

New 38mm (1½ in) diameter tubes having S20 or bialkali photocathode and 10 dynodes

Provisional Data

- End-on low potassium borosilicate envelope with option of quartz (Spectrosil) window
- Fast response—3 n. sec. rise time
- Choice of plain glass (B14B) or overcapped (B12) base
- Bialkali photocathode (9633) for high blue sensitivity and very low dark current or trialkali (9683) for extended red

These new tubes are intended for use in applications where the high performance EMI 9635, 9750, 9558, 9658, 9659 tubes are not required. Typical applications include general low level photometry and laser detection.

Spectral coverage of the tubes with borosilicate window is about 310 to 650nm (bialkali) and about 310nm to beyond 850nm (trialkali). The U.V. response can be extended to approximately 170nm by using tubes with quartz windows.

Notes

- 1 Each tube is individually calibrated and supplied with a test ticket giving the cathode sensitivity in $\mu\text{A}/\text{lm}$ (except 9633); cathode sensitivity measurements with filters appropriate to the type of photocathode; the overall voltage for 20A/lm and the relevant dark current (at 20°C).
A Corning glass filter (CS-5-58 ground to half stock thickness) is used to give a measure of the 'blue' sensitivity; a Corning glass filter (CS-2-62), which passes all radiation longer than approximately 600nm, to indicate 'red' sensitivity (except 9633), and a Wratten 87 filter, which passes all radiation longer than approximately 800 nm, to indicate sensitivity in the near infra red region (except 9633).
- 2 Test data is obtained with K to d1 held at 100 volts and the standard dynode chain.*
- 3 Generally, tubes should be operated at, or near, their rated overall sensitivity. Care should be taken not to exceed the maximum rated sensitivity or voltage.
- 4 For optimum stability under d.c. conditions, the mean anode current should not exceed 1 μA .

*For recommended dynode chains, refer to groups D', E', F' on page 14 of the EMI Photomultiplier Tube Catalogue ref. P001/fP70 (available on request).

MECHANICAL CHARACTERISTICS

Envelope diameter	Maximum	40 mm (1.58 in)
Cathode diameter	Nominal	25 mm (0.98 in)
Cathode type		9683 trialkali (S20) 9633 bialkali (KCs)
Window material		9633B, 9633KB, 9683B, 9683KB borosilicate



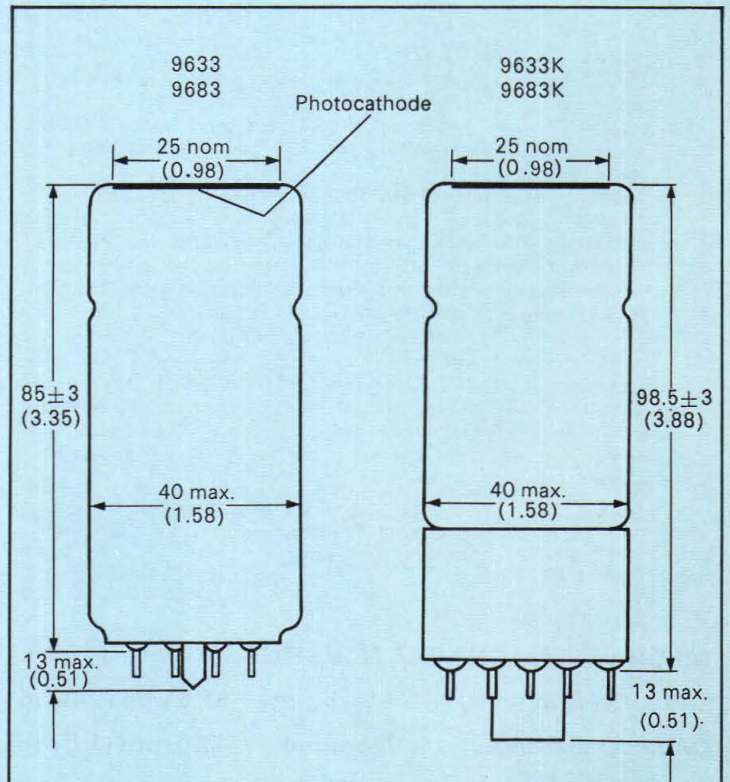
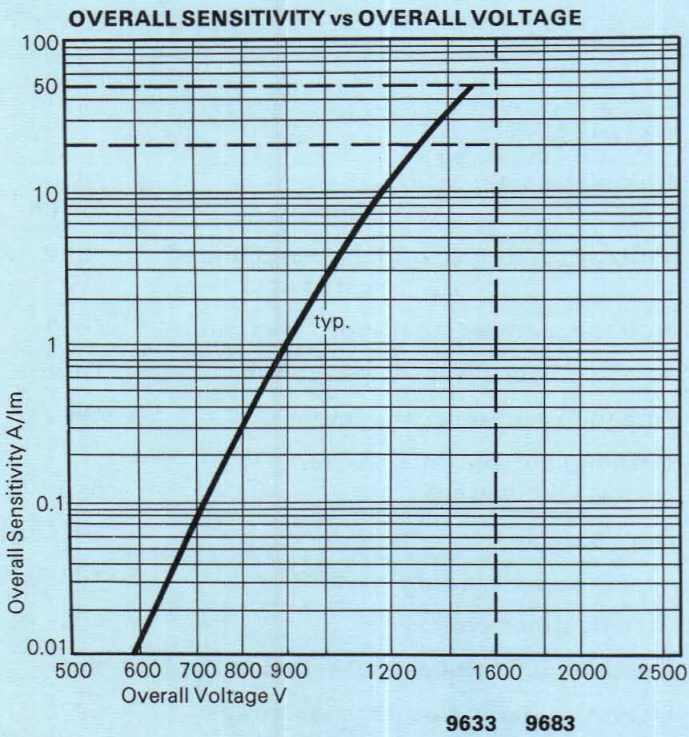
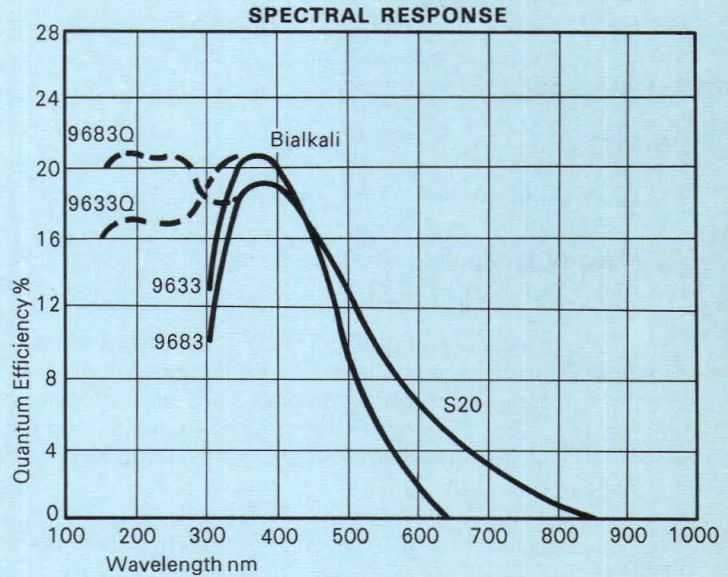
RATINGS

