

BRITISH STANDARDS INSTITUTION

2, PARK STREET, LONDON, W1A 2BS

Specification available from:— AS SHOWN IN PD 9002,
CECC 00200, AND*THORN EMI VARIAN Limited*
248 BLYTH ROAD,
HAYES, MIDDLESEX, UB3 1HR
TELEPHONE 01 573 3888, TELEX 28828

BS CECC 36 001 011

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Amendment 1, October 1982

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ELECTRONIC COMPONENTS OF ASSESSED QUALITY
DETAIL SPECIFICATION IN ACCORDANCE WITH

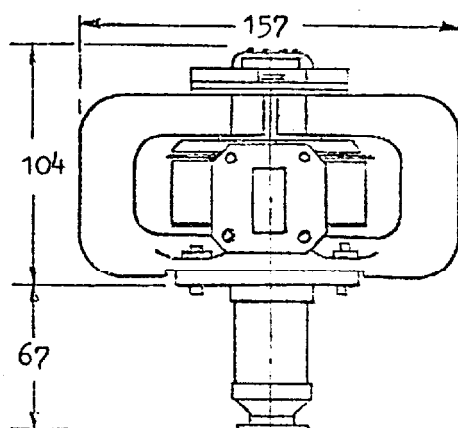
BS CECC 36 000 : 1978

MANUFACTURER'S TYPE NUMBER

PT 5018

SEE PD 9002 AND CECC 00200

Outline and dimensions First angle projection



Marking information 4.1

For ordering information
see 4.2

PULSED COAXIAL MAGNETRON

Packaged X-band, 64 kW,
tunable, conduction and
forced air cooled
9.070 to 9.090 GHzINPUT: to mate with Jettron
P/N 90-006 or -030
or equivalentRF OUTPUT: WG15 to mate with
flange 154 IEC CBR 84WITH ADDITIONAL
ASSESSMENT1. ELECTRICAL LIMITING VALUES (not for inspection purposes)

Absolute maximum rating system in accordance with IEC 134.

	Symbol	Min	Max	Unit
Cathode preheat time	t_k	120	-	s
Heater surge current (< 10 ms)	I_h	-	10	A
Heater voltage	V_h	See note 1		
Anode voltage, peak	V_a	-	16	kV
Anode current, peak	I_{apk}	5	18	A
Pulse duration	t_p	0.15	2.7	μ s
Duty factor	du	-	.0012	
Rate of rise of voltage	rrv	40	180	kV/ μ s
Load v.s.w.r.		-	1.5:1	
Input power	P_{in}	-	288	W

Note 1 When the tube is operating the heater voltage must be reduced to the appropriate value determined from the formula

$$V_h = 12.6 - .021 P_{in} \pm 10\% V_{ac}$$

where P_{in} = mean anode current (mA) X peak anode voltage (kV)

Refer to Qualified Products List PD 9002 and/or CECC 00200 for details of manufacturers approved to this specification.

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2. MECHANICAL AND ENVIRONMENTAL DATA (not for inspection purposes)

	<u>Symbol</u>	<u>Min.</u>	<u>Max.</u>	<u>Units</u>
Dimensions	See Inspection drawing APPENDIX B			
Weight		-	4.0	kg
Mounting position	Any			
Proximity of magnetic materials		50	-	mm
Proximity of magnets		100	-	mm
Anode block temperature at specified reference point	T _a	-	150	deg C
Storage temperature range	T _{stg}	-55	+85	deg C
Ambient operating temperature range	T _{amb}	-55	+85	deg C
Input insulator temperature at specified reference point	T _i	-	185	deg C
Continuous vibration, operating frequency range 3.0 Hz to 22 Hz		-	0.5	mm
22 Hz to 500 Hz		-	9.8	m/s ²
Short duration shock (half sine, 11 ms)		-	294	m/s ²
Tuner shaft rotation rate		-	800	rpm
Dynamic torque (Note 2)		.09	0.35	Nm
Cooling air		5-7	-	g/s
Air pressure, waveguide output		86	310	kPa

Note 2 The tuner drive must never exceed the maximum value of tuner torque, especially when the tuner is driven against its end stops.

