NEC

HIGH POWER CW KLYSTRONAMPLIFIER FOR GROUND TERMINALS

LD4606A

30 GHz, 380 W CW, HIGH EFFICIENCY, HIGH POWER GAIN

GENERAL DESCRIPTION

The NEC LD4606A is a five-cavity Klystron amplifier and ideal for use in the earth-to-satellite communications transmitter.

This is designed for operating at 380 W CW power levels in the frequency range of 27.50 to 29.10 GHz. The instantaneous bandwidth of minus one-decibel is at least 70 MHz over the entire 1.6 GHz range.

The tube is forced-air-cooled at the 380 W operation.

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

FEATURES

1 High Efficiency
The DC to RF conversion efficiency is typically 23 % by incorporating a 39 % depressed collector.

2 High Power Gain
The power gain is typically 40 dB at the 380 W level, so the driving power is less than 50 mW.

3 Simple Cooling System
The klystron is all forced air cooled with only one blower, so that the cooling systems are greatly simplified.

4 Permanent Magnet
The klystron is permanent magnet focused, eliminating entirely the requirement for focusing power supplied and interlock circuits.

5 Rugged Construction
The klystron is designed to be rugged.

For safe use of microwave tubes, refer to NEC document "Safety instructions to all personnel handling electron tubes" (ET0048EJ∗V∗UM00)

Document No. ET0117EJ3V1DS00 (3rd edition)
Date Published August 1998 M
Printed in Japan

GENERAL CHARACTERISTICS

ELECTRICAL	
Frequency	27.50 to 29.10 GHz
Output Power	380 W
Heater Voltage	4.3 V
Heater Current	2.5 A
Type of Cathode	Indirectly Heated, Impregnated
MECHANICAL	
Dimensions	See Outline
Focusing	Permanent Magnet
Electrical Connections	
Heater	AMP (861647-8) Receptacle
Heater-Cathode	AMP (861647-8) Receptacle
Body, Collector	AMP (861647-8) Receptacle
RF Connections	
Input	Mates with FUBR-260
Output	Mates with FUBR-260
Mounting Position	Vertical (Cathode down)
Weight	45 kg approx.
Cooling	
Gun	Forced Air
Collector	Forced Air
Body	Forced Air
Cavity Tuning Method	Hand Tuning

ABSOLUTE RATINGS (Note 1, 2 and 3)

ELECTRICAL	Min.	Max.	Unit
Heater Voltage	3.5	5.5	V
Heater Surge Current	–	5.5	A
Heater Warm-up Time	300	–	s
Body Voltage	–	9.5	kV
Collector Voltage	–	9.0	kV
Beam Current	–	400	mA
Body Current	–	20	mA
Collector Current	–	400	mA
DC Input Power	–	2.5	kW
Load VSWR			
Normal Value	–	1.2	
Instantaneous Value	–	1.5	
MECHANICAL			
Collector Temperature	–	200	°C
Cooling Air Temperature	–10	45	°C
Air Flow for Collector Body and Gun	238	–	kg/hr
Ambient Temperature			
Operating	–10	45	°C
Storage	–40	70	°C

TYPICAL OPERATION (Note 3, 4 and 5)

		Unit
Frequency	28.5	GHz
Heater Voltage (Note 4)	4.3	V
Heater Current	2.5	A
Body Voltage	8.5	kV
Body Current	10	mA
Collector Voltage	5.2	kV
Collector Current	300	mA
DC Input Power	1.65	kW
Driving Power	44	mW
Output Power	380	W
Power Gain	40	dB
Band Width (-1 dB)	80	MHz
Air Flow of Collector, Body and Gun	250	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. Equipment design should limit voltage and environmental variations so that ratings will be exceeded.

Note 2 : The Klystron body should be at ground potential in operation.

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

Note 4 : The optimum operating value is shown on a test performance sheet for each tube.

Note 5 : Characteristics and operating values on this Data Sheet are based on performance test. These 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.

LD4606A OUTLINE (Unit in mm)