

# ODPA Ku-Band Outdoor Power Amplifier



8/16W P<sub>1dB</sub>  
(10/20W P<sub>sat</sub>)



25/32/40/50W P<sub>1dB</sub>  
(32/40/50/60W P<sub>sat</sub>)

## INTRODUCTION

Using components from Comtech EF Data's proven line of Ku-band transceivers, this Ku-Band Outdoor Power Amplifier (ODPA) provides higher output power than typically available in a block package.

The optional L-Band Up Converter requires 24 VDC and a 10 MHz reference on the coax from an L-Band modem. The SSPA portion is line powered and provides an analog interface for fault status and mute control.

The ODPA delivers up to 20 Watts, at the 1 Db compression point (60W P<sub>sat</sub>), to the transmit waveguide flange. It provides a cost-effective and reliable replacement for TWT amplifiers in Ku-Band terminals. Due to a small form factor, it is 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.

## FEATURES AND OPTIONS

- Innovative mechanical design:
  - Light and compact
  - Protective chassis configuration
  - High terminal dissipation efficiency
  - Forced air cooling for extreme environments
- System mounting kit available for output power levels
- Over temperature shutdown
- Mute control
- Summary fault relay for ODPA
- Customer accessible service loop between output of converter and input of ODPA

## THE SOLID-STATE ADVANTAGE

The ODPA is constructed with highly reliable GaAs FETs. With third-order intermodulation products from 4 to 6 dB better than TWT ratings, the Comtech EF Data unit will replace TWTs with saturated power levels of up to twice the ODPA's rated power. The ODPA provides an MTBF that is 5 to 6 times greater than the typical TWT MTBFs.

## FUNCTIONAL DESCRIPTION

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

# ODPA Ku-Band Outdoor Power Amplifier

## Characteristics

Input Frequency - IF 950 to 1450 MHz  
 Output Frequency Range 14.00 – 14.50 GHz  
 Optional: 13.75 – 14.50 GHz

Max. Input Power without damage (ODPA) +15 dBm  
 (L-Band) -17 dBm

	Model	ODPA	ODPA w/L-Band
System Gain (Nominal)	8	33 dB	63 dB
	16	36 dB	66 dB
	25	40 dB	70 dB
	32	42 dB	72 dB
	40	44 dB	74 dB
	50	45 dB	75 dB

Gain Flatness over Full Band (ODPA) ± 1.0 dB max

Gain Variation over 36 MHz ± 1.0 dB

Gain Stability over Temperature (ODPA) ± 1.0 dB

(ODPA w/L-Band) ± 2.5 dB

Gain Slope (ODPA) 0.5 dB/40 MHz max

Noise Figure at max Gain 10 dB

Power Output @ 25°C:

Model	P1dB	Psat(typ)	TOI
8	39 dBm (8W)	40 dBm (10Watt)	47dBm
16	42 dBm (16W)	43 dBm (20Watt)	50 dBm
25	44 dBm (25W)	45 dBm (32Watt)	52 dBm
32	45 dBm (32W)	46 dBm (40Watt)	53 dBm
40	46 dBm (40W)	47 dBm (50Watt)	54 dBm
50	47 dBm (50W)	47.5 dBm (60Watt)	55 dBm

3rd Order IMD -28 dBc @ 3dB backoff  
 (SCL 6 dB backoff from P1 db)

Input/Output Return Loss 18 dB minimum  
 Spurious (in-band) at Rated Power (ODPA) -50 dBc maximum

Spurious at Rated Power (ODPA) -65 dBc max

Spurious (Rx band) at Rated Power -70 dBc maximum

Harmonics at Rated Power (ODPA) -65 dBc max

AM/PM Conversion (ODPA) 2.5°/dB ty  
 3.0°/dB max

## Group Delay

Linear 0.02 nsec/NHz  
 Parabolic 0.003 nsec MHz<sup>2</sup>  
 Ripple 1 nsec peak-to-peak  
 RF-Mute -60 dB

## Phase Noise

Offsets Limits (dBc/Hz)  
 300 Hz offset -60 dBc/Hz  
 1 kHz offset -70 dBc/Hz  
 10 kHz offset -80 dBc/Hz  
 100 kHz offset -90 dBc/Hz  
 1 MHz offset -100 dBc/Hz

## Required External Reference Signal

Frequency 10 MHz  
 Input Power -5 to +5 dBm  
 Phase Noise -125 dBc/Hz max. @ 100Hz  
 -135 dBc/Hz max. @ 1 kHz  
 -140 dBc/Hz max. @ 10 kHz

## L-Band (Optional)

Power Requirement +15 to +24 VDC  
 Power Consumption 2.5 A max. @ +15V

## System Power Requirements

ODPA Input Power. 85 - 264 VAC,  
 47 - 63 Hz

Model	Wattage
8	150Watt
16	180Watt
25	360Watt
32	370Watt
40	390Watt
50	400Watt

110/220 VAC ± 15% (47 to 63Hz)  
 AC Input Voltage Auto Ranging (12, 24, & 48 are optional)

## Mechanical Requirements

Interface

IF Input	Type N (F optional)
RF Output	WR75 *
M&C Analog	MS3112E16-26P *
Power	(ODPA) MS3102R16-10P * Molex Custom (#84855 Series)

\*Other options are available

## Environmental

Temperature

Operating	-40° to 122°F (-40° to 55°C)
Storage	(ODPA) -67° to 167°F (-55° to 75°C)

Humidity 100% condensing rain 2" per hour  
 Altitude 10,000 AMSL  
 Shock Normal commercial shipping and Handling

## Physical

Dimensional

8 and 16 Watt	12.40 x 5.93 x 6.74 in (32 x 31.5 x 17 cm)
25 thru 50 Watt	ODPA 20.90 x 11.50 x 10.30 in (51 x 30 x 16 cm) ODPA w/L-Band 20.90 x 11.50 x 12.6 in (51 x 30 x 32 cm)

Weight

8 and 16 Watt	ODPA 20s (9 kg) ODPA w/L-Band Input 22 lb (10kg) ODPA 52 lb (24.0 kg)
25 thru 50 Watt	ODPA w/L-Band Input 61 lb (27.7 kg)