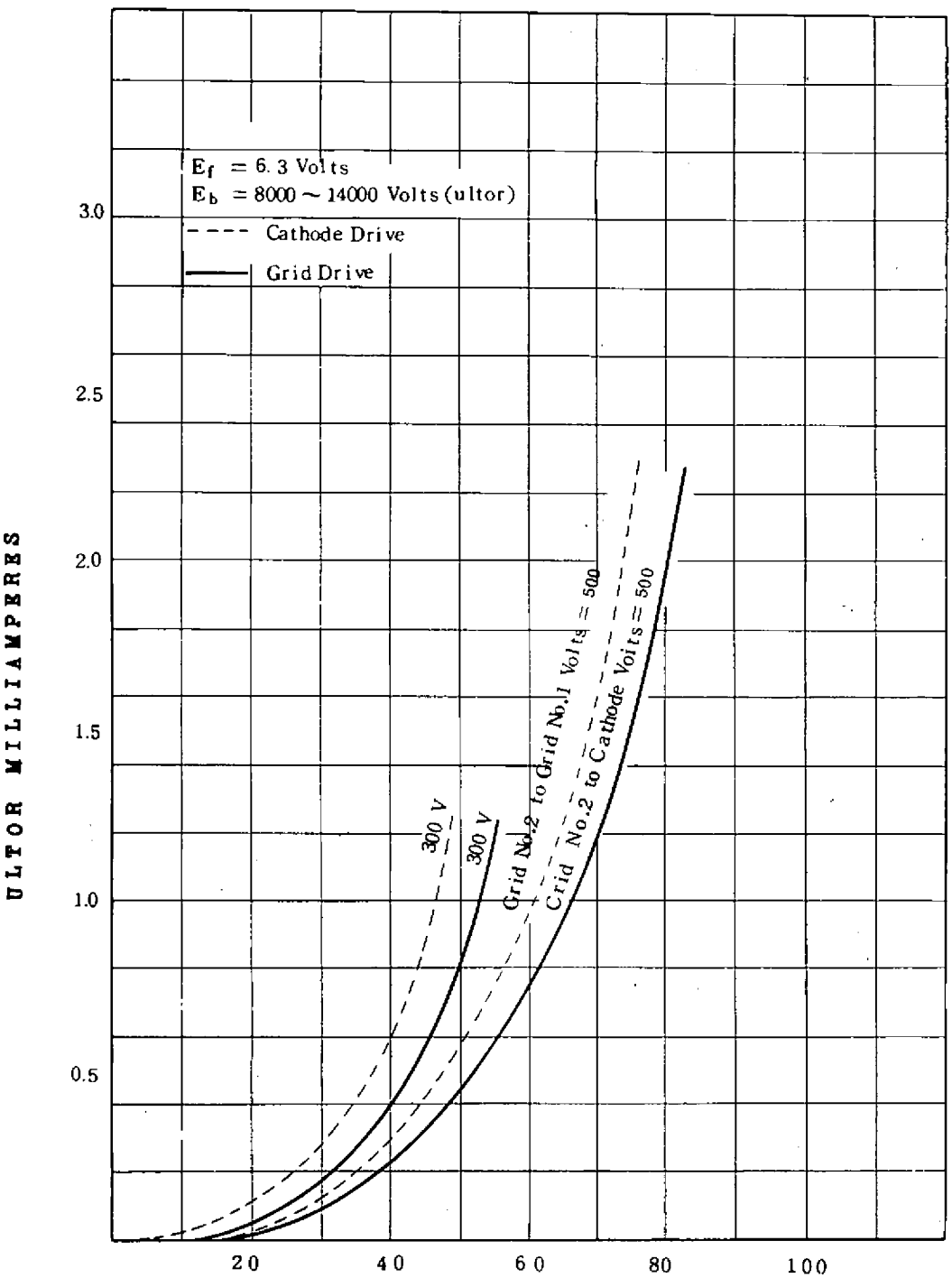
Notes:

1. Brilliance and definition decrease with decreasing voltage of ultor to Grid - No. 1 voltage. In general the ultor voltage or ultor to Grid- No. 1 voltage should not be less than 8000 volts.

