

GaAs IC Dual-Band WLAN T/R Transfer Switch 2–3 and 5–6 GHz


AS224-340

Applications

- WLAN 802.11a, b, g Diversity

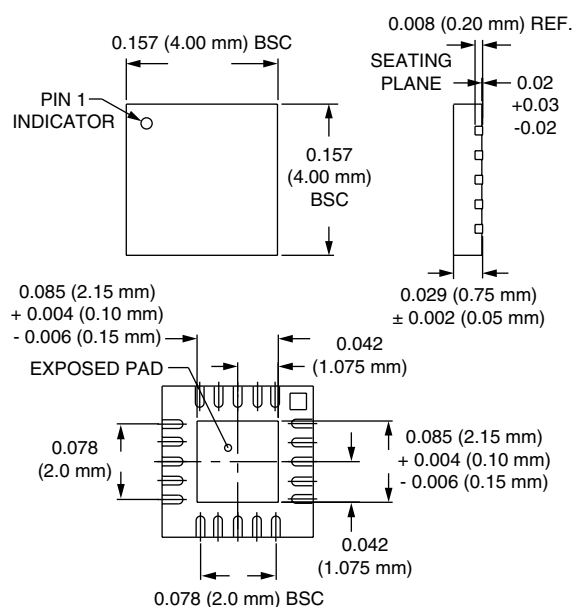
Features

- Operating Frequency 2–3 GHz and 5–6 GHz
- Positive Low Voltage Control (0/ +3 V Operation)
- Low Insertion Loss
- PHEMT Process

Description

The AS224-340 is a dual-band transfer switch designed to combine T/R and antenna diversity switching functions on a single IC. This device is capable of covering two separate bands: 2.4 GHz band and 5 GHz band.

QFN-20 (4 x 4 mm)



Electrical Specifications at 25°C — 2 GHz Band at 25°C (0,+ 3 V)

Parameter ¹	Condition	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss ²	Ant 1 to 2R _X , 2T _X	2.0–2.3 GHz		1.3		dB
		2.3–2.6 GHz		1.4		dB
		2.6–3.0 GHz		1.6		dB
	Ant 2 to 2R _X	2.0–2.3 GHz		1.3		dB
		2.3–2.6 GHz		1.3		dB
		2.6–3.0 GHz		1.4		dB
	Ant 2 to 2T _X	2.0–2.3 GHz		1.3		dB
		2.3–2.6 GHz		1.4		dB
		2.6–3.0 GHz		1.6		dB
Isolation	Ant 1 to 2R _X when A1 to 2T _X ON	2.0–2.3 GHz		28		dB
		2.3–2.6 GHz		27		dB
		2.6–3.0 GHz		24		dB
	Ant 2 to 2R _X when A2 to 2T _X ON	2.0–2.3 GHz		26		dB
		2.3–2.6 GHz		25		dB
		2.6–3.0 GHz		24		dB
	Ant 1 to 2T _X when A1 to 2R _X ON	2.0–2.3 GHz		25		dB
		2.3–2.6 GHz		24		dB
		2.6–3.0 GHz		23		dB
Return Loss	Ant 1 to 2R _X	2.0–2.3 GHz		16		dB
		2.3–2.6 GHz		15		dB
		2.6–3.0 GHz		14		dB
	Ant 1 to 2T _X	2.0–2.3 GHz		19		dB
		2.3–2.6 GHz		18		dB
		2.6–3.0 GHz		18		dB
	Ant 2 to 2R _X	2.0–2.3 GHz		24		dB
		2.3–2.6 GHz		24		dB
		2.6–3.0 GHz		23		dB
	Ant 2 to 2T _X	2.0–2.3 GHz		20		dB
		2.3–2.6 GHz		18		dB
		2.6–3.0 GHz		16		dB

