NEC

HIGH POWER TRAVELING WAVE TUBE FOR GROUND TERMINALS
LD7215W

6 GHz, 3 kW CW, PPM FOCUSING, HIGH POWER GAIN

GENERAL DESCRIPTION

NEC LD7215W is a PPM-focused traveling wave tube designed for use as final amplifier in the earth-to-satellite communications transmitter.

This is capable of delivering an output power of 3 kW over the range of 5.85 to 6.65 GHz.

It provides a high power gain of 42 dB at a rated output power.

Furthermore, this is of rugged and reliable design offering long-life service.

FEATURES

- ○ High Power Gain
  The power gain is typically 42 dB minimum at 3 kW level.
- ○ Simple Cooling System
  The tube is forced-air-cooled, so that the cooling systems are simplified.
- ○ PPM Focusing
  The tube is PPM (Periodic Permanent Magnet) -focused, eliminating entirely the focusing power supplies and interlock circuits.
- ○ Rugged Construction
  The tube is designed to be rugged, therefore it is suitable for transportable systems.
- ○ Long Life and High Stability
  The tube employs an advanced impregnated cathode with a low operating temperature for long life.
- ○ Microdischarge Free
  The tube is carefully designed to be free from microdischarge in the electron gun for long term operation, therefore it is suitable for digital communication service.

For safe use of microwave tubes, refer to NEC document "Safety instructions to all personnel handling electron tubes" (ET0048EJ∗V∗UM00)

The information in this document is subject to change without notice.

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GENERAL CHARACTERISTICS

ELECTRICAL

Frequency	5.85 to 6.65 GHz
Output Power	3 kW
Heater Voltage	6.3 V
Heater Current	4.5 A
Type of Cathode	Indirectly heated, Impregnated
Cathode Warm-up Time	300 s

MECHANICAL

Dimensions	See outline
Weight	30 kg approx.
Focusing	Periodic Permanent Magnet
Mounting Position	Any
Electrical Connections	Flying Leads
Heater, Heater-Cathode, Helix, Anode, Collector and Thermal Protection	
RF Connections	
Input	Type SMA Female
Output	Mates with CPR-137F Flange
Cooling	Forced Air

ABSOLUTE RATINGS (Note 1, 2 and 3)

ELECTRICAL

	Min.	Max.	Unit
Heater Voltage	6.0	6.6	V
Heater Surge Current	–	8.0	A
Heater Current	3.0	5.0	A
Heater Warm-up Time	300	–	s
Helix Voltage	12.5	13.7	kV
Helix Current	–	25	mA
Anode Voltage	10.0	13.0	kV
Anode Current	–0.5	0.5	mA
Collector Voltage	8.0	9.5	kV
Cathode Current	–	1.5	mA
Drive Power	–	24	mW
Load VSWR	–	1.15 : 1	

MECHANICAL

	Min.	Max.	Unit
Cooling Air Flow	720	–	kg/hr
Operating temperature	0	+45	˚C
Inlet air temperature	–20	+45	˚C
Storage temperature	–30	+70	˚C

TYPICAL OPERATION (Note 2, 3 and 5)

			Unit
Frequency		5.85 to 6.65	GHz
Heater Voltage (Note 4)		6.3	V
Heater Current		4.5	A
Helix Voltage		13.5	kV
Helix Current		10.0	mA
Anode Voltage		11.8	kV
Anode Current		0.01	mA
Collector Voltage		8.25	kV
Cathode Current		1.4	mA
Saturated Output Power		3.3	kW
Power Gain	at 500 W	51	dB
	at 3 kW	45	dB
Gain Variation	at 500 W	1.5	dB/800 MHz
Gain Slope	at 500 W	0.02	dB/MHz
AM-PM Conversion			
at 500 W		1.7	deg./dB
at 3 kW		3.0	deg./dB
3rd Order Intermodulation			
(two equal carriers, 300 W total)		–31.5	dBc
Air Flow		720	kg/hr
Air Pressure Drop		882.6	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.

