

HIGH POWER TRAVELING WAVE TUBE FOR GROUND TERMINALS LD7202 SERIES

14 GHz, 600W CW, PPM FOCUSING, HIGH POWER GAIN

GENERAL DESCRIPTION

The series of NEC LD7202 is PPM-focused traveling wave tube line-up designed for final amplifier tube in the earth-to-satellite communication's transmitter.

It is capable of delivering an output power of 600W over the range of 12.75 to 14.5 GHz.

It provides a high power gain of 52 dB at a saturated output power.

Furthermore, it is of rugged and reliable design offering long life services.

The LD7202 is fully compatible with TH3591B.



FEATURES

- High Power Gain
The power gain is typically 52 dB at a saturated output power.
- Simple Cooling System
The tube is forced-air-cooled, so that the cooling systems are greatly simplified.
- PPM Focusing
The tube is PPM (Periodic Permanent Magnet)-focused, eliminating entirely the requirement for focusing power supplies and interlock circuits.
- Rugged Construction
The tube is designed to be rugged, therefore it is suitable for use in the transportable systems.
- Long Life and High Stability
The tube employs advanced impregnated cathode with lower operating temperature for long life.
- Microdischarge Free
The tube is carefully designed to be free from microdischarge in the electron gun for long time, therefore it is suitable for use in the digital communication services.

GENERAL CHARACTERISTICS**ELECTRICAL**

Frequency

LD7202, LD7202A, LD7202B	14.0 to 14.5 GHz
LD7202L	13.75 to 14.5 GHz
LD7202W	12.75 to 13.25 GHz, 13.75 to 14.5 GHz

Output Power 600 W

Heater Voltage 6.3 V

Heater Current 1.4 A

Type of Cathode Indirect-Heated, Impregnated

Cathode Warm-up Time 300 s

MECHANICAL

Dimensions See Outline Drawing

Weight 6.0 kg approx.

Focusing Periodic Permanent Magnet

Mounting Position Any

Cooling Forced Air

Electrical Connections See Outline Drawing

RF Connections

Input SMA-Jack

Output UBR-120 Flange

Thermal Switch Connections See Outline Drawing

ABSOLUTE RATINGS (Note 2, 3 and 4)

ELECTRICAL

	Min.	Max.	Unit
Heater Voltage	5.5	6.5	V
Heater Surge Current	—	4.5	A
Heater Current	—	3	A
Heater Warm-up Time	300	—	s
Collector Voltage*	4.75	6.2	kVdc
Collector Current	—	425	mAdc
Helix Voltage	10.25	10.75	kVdc
Helix Current	—	12	mAdc
Anode Voltage	5.5	6.5	kVdc
Anode Current	—	0.5	mAdc
Collector Dissipation	—	2.4	kW
RF Drive Power	—	20	mW
Output Power	—	670	W
Load VSWR**	—	1.15:1	

* The voltage between a helix and a collector must not exceed 8 kV.

** Load VSWR must be met as follows.

In Band	1.15 : 1 max.
13.5 to 15.0 GHz	1.5 : 1 max. (LD7202, LD7202A, LD7202B)
13.25 to 15.0 GHz	1.5 : 1 max. (LD7202L)
12.25 to 15.0 GHz	1.5 : 1 max. (LD7202W)
15.0 to 16.0 GHz	1.8 : 1 max.
16.0 to 17.0 GHz	2.2 : 1 max.

MECHANICAL

	Min.	Max.	Unit
Air Flow of Collector	4.2	—	kg/min.
Ambient Temperature (Operation)	−10	+50	°C
Storage Temperature	−40	+80	°C

TYPICAL OPERATION (Note 4 and 5)

		Unit
Frequency		
LD7202/A/B	14.0 to 14.5	GHz
LD7202L	13.75 to 14.5	GHz
LD7202W	12.75 to 13.25, 13.75 to 14.5	GHz
Heater Voltage (Note 5)	6.3	V
Heater Current	1.4	A
Helix Voltage	10.5	kVdc
Helix Current	3	mA _{dc}
Collector Voltage	5.4	kVdc
Collector Current	360	mA _{dc}
Anode Voltage	5.9	kVdc
Anode Current	0.1	mA _{dc}
Saturated Output Power	630	W
Power Gain		
at 70 W	58	dB
at 600 W	52	dB
Gain Variation (at P _o =70 W)		
LD7202/A/B	2	dB/500MHz
LD7202L	2.4	dB/750MHz
LD7202W (12.75 to 13.25 GHz)	2	dB/500MHz
(13.75 to 14.5 GHz)	2.4	dB/750MHz
Gain Slope	0.01	dB/MHz
AM-PM Conversion		
at 70 W	1.5	deg./dB
at 600 W	5	deg./dB
3rd Order Intermodulation	-28	dBc
(two equal carriers, 70 W total)		
Cooling Air Flow	4.2	kg/min.
Pressure Drop	588	Pa

