

# FutureAccess™ Type-C 28 GHz Beamformer IC



## Overview

Fujikura's 28 GHz Beamformer IC with Wafer Level Package (WLP) design has transmitter and receiver functions supporting dual polarization (pol.) of 8 channels per pol. at 24.25-29.50 GHz.

This IC provides accurate beam operation without gain/phase calibration, which is useful for customers with optimal TCO and reduced development time.

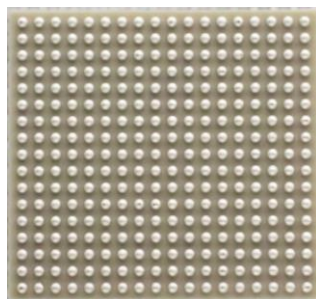
Large number of beam directions over 20,000 with fast beam switching less than 220 ns can make for large scale antenna systems and can cover wide spatial areas.

Front view of IC



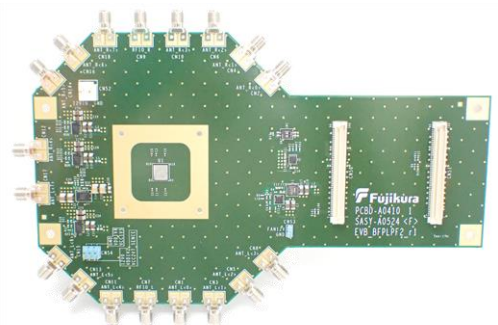
Size: 7.0 mm x 7.5 mm

Back view of IC



306pin BGA (0.4 mm pitch)

Evaluation Board for IC

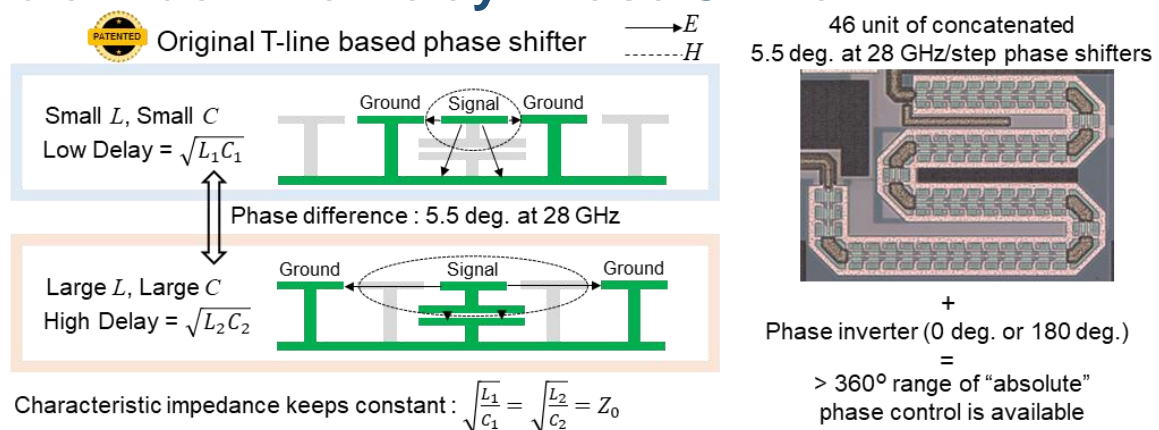


Size: 145 mm x 215 mm

## Features

- 5G NR multi band supported: 24.25-29.5 GHz (n257, 258, n261)
- Low cost design : Fan out Wafer Level Package (FOWLP)
- Calibration-free: Easy operation without gain/phase calibration
- Dual pol. (H pol., V pol.) beam forming: Simultaneous 2 beam operation
- Accurate beam control :  $\geq 20,000$  beam directions in  $\pm 60$  deg. range
- Fast beam switching :  $\leq 220$  ns switching time including control
- Wideband beamforming operation for True-time Delay Phase Shifter

## Tunable True-time Delay Phase Shifter



MW96-11-25-0007(2)



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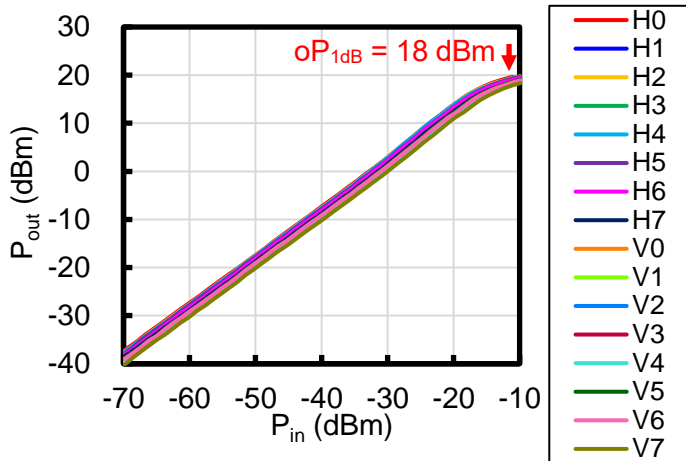
Web site: <https://mmwavetech.fujikura.jp/5g/>

