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High-Power Travelling Wave Tube

F = 7.9 to 8.4 GHz

Design and Application

High-power travelling wave tube for multi-carrier operation in the frequency band 7.9 to 8.4 GHz with a minimum saturation power of 8 kW. In single-carrier operation the tube gives a CW output power of 8 kW at a minimum gain of 34 db over the complete frequency band 7.9 to 8.4 GHz; in two-carrier operation the minimum third order intermodulation product is -18 db at a CW output power of 1.25 kW per carrier.

The tube YH 1047 is a solenoid-focused travelling wave tube and is designed to operate with depressed or non-depressed collector.

The tube is field-replaceable and can be easily inserted in the focusing system.

The input and output ports are designed for connection to waveguides. The collector, delay line and solenoid are water-cooled.

Weight of tube	: approx. 20 kg/44 lbs
Weight of solenoid	: approx. 100 kg/220 lbs
Length of tube	: approx. 910 mm/35.8"
Outer diameter of the solenoid:	approx. 230 mm/9.1"
Waveguide	: RG-51/U
Flange	: UG-51/U
Mounting position	: vertical, collector upwards

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Heating

Heater voltage	Ef	11 ± 1	V	1)2)
Preheating voltage	Ef'	0.85 · Ef	V	
Heater current	If	max 6	A	
Preheating time	tk	min 5	min	

indirect by dc, metal capillary dispenser cathode.

Characteristics

Frequency range	F	7.9 to 8.4	GHz	5)
Gain slope	$\Delta G/\Delta F$	max 0.1	db/MHz	5)
Bandwidth	B	500	MHz	
Saturation power	Psat	min 8	kW	
Gain (Po = 8 kW)	G	min 34	db	
Tube VSWR		1.5		3)
Cold attenuation	α	80	db	


Typical Operation

5 kW CW Single Carrier Operation

Operating frequency	F	8.3	GHz	
Output power	Po	5	kW	
Gain	G	36	db	
Collector voltage	Eb	13.5	kVdc	
Delay line voltage	Ed1	18.5	kVdc	1)
Modulating anode voltage	Ec2	9.5	kVdc	1)
Grid No.1 voltage	Ecl	-200	Vdc	1)
Cathode current	Ik	3.0	Adc	1)
Delay line current	Id1	80	mAdc	
Modulating anode current	Ic2	1.5	mAdc	
AM/PM conversion	kp	4.5	°/db	
Coil Current	Isol	20	Adc	1)4)

1) to 5) see page 4

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