Note 1 : Absolute rating should not be exceeded under continuous or transient conditions. A single absolute rating may be the limitation and simultaneous operation at more than one absolute rating may not be possible.

Note 2 : The tube helix is at the ground potential in operation.

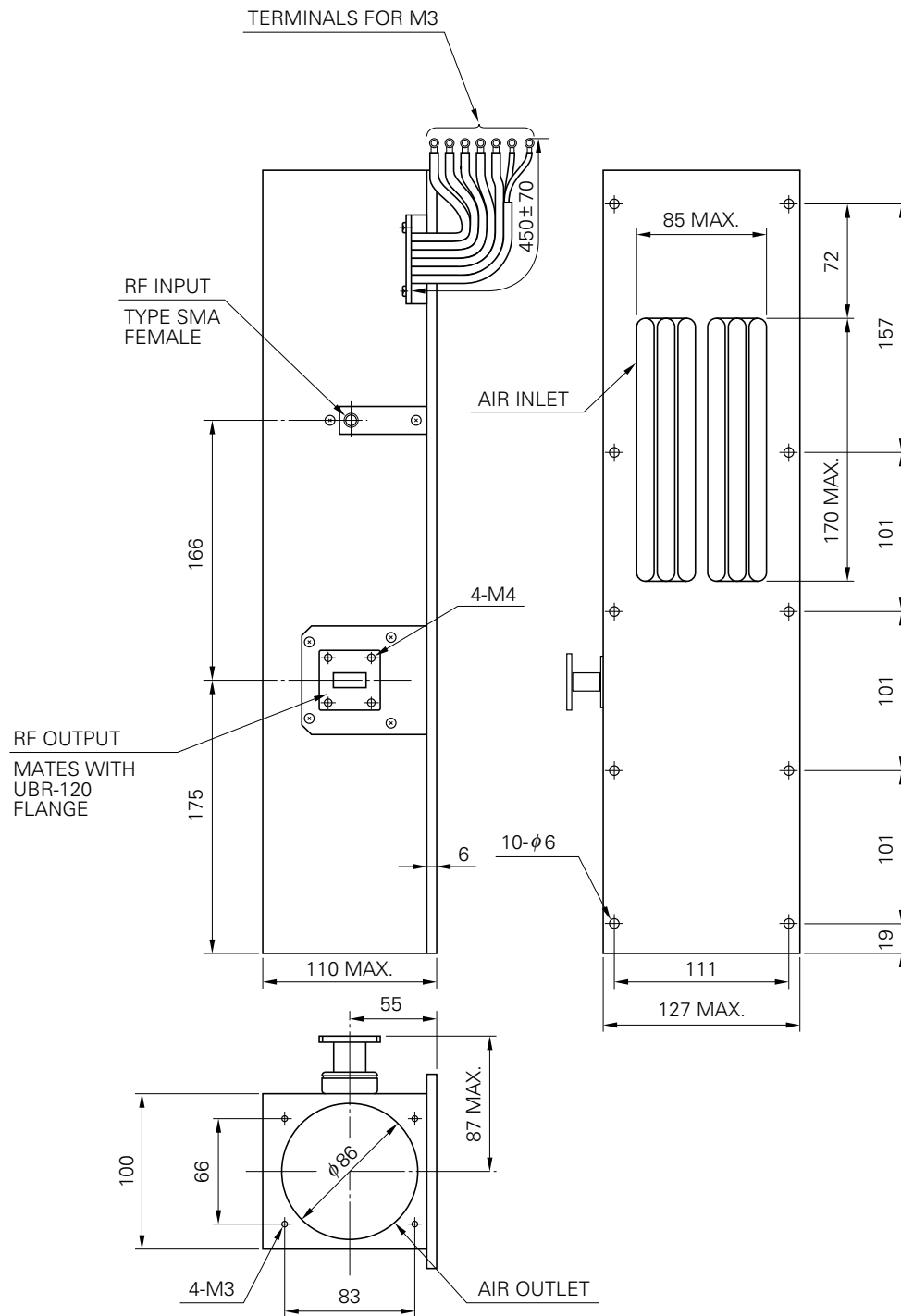
Note 3 : All voltages except heater voltage are referenced to the cathode potential.

