

# HIGH POWER TRAVELING WAVE TUBE FOR GROUND TERMINALS LD7246A

14 GHz, 123 W CW, CONDUCTION COOLING, MINIMUM SIZE

### GENERAL DESCRIPTION

NEC LD7246A is 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 130 W over the range of 13.75 to 14.5 GHz.

It provides a high power gain of 53 dB at 123 W output power.

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



### FEATURES

- Light weight, Compact and Efficient  
The tube has dual-depressed collectors and is designed to operate at high efficiency across wide power output range. It features state-of the art techniques to optimize size and efficiency.
- High Power Gain  
The power gain is typically 53 dB at 123 W level.
- Simple Cooling System  
The tube is conduction-cooled, so that the cooling system is greatly simplified.
- PPM Focusing  
The tube is PPM (Periodic Permanent Magnet) -focused, eliminating entirely focusing power supplies and inter-lock 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.

**GENERAL CHARACTERISTICS**

**ELECTRICAL**

Frequency .....	13.75 to 14.5 GHz
Output Power .....	123 W
Heater Voltage .....	4.5 V
Heater Current .....	1.0 A
Type of Cathode .....	Indirectly heated, Impregnated
Cathode Warm-up Time .....	180 s

**MECHANICAL**

Dimensions .....	See Outline
Weight .....	1.3 kg approx.
Focusing .....	Periodic Permanent Magnet
Mounting Position .....	Any
Electrical Connections .....	Flying Leads
Heater, Heater-Cathode, Helix, Collector-1, Collector-2	
RF Connections	
Input .....	SMA-Female
Output .....	Mates with UBR-120 Flange
Cooling .....	Conduction

**ABSOLUTE RATINGS ( Note 1, 2 and 3 )**

**ELECTRICAL**

	Min.	Max.	Unit
Heater Voltage .....	4.2	4.8	V
Heater Surge Current .....	-	2.5	A
Heater Current .....	-	1.3	A
Heater Warm-up Time .....	180	-	s
Helix Voltage .....	6.0	6.4	kV
Helix Current .....	-	5.0	mA
Collector-1 Voltage .....	3.1	3.3	kV
Collector-2 Voltage .....	1.5	1.7	kV
Cathode Current .....	-	140	mA
RF Drive Power .....	-	1.0	dBm
Load VSWR .....	-	1.5 : 1	

**MECHANICAL**

	Min.	Max.	Unit
Baseplate Temperature			
Storage .....	-30	+110	°C
Operation .....	-30	+110	°C

TYPICAL OPERATION (Note 2, 3 and 5)

		Unit
Frequency .....	13.75 to 14.5	GHz
Output Power .....	130	W
Heater Voltage (Note 4) .....	4.5	V
Heater Current .....	1	A
Helix Voltage .....	6.2	kV
Helix Current .....	3	mA
Collector Voltage-1 .....	3.2	kV
Collector Current-1 .....	80	mA
Collector Voltage-2 .....	1.6	kV
Collector Current-2 .....	42	mA
Cathode Current .....	125	mA
Power Gain at 6 W .....	58	dB
at 130 W .....	53	dB
Gain Variation at 13 W .....	2	dB/750 MHz
Gain Slope at 13 W .....	0.03	dB/MHz
AM-PM Conversion at 130 W .....	3.5	deg./dB
3rd Order Intermodulation (two equal carriers, 13 W total) .....	-32	dBc
Efficiency .....	38	%

**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.

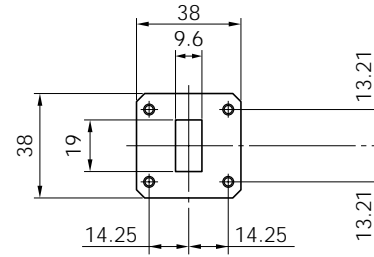
**Note 2 :** The tube body is at ground potential in operation.

