

MIDIUM POWER TRAVELING WAVE TUBE FOR COMMUNICATIONS LD7713

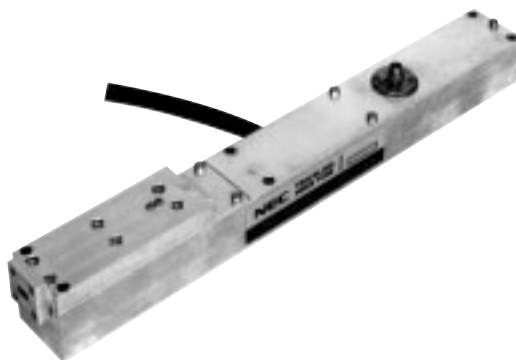
30 GHz, 20 W CW, Conduction Cooling, Mimimum Size

GENERAL DESCRIPTION

The NEC LD7713 is a PPM-focused traveling wave tube designed for use as final amplifier in the earth-to-satellite communications transmitter, LMDS (Local Multipoint distribution service) and other advanced communication systems.

This is capable of delivering an output power of 20 W over the range of 27.5 to 30.0 GHz and provides a power gain of more than 40 dB at 20 W level.

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



FEATURES

- Lightweight, Compact and Efficient

The tube has a dual-depressed collectors and designed to operate at high efficiency across the power output range. It features state-of-the-art techniques to optimize size and efficiency.

- Low Distortion

Distortion is a very important factor in multiplex digital signals transmission. NEC has developed techniques for the correction of non-linear distortion and phase generated in a TWT. As a result, the TWT has an optimum performance across a broad power range and is ideally suited for multi-carrier transmission systems.

- Simple Cooling System

The tube is conduction cooled, so that the cooling system is simplified.

- Rugged Construction

The power gain 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.

- Micro-discharge 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	27.5 to 30 GHz
Output Power	20 W
Heater Voltage	6.3 V
Heater Current	0.82 A
Heater Surge Current	2.5 A
Type of Cathode	Indirectly heated, Impregnated
Cathode Warm-up Time	180 s

MECHANICAL

Dimensions	See Outline
Weight	700 g approx.
Focusing	Periodic Permanent Magnet
Mounting Position	Any
Electrical Connections	Flying Leads
RF Connections	
Input	Mates with UG-599/U Flange or K connector Female
Output	Mates with UG-599/U Flange
Cooling	Conduction

ABSOLUTE RATINGS (Note 1, 2 and 3)

ELECTRICAL

	Min.	Max.	Unit
Heater Voltage	6.0	6.6	V
Heater Surge Current	-	2.5	A
Heater Current	-	1.2	A
Heater Warm-up Time	180	-	s
Helix Voltage	5.8	6.4	kV
Helix Current	-	5.0	mA
Collector-1 Voltage	2.2	2.5	kV
Collector-1 Current	-	30	mA
Collector-2 Voltage	1.1	1.3	kV
Collector-2 Current	-	42	mA
RF Drive Power	-	3	dBm
Load VSWR	-	1.5 : 1	-

ENVIRONMENTAL

Heat Sink Temperature	-30	+90	°C
Storage Temperature	-40	+90	°C

TYPICAL OPERATION (Note 2, 3 and 5)

		Unit
Frequency	28.0	GHz
Output Power	24.0	W
Heater Voltage (Note 4)	6.3	V
Heater Current	0.82	A
Collector-1 Voltage	2.2	kV
Collector-1 Current	22.0	mA
Collector-2 Voltage	1.1	kV
Collector-2 Current	14.5	mA
Cathode Current	38	mA
Helix Voltage	6.0	kV
Helix Current	1.5	mA
Power Gain (SSG)	52	dB
(LSG)	45	dB
Gain Variation at 2 W	2.5	dB/2.5 GHz
Gain Slope at 2 W	0.025	dB/MHz
AM-PM Conversion	3.5	deg./dB
3rd Order Intermodulation	-31	dBc
(two equal carriers, 2 W total)		
Spurious	-60	dBc
Noise Figure	32.5	dB
Overall Efficiency	30.5	%

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.