1. All measurements made in a 50 Ω system.

2. Insertion loss changes by 0.003 dB/C.

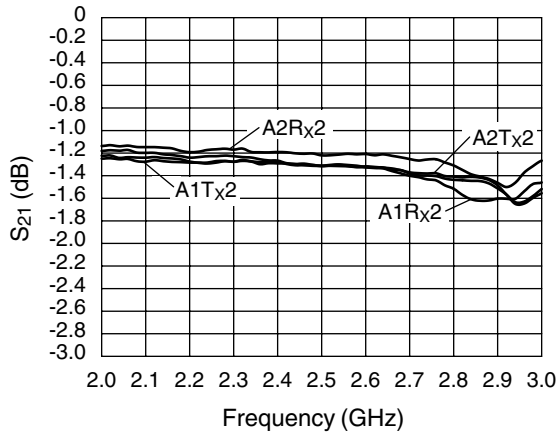
Electrical Specifications at 25°C — 5 GHz Band at 25°C (0,+ 3 V)

Parameter ¹	Condition	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss ²	Ant 1 to 5R _X , 5T _X	5.0–5.3 GHz		1.6		dB
		5.3–5.6 GHz		1.8		dB
		5.6–6.0 GHz		1.9		dB
	Ant 2 to 5R _X	5.0–5.3 GHz		1.6		dB
		5.3–5.6 GHz		1.7		dB
		5.6–6.0 GHz		1.9		dB
	Ant 2 to 5T _X	5.0–5.3 GHz		1.5		dB
		5.3–5.6 GHz		1.6		dB
		5.6–6.0 GHz		1.8		dB
Isolation	Ant 1 to 5R _X when A1 to 5T _X ON	5.0–5.3 GHz		30		dB
		5.3–5.6 GHz		30		dB
		5.6–6.0 GHz		30		dB
	Ant 2 to 5R _X when A2 to 5T _X ON	5.0–5.3 GHz		28		dB
		5.3–5.6 GHz		28		dB
		5.6–6.0 GHz		27		dB
	Ant 1 to 5T _X when A1 to 5R _X ON	5.0–5.3 GHz		19		dB
		5.3–5.6 GHz		19		dB
		5.6–6.0 GHz		18		dB
Return Loss	Ant 1 to 5R _X	5.0–5.3 GHz		20		dB
		5.3–5.6 GHz		19		dB
		5.6–6.0 GHz		18		dB
	Ant 1 to 5T _X	5.0–5.3 GHz		27		dB
		5.3–5.6 GHz		26		dB
		5.6–6.0 GHz		25		dB
	Ant 2 to 5R _X	5.0–5.3 GHz		20		dB
		5.3–5.6 GHz		18		dB
		5.6–6.0 GHz		18		dB
	Ant 2 to 5Tx	5.0–5.3 GHz		22		dB
		5.3–5.6 GHz		20		dB
		5.6–6.0 GHz		18		dB

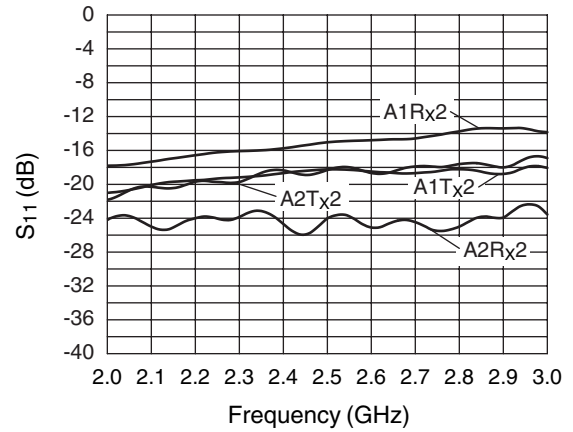
1. All measurements made in a 50 Ω system.

