

HIGH POWER TRAVELING WAVE TUBE FOR GROUND TERMINALS LD7249 SERIES

14 GHz, 350 W/400 W CW, CONDUCTION COOLING, HIGH POWER GAIN

GENERAL DESCRIPTION

NEC LD7249 series of PPM-focused traveling wave tube are designed for use as final amplifiers in the earth-to-satellite communications transmitter.

Two models of the LD7249 series are capable of delivering an output power of 350 W and 400 W over the range of 13.75 to 14.5 GHz and provide a high power gain of more than 47 dB at the rated output power level.

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



FEATURES

- High Power Gain
The power gain is typically 54 dB at the rated output power 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 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.

GENERAL CHARACTERISTICS

ELECTRICAL

Frequency	13.75 to 14.5 GHz
Output Power	
LD7249	350 W
LD7249U	400 W
Heater Voltage	6.3 V
Heater Current	1.2 A
Type of Cathode	Indirectly heated, Impregnated
Cathode Warm-up Time	180 s

MECHANICAL

Dimensions	See outline
Weight	4 kg approx.
Focusing	Periodic Permanent Magnet
Mounting Position	Any
Electrical Connections	Flying Leads
Heater, Heater-Cathode, Helix, Collector-1, Collector-2 and Thermal Protection	(Optionally, the HV lead out let position can be changeable)
RF Connections	
Input	Type SMA Female
Output	Mates with UBR-120 Flange, Waveguide : WR-75
Cooling	Conduction

ABSOLUTE RATINGS (Note 1, 2 and 3)

ELECTRICAL

	min.	max.	Unit
Heater Voltage	6.0	6.6	V
Heater Surge Current	-	3.0	A
Heater Current	1.0	2.0	A
Heater Warm-up Time	180	-	s
Helix Voltage	8.0	9.2	kV
Helix Current	0	10	mA
Collector-1 Voltage	4.0	4.6	kV
Collector-1 Current	-	180	mA
Collector-2 Voltage	2.3	3.1	kV
Collector-2 Current	-	290	mA
Cathode Current	200	290	mA
RF Drive Power	-	5	mW
Load VSWR	-	1.5 : 1	

MECHANICAL

	Min.	Max.	Unit
Heat Sink Temperature	-40	+115	°C

ENVIRONMENTAL

	Min.	Max.	Unit
Ambient Temperature			
Storage	-50	+90	°C
Operating	-40	+100	°C

TYPICAL OPERATION (Note 2, 3 and 5)

	LD7249	LD7249U	Unit
Frequency	14.25	14.25	GHz
Output Power	350	400	W
Heater Voltage (Note 4)	6.3	6.3	V
Heater Current	1.2	1.2	A
Helix Voltage	8.6	8.8	kV
Helix Current	1.5	2.4	mA
Collector-1 Voltage	4.3	4.4	kV
Collector-1 Current	141	147	mA
Collector-2 Voltage	2.7	2.8	kV
Collector-2 Current	94	100	mA
Cathode Current	237	250	mA
Power Gain			
at 20 W	62	58	dB
at 350 W	58	54	dB
Gain Variation			
at 20 W	0.86	1.02	dB/750MHz
Gain Slope			
at 40 W	0.006	0.006	dB/MHz
AM-PM Conversion			
Less than 100 W	0.3	0.3	deg./dB
at 350 W	2.5	2.5	deg./dB
3rd Order Intermodulation	-23	-24	dBc
(two equal carriers, 100 W total)			

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.

