DATASHEET

28 GHz Repeater with Holographic Beam Forming® Technology

Gbps+ Real Throughput Through Glass, Up to 1 km Range

Ultra-Low Latency

Powered Through Glass – Customer Installable

version 2021.1

version 2021.1

Overview

Pivotal Commware introduces the world's first and only on-glass beamforming repeater, Echo 5G, designed to counteract signal loss at millimeter wave frequencies.

Breakthrough in Electromagnetic Physics

The Echo 5G uses Pivotal's patented Holographic Beam Forming® (HBF) to counteract window penetration and reflection loss so consumers and enterprises can enjoy Gigabit speeds beyond the reach of cable and DSL. HBF offers the lowest available size, weight and power consumption beamformer profile and is an essential element in the 5G Ecosystem.

Business Case Solved

Low weight and power consumption, in particular, allow the Echo 5G to attach to glass and receive power through the window from inside. Subscribers can install the unit themselves. Besides saving on installation costs, service providers can reach more subscribers using fewer base stations. Echo 5G allows 5G service providers to close the millimeter wave business case for serving fixed and mobile subscribers with higher performance.

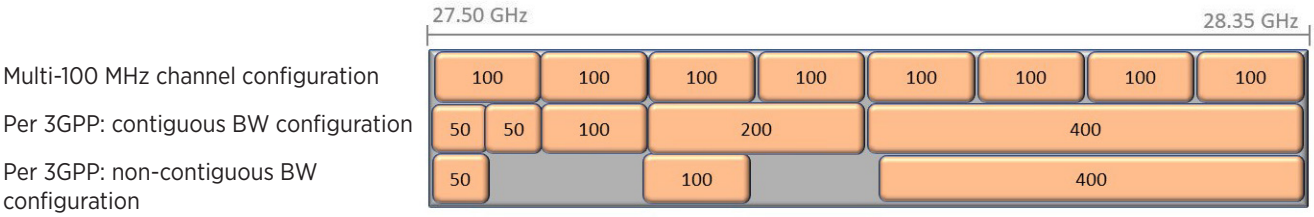
Key Features

The Echo 5G offers the following advanced features:

- Customer installable on-the-window RF repeater
- Overcomes standard and low-E glass penetration loss by adding up to 30 dB to the mmWave link budget
- Overcomes reflection loss by scanning to near horizon in azimuth
- Narrow and steerable beam towards gNB, wide static beam towards indoor CPE/UE
- Outdoor Unit (ODU) with HBF antenna and RF Front End functions, wirelessly powered through the window (< 20 Watts)
- Indoor Unit (IDU) with wireless power module and AC adapter interface
- Self-commissioning with auto acquisition and auto ranging functions
- Enables Gbps service indoors at distances up to 1 kilometer from the base station
- Compatible with 5G TF, 5G NSA EN-DC and 5G NR SA, etc.
- Small form factor, 7” x 7” x 1.5”, less than 3 lbs.
- Cloud based remote OA&M and optimization functions via LTE Cat M1 remote connectivity
- 5 nanosecond latency

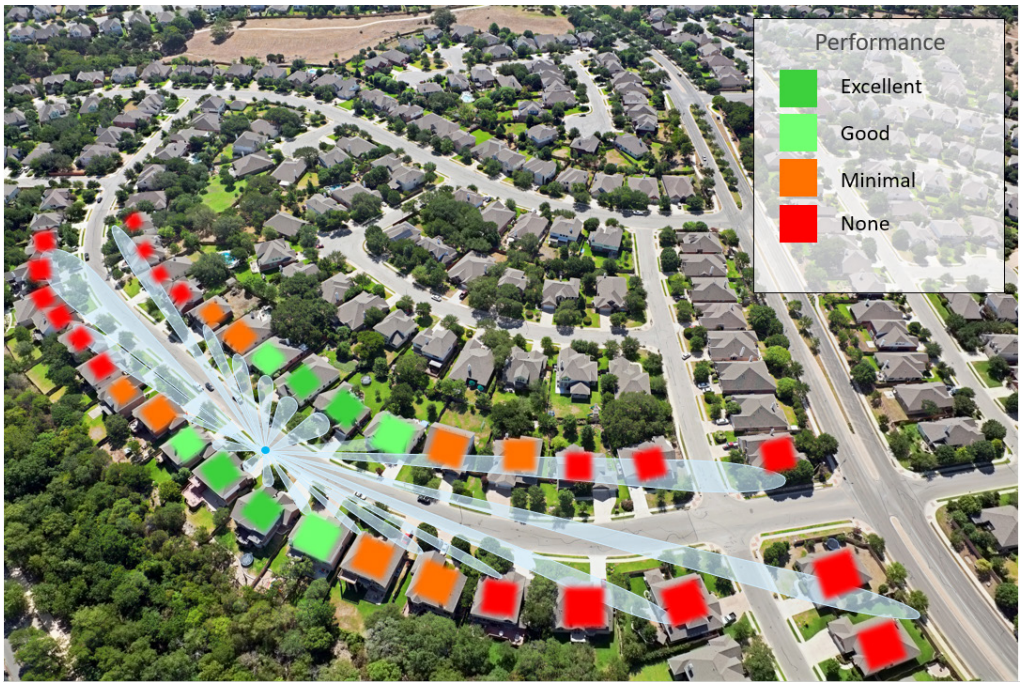
Bandwidth Flexibility at 28 GHz

Echo 5G accommodates all 3GPP-compliant bandwidth configurations.

