



THOMSON-CSF

DIVISION TUBES ELECTRONIQUES

DATA TEH 4447 A

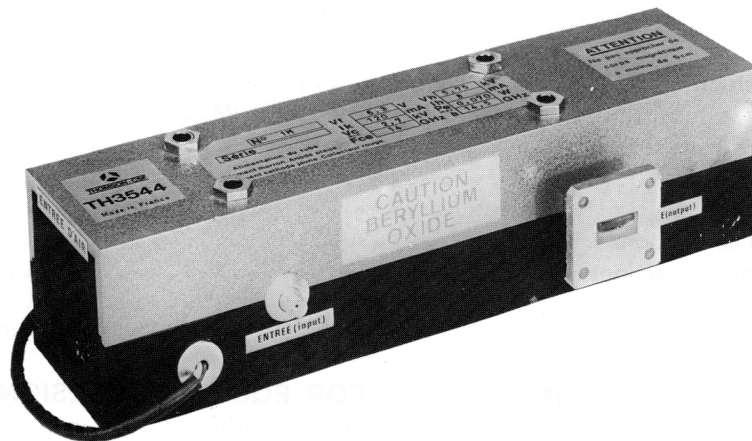
TH 3544

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TH 3544 125 W CW TRAVELING-WAVE TUBE

Features

- Specially designed for communications-satellite earth stations.
- More than 125 watts CW in Ku-Band.
- PPM-focused, for reduced power consumption and simple forced-air cooling.
- Rugged all metal-and-ceramic construction, with a copper helix brazed to beryllium-oxide support rods.
- Compact and lightweight.
- Highly reliable and offers long tube life.



The TH 3544 is a high-gain, medium-power traveling-wave tube, designed for transmitter use in satellite-communications-system earth stations operating in the 14 to 14.5 GHz band.

Featuring a brazed copper helix slow-wave structure, the TH 3544 is especially well-suited for multicarrier operation in low-cost, small capacity INTELSAT-V or OTS-type earth stations, either fixed or transportable. Careful matching of its coupling elements and lossy sections has resulted in a TWT providing wideband operation with nearly flat gain, very low group-delay distortion and small AM/PM conversion distortion.

If operated in the normal depressed-collector configuration, the TH 3544 has a minimum overall efficiency of 25 %, with typical efficiency on the order of 30 %.

Air-cooled, the TH 3544 requires a minimum cooling-air flow of only 30 liters a second (60 cu.ft./min.).

The dispenser-type cathode, made of specially treated barium-impregnated tungsten, ensures long tube life. In addition, tube life can be further prolonged because the electron-gun design allows readjusting the cathode current as the tube ages, without changing the helix voltage.

A power supply, specially designed for the TH 3544, can be delivered on order.



GENERAL CHARACTERISTICS

Electrical

Frequency range	14 - 14.5	GHz
Output power, at saturation	≥ 125	W
Efficiency (depressed collector)	≥ 30	%
Gain, at rated power	≥ 50	dB
Gain variation over the band	≤ 1.5	dB
Gain slope, small-signal	≤ 0.03	dB/MHz
AM/PM conversion	≤ 6	°/dB
Noise figure	≤ 35	dB
Noise measured in a 4 kHz window	≤ -42	dBm
Heater voltage	7	V
Heater current	1 to 1.1	A
Cathode current	110 to 130	mA
Helix voltage	5.4 to 5.8	kV
Cathode current	110 to 130	mA
Anode voltage	4.7 to 5.2	kV
Collector voltage	2.8 to 3.5	kV
Load VSWR (max.)	1.2 : 1	

Mechanical

Operating position	Any
Dimensions	334 mm x 87 mm x 65 mm
Weight, approximate	1.5 kg
RF Connections	Input : coaxial 3 mm female Output waveguide : WR-75
Power-supply connections	Flying leads
Thermal-switch connections	Flying leads
Cooling	Forced air

LIMITING VALUES FOR EQUIPMENT DESIGN*

(non-simultaneous)

	Min.	Max.	Units
Heater surge current	—	2	A
Heater voltage	6.8	7.2	V
Warm-up time	3	—	mn
Anode voltage	—	V _a (nom) + 0.1	kV
Anode current	-1	+ 1	mA
Drive power	—	5 dB above P _D (nom)	mW
Helix voltage	V _h (nom) - 0.1	V _h (nom) + 0.1	kV
Helix current	—	12	mA
Load VSWR	—	2 : 1	
Collector voltage	—	3.8	kV
Cooling air flow	30	—	g/s
Inlet cooling air temperature	-40	+ 60	°C
Distance from magnetic materials	5	—	cm

* Equipment-design values, NOT operating values. No one value ever to be exceeded, even under transient conditions, and operation at more than one limiting value at the same time may cause tube damage.

