6900K Series

20 Watt Power Amplifier

Features

- *1.0 TO 18 GHz*
- *Octave Bandwidths or Greater*
- *Optional GPIB Control*
- *One Year Warranty (Unlimited Hours)*
- *Worldwide Support Centers*
- *24 Hour Hotline for customer support (800) 231-4818 or 1-415-846-3600)*
- *Meets EMC 89/336/EEC*

Description

For test and measurement applications that require RF power of 20 Watts, CPI offers the 6900K Series power amplifier. For testing on antenna ranges, in EMC chambers or on a test bench, CPI provides equipment built with quality and reliability that you can trust.

The 6900K series amplifiers are constructed with proven reliable all metal-ceramic travelling wave tubes (TWTs), which are renowned for their high power and wide band capabilities. These TWTs have a wide range of applications and are readily available, resulting in CPI's ability to offer additional tubes in a timely manner. The power supply for the 6900K series has a calculated MTBF of more than 41,000 hours. Combined with CPI TWTs, the 6900K series amplifier provides the industry standard for dependability.

The 6900K series TWT amplifier has a full line of standardized options including remote control, input and output isolators and harmonic filters. For ATE applications, IEEE 488 bus controllable amplifiers* are available, with internal GPIB cards or external modules. More than a thousand CPI 6900K series amplifiers are used throughout the world, performing over a wide range of specifications, in a variety of environmental and operating conditions.

CPI 6900K series TWT amplifiers are manufactured with the same quality as all CPI amplifiers and are backed by CPI's worldwide 24-hour customer support network that includes 9 regional factory service centers. Quality, reliability and product support are integral parts of your CPI power amplifier.

Selection Guide

Model #	Power (Watts)	Freq (GHz)	Gain (dB)	O/P Conn
VZL-6941K1	20	1-2	35	N
VZS-6951K1	20	2-4	35	N
VZC-6961K1	20	4-8	35	N
VZX-6981K1	20	8-12.4	40	N
VZU-6991K1	20	12.4-18	40	N
VZM-6991K3	20	8-18	40	N

For special frequency ranges and options, please contact the factory.
*For models with integral IEEE 488 capability, please refer to publication MKT 45, 6900K7 Series

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Specifications

Frequency Range	1.0 to 18 GHz (see Selection Guide)
Rated Output Power	20 Watts CW. Saturated output power may exceed rated power by 6 dB or more near band center. Output power is reduced by the insertion loss of all microwave options added at the output. (Options C, D, E, J).
Small Signal Gain	35 to 40 dB (see Selection Guide). Typically 10 to 20 dB higher near band center. Gain at Saturated Power is typically 5 dB less than small signal gain. Gain is reduced by the insertion loss of all microwave options.
Gain Stability	0.25 dB/day at constant drive and temperature.
Gain Variation	10 dB peak-to-peak (typical), except M-Band 15 dB (typical)
Impedance	50 Ohms nominal
VSWR	
Input:	2.0:1 typical
Output:	2.0:1 typical
Load:	1.3:1 max. for full spec compliance, 2.0:1 max. for no damage. Any value without damage if Option D is included.
Noise & Spurious	-50 dBc typical excluding harmonics and residual modulation
Residual AM	-40 dBc
Residual FM	Less than 4 kHz peak-to-peak in any 5 MHz band
AM/PM Conversion	2.5/dB typical at 6 dB below rated output
Noise Figure	35 dB max.
Harmonic Content	-3 dBc at lower band edge decreasing to -15 dBc (typical) at upper band edge without optional harmonic filter.

Meters, Monitors, Controls & Indicators

Meters	Helix Current, Filament Elapsed Time (Option H)
Monitors	Output Sample Port (Option E)
Controls	• Mains Power ON/OFF • High Voltage ON/OFF and/or Fault Reset, • Local/Remote (Option G) • RF Attenuator (Option B)
Indicators	• Mains Power ON • Operate/Standby • Summary Fault • Current Fault (TWT Helix)

Mechanical & Environmental

Ambient Temperature	0 to +50°C
Relative Humidity	95% non-condensing
Altitude	6,000 feet max.
Shock & Vibration	As normally encountered in a protected engineering laboratory environment
Cooling	Forced air with integral blower, air intake from sides and rear, exhaust at rear
RF Connectors	Type N (female), Front panel (rear panel, Option J)
Prime Power	115 Vac, ±10%, 50/60 Hz, single phase; (100 and 230 Vac, Options Q and K)
Power Consumption	400 Watts
Dimensions (W x H x D)	19 x 3.5 x 19.25 inches; 480 x 89 x 487 millimeters
Weight	35 lbs./15.9 kg. (max.)

Options

A Input Isolator: Inserted between the input and the TWT. Input VSWR is reduced to less than 1.5:1.

B Input RF Attenuator: 20 dB continuous variation of RF gain (except for L-Band which is 10 dB). This attenuator is connected after the input isolator.

C Harmonic Filter: Inserted after the output isolator. The amount of filtering depends upon the harmonic frequency relative to the upper band edge.

