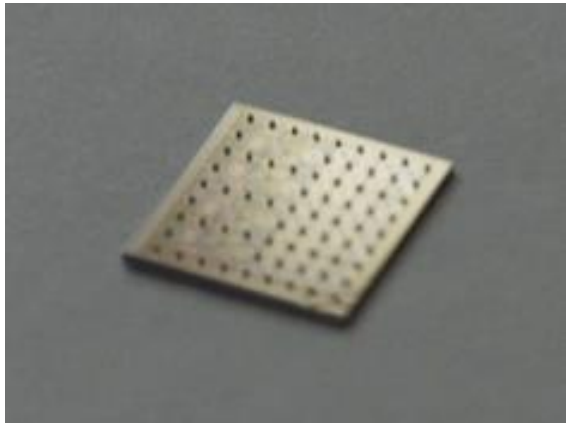


# KU10408 Camelot1 RFIC Product Brief



## Overview

KU10408 Camelot1 Tap Chip RFIC is a chip-scale implementation of programmable RF taps for analog self-interference cancellation or analog filtering. Figure 1 shows a system view of a general self-interference cancellation system using the KU10407 RFIC along with optional frequency agnostic taps and digital taps (available separately from Kumu).

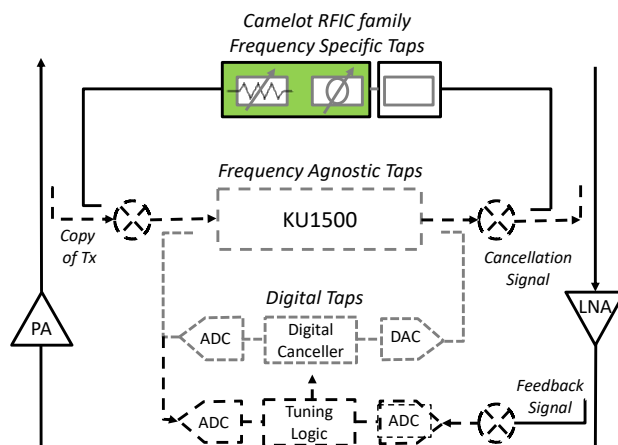


Figure 1: Self-Interference Cancellation System

The KU10408 RF Tap chip integrates four independent RF channels, each comprising

10-bit Digital Step Attenuators (DSA) and 11-bit Digital Phase Shifters (DPS).

The four independent channels are programmed with a low voltage CMOS serial interface. Each channel can cover a maximum phase range of  $> 360^\circ$  with a  $0.25^\circ$  phase step and an attenuation range of 32 dB in 0.04 dB steps.

Key applications for the chip include adjacent channel isolation enhancement, integration inside 3-4GHz FR1 5G Radio Units (RU) to mitigate interference between antenna elements to enable implementation of Sub-band Full Duplex feature for 3GPP Release 18 RU's or cancel external or internal interferers.

## Features

- Highly integrated RFIC providing accurate, calibrated gain and phase adjustments between 2500 MHz – 4500 MHz operating frequencies
- 10-bit, 0.04dB gain steps from 0 to 32dB
- 11-bit, 0.25 degree phase steps 0-360 degrees
- Insertion loss  $< 6\text{dB}$  for each channel
- Simple, high-speed SPI interface for synchronous gain / phase adjustment
- Multiple taps can be cascaded to create higher order filters or cancellers
- Low power consumption ( $\sim 500\mu\text{A}$ )
- Small Size: 4.7mm x 5.1mm x 0.3mm CSP60 with 550um solder bump pitch

## Electrical Specifications

Parameter	Min	Typ	Max	Units
Operating Frequency	2500		4500	MHz
Number of taps		4		
Input IP3	55		62	dBm
Insertion Loss		6		dB
Input Power Sinusoidal (total)			24	dBm
Gain Range		32		dB
Gain Step		0.04		dB
Phase Range		360		degrees
Phase Step		0.25		degrees
Supply Voltage		3.3	2.5V	
Operating Current Consumption		500		uA
Operating Temperature	-40		85	C

## Functional Block Diagram

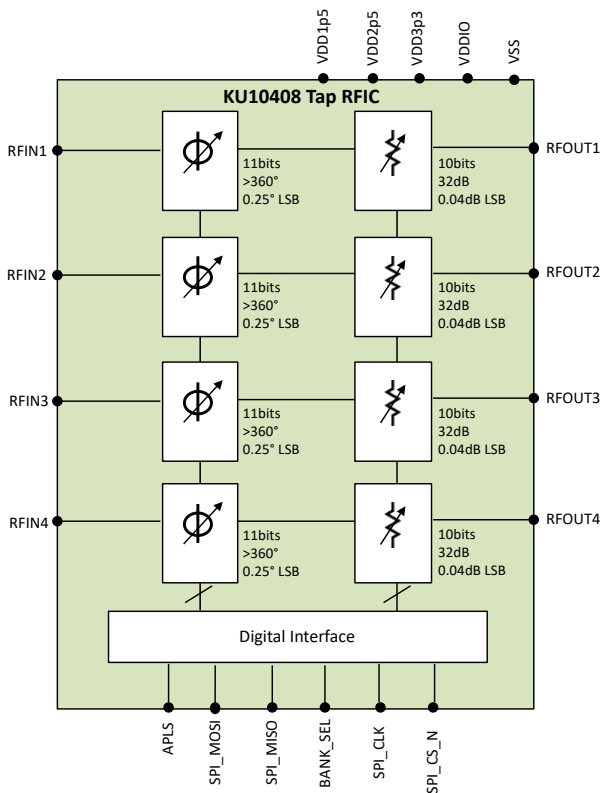


Figure 2: KU10408 Functional Block Diagram

## Pin Descriptions

Pin Name	Description
RFIN[4:1]	RF Inputs to Tap Chip
RFOUT[4:1]	RF Outputs from Tap Chip
SPI_MOSI	Serial Data Input
SPI_MISO	Serial Data Output
SPI_CLK	Clock Input
SPI_CS_N	Serial Data Interface Enable
BANK_SEL	Select between 2 sets of Coeff.
APLS	Apply all Coefficients
VDD3p3	3.3V Power Supply
VSS	Ground
VDDN2p5	Opt. neg. 2.5V Bias Input
VDD1p5	1.5V Pin for decoupling Cap
VDDIO	Digital Interface Supply Voltage

## Package

