

## TRAVELING WAVE TUBE AMPLIFIER FOR GROUND TERMINALS LD79U12K

14 GHz, 123 W CW, LIGHT WEIGHT, COMPACT, EFFICIENT

### GENERAL DESCRIPTION

NEC TWTA (Traveling Wave Tube Amplifier) LD79U12K delivers an output power of 123 W over the range of 13.75 to 14.5 GHz with a gain of 50 dB.

The Traveling Wave Tube (TWT : LD7246A) in the LD79U12K has been designed and developed upon the NEC's advanced technology and enormous experience on a number of TWTs used in satellite ground terminals and terrestrial microwave links.

The very small and light weight Electric Power Conditioners (EPC) designed with sophisticated and experienced circuit technology ensures higher reliability, reduced maintenance costs and improved technical performance.

The LD79U12K is most suitable for a power amplifier in digital communication systems.



### FEATURES

- Light weight, Compact, and Efficient

The TWT has a dual-depressed collector and is designed to operate at high efficiency across the power output range. The EPC features state-of-the-art techniques to optimize size and efficiency and the combination results in a unit significantly smaller and with less power consumption than a comparable solid state amplifier.

- Low Distortion

NEC has developed techniques for the correction of non-linear distortion of gain and phase generated in a TWT. As a result, the TWTA has optimum performance across a broad power range and is ideally suited for multi-carrier transmission systems.

- Long Life

The TWT is designed to have a lifetime of 50,000 hours or more, which in actual usage.

- Ideal for Digital Systems

A mini-arc in the electron gun have been eliminated in the TWT used in the TWTA.

