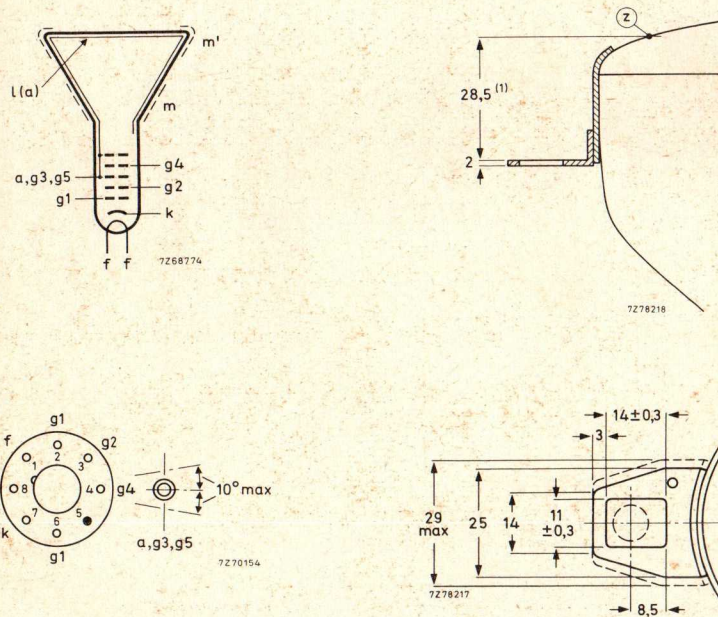


This information is derived from development samples made available for evaluation. It does not form part of our data handbook system and does not necessarily imply that the device will go into production

MONITOR TUBES



- 110° deflection angle
- 38 cm (15 in) face diagonal; rectangular glass
- 28,6 mm neck diameter
- white or green screen phosphor

QUICK REFERENCE DATA

Deflection angle	110°	
Face diagonal	38 cm (15 in)	
Overall length	278,1 mm	
Neck diameter	28,6 mm	
	M38-300	M38-310
Heating	6,3 V/240 mA	6,3 V/300 mA
Grid 2 voltage	130 V	400 V
Cathode	quick heating	

APPLICATION

These monitor tubes are used for information display and data terminals, e.g. in video monitoring equipment, computer terminals, word processors. The tubes are supplied with different screen phosphors: white (W) or green (GH and GR). They are available with safety panels, which are etched to avoid reflection of light sources. The tubes can be supplied with additional deflection unit.

AVAILABLE VERSIONS

monitor tubes without etched safety panel without lugs	M38-300W M38-300GH M38-300GR	M38-310W M38-310GH M38-310GR
monitor tubes with etched safety panel without lugs	M38-301W M38-301GH M38-301GR	M38-311W M38-311GH M38-311GR
monitor tubes without etched safety panel with lugs	M38-302W M38-302GH M38-302GR	M38-312W M38-312GH M38-312GR
monitor tubes with etched safety panel with lugs	M38-303W M38-303GH M38-303GR	M38-313W M38-313GH M38-313GR

(1) If a safety panel is present, this dimension has to be increased with approx. 6,5 mm.

blue binder, tab 3



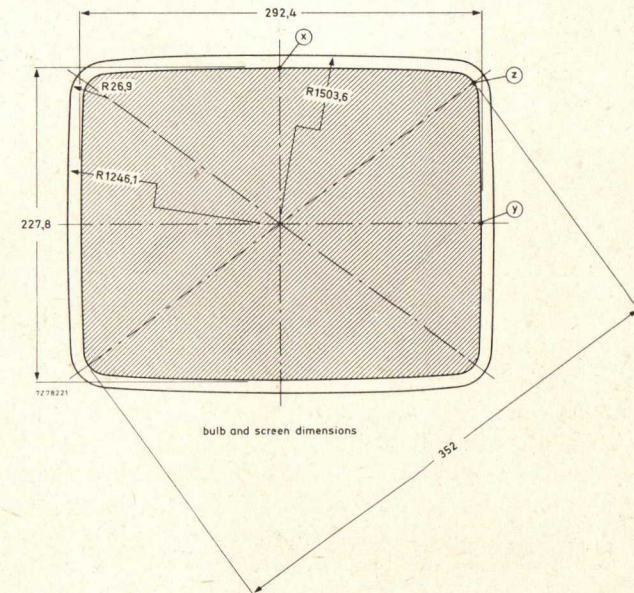
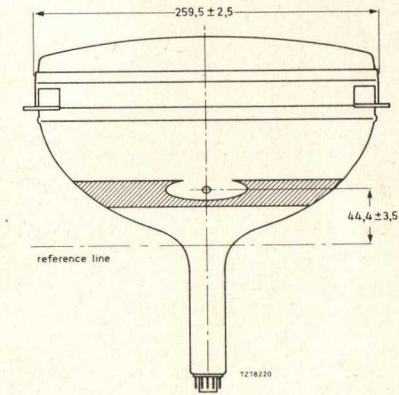
ELECTRICAL DATA