Note 4 : The optimum operating parameters are shown on a test performance sheet for each tube.

Note 5 : These characteristics and operating values may be changed as a result of additional information or product improvement. NEC should be consulted before using this information for equipment design.

LD7202, LD7202L, LD7202W OUTLINE DRAWING

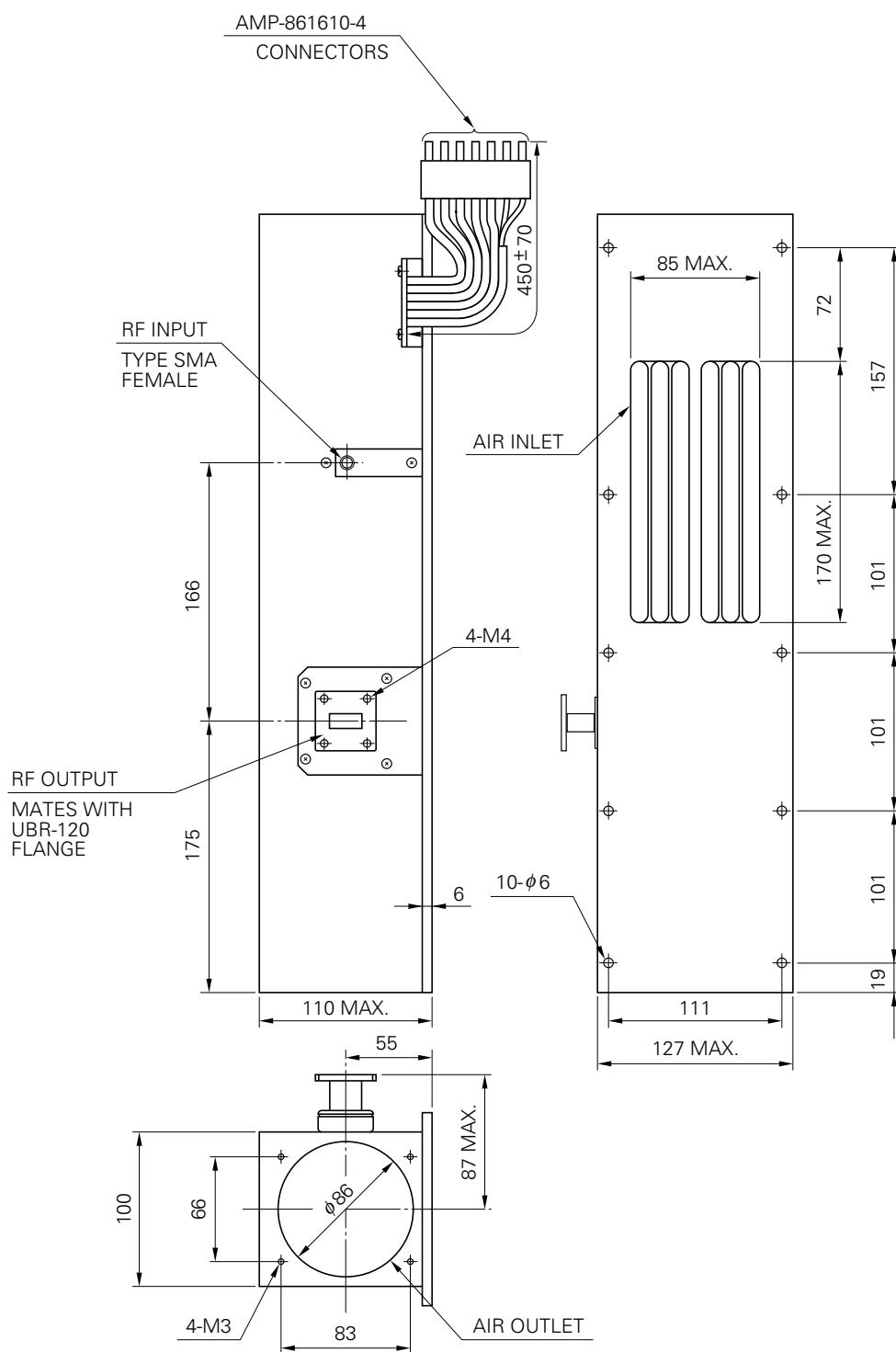
Dimensions in mm



Note. The thermal switch contacts are normally closed.

