MICROWAVE MIXER DIODES

AAY50 AAY50R

TENTATIVE DATA

Coaxial germanium point-contact diodes for use in pre-tuned X-band low noise mixer circuits. The AAY50 and AAY50R are intended as low noise retrofits at X-band frequencies for coaxial mixer diodes, types SIM2/5, GEM3/4, etc. The two types have identical dimensions and characteristics, but the polarity is reversed. The pair are intended for use in balanced mixer circuits.

QUICK REFERENCE DATA		
Typ. noise figure at X-band	6.2	dB
Max. operating frequency	12	GHz

OUTLINE AND DIMENSIONS

Conforms to B.S. 3934 SO-26

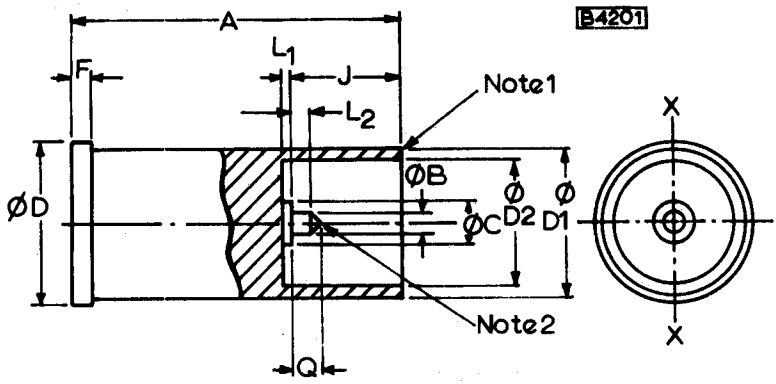
See page 2 for details

Terminal identification

AAY50	Pin	cathode
	Body (red spot)	anode
AAY50R	Pin	anode
	Body (green spot)	cathode

ACCESSORIES

Holders to fit these coaxial diodes are available in the U.K. from W.H.Sanders Ltd,. Stevenage, Herts



The millimetre dimensions are derived from the original inch dimensions

	Millimetres		Inches	
	Min.	Max.	Min.	Max.
A	18.80	19.30	0.740	0.760
ØB	1.270	1.320	0.050	0.052
ØC	3.023	3.073	0.119	0.121
ØD	9.28	9.52	0.365	0.375
ØD1	8.611	8.737	0.339	0.344
ØD2	7.163	7.264	0.282	0.285
F	1.15	1.39	0.045	0.055
J	6.300	6.477	0.248	0.255
L1	0.686	0.762	0.027	0.030
L2	1.02	1.27	0.040	0.050
Q	1.86	2.10	0.073	0.083

NOTES

1. The device is designed to make contact on this open face.
2. Cone tapers to a radius (0.13mm) 0.005in. nominal.

RATINGS

Limiting values of operation according to the absolute maximum system.

Electrical

Max. burn-out (r.f. spike)	0.2	erg
Max. burn-out pulse peak power (pulse duration=0.5μs)	2.0	W

Temperature

T_{stg} range	-55 to +100	°C
T_{amb} range	-55 to +100	°C

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C)

		Min.	Typ.	Max.	
Static					
I_R	Reverse current, V_R=0.5V	-	3.0	-	μA
I_F	Forward current, V_F=0.5V	-	9.0	-	mA
Dynamic					
F_o	Noise figure (see note 1)	-	6.2	6.8	dB
L_c	Conversion loss	-	4.4	-	dB
N_r	Noise temperature ratio (see note 2)	-	1.1	-	
v.s.w.r.	Voltage standing wave ratio (see note 3)	-	-	1.43	
Z_{if}	Intermediate frequency impedance	300	-	500	Ω
f	Operating frequency range	-	-	12	GHz

NOTES.

1. Measured at 9.375GHz, 1.0mA rectified current, R_L=15Ω in standard SIM2/5 holder. F_o includes F_{if}=1.5dB. K1007, Issue 3, Section 8B3.3.1/2.
2. Intermediate frequency = 45MHz.
3. Tested at 9375 ± 10MHz under conditions as in note 1. The nominal rectifier admittance at a plane 0.247in inside the body from the open end is:

$$\frac{1}{83.5} + \frac{j}{350} \text{ mho}$$

OPERATING NOTE

The AAY50, 50R will exhibit their inherent improved noise figure performance over the frequency range 1.0 to 12GHz, but are not recommended for use as direct replacements in pre-tuned mounts designed for the SIM2/5 type coaxial diode, at other than X-band frequencies.

APPLICATION INFORMATION FOR AAY50, 50R

		Typ.	
1.	Signal/Flicker noise ratio at 9.5GHz Measured at 2kHz from carrier in 70Hz bandwidth	131	dB
2.	Detector performance		
	S_t Tangential sensitivity at 9.375GHz 1.0MHz video bandwidth, I_F (bias) = 50μA	-52	dbm
	Z_v Video impedance I_F (bias) = 50μA	800	Ω