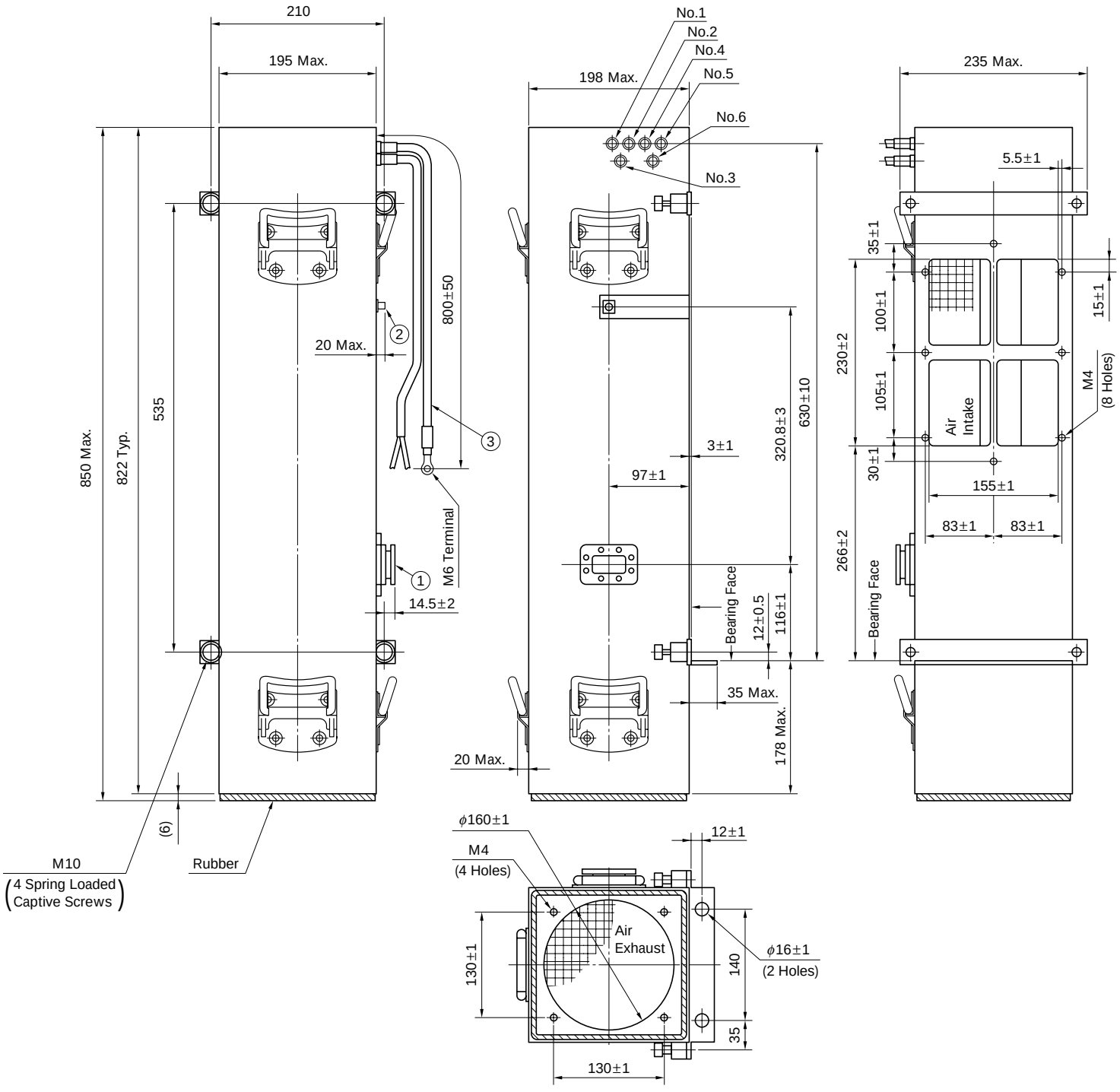
Note 2 : The tube body is at ground potential in operation.

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

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. This data sheet should not be referred to a contractual specification.

LD7215W OUTLINE (Unit in mm)



①	RF OUTPUT	CPR-137 FLANGE (NO. 10-32 UNF 2B THREADED HOLES)
②	RF INPUT	FEMALE SMA CONNECTOR
③	HIGH VOLTAGE CONNECTIONS	FLYING LEADS WITH M6 TERMINALS

LEAD CONNECTIONS

LEAD NO.	LEAD NAME	(COLOR)
1	HEATER (–)	(BROWN)
2	HEATER (+), CATHODE	(YELLOW)
3	ANODE	(BLUE)
4	COLLECTOR	(RED)
5	HELIX (GROUND)	(BLACK)
6	THERMAL PROTECTION SWITCH	(GRAY)

NOTE 1 : THE 3RD ANGLE ORTHOGRAPHIC PROJECTION.