F4064A
TRAVELING WAVE TUBE

The F4064A is a low noise traveling wave tube amplifier. It delivers a saturated output power of at least 0.08 mW from 1.2 to 1.4 GHz. The nominal gain is 25 dB at small signal level.

The F4064A uses integral permanent magnet focusing and natural conduction and convection cooling.

A voltage divider integral to the tube and preset for optimum noise performance permits operation with only two voltage supplies.

The F4064A finds applications in telecommunication systems.

The AMP.2023 low noise amplifier manufactured by Thomson CSF is provided with the F4064A low noise traveling wave tube. Designed for transportable equipment, focusing with a permanent magnet saves weight and eliminates adjustments. Installation or replacement of the tube are simplified.

The AMP.2023 amplifier features increased ruggedness and reliability. It is particularly suitable in industry or university laboratories use and in all applications where accuracy, stability and low noise are required.

GENERAL CHARACTERISTICS

Electrical

Heater voltage		6.3	V
Heater current		0.3 to 0.6	A
Beam voltage		300	V
Beam current		4.0 to 8.0	mA
Noise figure			
1.2 - 1.4 GHz band	max.	4.5	dB
1.25 - 1.35 GHz band	max.	4.0	dB
Gain, small signal (– 45 dBm)			
1.2 - 1.4 GHz band	min.	25	dB
Saturated power		0.08 to 0.5	mW
Attenuation	min.	50	dB
Input VSWR	max.	1.7 : 1	
Output VSWR	max.	2.0 : 1	

Mechanical

RF connections (input and output)	type "N"
Power supply connector	Jaeger n° 536756
Coupling to type (supplied with the tube)	Jaeger n° 532356
Mounting position	any
Weight	11 kg

THOMSON-CSF
GROUPEMENT TUBES ELECTRONIQUES

Typical operation

Frequency	1. 20	1. 30	1. 40	GHz
Beam voltage	300	300	300	V
Beam current	70	70	70	μA
Noise figure	4. 0	3. 8	4. 0	dB
Gain, small signal (–45 dBm)	27. 5	28. 5	28. 0	dB
Saturated power	0. 19	0. 17	0. 14	mW
Input VSWR	1. 40 : 1	1. 20 : 1	1. 40	
Output VSWR	1. 35 : 1	1. 10 : 1	1. 40	
Attenuation	55	60	65	dB
Peak power output (1)	-	0. 13	-	mW
Variation of noise figure versus VSWR seen from input connector				
VSWR = 1. 25 : 1	±0. 1	± 0. 1	±0. 08	dB
VSWR = 1. 5 : 1	±0. 2	±0. 15	±0. 13	dB
VSWR = 2. 0 : 1	±0. 3	±0. 25	±0. 22	dB

(1) For a peak drive power of 0. 5 kW

Absolute ratings

	min.	max.	
RF drive power (peak)	-	500	W
RF drive power (average)	-	0. 5	W
Filament voltage	6. 2	6. 4	V
Beam voltage :			
for guaranteed performance	297	303	V
for life of the tube	270	315	V
Warm-up time	3	-	mn
Ambient temperature	–40	+70	°C
Altitude without pressurization	-	3000	m

OPERATING INSTRUCTIONS

FOCUSING

Disturbance of the magnetic field by external means may seriously affect tube performance (gain and noise figure) without change on the cathode current, and in extreme cases, may destroy the tube. All wrenches and screw-drivers used to mount the tube must be non-magnetic. Magnetic materials (such as permanent magnets, transformers, etc..) should be kept away from the tube. In case of such a failure, the tube should be returned to the factory for a check-up.

POWER SUPPLIES

Heater and beam voltage should be checked to ensure they have proper stabilization. Supplies must be isolated from ground by at least 500 Vdc.

SECURITY DEVICES

An interlock should prevent the application of beam voltage before the heater voltage has been applied for a least 3 minutes.

A meter is necessary to adjust the cathode current to the value specified on the Test Data Sheet provided with each tube. This microammeter should present the following characteristics :

Full scale deviation	100	μA	
Internal resistance	1000	Ω	max.
Insulation	500	V	d c

DRIVE POWER

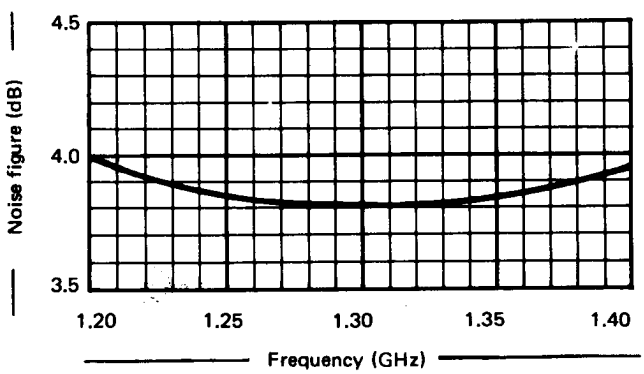
The TWT helix could be damaged by an excess of either peak or average drive power and it is important to keep the latter within ratings.