Focusing method	electrostatic
Deflection method	magnetic
Deflection angles	
diagonal	approx. 110°
horizontal	approx. 98°
vertical	approx. 81°
Direct interelectrode capacitances	
cathode to all other electrodes,	
M38-300	approx. 3 pF
M38-310	approx. 5 pF
grid 1 to all other electrodes	approx. 7 pF
external conductive coating to anode	max. 1000 pF
	min. 700 pF
Heater voltage	6,3 V
Heater current at 6,3 V	
M38-300	240 mA
M38-310	300 mA
Electron gun	
ion trap	none
focus lens	unipotential

OPTICAL DATA

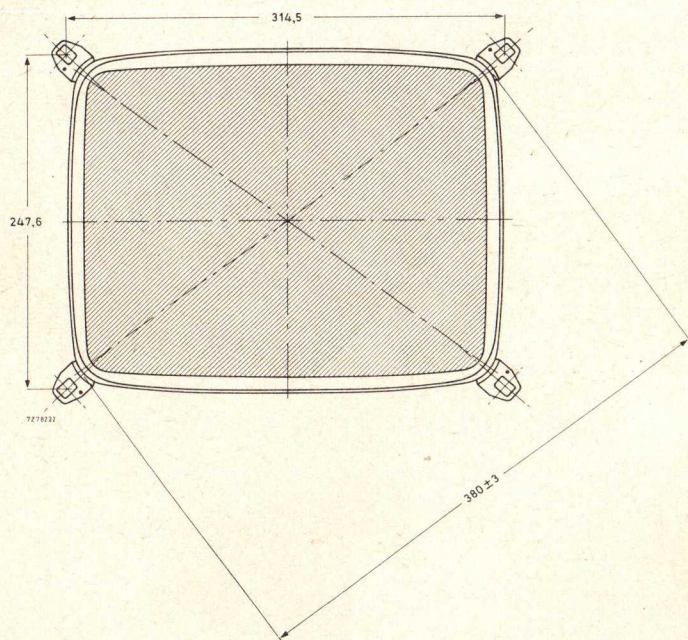
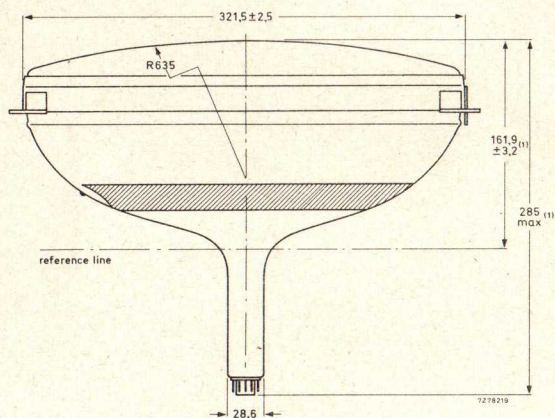
Phosphor number	W, GH and GR (P4, P31 and P39 respectively, according to JEDEC)
Light transmission at centre of face plate of safety panel	approx. 46% approx. 61%
Anti-reflection treatment	etched safety panel (if present)

DEVELOPMENT SAMPLE DATA



DIMENSIONAL DATA

Dimensions in mm



Monitor tubes

MECHANICAL DATA (see also the figures on pages 10 and 11)

Overall length	max. 285 mm
Greatest dimensions of tube	
diagonal	380 ± 3 mm
width	321,5 ± 2,5 mm
height	259,5 ± 2,5 mm
Minimum useful screen dimensions (projected)	
diagonal	352 mm
horizontal axis	292,4 mm
vertical axis	227,8 mm
area	665 cm ²
Implosion protection	rimband or safety panel
Bulb	EIA J-J380A1
Bulb contact designation	IEC67-III-2; JEDEC J1-21
Base designation	IEC67-1-31a; JEDEC B7-208
Basing	8 HR
Mass, without safety panel	approx. 4 kg

RATINGS (Absolute Maximum System); cathode drive

Unless otherwise specified voltage values are positive and measured with respect to grid 1.

