



ELECTRON TUBE DEPARTMENT ■ COMPONENTS DIVISION
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, CLIFTON, NEW JERSEY

**D-2023
TRAVELING
WAVE TUBE**

T E N T A T I V E

DESCRIPTION:

THE D-2023 IS A 1 KILOWATT PULSE TRAVELING WAVE TUBE HAVING 30 DB GAIN AND 4.0 TO 8.0 FREQUENCY RANGE. IT IS CONSTRUCTED IN A RUGGED METAL-CERAMIC ENVELOPE WITH A HELIX TYPE SLOW WAVE STRUCTURE. THE INTEGRAL MATCHING CIRCUIT IS IN 50 OHM COAXIAL LINE AND IS PROVIDED WITH FEMALE TYPE TNC CONNECTORS. THE TUBE IS SELF-ALIGNING IN AN EXTERNAL SOLENOID, WHICH IS REQUIRED TO PROVIDE A UNIFORM MAGNETIC FIELD. A CONVERGENT BEAM GUN AND OXIDE IMPREGNATED CATHODE ARE USED. DUTY CYCLES UP TO .01 CAN BE USED.

A CONTROL GRID FOR GRID PULSING IS PROVIDED.

ELECTRICAL INFORMATION:

HEATER VOLTAGE	6.3 (^t 5%)	VOLTS
HEATER CURRENT	5.0	AMPS
MAXIMUM FREQUENCY	8.0	
MINIMUM FREQUENCY	4.0	
MINIMUM TRANSMISSION LOSS AT GRID BIAS		
■ .60 VOLTS	40	DB
CAPACITANCE		
CONTROL GRID TO ALL OTHER ELEMENTS	22	UUFD

ELECTRICAL RATINGS, ABSOLUTE VALUES:

MAXIMUM ANODE VOLTAGE (NOTE 1)	10,000	VOLTS
MAXIMUM HELIX CURRENT	0.35	AMPS
MAXIMUM COLLECTOR DISSIPATION	240	WATTS
MAXIMUM R.F. INPUT POWER	5	WATTS
MAXIMUM DUTY CYCLE	.01	
MAXIMUM GRID VOLTAGE		
NEGATIVE	-200	VOLTS
POSITIVE	400	VOLTS PEAK
MAXIMUM GRID CURRENT	0.3	AMPS PEAK

MECHANICAL INFORMATION:

TYPE OF CATHODE		OXIDE IMPREGNATED
GUN CONNECTIONS		FLYING LEADS
R-F CONNECTIONS		FEMALE TNC
MAGNETIC FIELD STRENGTH	2000	GAUSS
MOUNTING POSITION		ANY
TYPE OF COOLING (NOTE 2)		

TYPICAL OPERATION: (NOTE 3)

CENTER FREQUENCY	5.5	KMC
ANODE VOLTAGE	8800	VOLTS
CATHODE CURRENT	2.5	AMPS PEAK
POWER OUTPUT (AT CENTER FREQUENCY) (NOTE 4)	1.5	KW PEAK
BAND WIDTH (NOTE 4)	4 TO 8	KMC
GAIN (NOTE 4)	30	DB
DUTY	VARIABLE TO 0.01	MAX.
PULSE WIDTH	2	USEC.
GRID BIAS (FOR CUTOFF)	-60	VOLTS
GRID VOLTAGE DURING PULSE	200	VOLTS PEAK
GRID CURRENT DURING PULSE	0.2	AMPS PEAK

NOTE 1: ALL VOLTAGES SHOWN ARE WITH RESPECT TO CATHODE. ANODE, COLLECTOR AND OUTER COAX CONDUCTOR OF THE R-F TERMINALS ARE CONNECTED INTERNALLY TO THE SHELL. THE HELIX IS CONNECTED TO THE CENTER CONDUCTOR OF THE COAX LINE AND A DC CONNECTION FROM THE HELIX TO THE SHELL MUST BE PROVIDED EXTERNALLY IN THE R-F CIRCUITRY.

NOTE 2: A MAXIMUM OF 240 WATTS IS DISSIPATED AT THE COLLECTOR. A SUITABLE HEAT SINK MUST BE PROVIDED TO CONDUCT HEAT FROM THE COLLECTOR AND MAINTAIN ITS SURFACE TEMPERATURE BELOW 180°C MAXIMUM. COOLING OF THE EXTERNAL SOLENOID MUST BE PROVIDED SUCH THAT THE TUBE WHICH IS INSERTED INTO IT WILL NOT EXCEED 180°C.

NOTE 3: THE VALUES OF VOLTAGES TO BE USED ARE PROVIDED IN TEST DATA SUPPLIED WITH EACH TUBE. HIGH VOLTAGE MUST NOT BE APPLIED IN THE ABSENCE OF PROPER GRID BIAS VOLTAGE. POSITIVE GRID PULSE VOLTAGE MUST NOT BE SUPPLIED IN THE ABSENCE OF HIGH VOLTAGE. GRID PULSE VOLTAGE IN EXCESS OF THAT INDICATED FOR EACH TUBE SHOULD NOT BE USED SINCE BEAM DEFOCUSING WILL OCCUR. PROVISIONS MUST BE MADE NOT TO EXCEED MAXIMUM RATINGS, ESPECIALLY HELIX CURRENT AND DUTY CYCLE. INITIAL ADJUSTMENTS ARE CONVENIENTLY DONE AT LOW DUTY CYCLE (LESS THAN .001) WHERE MISADJUSTMENT OF PARAMETERS IS MUCH LESS LIKELY TO CAUSE TUBE DAMAGE.

NOTE 4: POWER OUTPUT OF 1 KW PEAK OR MORE IS OBTAINED OVER THE FREQUENCY RANGE 4.0 TO 7.5 KMC, AND 800 WATTS OR MORE OVER THE FREQUENCY RANGE 7.5 TO 8.0 KMC. POWER INPUT REQUIRED TO OBTAIN THIS POWER OUTPUT DOES NOT EXCEED 1 WATT.

ADDITIONAL INFORMATION FOR SPECIFIC APPLICATIONS CAN BE OBTAINED FROM THE:

ELECTRON TUBE APPLICATIONS SECTION
ITT COMPONENTS DIVISION
POST OFFICE BOX 7065
ROANOKE, VIRGINIA



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INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, CLIFTON, NEW JERSEY