2. Individual tubes will have satisfactory focus at same value of Grid-No. 4 (or Grid - No. 4 to Grid No. 1) voltage between 0 and 400 volts with the combined bias voltage and video - signal voltage adjusted to produce an ultor current of 100 micro amperes.

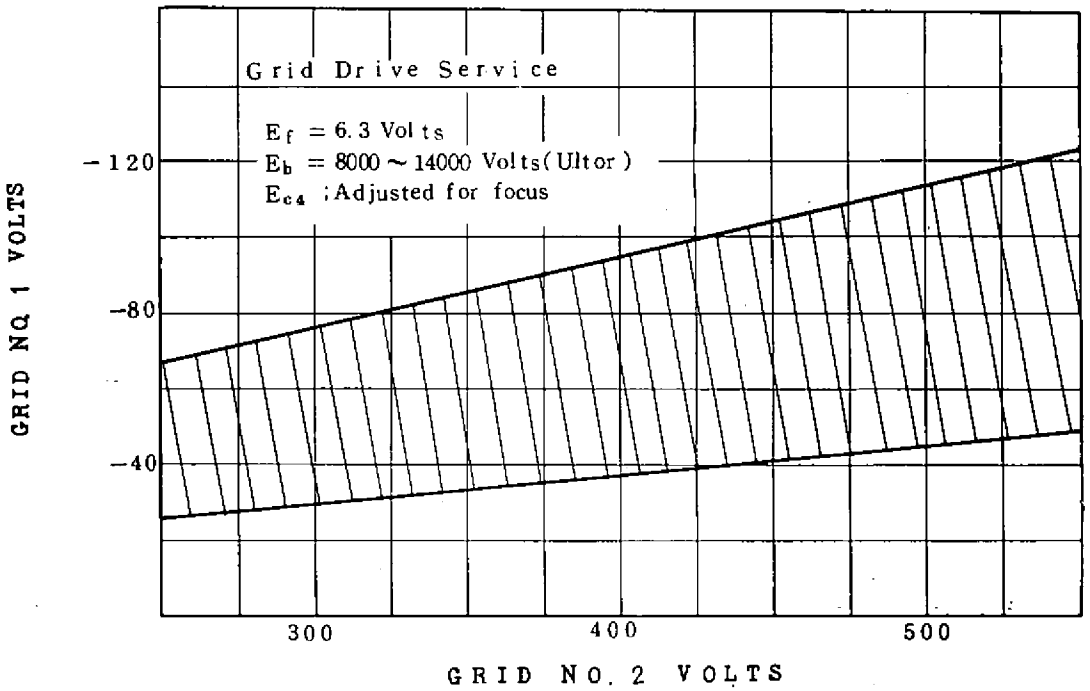
3. Distance from Reference line for suitable P. M. centering magnet should not exceed 2-1/8. Excluding extraneous fields, the center of the undeflected focused spot will fall within a circle having a 5/16 inch radius concentric with the center of the tube face. It is to be noted that the earths magnetic field can cause as much as 7/16 inch deflection of the spot from the center of the tube face.