TYPICAL OPERATION

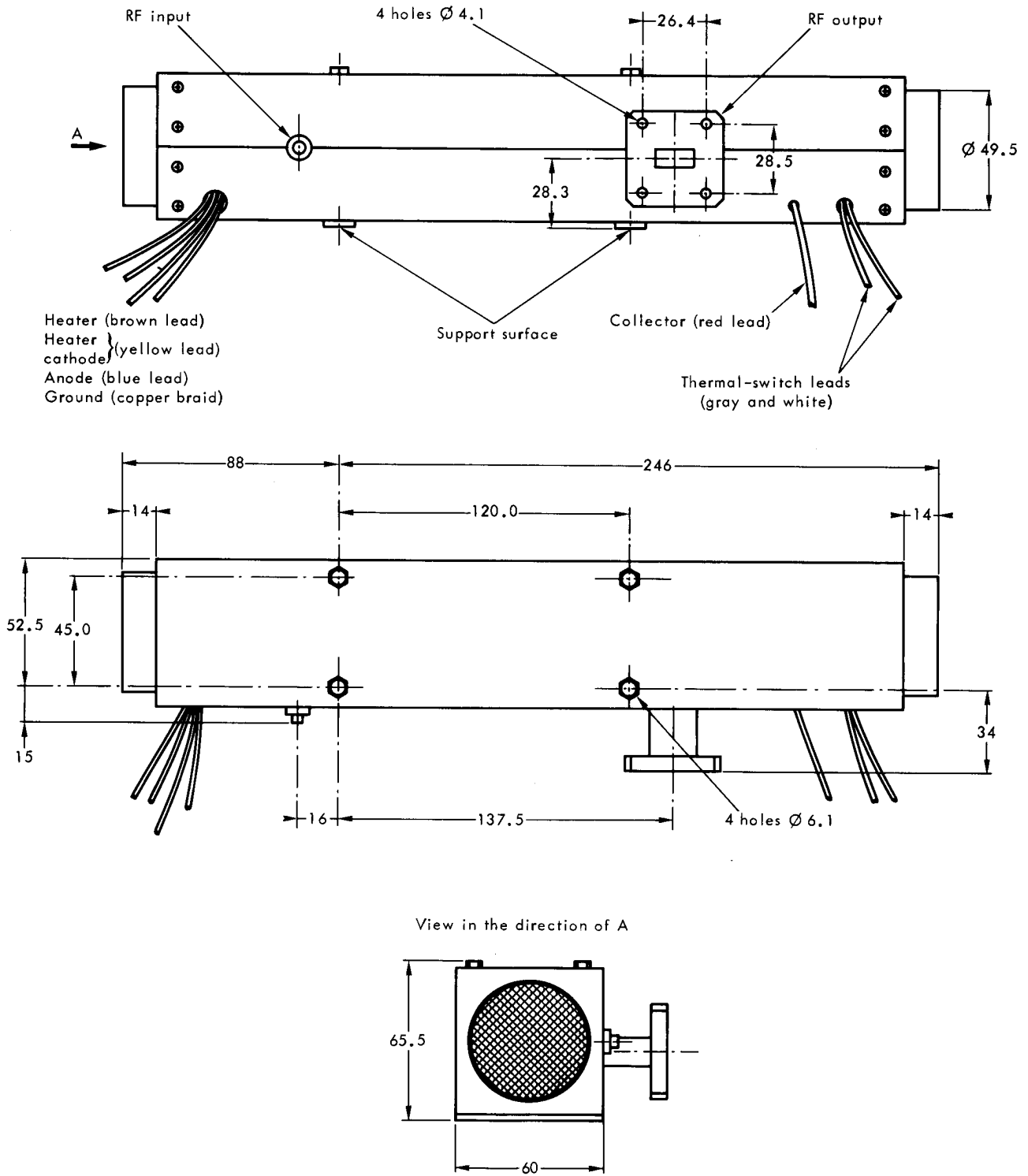
Single-carrier mode

Frequency	14 - 14.5	GHz
Output power	150	W
Gain :		
- saturated	55	dB
- small-signal	60	dB
Efficiency	35	%
Maximum gain variation over the band, $P_{out} = 150\text{ W}$	0.3	dB
Gain slope, maximum	0.02	dB/MHz
Noise measured in a 4-kHz window	-48	dBm
Heater voltage	7	V
Heater current	1	A
Cathode current	130	mA
Anode voltage	4.9	kV
Anode current	0	mA
Helix voltage	5.75	kV
Helix current	5	mA
Collector voltage	3	kV
Collector current	115	mA
AM/PM conversion	5	°/dB

Multi-carrier mode

First carrier frequency, F_1	14.24	GHz
Second carrier frequency, F_2	14.26	GHz
Output power, per carrier	15	W
Intermodulation products	-26	dB
AM/PM conversion	2	°/dB
Maximum gain variation over the band, small-signal	1	dB

OUTLINE DRAWING



All dimensions nominal in mm

