PUP_SO24CP_T2R2

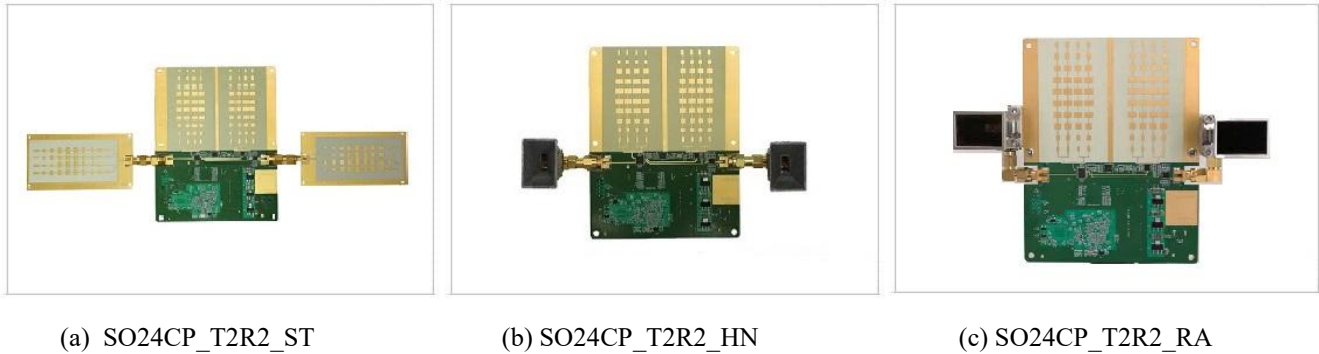(a) SO24CP_T2R2_ST   (b) SO24CP_T2R2_HN   (c) SO24CP_T2R2_RA

Figure 1. PUP_SO24CP_T2R2

PUP_SO24CP_T2R2 (Figure 1) is a single board MIMO radar evaluation kit. It works at K band with two transmitting and two receiving channels.

Tx1 transmitter and Rx1 receiver antennas use two onboard antennas. This model has three different configurations, each uses different external antennas for different purposes. The PUP_SO24CP_T2R2_ST uses two external right angle patch antennas, the PUP_SO24CP_T2R2_HN uses two external straight patch antennas, and the PUP_SO24CP_T2R2_RA uses two external horn antennas.

PUP_SO24CP_T2R2_ST and PUP_SO24CP_T2R2_HN are configured bi-polarized radar kits, so the following combinations can be achieved:

HH - for horizontal transmit and horizontal receive.
VV - for vertical transmit and vertical receive.
HV - for horizontal transmit and vertical receive.
VH - for vertical transmit and horizontal receive.

The RF front-end frequency sweep is implemented with a phase-locked loop (PLL) to achieve linearity of frequency modulations. The FPGA-based controller connects the front end with a four-channel LVDS (low-voltage differential signaling) 65Msps pipeline ADC module and connects the user's computer with a high speed (up to 480Mb/s) USB interface.

The kit comes with user-friendly Matlab GUI (graphical user interface) source code. It is also a template of the working process, data format, and signal processing that can be quickly converted to the codes in your projects.

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The kit works normally between 24GHz and 25GHz and is expandable to 23.5GHz-26GHz. The detectable range is approximately 25 meters for people and 60 meters for a medium-sized vehicle(when a single Tx is active). When works at Tx1.Tx2 mode, the two antennas are alternately activated, thus the average output power for each Tx is dropped to half, the detectable range is getting smaller.

Raw data can be recorded for post-processing.

SPECIFICATIONS

Specification	Minimum	Typical	Maximum
Channels		2x Transmitters, 2x Receivers	
Antennas		2x On Board Patch Antennas, 2x External Antennas	
Modulations		FMCW, CW	
Typical Frequency Range	24GHz		25GHz
Expandable Frequency Range	23.5GHz		26GHz
Sweep Time		0.5ms, 1ms, 2ms, 4ms, 8ms	
Sample Per Sweep		128,256,512,1024,2048,4096	
Tuning Voltage	0		4V
Tuning Sensitivity		0.8GHz/v	
Transmitting Power	16dBm	17dBm	18dBm
SSB Phase Noise @1MHz offset		-99dBc	
Noise Figure		12dB	
Maximum Input power		5dBm	
IIP_1dB		-12dBm	
Supply Voltage	5.75V	6V	6.25V
Supply Current		1100mA	
Operation Temperature	-40ºC		85ºC
Dimensions		L: 130mm, W: 102mm, H: 15mm	

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