	9633	9683
Overall sensitivity: rated	20A/lm	20A/lm
maximum	50A/lm	50A/lm
Voltage, cathode to d1: recommended	100V	100V
maximum	150V	150V
Voltage, anode to cathode: maximum	1600V	1600V
Anode current (mean): maximum	0.5mA	0.5mA
Anode dissipation: maximum	0.5W	0.5W
Cathode current: maximum (using whole area)	0.1 μA	1.5 μA
Anode pulse rise time: typical	2.5 n. sec.	2.5 n. sec.
Anode pulse f.w.h.m.: typical	6.0 n. sec.	6.0 n. sec.
Transit time: typical	25 n. sec.	25 n. sec.
Capacitance, anode to all dynodes: typical	7pF	7pF
Operating temperature: maximum	60°C	60°C
minimum	-5°C	-180°C
Dark current shot noise equivalent input*	Lumens 2.3×10^{-13} Watts 2.3×10^{-16}	4×10^{-13} 1.4×10^{-15}

* Calculated from typical performance data using Q.E. at λ peak and assuming Δf of 1 Hz and enhancement factor of unity.

	9633QB, 9633QKB, 9683QB, 9683QKB, quartz (Spectrosil)
Dynodes	10 compact focused with BeCu surfaces
Base	9633B, 9633QB, 9683B, 9683QB, B14B (socket supplied) 9633KB, 9633QKB, 9683KB, 9683QKB, B12 (socket extra)

Tube Type Number	Cathode Sensitivity				Overall Sensitivity							
	$\mu\text{A}/\text{lm}$		Corning Blue		20A/lm				50A/lm			
	Min.	Typ.	Min.	Typ.	V. Overall		Dark Current nA		V. Overall		Dark Current nA	
				Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
9633B	—	60	—	8.0	1300	—	0.2	—	1600	—	0.5	
9683B	—	200	—	—	1250	—	2.0	—	1500	—	5.0	



All dimensions are in millimetres with inches shown in parentheses.

PIN CONNECTIONS (viewed from below starting left of short pin or key)

Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	socket
9633	d1	d3	d5	d7	d9	A	d10	d8	d6	d4	d2	—	K	—	B14A
9683															
9633K	d1	d3	d5	d7	d9	A	d10	d8	d6	d4	d2	K	—	—	B12A
9683K															