NEC

HIGH POWER TRAVELING WAVE TUBE FOR COMMUNICATIONS

LD7272 SERIES

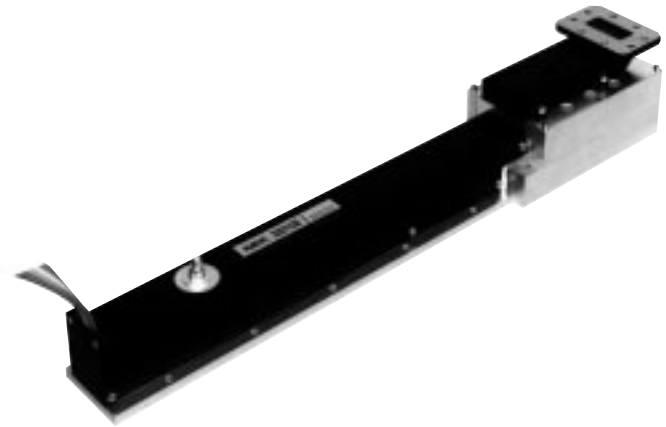
6 GHz, 400 W CW, CONDUCTION COOLING, HIGH POWER GAIN

GENERAL DESCRIPTION

The NEC LD7272 series of PPM focused traveling wave tubes are designed for final amplifier in the earth-to-satellite communication's transmitter.

These are capable of delivering an output power of 400 W over the range of 5.85 to 6.45 GHZ and an output power of 400 W over the range of 5.85 to 7.1 GHZ with a power gain of more than 49 dB at any power level.

Furthermore, these are rugged and reliable design offering long life services.



FEATURES

- ○ Lightweight, Compact and Efficient
  The tube has 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)

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GENERAL CHARACTERISTICS

ELECTRICAL

Frequency	5.85 to 6.45 GHz
	5.85 to 7.1 GHz
Output Power	400 W
Heater Voltage	6.3 V
Heater Current	1.6 A
Type of Cathode	Indirectly heated, Impregnated
Cathode Warm-up Time	180 s

MECHANICAL

Dimensions	See Outline
Weight	3.2 kg approx.
Focusing	Periodic Permanent Magnet
Mounting Position	Any
Electrical Connections	Flying Leads
RF Connections	
Input	SMA Female
Output	CPR-137 Flange
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	–	2.2	A
Heater Warm-up Time	180	–	s
Helix Voltage	8.5	9.2	kVdc
Helix Current	–	15.0	mAdc
Collector-1 Voltage	4.2	5.5	kVdc
Collector-1 Current	–	175	mAdc
Collector-2 Voltage	2.0	3.2	kVdc
Collector-2 Current	–	310	mAdc
RF Drive Power	–	5	dBm
Load VSWR	–	1.5 : 1	–

ENVIRONMENTAL

	Min.	Max.	Unit
Heat Sink Temperature	–40	+105	˚C
Ambient Temperature			
Storage	–50	+85	˚C

TYPICAL OPERATION (Note 2, 3, 4 and 5)

			Unit
Frequency		6.15	GHz
Output Power		432	W
Heater Voltage **(Note 4)**		6.3	V
Heater Current		1.55	A
Collector-1 Voltage		4.5	kVdc
Collector-1 Current		146	mAdc
Collector-2 Voltage		2.88	kVdc
Collector-2 Current		143	mAdc
Cathode Current		294	mAdc
Helix Voltage		9.0	kVdc
Helix Current		3.6	mAdc
Power Gain	at (SSG)	57.2	dB
	at (LSG)	52.7	dB
Gain Variation	at 40 W	1.5	dB/600MHz
Gain Slope	at 40 W	0.015	dB/MHz
AM-PM Conversion			
	at 40 W	0.9	deg./dB
	at 400 W	1.4	deg./dB
3rd Order Intermodulation (two equal carriers, 100 W total)		–26	dBc
Spurious		–67	dBc
Noise Figure		25	dB
Overall Efficiency		39	%

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.