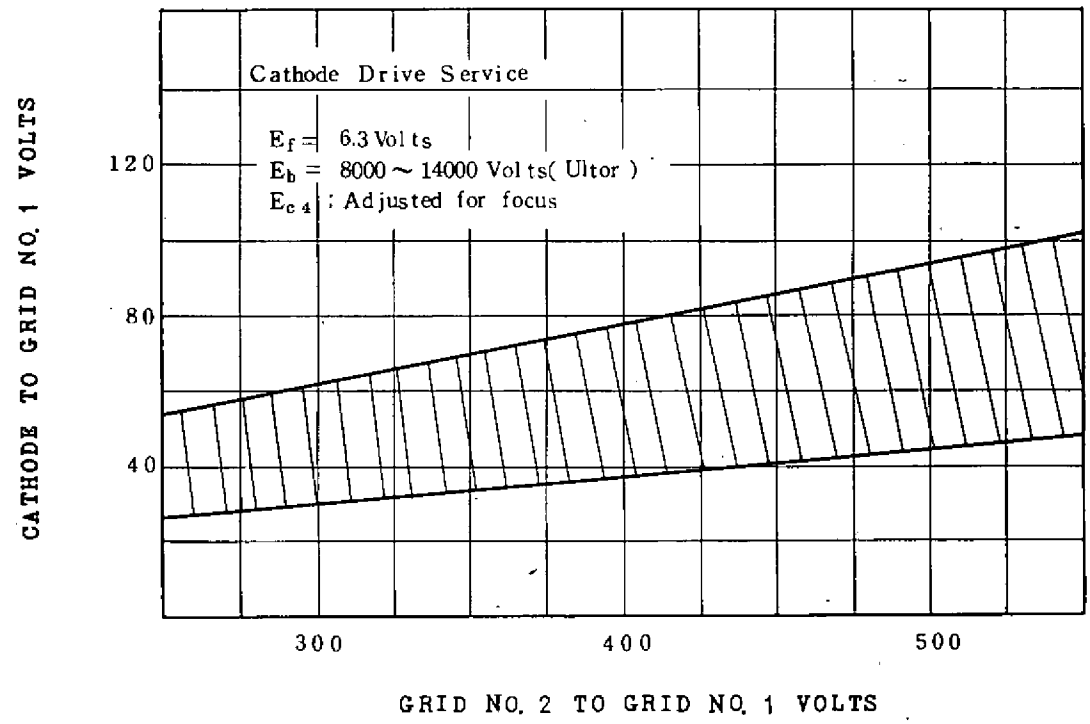
AVERAGE DRIVE CHARACTERISTICS



VIDEO SIGNAL VOLTS FROM RASTER CUTOFF

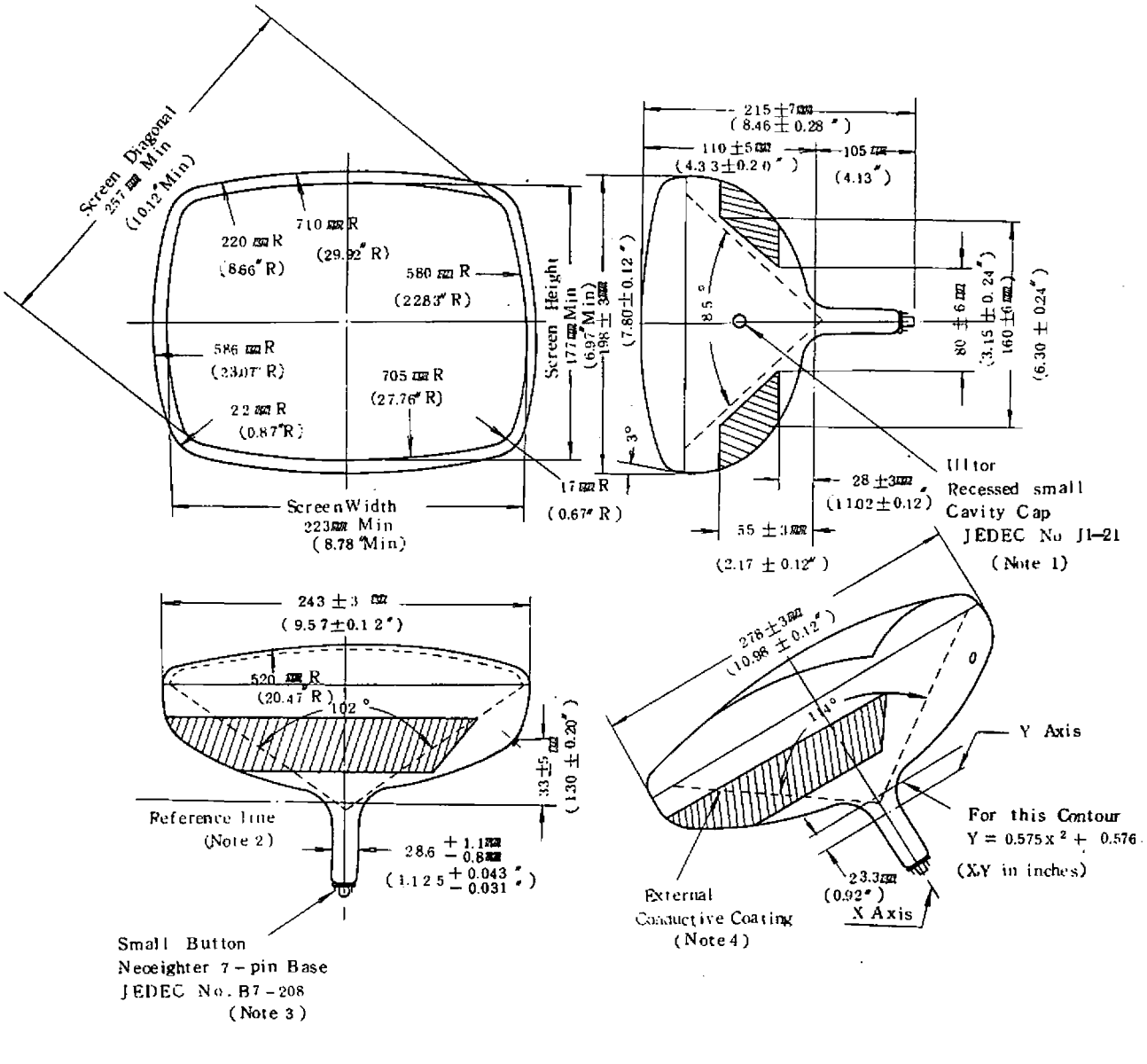
RASTER CUTOFF-RANGE CHARTS





Dimensional Outline

(Dimension in mm & inch)



NOTES FOR DIMENSIONAL OUTLINE

Notes:

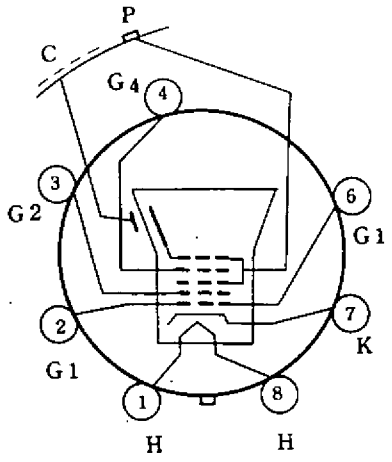
1. The plane through the tube axis and Pin No. 4 may vary from the plane through the tube axis and ultor terminal by angular tolerance of ± 30 degree. Ultor terminal is on the same side as Pin No. 4.

2. With tube neck inserted through flare end of reference-line gauge JEDEC G-126 and with tube seated in gauge, the reference-line is determined by the inter-section of the plane CC' of the gauge with the glass funnel.

3. Socket for this base should not be rigidly mounted it should have flexible leads and be allowed to move freely.

4. External conductive coating must be grounded.

SOCKET CONNECTION BOTTOM VIEW (8HR)



Pin 1: Heater
Pin 2: Grid No. 1
Pin 3: Grid No. 2
Pin 4: Grid No. 4
Pin 6: Grid No. 1
Pin 7: Heater
P : Ultor
C : External conductive coating

All inquiries as to the data should be addressed to Tokyo Shibaura Electric Co., Ltd. Tube and Semiconductor Division, 12, 1-Chome, Yuraku-Cho, Chiyoda-Ku, Hibiya Mitsui Building, Tokyo, Japan.