

# HIGH POWER TRAVELING WAVE TUBE FOR GROUND TERMINALS LD7217 SERIES

**6 GHz, 600 W/700 W CW, PPM FOCUSING,  
HIGH POWER GAIN**

### GENERAL DESCRIPTION

NEC LD7217 series of PPM-focused traveling wave tubes are designed for use as final amplifiers in the earth-to-satellite communications transmitter.

LD7217S and LD7217 are capable of delivering an output power of 600 W and 700 W over the range of 5.85 to 6.425 GHz and provide a high gain of 45 / 54 dB at 600 / 700 W level. In addition, LD7217W is capable of delivering an output power of 700 W with a gain of 54 dB over the range of 5.85 to 6.65 GHz. The LD7217 series provide a flat gain variation of 1.5dB (LD7217S), 1.0dB (LD7217) and 1.8dB (LD7217W) at any power level.

Furthermore, these are of rugged and reliable design offering long-life service.

LD7217S is fully compatible with VTC6361B3, and LD7217 is also fully compatible with VTC6361B4.



### FEATURES

- High Power Gain  
The power gain is typically 45 dB at 600 W level and 54 dB at 700 W level.
- Simple Cooling System  
All the tubes are forced-air-cooled, so that the cooling systems are greatly simplified.
- PPM Focusing  
The tubes are PPM (Periodic Permanent Magnet) -focused, eliminating entirely the focusing power supplies and interlock circuits.
- Rugged Construction  
The tubes are designed to be rugged, therefore they are suitable for transportable systems.
- Long Life and High Stability  
The tubes employ an advanced impregnated cathode with a low operating temperature for long life.
- Microdischarge Free  
The tubes are carefully designed to be free from microdischarge in the electron gun for long term operation, therefore they are 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	
LD7217, LD7217S .....	5.85 to 6.425 GHz
LD7217W .....	5.85 to 6.65 GHz
Output Power	
LD7217S .....	600 W
LD7217, LD7217W .....	700 W
Heater Voltage .....	6.3 V
Heater Current .....	1.7 A
Type of Cathode .....	Indirectly heated, Impregnated
Cathode Warm-up Time .....	180 s

**MECHANICAL**

Dimensions .....	See Outline
Weight .....	7 kg approx.
Focusing .....	Periodic Permanent Magnet
Mounting Position .....	Any
Electrical Connections .....	AMP LGH-11
Thermal Switch Connection .....	Deutsch DM9601-3P
RF Connections	
Input .....	N-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 .....	-	5.0	A
Heater Current .....	1.5	2.5	A
Heater Warm-up Time .....	180	-	s
Helix Voltage .....	10.2	11.9	kV
Helix Current .....	-	25	mA
Accelerating Anode Voltage .....	0	Note 5	kV
Accelerating Anode Current .....	-	2.0	mA
Collector Voltage .....	5.7	7.5	kV
Cathode Current .....	-	475	mA
Drive Power .....	-	0.1	W
Load VSWR .....	-	1.7:1	

**MECHANICAL**

	Min.	Max.	Unit
Cooling Air Flow .....	204	-	kg/hr
Ambient Temperature			
Storage .....	-30	+70	°C
Operation .....	-10	+60	°C

**TYPICAL OPERATION (Note 2, 3 and 6)**

	LD7217S	LD7217, LD7217W	Unit
Frequency .....	5.85 to 6.425	5.85 to 6.425, 5.85 to 6.65	GHz
Output Power .....	600	700	W
Heater Voltage (Note 4) .....	6.3	6.3	V
Heater Current .....	1.7	1.7	A
Helix Voltage .....	11.0	11.2	kV
Helix Current .....	6.0	3.0	mA
Anode Voltage .....	11.0	11.2	kV
Anode Current .....	0.3	0.1	mA
Collector Voltage .....	6.0	6.2	kV
Cathode Current .....	425	430	mA
Power Gain .....	48 (at 60 W)	57 (at 70 W)	dB
	45 (at 600 W)	54 (at 700 W)	dB
Gain Variation .....	1.5	1.0 (LD7217)	dB/575 MHz
		1.8 (LD7217 W)	dB/800 MHz
Gain Slope .....	0.01 (at 60 W)	0.015 (at 70 W)	dB/MHz
AM-PM Conversion .....	1.5 (at 60 W)	1.5 (at 70 W)	deg./dB
	3.5 (at 600 W)	3.5 (at 700 W)	deg./dB
3rd Order Intermodulation (two equal carriers, 350 W total) .....	-19	-19	dBc
Air Flow .....	204	204	kg/hr