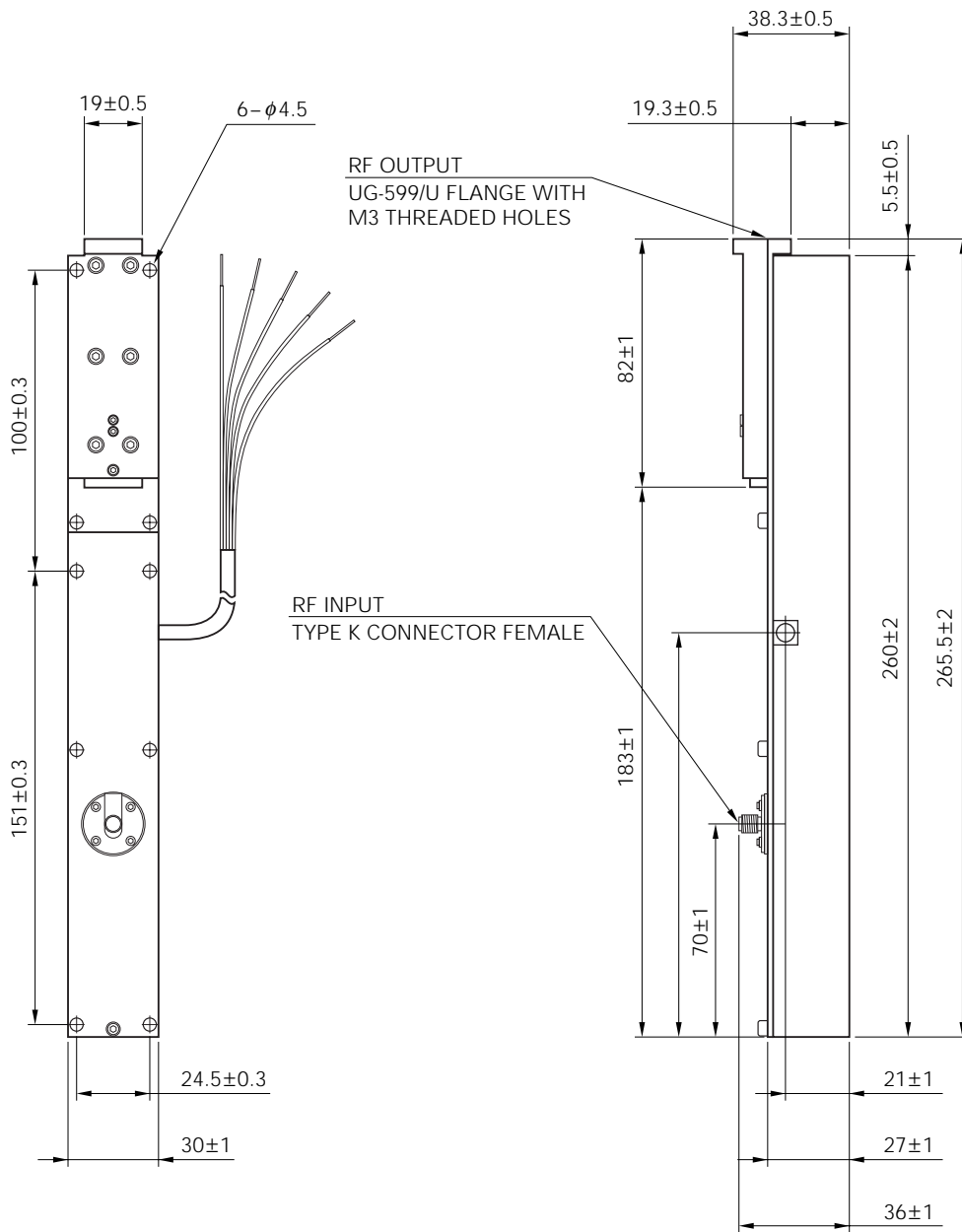
Note 2 : The tube body is at ground potential in operation.

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.

LD7713 OUTLINE (Unit in mm)



LEAD COLOR	LEAD CONNECTIONS	LENGTH
BROWN	HEATER	500 mm MIN.
YELLOW	HEATER-CATHODE	500 mm MIN.
RED	COLLECTOR-1	500 mm MIN.
GREEN	COLLECTOR-2	500 mm MIN.
BLACK	HELIX (GROUND)	500 mm MIN.

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Anti-radioactive design is not implemented in this product.