# Ku-Band
# Solid State Power Amplifier



## APPLICATION

The Comtech EFData Model KPA-040 Ku-Band solid-state power amplifier (SSPA) delivers 40 Watts, at the 1 dB compression point, to the transmit waveguide flange. It provides a cost effective and more reliable replacement for TWT amplifiers in Ku-Band terminals. Due to its small rack height, it is also ideal for the construction of small “flyaway” terminals, Intelsat earth stations, and hub earth stations for small to medium size private networks or point-to-point links.

## THE SOLID-STATE ADVANTAGE

The Model KPA-040 SSPA is constructed with highly reliable GaAs FETs. With third order intermodulation products from 4 to 6 dB better than TWT ratings, the Comtech EFData unit replaces TWTs with saturated power levels of up to 125 Watts. The KPA-040 also provides an MTBF that is 5 to 6 times greater than the typical TWT MTBFs.

## OPTION FREE

Comtech EFData’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

The KPA-040 consists of a chassis, power supply, fan assembly, front panel assembly, monitor/control processor (MCP) and a Comtech EFData SSPA module. The amplifier was designed using a Comtech EFData low loss combining technique and an MCP based temperature versus gain compensation.

## FRONT PANEL

The KPA-040 front panel contains a user-friendly LCD menu display and cursor control keys in order to display status or change parameters. The front panel also has LEDs for quick reference to binary status points and both input and output sample ports at -20 dBc and -40 dBc for easy test point access.

## BUILT–IN REDUNDANCY CONTROLLER

Each Comtech EFData KPA-040 SSPA 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.

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# KPA-040

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## Output

| | |
|---|---|
| Frequency | 14.0 to 14.5 GHz |
| Power | 45.5 dBm min at 1dB compression |
| Mute | -60 dB |
| Impedance | 50 Ohms |
| VSWR | 1.25:1 maximum |
| Connector | WR75G waveguide |

## Gain

| | |
|---|---|
| Linear | 60.0 dB min, 63 dB typ |
| 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 Intermodulation

| | |
|---|---|
| Intercept | +53.5 dBm min, 56.0 typ |
| Products | -30 dBc typ, -25 dBc max |
| | @ 3 dB total back-off |
| | (two tones, Æf =1Mhz) |

## AM To PM Conversion

2.0 degrees 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

| | |
|---|---|
| Level | -10 dBm typical |
| Impedance | 50 Ohms |
| Noise Figure | 10 dB typ, 15 dB max at max gain |
| VSWR | 1.25:1 maximum |
| Connector | SMA female |

## Front Panel

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

## Remote Control

| | |
|---|---|
| Com Port | EIA-485 or EIA-232 |
| Protocol | ASCII |

## Alarms

| | |
|---|---|
| Summary | Fault form C |

## LED

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

## Mechanical

| | |
|---|---|
| Height | 7 inches (17.8 cm) |
| Width | 19 inches (48.3 cm) |
| Depth | 24 inches (60.9 cm) |

## Environmental

| | |
|---|---|
| Temperature | Operating 0 to 50°C (32 to 122° F) |
| | Storage -40 to 70°C (-40 to 158° F) |
| Humidity | 10 to 95% non-condensing operating |
| | 0 to 100% non-condensing storage |
| Shock | Normal commercial |
| | Shipping and handling |

## Power Requirements

90 to 135 or 180 to 270 VAC,
47 to 63 Hz, 600W (Auto-select)

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ISO 9001 SGS REGISTERED COMPANY

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