INPUT VSWR

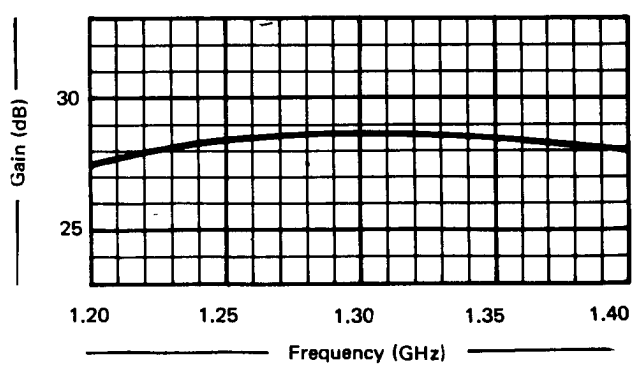
In case the input VSWR should exceed 1. 5 : 1 a low loss circulator could be inserted to limit the noise figure increase.

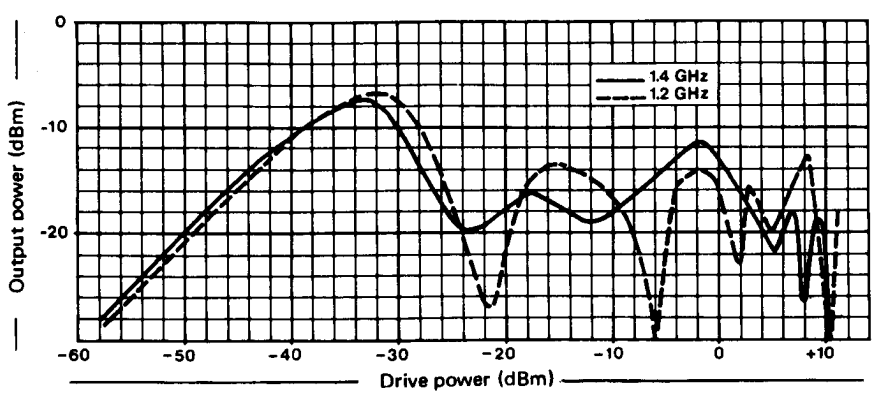
TYPICAL CHARACTERISTICS

Noise figure



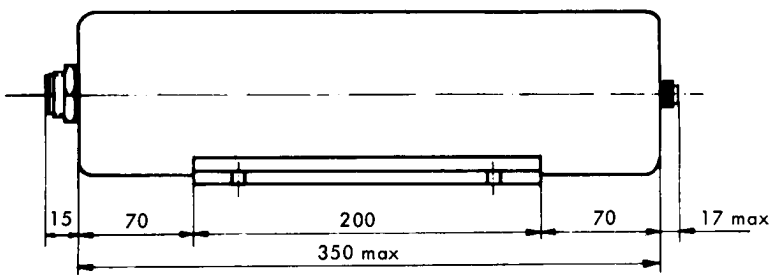
Gain

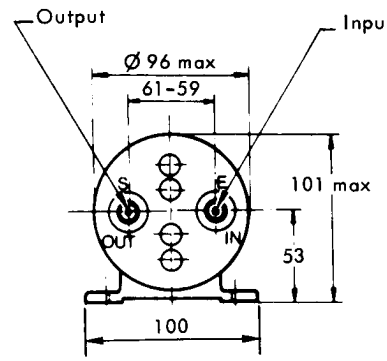


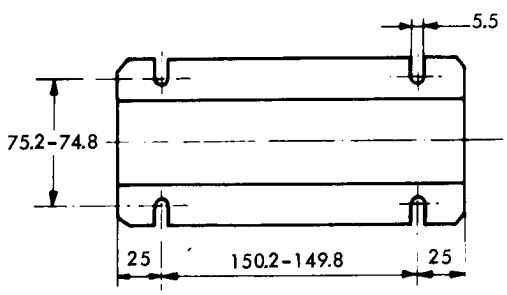


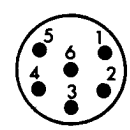
THOMSON-CSF
GROUPEMENT TUBES ELECTRONIQUES

OUTLINE DRAWING









1 - Heater
2 + Heater
4 + HT
3 - HT
3 - Microammeter
5 + Microammeter
6 Ground

Dimensions in mm