Anode voltage	max. 19 kV	min. 12 kV
Grid 4 (focusing electrode) voltage	-500 to + 1000 V	
Grid 2 voltage		
M38-300	max. 200 V*	min. 80 V
M38-310	max. 700 V*	min. 350 V
Cathode voltage to grid 1		
negative bias value	max. 0 V	max. 2 V
negative peak value		
positive bias value		
M38-300	max. 200 V	
M38-310	max. 150 V	
positive peak value	max. 400 V	
Heater voltage	max. 7,3 V**	min. 5,3 V**
Cathode-to-heater voltage		
M38-300	max. 200 V	
M38-310	max. 250 V	

DEVELOPMENT SAMPLE DATA

(1) If a safety panel is present, this dimension has to be increased with approx. 6,5 mm.

* Improved picture sharpness is obtainable with increased grid 2 voltage (higher resolution).
** For maximum cathode life it is recommended that the heater supply be regulated at 6,3 V.



TYPICAL OPERATING CONDITIONS; cathode drive

Voltages are specified with respect to grid 1

Anode voltage	17 kV
Grid 4 (focusing electrode) voltage	
M38-300	0 to 130 V note 1
M38-310	0 to 400 V note 2
Grid 2 voltage	
M38-300	130 V note 3
M38-310	400 V note 3
Cathode voltage	
M38-300	42 to 62 V note 4
M38-310	36 to 66 V note 4

MAXIMUM CIRCUIT VALUES

Grid 1 circuit resistance	max. 1,5 MΩ
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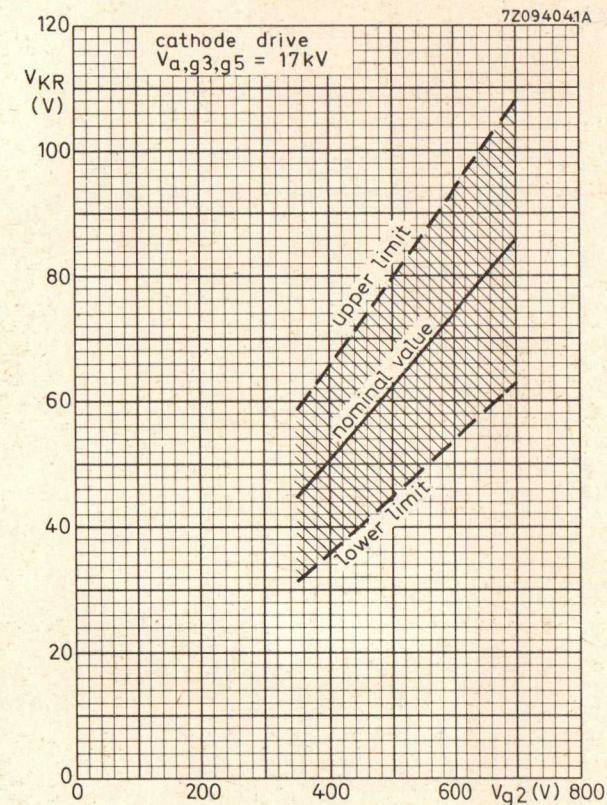
X-RADIATION CHARACTERISTIC

X-radiation emitted will not exceed 0,5 mR/h throughout the useful life of the tube, when operated within the given ratings. See curves on the opposite page.

Notes

1. Because of the flat focus characteristic it is sufficient to choose a focusing voltage between 0 and 130 V (e.g. two taps, 0 V and 130 V). The optimum focus voltage of individual tubes may be between -100 and +200 V.
2. Individual tubes will have optimum focus voltage within this range. In general an acceptable picture will be obtained with a fixed focus voltage.
3. Improved picture sharpness is obtainable with increased grid 2 voltage (higher resolution).
4. Visual extinction of focused raster.