LD7202A OUTLINE DRAWING

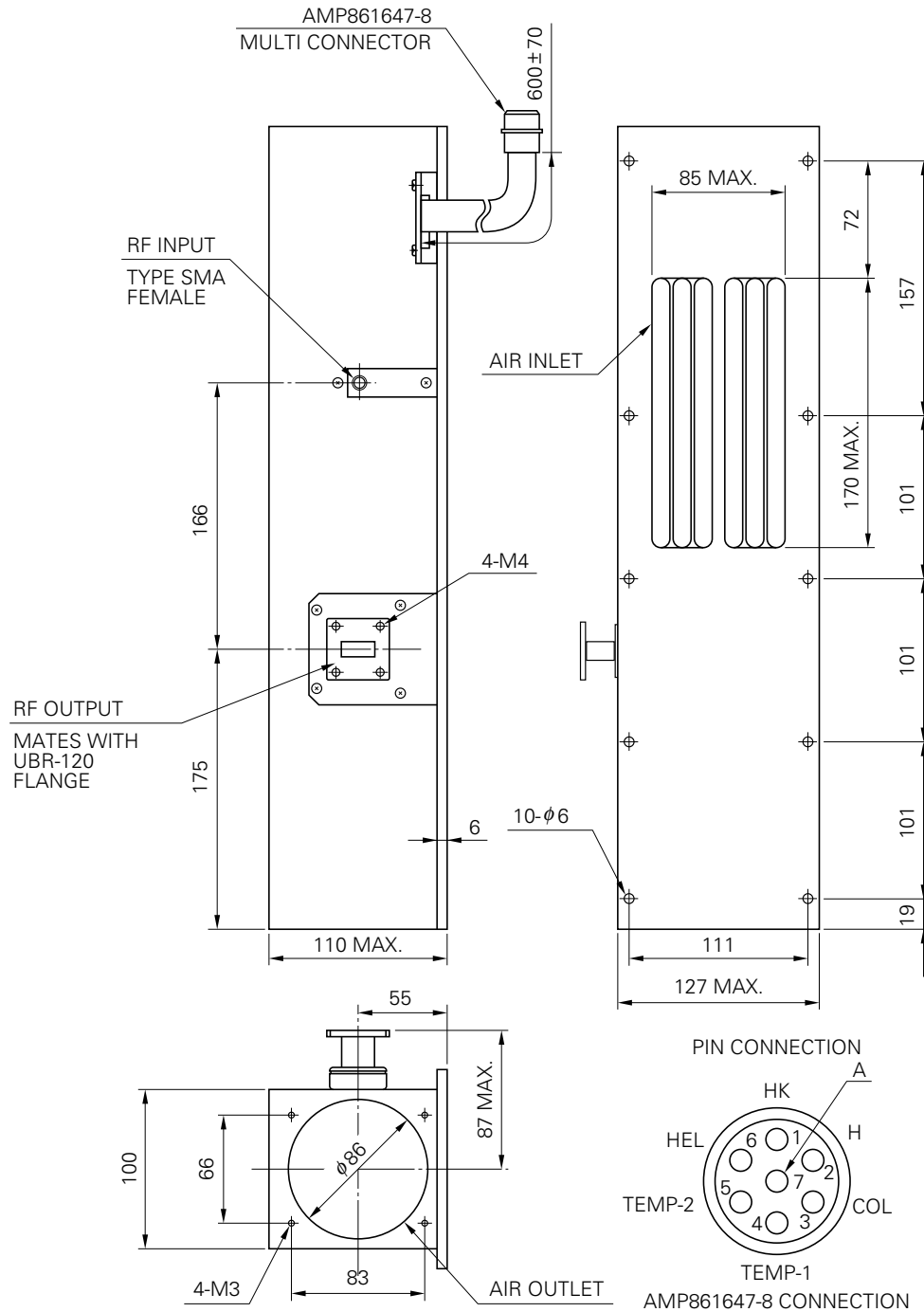
Dimensions in mm



Note. The thermal switch contacts are normally closed.

LD7202B OUTLINE DRAWING

Dimensions in mm



Note. The thermal switch contacts are normally closed.

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