30mm tubes
S, S-11, S-13 cathodes

The 9524B is a small diameter (30 mm nom.) high gain photomultiplier having 11 box and grid dynodes with highly stable CsSb surfaces. This type of dynode structure gives the highest gain per stage, for a given voltage, when compared with any of the other commonly used designs. The small size coupled with the high gain (typically 4×10^6 at 1000 volts), low dark current, and the inherently rugged design make the 9524B a very desirable tube for portable instruments and other applications where available power may be limited.

The 9524B has an S-11 (CsSbO) spectral response with a typical peak quantum efficiency in the region of 17½–20%. For very low light level applications, the 9524S should be used. This type incorporates the unique EMI "S" cathode which is specially processed for low thermionic emission. Typical dark current is of the order of 0.2 nanoamps.

Two other versions incorporate all the features of the 9524, but have Spectrosil (fused silica) windows (types 9526B and 9526S). This extends the spectral response in the near UV to ca. 1650Å. In addition to the photometric uses, the 9526 is very useful in low level scintillation counting, due to the low natural radioactivity in the window.

The 9601B is an S-11 type but equipped with a blown window of Corning 9741 glass, which extends the useful spectral range to ca. 1850Å and has the virtue of being considerably less expensive than the 9526B.

The 9734B is a 9-stage S-11 tube with a seated height of 87 mm compared with 112 mm for the 9524. It is therefore useful where size is an important factor and the high gain of the 9524 is not required. A Spectrosil (fused silica) version is also available, namely type 9734QB.

Notes

1 a) Each tube is individually calibrated and the test ticket furnished with the tube specifies the cathode sensitivity in μA/lm, the overall voltage at 200 A/lm (9524, 9526, 9601) or 50 A/lm (9734) and the dark current at that overall sensitivity at 20°C.
b) Test data is obtained with cathode −D1 voltage held at 150V and a linear dynode chain.*
c) In general, when setting up experiments or designing for equipment, it is desirable to work at, or below, the ticket voltage of the individual tube.
d) For highest stability in d.c. conditions, mean anode current should not exceed 2 μA.

2 Any material in contact with the glass envelope must be held at cathode potential. Failure to do so may result in erratic operation and high dark current.

3 Take great care in clamping tubes, particularly those with Spectrosil (fused silica) windows. Excess pressure may fracture the glass in which case the warranty is void.

4 Photomultipliers are affected by magnetic fields and mu-metal shields should be used, (see page 64).

* For recommended dynode chains refer to Groups H, I, J' (9524, 9526, 9601) and Groups E, F, F" (9734) on page 14.

MECHANICAL CHARACTERISTICS

Max. envelope dia.	29 mm (1.14 in)
Nom. cathode dia.	23 mm (0.91 in)
Cathode type	9524B S-11 9524S "S" 9526B S-13 9526S "S" (Q) 9601B S-11 (C) 9734B S-11 9734QB S-13
Window material	9524 9734B Lime Soda 9526 9734QB Spectrosil (fused silica) 9601B Corning type 9741 (blown window, not optically flat)
Dynodes	9734 (9 stages); 9524, 9526, 9601 (11 stages): box and grid dynodes with CsSb secondary emitting surfaces
Base	Low loss 14-pin pressed glass base furnished with high quality Teflon socket type B14B

