

CPA C-Band Solid State Indoor Power Amplifiers



CPA-50



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 Traveling 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 _{1dB}	dBm	+47	+50	+53	+55.5
Output Power, P _{sat} . Typ	dBm	+48	+51	+54	+56.5
Mute	-60 dB				
Impedance	50Ω				
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-50/100/200	± 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-50	+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-50/100/200	-32 dBc typ, -25 dBc max @ 3 dB total backoff (two tones, Δf+ 1MHz)
CPA-350	-30 dBc typ, -25 dBc max @3 dB total backoff (two tones)

AM to PM Conversion

CPA-50/100/200	1.0° typ, 2.5 max at rated output
CPA-350	2.0° typ, 3.0 max at rated output

Group Delay (per 40 MHz)

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

Spurious

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

Impedance	50Ω
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	ProtocolComtech EF Data ASCII or Emulation Mode

Alarms

Summary Fault	Form C
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LED

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

Mechanical (Dimensions)

Dimensions	
CPA-50	19W x 5.25H x 24D inches (48W x 13H x 60D cm)
CPA-100	19W x 8.75H x 24D inches (48W x 22H x 60D cm)
CPA-200	19W x 10.5H x 24D inches (48W x 27H x 60D cm)
CPA-350	19W x 17.5H x 24D inches (48W x 44H x 60D cm)

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

CPA-50	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

