



### 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 40 Watts, at the 1 dB compression point, 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.



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## Characteristics

Input Frequency - IF	950 to 1450 MHz
Output Frequency Range	14.00 – 14.50 GHz
	Optional: 13.75 to 14.50 GHz
Max. Input Power without damage	(ODPA) +15 dBm
Max. Input Power without damage	(L-Band) -17 dBm

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

Gain Flatness over Full Band	(ODPA) $\pm 1.0$ dB max (ODPA w/L-Band) $\pm 2.5$ dB nominal
Gain Variation over 36MHz	$\pm 1.0$ dB
Gain Variation (ODPA) $\pm 1.0$ dB over operating temperature range	
Gain Stability over Temperature	(ODPA w/L-Band) $\pm 2.5$ dB
Gain Slope	(ODPA) 0.5 dB/40 MHz max
Noise Figure at max Gain	10 dB

Power Output @1dB Compression @ 25°C:	8W +39dBm 16W +42 dBm 25W +44 dBm 32W +45 dBm 40W +46 dBm
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3 <sup>rd</sup> Order Intercept Point:	8W +47 dBm 16W +50 dBm 25W +52 dBm 32W +53 dBm 40W +54 dBm
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3 <sup>rd</sup> Order IMD: -34 dBc @ 6dB backoff (SCL 9 dB backoff from P1 dB) -28 dBc @ 3dB backoff (SCL 6 dB backoff from P1dB)	
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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 typical (@P1dB) and 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
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## Phase Noise

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

## Required External Reference Signal

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	8W 150W 16W 180W 25W 360W 32W 370W 40W 390W
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AC Input Voltage	110/220 VAC $\pm 15\%$ (47 to 63Hz) Auto Ranging, 12, 24, & 48 are optional)
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## Mechanical Requirements

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

\*Other options are available

## Environmental

Temperature:	
Operating	-40° to 55° C. (-40° to 122° F)
Storage	(ODPA) -55° to 75° C (-67° to 167° F)
Humidity	100% condensing rain 2" per hour
Altitude	10,000 AMSL
Shock	Normal commercial shipping and Handling

## Physical

Dimensional :

8 and 16 Watt	ODPA 12.40 x 10.25 x 8.38 (32 x 26 x 21 cm) ODPA w/L-Band 12.4 0 x 10.25 x 10.25 (32 x 26 x 26 cm)
25 thru 40 Watt	ODPA 20.90 x 11.50 x 10.30(51 x 30 x 16 cm) ODPA w/L-Band 20.90 x 11.50 x 12.6 (51 x 30 x 32 cm)

Weight:

8 and 16 Watt OPDA	27lbs (12.2 kg)
ODPA w/L-Band Input	32 lb (14.5 kg)
25 thru 40 Watt ODPA	52 lb (24.0 kg)
ODPA w/L-Band Input	61 lb (27.7 kg)



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