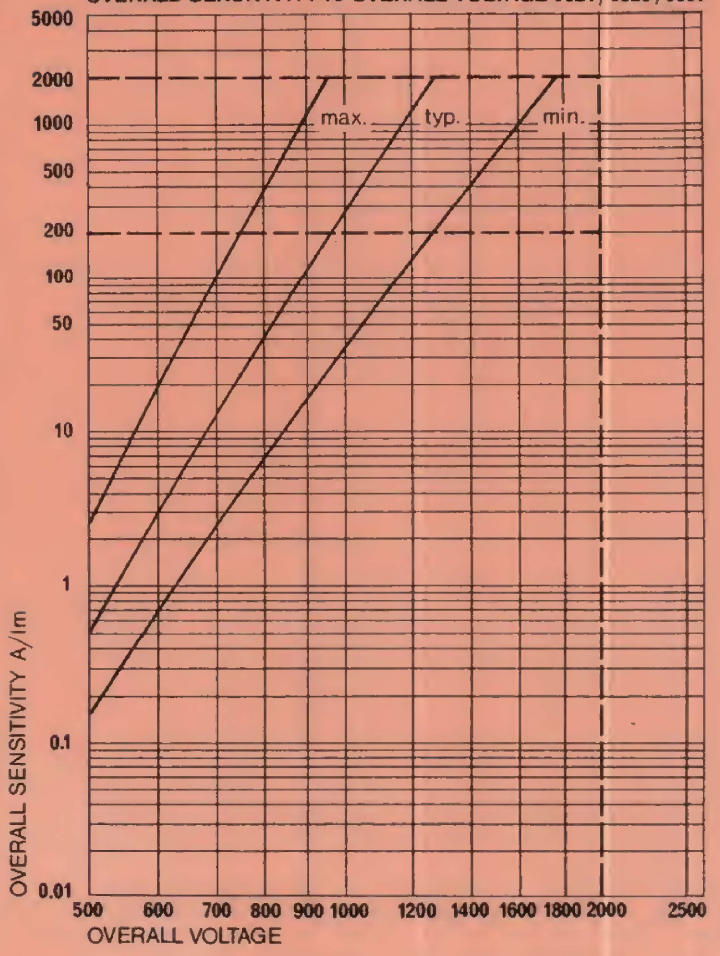
ELECTRICAL RATINGS

	9524 9526 9601	9734
Cathode to D1	300V Max.	300V Max.
Recommended cathode to D1 voltage	150V	150V
Cathode to anode (subject to not exceeding	2000V Max. 2000A/lm	1800V Max. 200A/lm)
Overall sensitivity: Rated Max.	200A/lm 2000A/lm	50A/lm 200A/lm
Max. anode current (mean)	100μA	100μA
Max. anode dissipation	0.1W	0.1W
Max. tolerable cathode current	0.1μA	0.1μA
Max. operating temperature	60°C	60°C
Min. operating temperature	−80°C	−80°C
Anode pulse rise time	18 ns	17 ns
Anode pulse f.w.h.m.	38 ns	30 ns
Transit time	70 ns	65 ns
Capacitance, anode to all dynodes	6 pF	6 pF

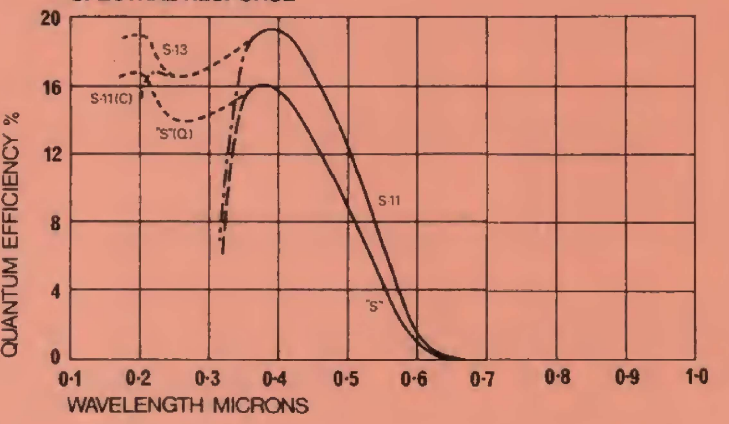
Dark current shot noise Typical (λ peak)	9524B 9526B 9601B	9524S 9526S	9734B 9734QB
lumens:	1.5×10^{-13}	7.3×10^{-14}	2.1×10^{-13}
watts:	1.8×10^{-16}	0.9×10^{-16}	2.5×10^{-16}

	Cathode Sensitivity μA/lm		Overall Sensitivity 200A/lm				Overall Sensitivity 2000A/lm			
			V Overall		Dark Current nA		V Overall		Dark Current nA	
	Min.	Typ.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.
9524B 9526B 9601B	50	70	950	1250	1	25	1300	—	10	—
9524S 9526S	40	60	950	1250	0.2	2	1300	—	2	—
			50A/lm				200A/lm			
9734B 9734QB	50	70	1000	1350	0.5	5	1300		2	—