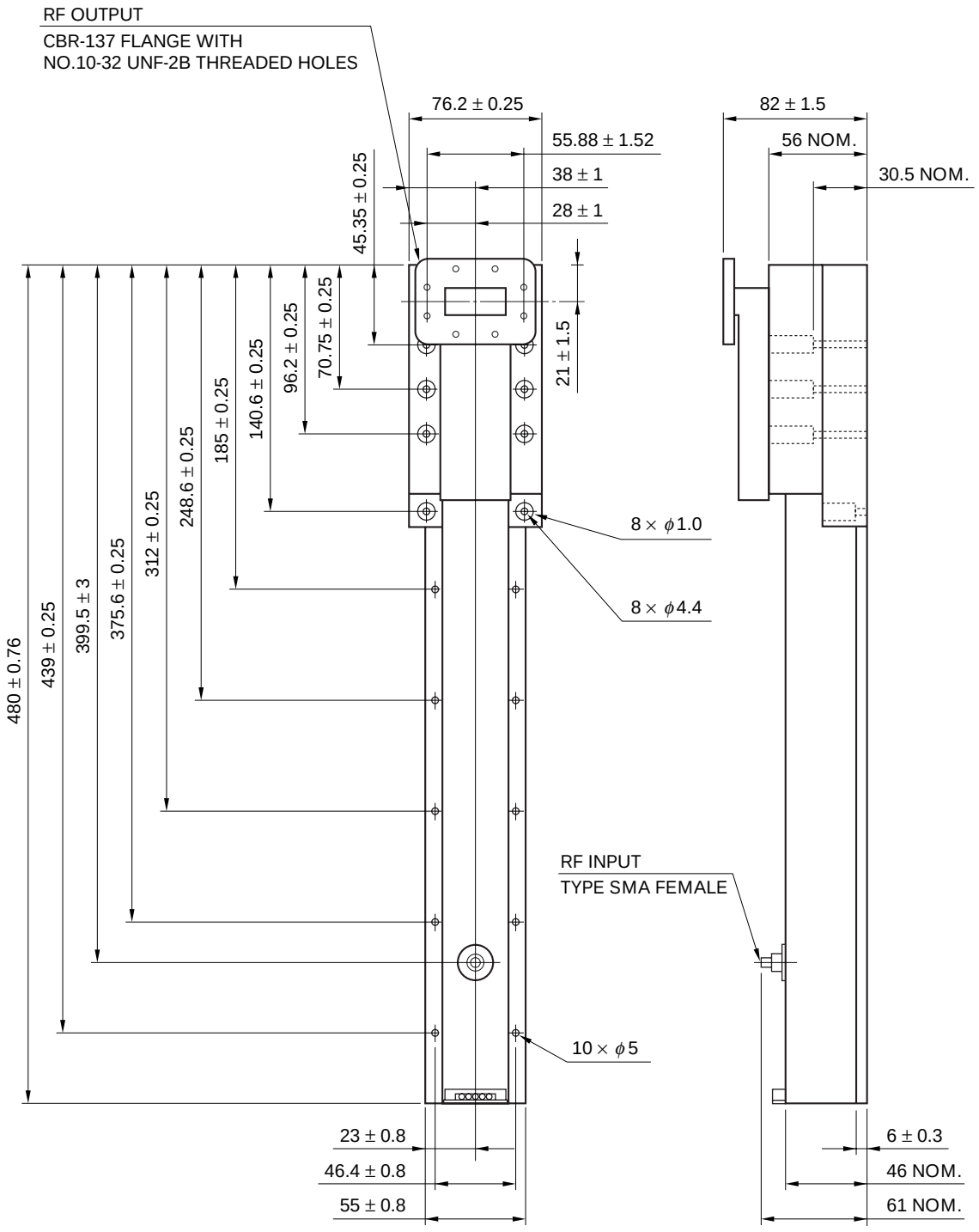
Note 2 : The tube body is at ground potential in operation.

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.

LD7272 series OUTLINE (Unit in mm)



LEAD COLOR	LEAD CONNECTIONS	LENGTH
BROWN	HEATER	460 mmMIN.
YELLOW	HEATER-CATHODE	460 mmMIN.
ORANGE	COLLECTOR-1	460 mmMIN.
BLUE	COLLECTOR-2	460 mmMIN.
GREEN	HELIX (GROUND)	460 mmMIN.