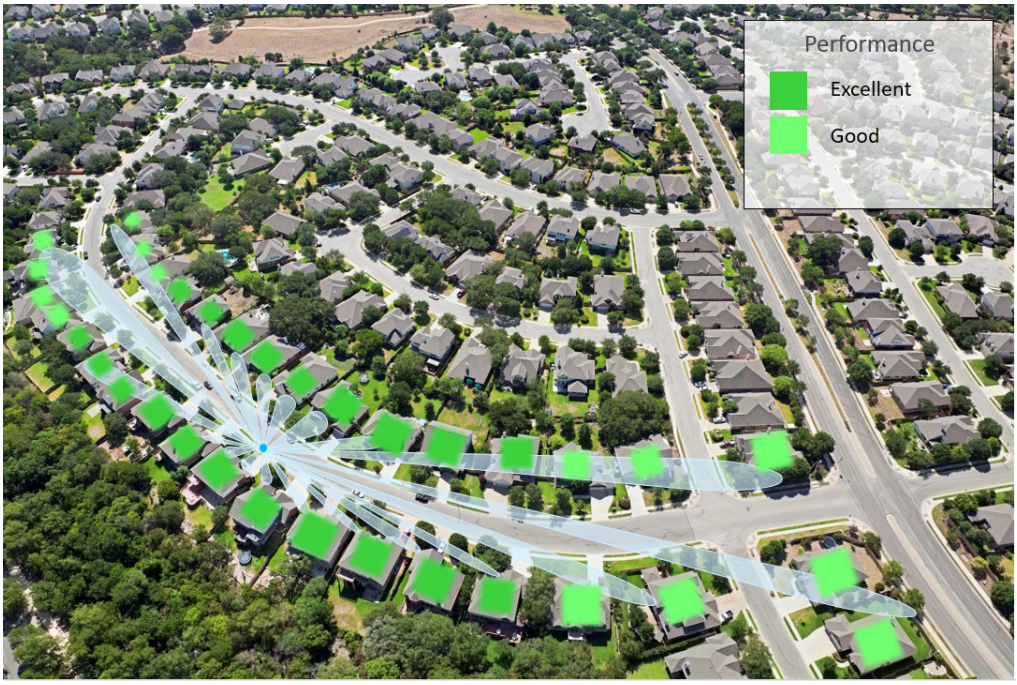


Extending the Reach of mmWave

The Echo 5G reduces gNB deployment costs by minimizing beamformer size, weight and power consumption and by providing near horizon scanning range.



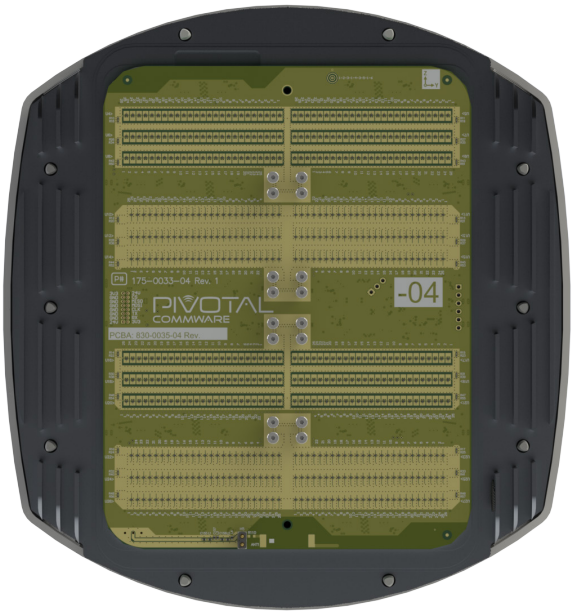
Window reflection and building penetration result in fewer subscribers served per gNB.



With Echo 5G and its near horizon scanning capability, more subscribers can be served per gNB.

Parameter	Specification
Frequency of operation	27.5 to 28.35 GHz
HBF az scan envelope	+/-76°
HBF el scan envelope	+/-30°
HBF antenna gain (donor side)	16 dB
HPBW towards gNB - azimuth	5°
HPBW towards gNB - elevation	20°
HBF scan loss	6 dB at 76°
Static antenna gain (service side)	6 dB
HPBW towards CPE/UE - azimuth	100°
HPBW towards CPE/UE - elevation	100°
Gain tunable range - DL	15 dB
Gain tunable range - UL	15 dB
Max electronic gain - DL	55 dB
Max electronic gain - UL	55 dB
Max EIRP - DL	29.5 dBm
Max EIRP - UL	29.5 dBm
Min noise figure - DL	5 dB
Min noise figure - UL	5 dB
In-band ripple (per 100 MHz channel)	2 dB
Operating Temperature	-30 to 45° C
Maximum Donor Range (to gNB)	3000 ft
Maximum Indoor Range (to CPE/UE)	30 ft
Dimensions	7″ x 7″ x 1.5″ for RF ODU, and 3.7″ circle, 1.1″ depth for IDU
Weight RF ODU	2.4 lbs.
Weight IDU	0.4 lbs.
IP Rating	IP54 for ODU; IP32 for IDU
Support Glass Type	Standard: single and double pane
Mounting	Adhesive, VHB
Max. Power Consumption	36 Watts (from outlet)
Power Method	AC adapter for IDU and wireless power magnetically induced for ODU
Configuration Management Interface	Bluetooth® and LTE CAT M1
Commissioning	Automated
Certifications	FCC, UL


PIVOTAL
5G
ECHO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PCBA: 830-0035-04 Rev.

WARNING: This is not a CONSUMER device. This device may not be sold at retail. You MUST have a FCC LICENSE or express consent of an FCC Licensee (or express consent of your service provider) to operate this device. Antennas must be installed at least 20 cm (8 inches) from any person. Unauthorized use may result in signficant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.

PIVOTAL COMMWARE®

www.pivotalcommware.com

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