

## MICROWAVE POWER MODULE FOR GROUND TERMINALS LD79U04K

14 GHz, 40 W CW, LIGHT WEIGHT, COMPACT, EFFICIENT

### GENERAL DESCRIPTION

NEC Microwave Power Module (MPM) LD79U04K is a microwave power device in which a traveling wave tube (TWT) and an electric power conditioner (EPC) are combined, so that both components can accomplish each full performance.

LD79U04K delivers an output power of 40 W over the range of 13.75 to 14.5 GHz with a gain of 25 dB.

The TWT in the LD79U04K 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 EPC designed with sophisticated and experienced circuit technology ensures higher reliability, reduced maintenance costs and improved technical performance.

The LD79U04K is most suitable for a power amplifier in digital communication systems.

A configuration of separated TWT and EPC can offer superior flexibility of design for high power section of transmitters.



### 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 MPM has optimum performance across a broad power range and is ideally suited for multi-carrier transmission systems.

- Long Life

The TWT in NEC's MPM is designed to have a lifetime of 100,000 hours or more, which is comparable to that of a solid state amplifier in actual usage.

- Ideal for Digital Systems

A mini-arcing in the electron gun have been eliminated in the TWT used in the MPM.

**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 .....	40 W minimum
Instantaneous Bandwidth .....	750 MHz
Gain Variation .....	2.0 dB / 750 MHz
Gain .....	25 dB (at Po = 40 W) 35 dB (at small signal)
Gain Stability .....	±0.25 dB / 24 h (25°C±10°C)
Gain Slope .....	0.02 dB / MHz
Harmonic Output .....	15 dB below at rated output power
Spurious Output .....	-90 dBW in any 4 kHz band in the 13.75 to 14.5 GHz
AM to PM Conversion .....	4.5°/ dB at rated power
Intermodulation .....	28 dB below each of two equal carriers (total 8 W)
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	
Connector .....	Mates with Type SMA Female
VSWR .....	2.0 : 1 maximum
Load VSWR .....	Operate into 1.5 : 1 maximum
Primary Power .....	-48 V ± 10%
Power Consumption .....	163 W
Electrical Connection .....	DA-9-N D-Sub Connector
Dimensions	
TWT .....	178 × 33 × 25 mm
EPC .....	220 × 140 × 47 mm
Weight .....	2.5 kg (both TWT and EPC)

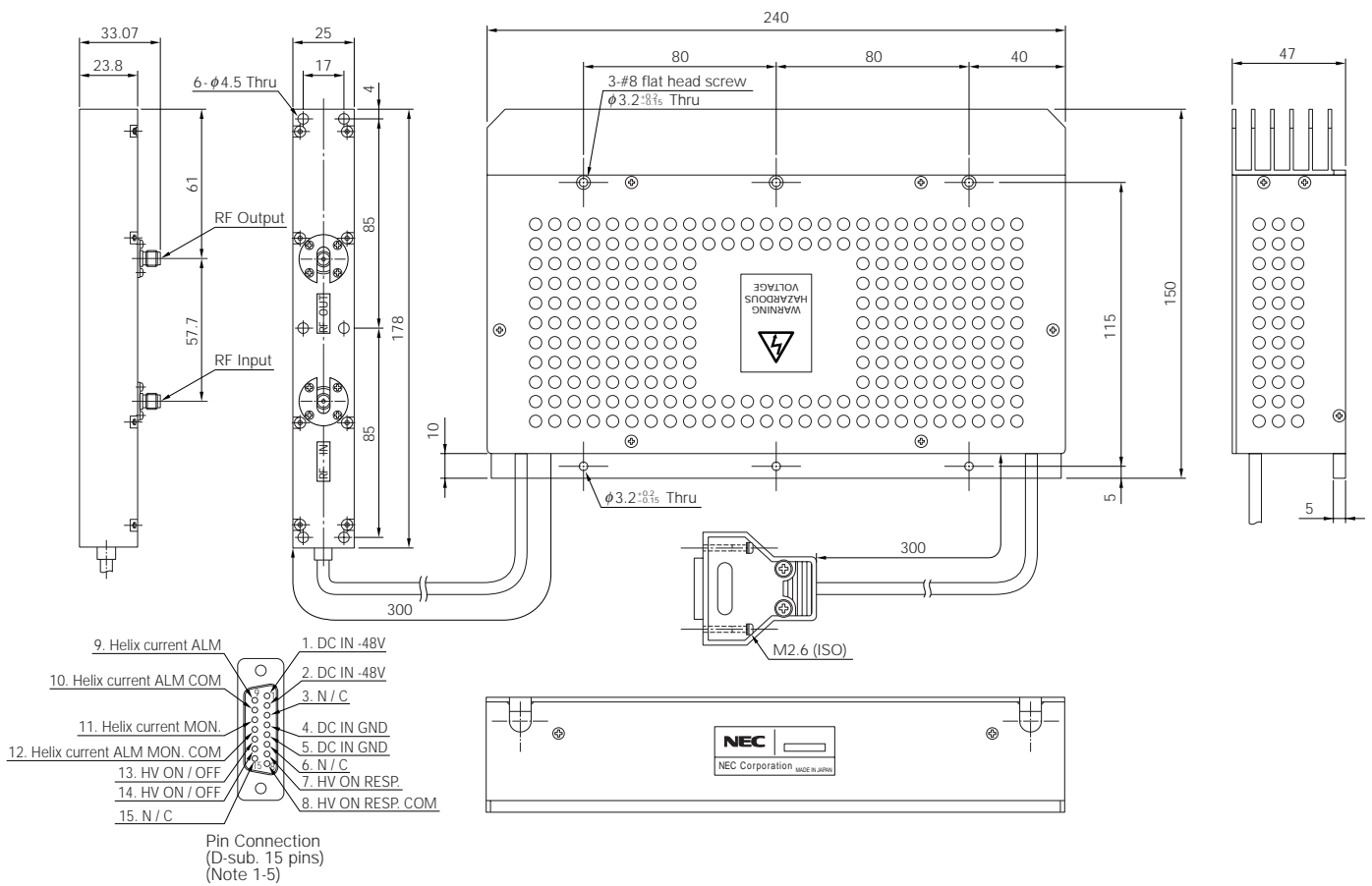
**ENVIRONMENTAL CONDITIONS**

- Ambient Temperature
  - 15°C to +50°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 :** 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 :** 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.

LD79U04K OUTLINE (Unit in mm)



- Note**
- DC IN -48 V : No.1 and NO.2 are Connecting  
DC IN GROUND : No.4 and NO.5 are Connecting
  - HV ON/OFF RESPONSE SIGNAL : Photocoupler Interface (No.7: Collector, No.8: Emitter)  
HV ON : No.7 and No.8 conduct
  - Ihel ALM Signal : Photocoupler Interface (No.9: Collector, No.10: Emitter)  
Ihel ALM Signal ON : No.9 and No.10 conduct
  - Ihel Monitor (No.11, No.12) : 1 V/mA
  - HV ON : When No.13 and No.14 conduct, TWT will be ready to amplify

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