## SIKYWORIKS

## PRELIMINARY DATA SHEET

## SKY13252-321: PHEMT GaAs IC Diversity Switch DC-6 GHz

## Applications

- WLAN 802.11a, b, g diversity


## Features

- Operating frequency DC-6 GHz
- Positive low voltage control ( $0 / 3 \mathrm{~V}$ operation)
- Low insertion loss
- High linearity
- Miniature QFN-12 plastic package
- PHEMT process


## Description

The SKY13252-321 is a broadband transfer switch designed to combine T/R and antenna diversity switching functions on a single IC. The device is designed to have a low insertion loss and maintain high linearity at low control voltages. This low cost switch is ideal for Wireless LAN applications and is capable of covering both the 2.4 GHz and 5 GHz bands.

QFN-12


## Electrical Specifications at $\mathbf{2 5}^{\mathbf{\circ}} \mathbf{C}(\mathbf{0}, \mathbf{+ 3} \mathbf{~ V})$

| Parameter | Condition | Frequency | Min. | Typ. | Max. | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Insertion loss | Ant1, Ant2 to $\mathrm{T}_{\mathrm{X}}, \mathrm{R}_{\mathrm{X}}$ | $2.400-2.500 \mathrm{GHz}$ |  | 0.75 | 0.90 | dB |
|  |  | $\begin{aligned} & \hline 5.150-5.350 \mathrm{GHz} \\ & 5.725-5.825 \mathrm{GHz} \end{aligned}$ |  | $\begin{aligned} & 1.10 \\ & 1.20 \end{aligned}$ | $\begin{aligned} & 1.30 \\ & 1.35 \end{aligned}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ |
| Isolation | Ant1, Ant2 to $\mathrm{T}_{\mathrm{X}}, \mathrm{R}_{\mathrm{X}}$ | $\begin{aligned} & \hline 2.400-2.500 \mathrm{GHz} \\ & 5.150-5.350 \mathrm{GHz} \\ & 5.725-5.825 \mathrm{GHz} \end{aligned}$ | $\begin{aligned} & \hline 27.0 \\ & 23.0 \\ & 21.0 \end{aligned}$ | $\begin{aligned} & 33.0 \\ & 30.0 \\ & 24.0 \end{aligned}$ |  | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \\ & \mathrm{~dB} \end{aligned}$ |
|  | Ant1 to Ant2, $\mathrm{T}_{\mathrm{X}}$ to $\mathrm{R}_{\mathrm{X}}$ | $\begin{aligned} & 2.400-2.500 \mathrm{GHz} \\ & 5.150-5.350 \mathrm{GHz} \\ & 5.725-5.825 \mathrm{GHz} \end{aligned}$ | $\begin{aligned} & \hline 20.0 \\ & 17.0 \\ & 17.0 \end{aligned}$ | $\begin{aligned} & \hline 25.0 \\ & 20.0 \\ & 20.0 \end{aligned}$ |  | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \\ & \mathrm{~dB} \end{aligned}$ |
| Return loss | Ant1, Ant2 to $\mathrm{T}_{\mathrm{X}}, \mathrm{R}_{\mathrm{X}}$ | $\begin{aligned} & 2.400-2.500 \mathrm{GHz} \\ & 5.150-5.350 \mathrm{GHz} \\ & 5.725-5.825 \mathrm{GHz} \end{aligned}$ |  | $\begin{aligned} & \hline 17.0 \\ & 13.0 \\ & 13.0 \end{aligned}$ |  | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \\ & \mathrm{~dB} \end{aligned}$ |

## Operating Characteristics at $\mathbf{2 5}^{\circ} \mathrm{C}(\mathbf{0}, \mathbf{+ 3} \mathbf{V})$

| Parameter | Condition | Frequency | Min. | Typ. | Max. | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{P}_{1 \mathrm{~dB}}$ | @ 0, +3 V | 2-6 GHz |  | 27 |  | dBm |
| IP3 | 5 dBm per tone, 5 MHz spacing, @ $0,+3 \mathrm{~V}$ | 2-6 GHz |  | 45 |  | dBm |
| Control voltage | $\mathrm{V}_{\text {LOW }}=0-0.25 \mathrm{~V} @ 10 \mu \mathrm{~A}$ max. <br> $\mathrm{V}_{\text {HIGH }}=3-5.00 \mathrm{~V} @ 15 \mu \mathrm{~A}$ max. |  |  |  |  |  |

## Typical Performance Data



Insertion Loss vs. Frequency


Isolation vs. Frequency

## Truth Table

| Insertion loss path | $\mathbf{V}_{\mathbf{1}}$ | $\mathbf{V}_{\mathbf{2}}$ | State |
| :---: | :---: | :---: | :---: |
| Ant1-T $\mathrm{T}_{\mathrm{x}}$ Ant2- $\mathrm{B}_{\mathrm{X}}$ | 0 | 1 | 1 |
| Ant1-R $\mathrm{R}_{\mathrm{X}}$ Ant2- $\mathrm{T}_{\mathrm{X}}$ | 1 | 0 | 2 |




Isolation Between A1 and A2

## Pin Out (Top View)



DC blocking capacitors $\left(\mathrm{C}_{\mathrm{BL}}\right)=47 \mathrm{pF}$.