# ■ Specification

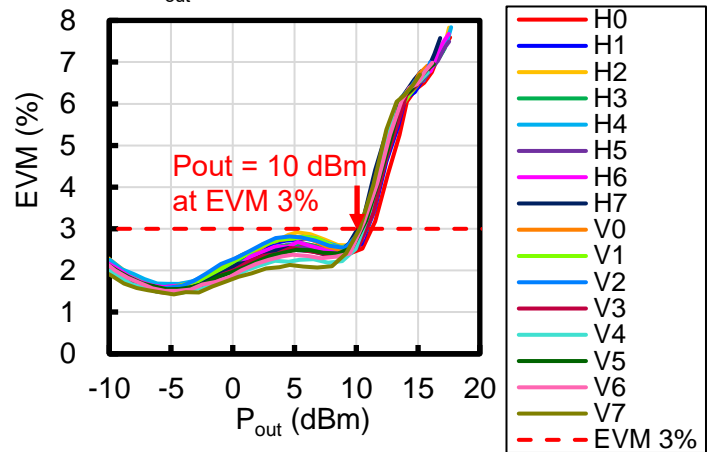
Parameter		Typical values
Frequency range (GHz)		24.25 to 29.50 (n257, n258, n261)
Number of channels (Ch.)		16 (8 horizontal and 8 vertical channels)
Beam states	Beam table mode	2,048
	On-Chip Calculation mode	$\geq 20,000$
Beam switching periodicity (ns)		$\leq 220$
Tx/Rx switching time ( $\mu$ s)		$\leq 1$
Operating temperature ( $^{\circ}$ C)		at junction temperature -40 to +125
Supply voltage (V)	Analog	1.5, 2.7
	Digital	1.2, 1.8
Phase resolution (deg.) at 28 GHz		5.5
Package size (mm)		7.0 x 7.5
Tx mode (per ch.)	$oP_{sat}$ (dBm)	20
	$oP_{1dB}$ (dBm)	18
	Linear output power (dBm) EVM = 3.0%, BW = 100 MHz, 256QAM	10
	Gain (dB)	30
Rx mode (per ch.)	Gain (dB)	28
	NF (dB)	4

# ■ Performance of Tx output power (CW, Modulation)

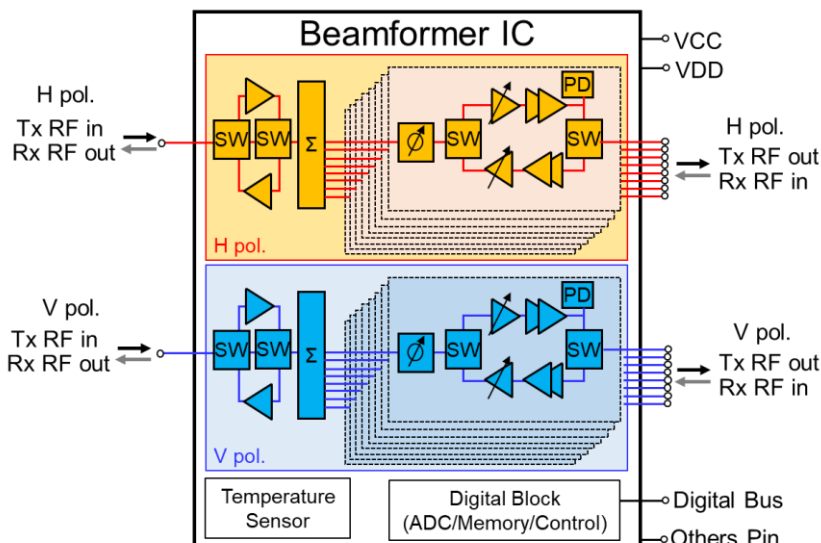
$P_{in}$  vs.  $P_{out}$  at RF 28 GHz with CW



EVM vs.  $P_{out}$  at RF 28 GHz, BW = 100 MHz, 256QAM



# ■ Block Diagram



# ■ Part Number

Part number	Product name
BFPLP-F2N	28 GHz Beamformer IC
BFPLP-F2N-EVB	Evaluation Board for 28 GHz Beamformer IC

### Note;

- The values on the table shown above are preliminary, not guaranteed.
- Please refer to the PRODUCT WARRANTY (MW96-11-22-0044) for more detail.
- All contents in this brief are subject to change without any notice.

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