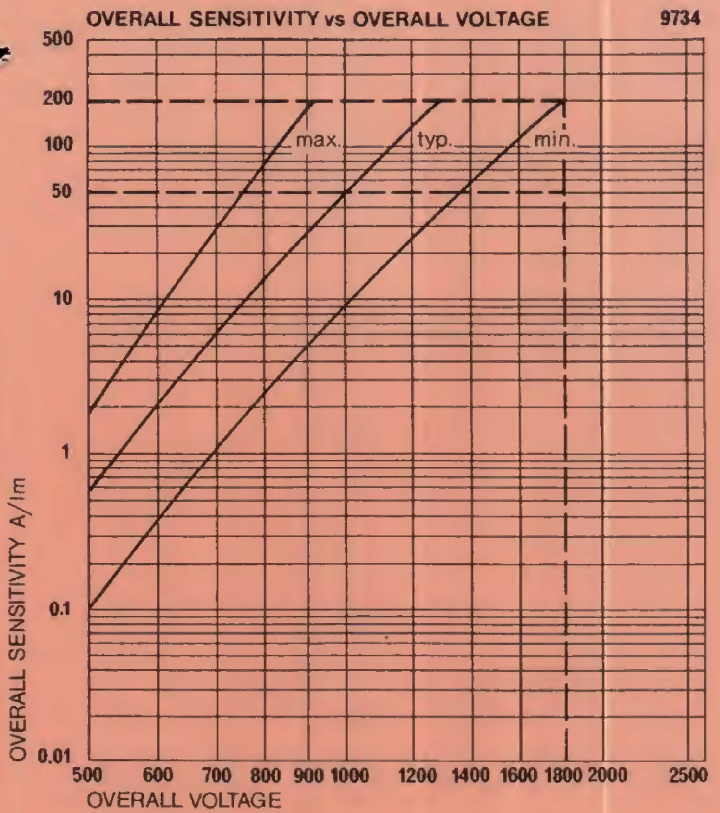
OVERALL SENSITIVITY vs OVERALL VOLTAGE 9524 / 9526 / 9601

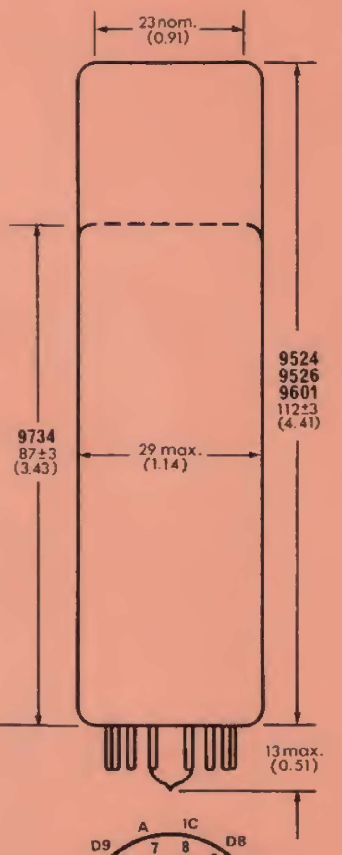


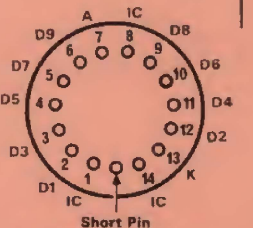
SPECTRAL RESPONSE



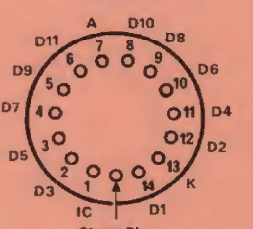
OVERALL SENSITIVITY vs OVERALL VOLTAGE 9734







PIN CONNECTIONS TYPE 9734
B14B SOCKET
(Viewed from below)



PIN CONNECTIONS TYPES
9524 9526 9601
B14B SOCKET
(Viewed from below)

All dimensions are in millimetres with inches shown in parentheses.