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

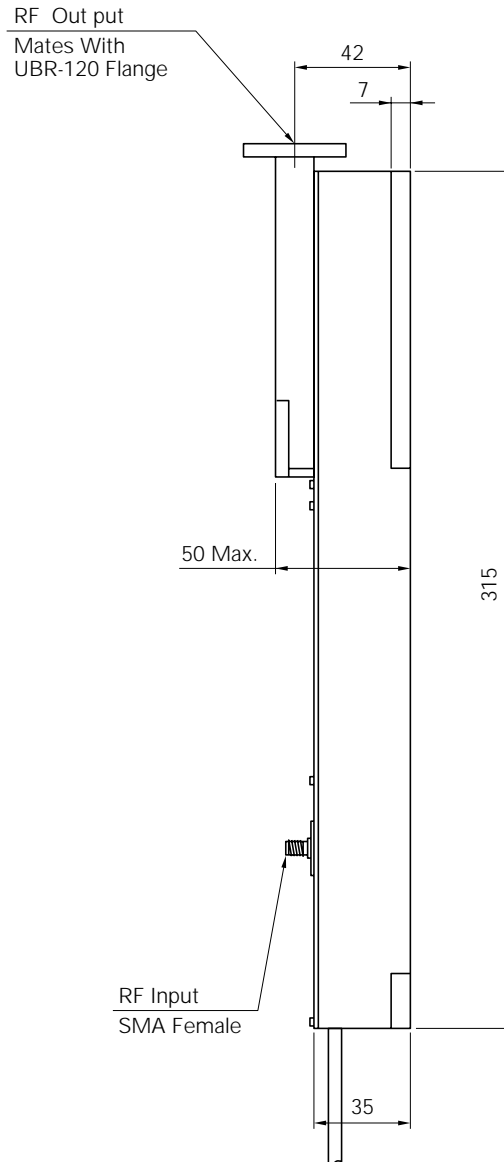
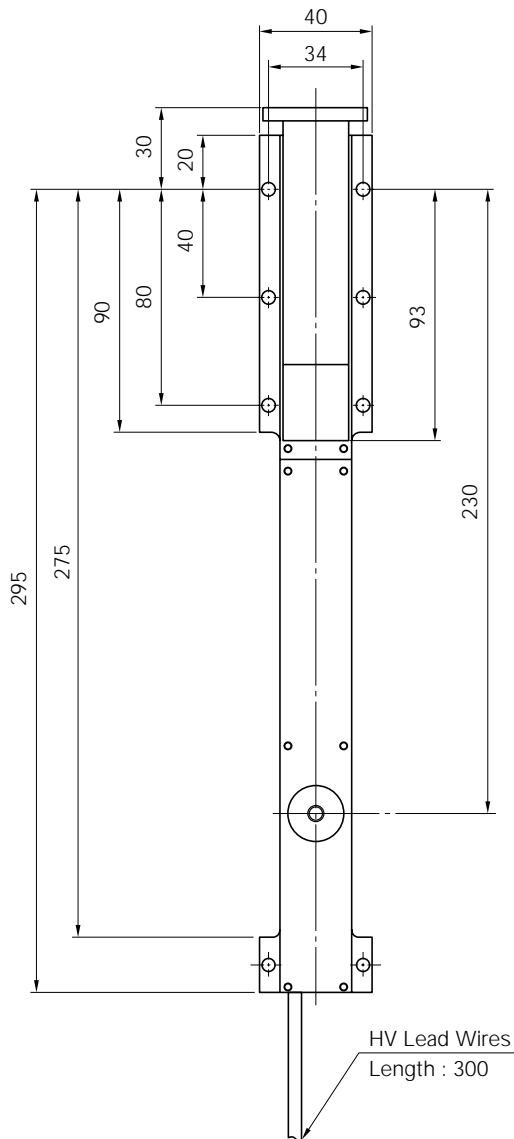
**Note 4 :** The optimum operating parameters are shown on a test performance sheet for each tube.

**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.

LD7246A OUTLINE (Unit in mm)



**Output Flange**



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