- Wide range of primary voltage

**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.

**TYPICAL OPERATIONS**

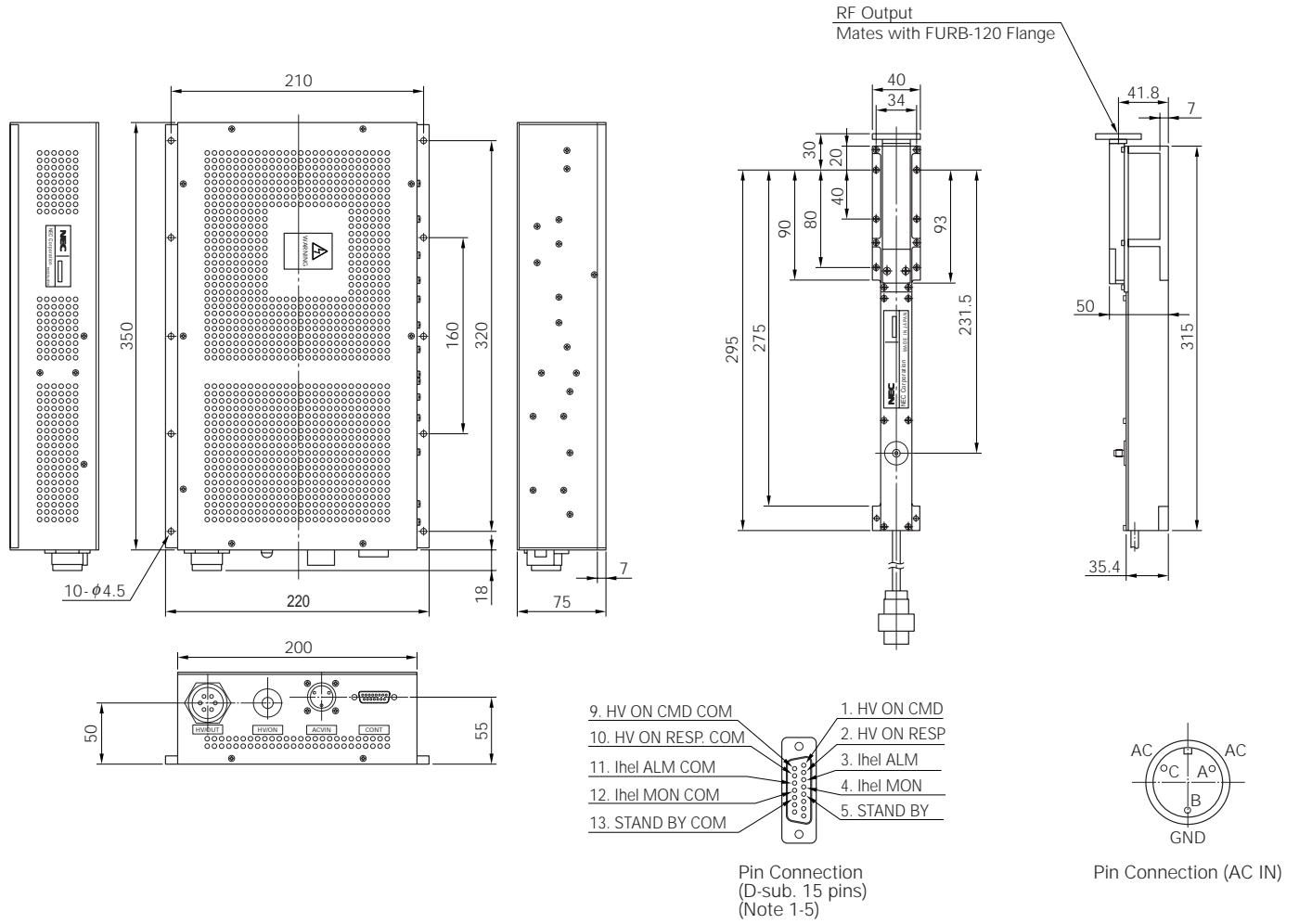
Frequency Range .....	13.75 – 14.5 GHz
Power Output .....	123 W minimum
Instantaneous Bandwidth .....	750 MHz
Gain Variation .....	1.0 dB / 750 MHz
Gain .....	53 dB (at Po = 123 W) 60 dB (at small signal)
Gain Stability .....	±0.25 dB / 24 h (25°C±10°C)
Gain Slope .....	0.03 dB / MHz
Harmonic Output .....	10 dB below at rated output power
Spurious Output .....	-70 dBW in any 4 kHz band in the 13.75 to 14.5 GHz
AM to PM Conversion .....	4° / dB maximum at rated power
Intermodulation .....	18 dB below each of two equal 45 dBm carriers
Group Delay	
Linear component .....	0.1 ns / MHz
Parabolic component .....	0.01 ns / MHz <sup>2</sup>
Ripple component .....	1.0 ns (p-p) in any 40 MHz band
RF Input	
Connector .....	Mates with Type SMA Female
VSWR .....	2.0 : 1 maximum
Load VSWR .....	Operate into 1.5 : 1 maximum
RF Output	
Waveguide .....	Mates with BRJ-120 Flange
VSWR .....	2.0 : 1 maximum
Load VSWR .....	Operate into 1.5 : 1 maximum
Primary Power .....	85 Vac-255 Vac (450 VA)
Power Factor .....	0.9 minimum
Electrical Connections	
AC IN .....	JL04V-2E10SL-3PE-B Connector
CONT & MON .....	DA-15P-N D-Sub Connector
Dimensions .....	TWT : 315 x 40 x 50 mm EPC : 350 x 220 x 75 mm
Weight .....	TWT : 1.3 kg EPC : 5 kg

**ENVIRONMENTAL CONDITIONS**

- Ambient Temperature
  - 0°C to +45°C (operating)
  - 30°C to +70°C (non operating, storage)
- Relative Humidity
  - 90% maximum (non dewing)
- Base Plate Temperature of the TWT
  - +90°C maximum

**Note 1 :** 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.

LD79U12K OUTLINE (Unit in mm)



AC IN : MS3102A 14S-7P (3 pins)  
 CONT : DA-15P-N D-Sub connector (15 pins)

- Note 1.** HV ON/OFF RESPONSE SIGNAL : Photocoupler Interface (No.2: Collector, No.10: Emitter)  
 HV ON : No.2 and No.10 conduct
- 2.** Ihel ALM Signal : Photocoupler Interface (No.3: Collector, No.11: Emitter)  
 Ihel ALM Signal ON : No.3 and No.11 conduct
- 3.** Ihel Monitor (No.4, No.12) : 1 V/mA
- 4.** HV ON : When No.1 and No.9 conduct, TWT will be ready to amplify
- 5.** STANDBY : After the heater warms up, No.6 and No.15 will conduct.

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