Frequency Relative to upper band edge	Attenuation (Typical)
0.95	0.25 dB to 2 GHz 0.35 dB to 18 GHz
1.00	0.25 dB to 2 GHz 0.35 dB to 8 GHz 0.45 dB to 18 GHz
1.05	3 dB
1.20	30 dB
1.35 and above	60 dB

D Output Isolator: Inserted immediately following the TWT to isolate it from load mismatches. The result is improved gain flatness vs. frequency and protection of the TWT. The output VSWR is reduced to 1.5:1 typically. Max. is 2.0:1.

E RF Output Sample Port: -40 dB directional coupler added at the output following the output isolator. It is brought to the front panel via a Type N connector.

F Chassis Slides

G Remote Control: Rear Panel connector providing remote control of Mains Power ON/OFF, High Voltage ON/OFF – FAULT RESET and External Interlock.

Mains Power ON requires +12 volts at 30 mA from an external power supply.
High Voltage ON/OFF is a contact closure to ground. External Interlock is a contact closure which must be closed for the amplifier to operate.

All Front Panel status indications are brought to this connector via open collector transistor outputs to ground rated at 14 Volts max. collector to emitter at 30 mA max.

H Elapsed Time Meter

J Rear RF Connectors

K 230 Vac Mains Prime Power

L Solid State Input Pre-Amplifier: Inserted between the RF attenuator and the TWT. Raises the overall gain so that at least 0 dBm will produce rated power output.

Q 100 Vac Mains Prime Power

U SMA Adapters

Note 1 The incorporation of all microwave options reduces the overall gain of the amplifier by the sum total of the insertion losses. (See Table 1.)

Note 2 The incorporation of all microwave options at the output reduces the maximum power delivered to the output connector by the sum total of the insertion losses. (See Table 1.)

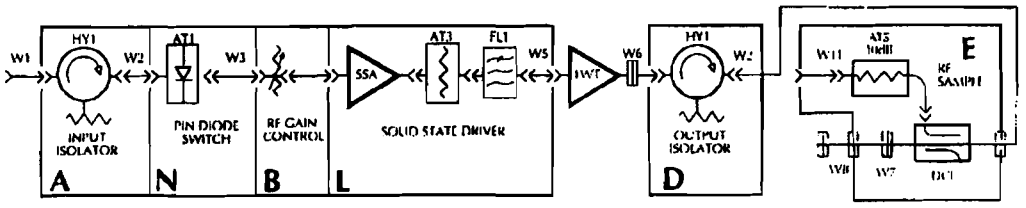
Table 1

Insertion Loss (dB) for Various Microwave Option Configurations

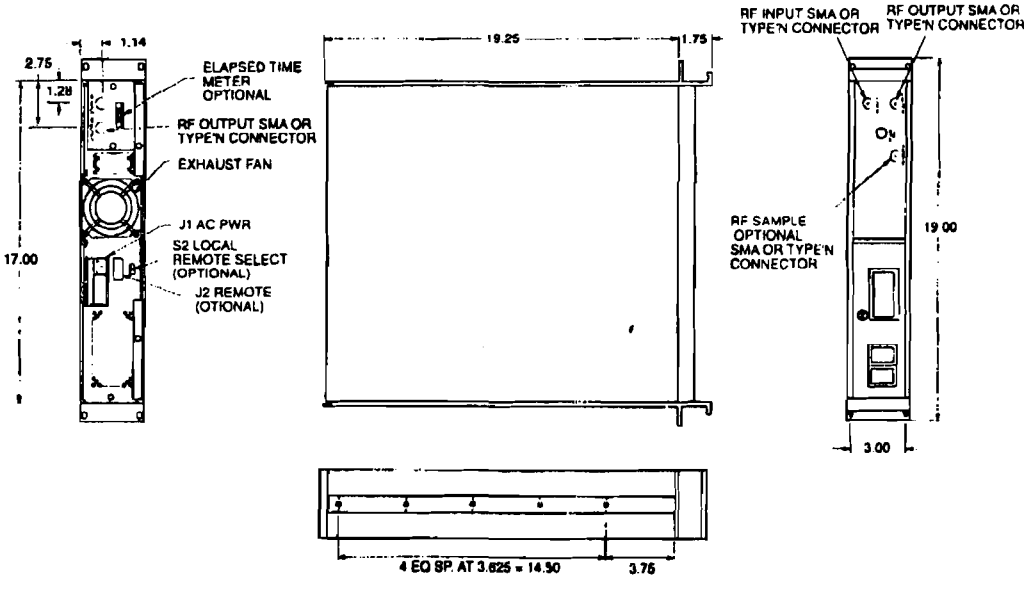
Frequency Range (GHz) Loss Affects		1-2		2-4		4-8		8-12.4		12.4-18		8-18	
Option	Description	Pwr	Gain	Pwr	Gain	Pwr	Gain	Pwr	Gain	Pwr	Gain	Pwr	Gain
A	Input Isolator	–	0.6	–	0.6	–	0.6	–	0.6	–	0.6		0.6
B	RF Gain Adjust	–	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–	1.5
C	Harmonic Filter	0.25	0.25	0.35	0.35	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
D	Output Isolator	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
E	RF Sample Port	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5
J	Rear Connector	0.15	–	0.25	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6

Note: Characteristics and operating values are based on performance tests. These figures may change without notice as a result of additional data or product refinement. Please contact CPI before using this information for system design.

Block Diagram



Outline Drawing



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