KPA Ku-Band Solid State Indoor Power Amplifiers

KPA-80/-100

Application

Each Comtech EF Data Ku-Band Power Amplifier (KPA) Solid State Power Amplifier (SSPA) delivers it's rated power, guaranteed, at the 1 dB compression point, to the transmit waveguide flange. It provides a cost effective and more reliable replacement for Traveling Wave Tube (TWT) amplifiers in Ku-Band terminals. Due to its small form factor, it is also ideal for the construction of small "flyaway" terminals, medium size (equivalent to Intelsat F) earth stations, and hub earth stations for small to medium size private networks, or point-to-point links.

The Solid-State Advantage

Each KPA series SSPA is constructed with highly reliable Gallium Arsenide Field Effect Transistors (GaAs FETs). With third order inter-modulation products from 4 to 6 dB better than TWT ratings, the Comtech EF Data unit replaces TWTs with saturated power levels of up to twice the KPA's rated output. The KPA SSPSs also provide a Mean Time Between Failure (MTBF) that is 4 to 5 times greater than the typical TWT MTBFs.

Option Free

Comtech EF Data's KPA series of SSPAs come equipped with useful features that other manufacturers offer as options. Included in the base price are temperature compensation, sample ports, power monitor, rack slides, and full remote monitor and control capabilities.

Functional Description

Each KPA series SSPA consists of a Comtech EF Data SSPA module with the Monitor/Control Processor (MCP), a field replaceable power supply, and a field replaceable fan assembly. The amplifier features a Comtech EF Data low loss combining technique and MCP based temperature versus gain compensation.

Built-In Redundancy Controller

Each Comtech EF Data KPA amplifier has the ability to function as a 1+1 or 1+2 redundancy controller in the backup mode. The optional redundancy configuration is implemented by attaching a ganged waveguide/coax transfer switch(es) to the input and output connectors of the amplifiers with a combination coaxial cable and waveguide kit. When the backup SSPA is commanded into the controller mode, it monitors the online SSPA(s) for faults. A faulted online unit may be disconnected and replaced without affecting the online power amplifier.

Remote Control

The remote control interface is selectable between EIA-232 and EIA-485, as well as full Ethernet including Telnet, SNMP and pre-loaded HTML GUI. All configuration control, status retrieval, and adjustments are available as simple ASCII commands through the serial interface or through the front panel menu. As a cost option, the remote control command structure can be customized in order to accommodate existing network control software.

Specifications

Output

Frequency	14.0 to 14.5 GHz		
Power (min. at 1 dB compression)	Model dBm	KPA-80 +48.5	KPA-100 +49.5
Mute	-60 dB		
Impedance	50 Ω		
VSWR	1.25:1 maximum		
Connector	WR75G Waveguide		

Gain

Linear	
KPA-80	61.0 dB min., 64.0 dB typical
KPA-100	65.0 dB min., 70.0 dB typical
Adjust	20 dB in 0.25 dB Steps
Full Band	± 0.75 dB
Per 40 MHz	± 0.25 dB
+0 to +50°C	± 0.50 dB@ center freq. ± 1.00 dB full band

Third Order Inter-Modulation

Products	-30 dBc typ, -25 dBc max. @ 3 dB total backoff (two tones, Δf+ 1MHz)

AM to PM Conversion

2.0° typ, 3.0 max at rated output

Group Delay (per 40 MHz)

Linear	± 0.03 ns/MHz
Parabolic	± 0.003 ns/MHz^2
Ripple	1.0 ns peak to peak

Input

Impedance	50 Ω
Noise Figure	10 dB typ, 15 dB max. @ max. gain
VSWR	1.25:1 maximum
Connector	SMA female
Level	-10 dBm typical

Phase Noise (dBc/Hz) (ith optional internal BUC and reference)	**Typical dBc/Hz**	**Spec dBc/Hz**
Offset = 100 Hz	-76	-69
1 KHz	-85	-82
10 KHz	-98	-90
100 KHz	-114	-102
1 MHz	-132	-115

Front Panel

Display	20 x 2 LCD
Data Entry	Cursor control keypad
Output Sample	Type N, 50 Ω, -40 dBc
Input Sample	Type N, 50 Ω, -20 dBc

Remote Control

Com Port	EIA-485 or EIA-232, RJ-45 for Ethernet
Protocol	ASCII

Alarms

Summary Fault	Form C

LED

Power On	Green
Fault	Red
Stored Fault	Red
TX On	Yellow
Online	Yellow
Remote	Yellow

Mechanical

Dimensions (height x idth x depth)	
KPA-80/-100	9” x 19” x 24” 22 x 48 x 60 cm)
Weight	
KPA-100	75 lbs (34 kg)

Environmental

Temperature	
Operating	32 to 122°F (0 to 50°C)
Storage	-40 to 158°F (40 to 70°C) (derate 2°C/1000ft AMSL)
Humidity	10 to 95% Non-condensing operating 0 to 100% Non-condensing storage
Shock	Normal commercial shipping and handling

Power Requirements

KPA-80/-100	180 to 270 VAC, 47 to 63 Hz, 1100 W (auto-select)