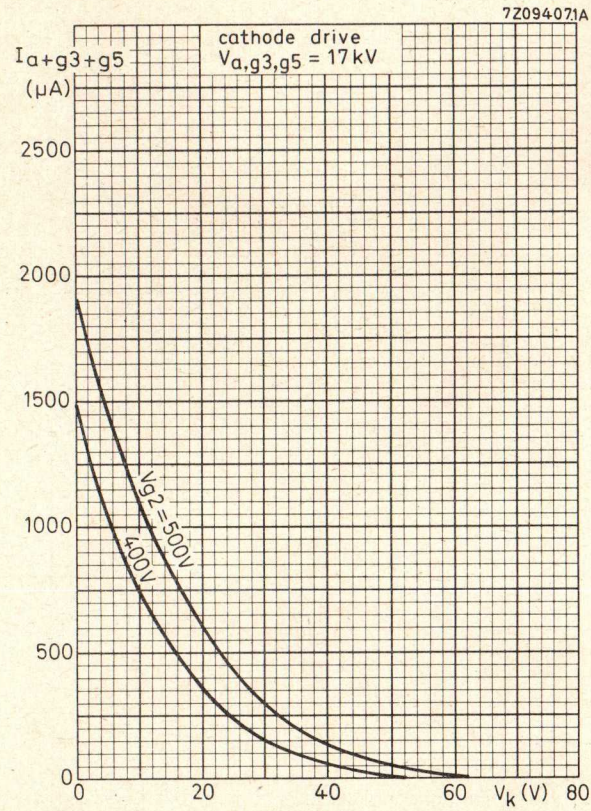
DEVELOPMENT SAMPLE DATA



Limits of cathode cut-off voltage as a function of grid 2 voltage for monitor tubes of M38-310 series.

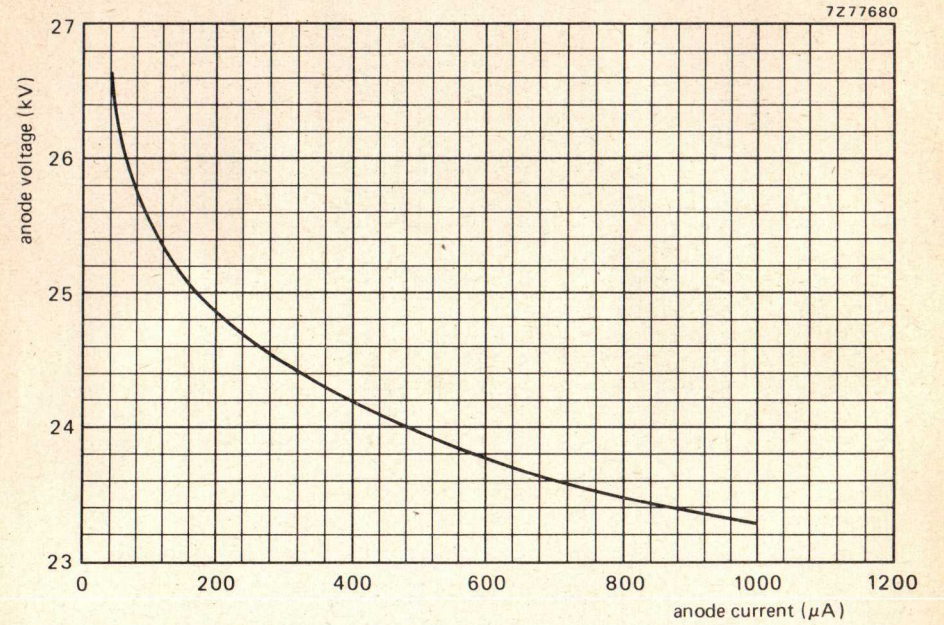
$$\frac{\Delta V_{KR}}{\Delta V_{a, g3, g5}} = 0,15 \times 10^{-3}$$



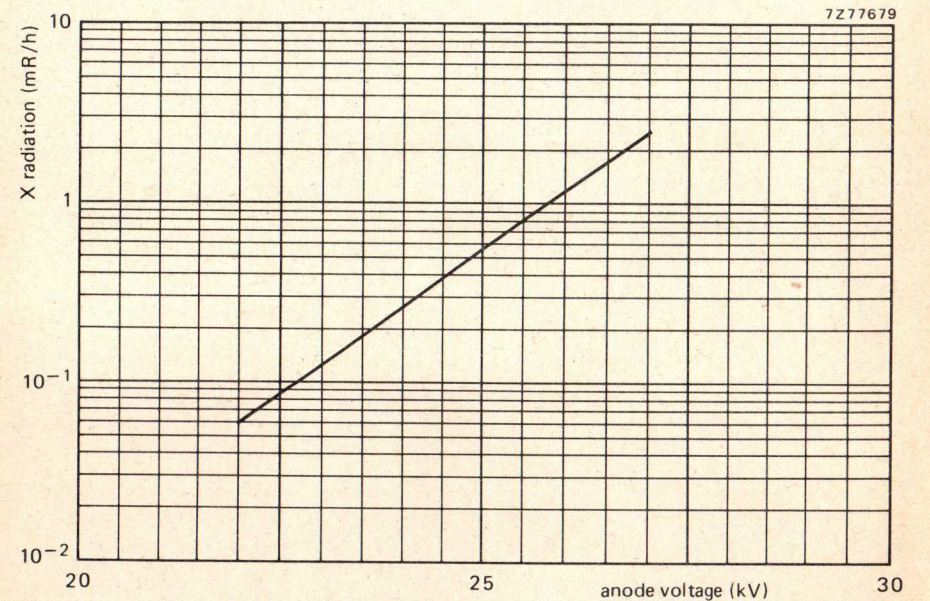


Final accelerator current as a function of cathode voltage for monitor tubes of M38-310 series.