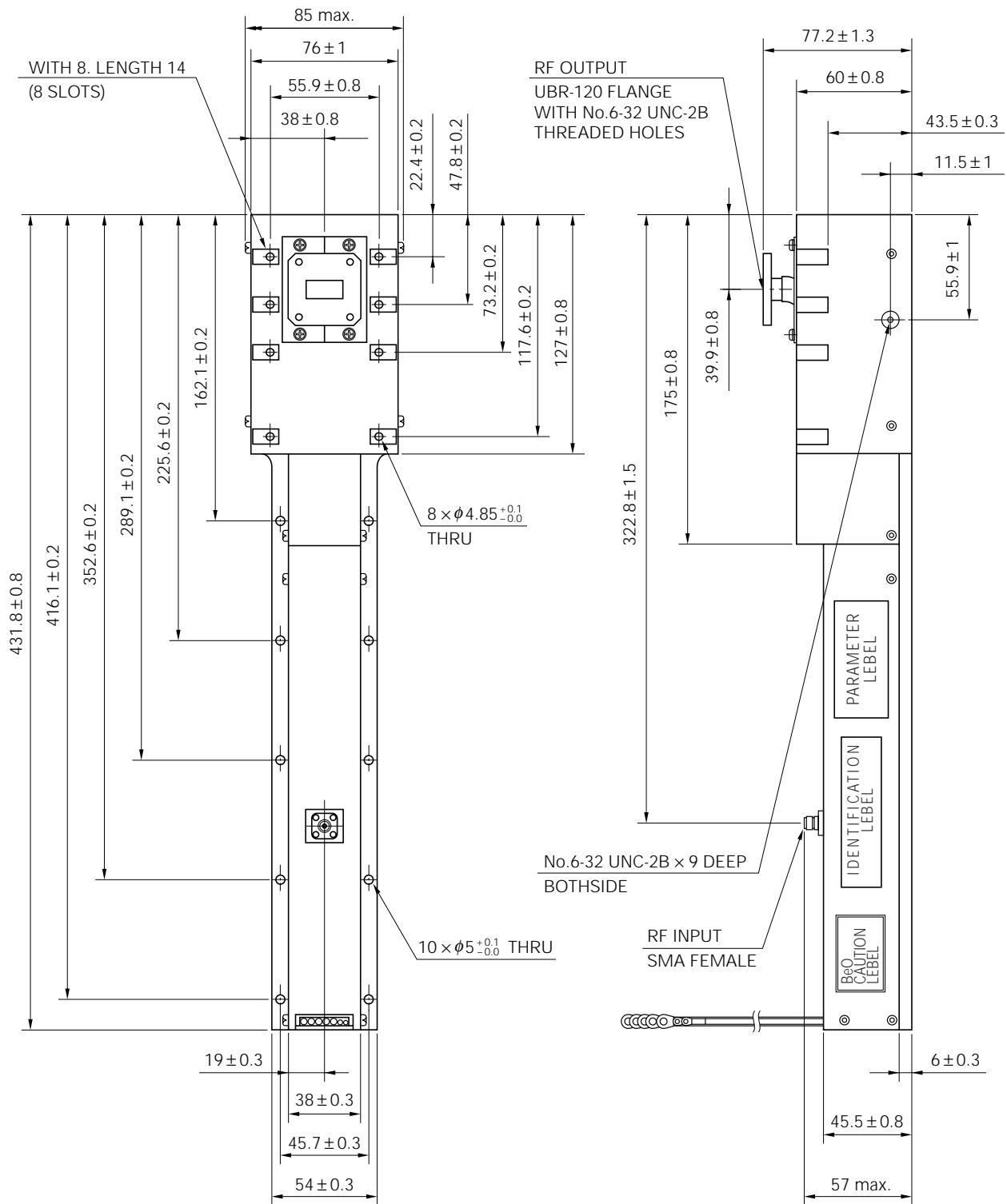
Note 2 : The tube body is at ground potential in operation.

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.

LD7249 OUTLINE (Unit in mm)



LEAD COLOR	LEAD CONECTIONS	LENGTH
BROWN	HEATER	650 mm
YELLOW	HEATER-CATHODE	650 mm
RED	COLLECTOR-1	650 mm
BLUE	COLLECTOR-2	650 mm
BLACK	HILIX (GROUND)	650 mm
BLUE (SLIM CABLE)	THERMAL SWITCH-1	650 mm
GREEN (SLIM CABLE)	THERMAL SWITCH-2	650 mm

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Anti-radioactive design is not implemented in this product.