



CPA-050



CPA-100/200



CPA-350

### APPLICATION

The Comtech EF Data Model CPA Indoor C-Band Solid-State Power Amplifier (SSPA) delivers 50, 100, 200, or 350 Watts guaranteed, at the 1 dB compression point, to the transmit waveguide flange. It provides a cost effective and more reliable replacement for Transfer Wave Tube (TWT) amplifiers in C-Band terminals. Due to its small rack height, 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

The 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 CPA unit replaces TWTs with saturated power levels of 125, 400, or 700 Watts, or 1 kilowatt. The CPA also provides a Mean Time Between Failure (MTBF) that is 5 to 6 times greater than the typical TWT MTBFs.

### OPTION FREE

The CPA 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 SSPA consists of a chassis, power supply, fan assembly, front panel assembly, Monitor/Control Processor (MCP), and an SSPA module. The amplifier was designed using a Comtech EF Data low-loss combining technique and an MCP-based temperature versus gain compensation.

### FRONT PANEL

The SSPA front panel contains a user-friendly Liquid Crystal Display (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 and -40 dBc for easy test point access.

### BUILT IN REDUNDANCY CONTROLLER

Each SSPA 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.



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### Output

Frequency 5.850 to 6.425 GHz

Power:

Model:	50W	100W	200W	350W
Output Power, P <sub>100</sub> dBm:	+47	+50	+53	+55.5
Output Power, P <sub>set</sub> , Typ dBm:	+48	+51	+54	+56.5

Mute -60 dB

Impedance 50 Ω

VSWR 1.25:1 Maximum

Connector CPR-137G Waveguide

### Gain

Linear CPA-050 54.0 dB min., 57.0 dB typ.  
 CPA-100/200 63.0 dB min., 67.0 dB typ.  
 CPA-350 70.0 dB min

Adjust 20 dB in 0.25 dB Steps

Full Band CPA-050/100/200 ± 0.75 dB  
 CPA-350 ± 1.00 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

Intercept CPA-050 +56 dBm min, 58 typ  
 CPA-100 +59 dBm min, 61 typ  
 CPA-200 +62 dBm min, 63.5 typ  
 CPA-350 +64.5 dBm min, 66.5 typ

Products CPA-050/100/200 -32 dBc typ, -25 dBc max  
 @ 3 dB total back-off  
 (two tones, Δf= 1MHz)

CPA-350 -30 dBc typ, -25 dBc max  
 @3 dB total back-off  
 (two tones)

### AM to PM Conversion

output CPA-050/100/200 1.0° typ, 2.5 max at rated

output CPA-350 2.0° typ, 3.0 max at rated

output

### Group Delay (per 40MHz)

Linear ± 0.03 ns/MHz

Parabolic ± 0.003 ns/MHz<sup>2</sup>

Ripple 1.0 ns Peak to Peak

### Spurious

Second Harmonic -60 dBc max @ 1 dB below rated output

### Input

Impedance 50 Ω

Noise Figure 8 dB typ, 15 dB max @ max gain

VSWR 1.25:1 Maximum

Connector Type N

### 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

Protocol Comtech EF Data ASCII or Emulation Mode

### Alarms

Summary Fault Form C

### LED

Power On Green

Fault Red

Stored Fault Red

TX On Yellow

Online Yellow

Remote Yellow

### Mechanical (Dimensions)

Dimensions	Inches	Centimeters
CPA-050	19W x 5.25H x 24D	48W x 13H x 60D
CPA-100	19W x 8.75H x 24D	48W x 22H x 60D
CPA-200	19W x 10.5H x 24D	48W x 27H x 60D
CPA-350	19W x 17.5H x 24D	48W x 44H x 60D

### Environmental

Temperature	Centigrade	Fahrenheit
Operating	0 to 50°	32 to 122°
Storage	-40 to 70°	-40 to 158°

(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

CPA-050	90 to 135 or 180 to 270 VAC, 47 to 63 Hz, 500W (Auto-Select)
CPA-100	90 to 135 or 180 to 270 VAC, 47 to 63 Hz, 800W (Auto-Select)
CPA-200	180 to 270 VAC, 47 to 63 Hz, 1300W (Auto-Select)
CPA-350	180 to 270 VAC, 47 to 63 Hz, 3.0 kW



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