3. ELECTRICAL CHARACTERISTICS (not for inspection purposes)

	<u>Symbol</u>	<u>Min.</u>	<u>Max.</u>	<u>Units</u>
Frequency (T anode = 70 deg C)	f	9.070	9.090	GHz
Peak output power	P _{opk}	64	-	kW
Pulse voltage	V _{pl}	14.0	15.0	kV
Frequency pulling at 1.5:1 v.s.w.r.	Δf	-	5.0	MHz
Frequency pushing over current range 15A to 17A peak		-	100	kHz/A

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	<u>Symbol</u>	<u>Min.</u>	<u>Max.</u>	<u>Units</u>
Negative temperature coefficient of frequency over any 30 deg C range of anode temperature between +20 deg C and +100 deg C		-	0.25	MHz/deg C
RF spectrum bandwidth	BW	-	10	MHz
Heater current ($V_h = 12.6V$)	I_h	2.0	2.4	A
RF radiation at 50 mm distance		-	10.0	W/m ²

4. SUPPLEMENTARY INFORMATION

4.1 Marking

The following symbols or codes shall be clearly and durably marked on the tube in the following order of precedence as space permits.

All symbols or codes, except terminal markings and operating conditions shall also appear on the primary pack (carton) used as initial protection or wrapping for delivery.

- (a) Manufacturer's type and serial numbers.
- (b) Manufacturer's factory identification code.
- (c) Date Code.
- (d) Manufacturer's name or trade mark.
- (e) Caution label : proximity of magnetic material.
- (f) Microwave radiation hazard label.
- (g) X-ray radiation hazard symbol.
- (h) CECC detail specification number : BS CECC 36 001 011
- (i) NATO stock number.
- (j) EHT symbol.

It shall also be marked with code letter and dial settings to indicate the following frequencies:

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$F_1 =$
 $F_2 =$
 $F_3 = 9080 \pm 10 \text{ MHz}$
 $F_4 =$
 $F_5 =$

4.2 Ordering information

Orders for magnetrons to this specification shall include the following minimum information:

Quantity

Manufacturer's type number (as given in PD 9002 and/or CECC 00 200)

BS CECC specification number, issue and date.

5. RELATED DOCUMENTS

BS CECC 36 000	'Generic specification : magnetrons'
BS E9000	'General requirements for electronic components of assessed quality harmonised with the CENELEC Electronic Components Committee System'
CECC 00 200	'Qualified products list'
IEC 68	'Basic environmental testing procedures'
IEC 134	'Rating systems for electronic tubes and valves and analogous semiconductor devices'
IEC 1542	'Flanges for waveguides, Part 2 : Relevant specifications for flanges for ordinary rectangular waveguides'
IEC 235	'Measurement of the electrical properties of microwave tubes'
IEC 410	'Sampling plans and procedures for inspection by attributes'
PD 9002	'BS 9000 component selection guide - Qualified products list'

6. ADDITIONAL INFORMATION (not for inspection purposes)

6.1 R.F. radiation

Personnel must be protected from the strong microwave fields generated by this tube. Microwave radiation due to leakage at the r.f. connections must be prevented, by ensuring that the waveguide connections are tight. If voltages are to be applied to the tube when it is not connected into a r.f. line, the r.f. output connection must be terminated with a shielded r.f. termination of adequate power rating (v.s.w.r. less than 1.5:1).

6.2 High voltage

The voltages required to operate this tube are extremely dangerous. Protective interlocks should be incorporated into all equipment to make accidental contact with these voltages impossible.

6.3 X-radiation

This device can produce X-radiation when energised. Personnel must be protected by appropriate shielding. Appropriate caution signs and notices must be attached to the operating equipments.

6.4 Magnetic materials

The tube is fitted with a permanent magnet with the north pole nearest to the cathode connection. The magnet has a very high field strength which must be maintained to ensure the correct operation of the tube. All tools (spanners and screwdrivers) used to mount and align the tube must be made from non-magnetic material. No magnetic materials should be allowed within 50 mm of the magnet and all other magnets must be at least 100 mm distant.

The primary pack, in which the magnetrons are supplied, provides adequate spacing. The tube should be stored in its pack at all times when it is not mounted in an equipment.

6.5 Pulse voltage rate of rise

The rate of rise of voltage (r.r.v.) is defined as $\frac{dV}{dt}$ at the onset of the r.f. oscillations. For rating purposes only it is defined as the steepest tangent to the leading edge of the voltage pulse, measured for voltages which are in excess of 80% of the running voltage of the magnetron.