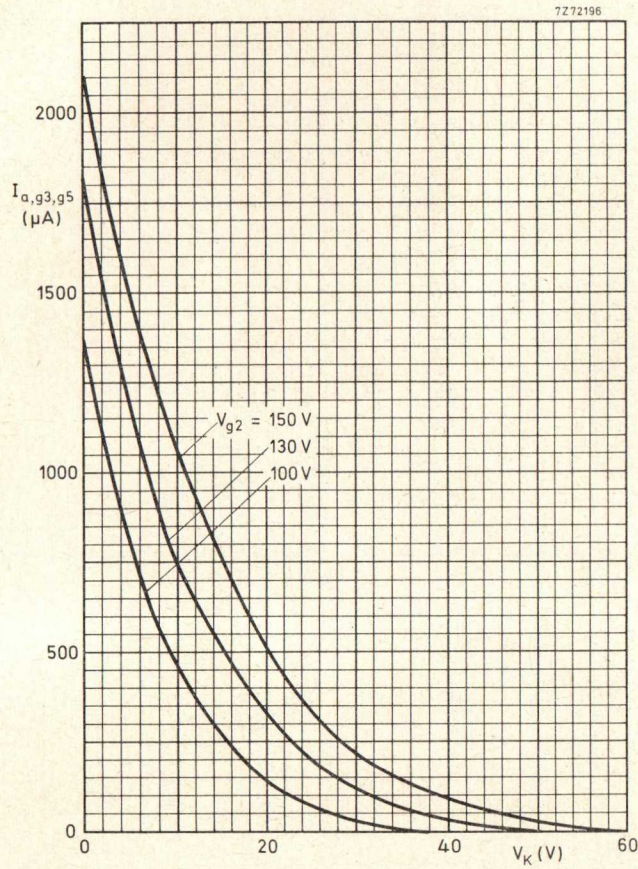
DEVELOPMENT SAMPLE DATA



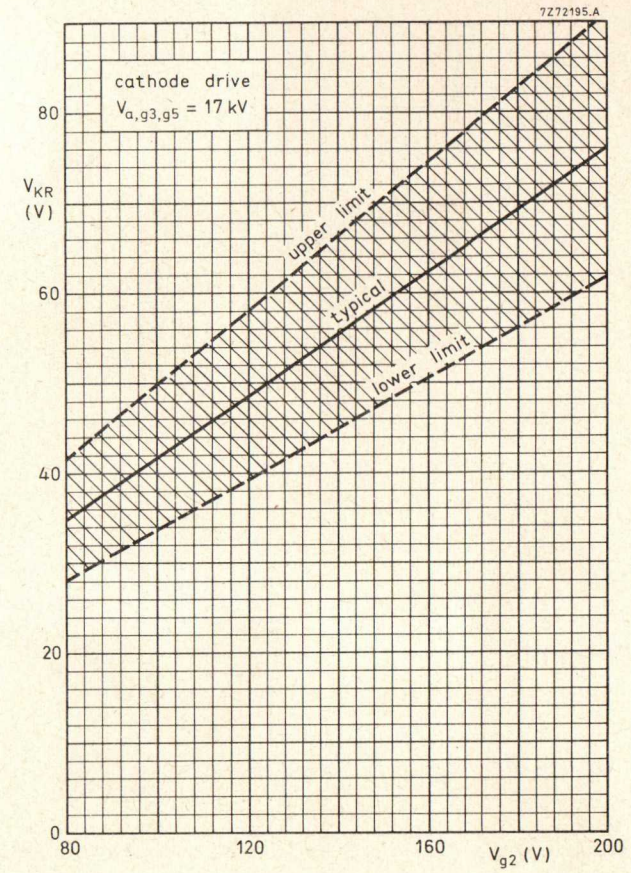
0,5 mR/h isodose-rate limit curve, according to JEDEC 64D.



X-radiation limit curve according to JEDEC 64D, at a constant anode current (I_a) of 250 μA .



Final accelerator current as a function of cathode voltage for monitor tubes of M38-300 series. Cathode drive; $V_{a,g3,g5} = 17 \text{ kV}$.



Limits of cathode cut-off voltage as a function of grid 2 voltage for monitor tubes of M38-300 series.

$$\frac{\Delta V_{KR}}{\Delta V_{a,g3,g5}} = 0,75 \times 10^{-3}$$

DEVELOPMENT SAMPLE DATA