**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.

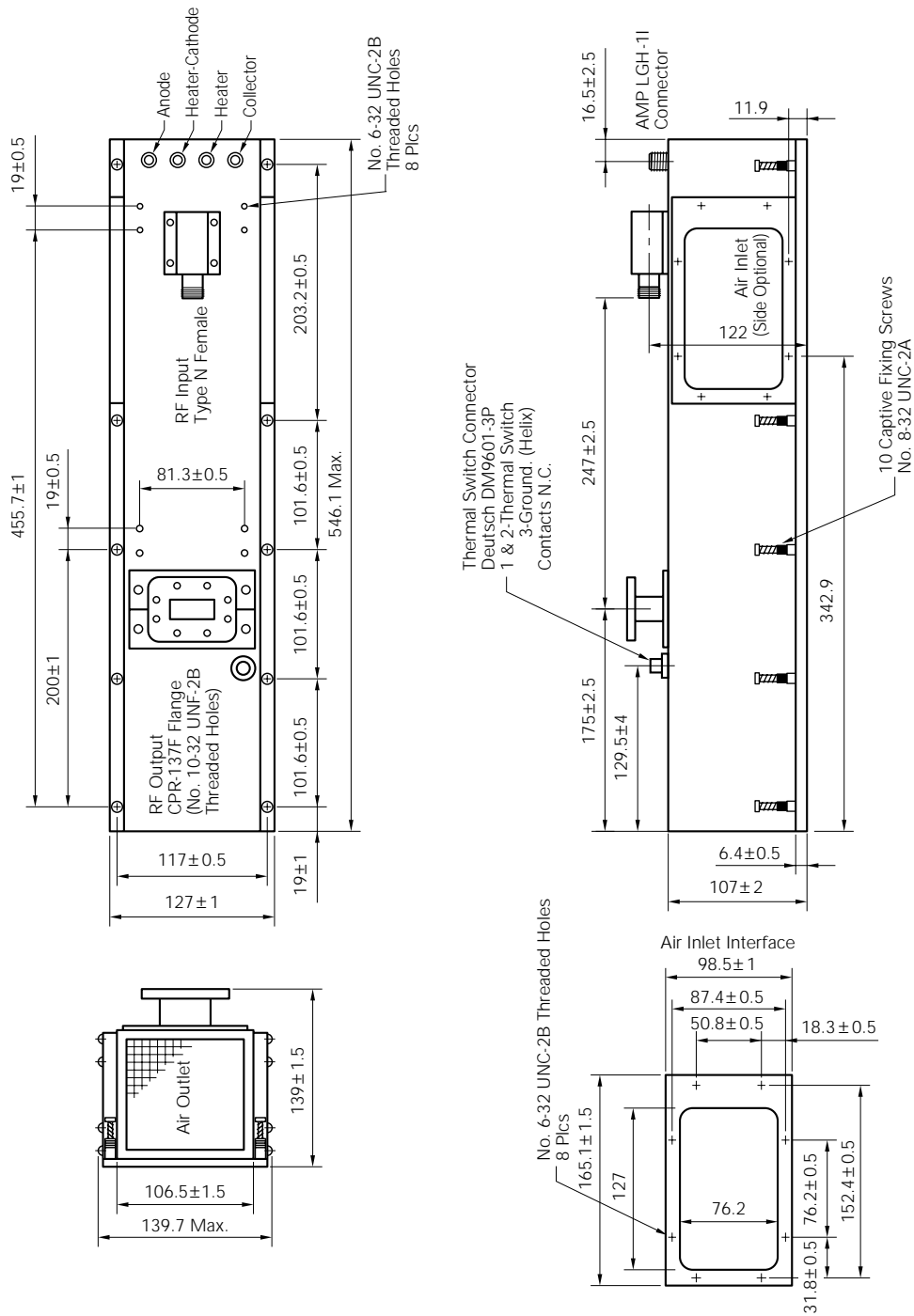
**Note 3 :** All voltages are referred to the cathode potential except the heater voltage.

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

**Note 5 :** The accelerating anode voltage should be at cathode potential for the off condition, and at helix for the full cathode current condition. The accelerating voltage should not exceed the helix voltage by 250 volts.

**Note 6 :** 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.

LD7217 SERIES OUTLINE (Unit in mm)



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