2. Insertion loss changes by 0.003 dB/C.

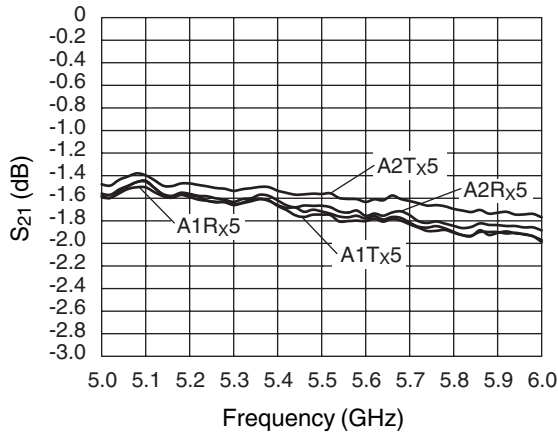
Typical Performance Data



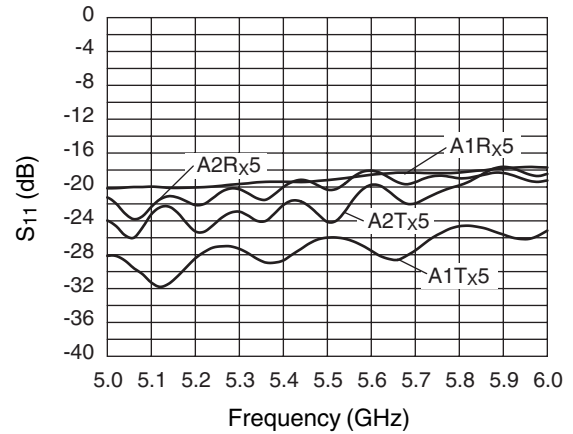
Insertion Loss 2–3 GHz



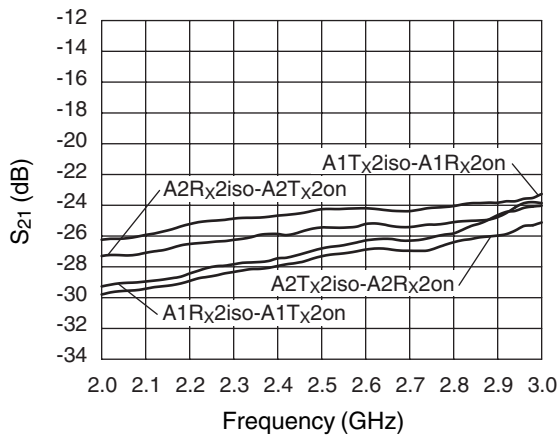
Return Loss 2–3 GHz



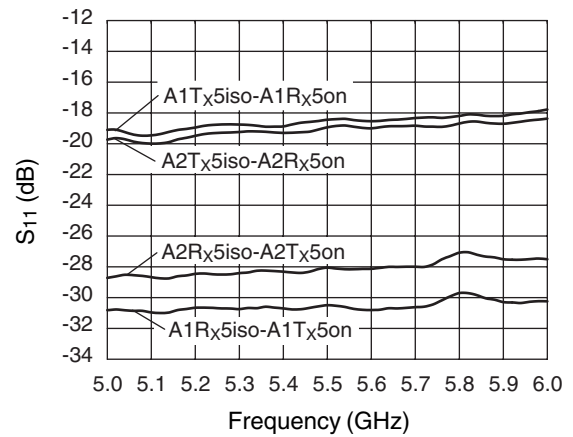
Insertion Loss 5–6 GHz



Return Loss 5–6 GHz



Isolation 2–3 GHz



Isolation 5–6 GHz

Truth Table

VA2_2Rx	VA2_2Tx	VA1_2Rx	VA1_2Tx	VA1_5Tx	VA1_5Rx	VA2_5Tx	VA2_5Rx	V5Tx Term	V2Tx Term	ANT 1	ANT 2	EXT TERM
1	0	0	0	0	0	0	0	0	0	N/C	2Rx	N/C
0	1	0	0	0	0	0	0	0	0	N/C	2Tx	N/C
0	0	1	0	0	0	0	0	0	0	2Rx	N/C	N/C
0	0	0	1	0	0	0	0	0	0	2Tx	N/C	N/C
0	0	0	0	1	0	0	0	0	0	5Tx	N/C	N/C
0	0	0	0	0	1	0	0	0	0	5Rx	N/C	N/C
0	0	0	0	0	0	1	0	0	0	N/C	5Tx	N/C
0	0	0	0	0	0	0	1	0	0	N/C	5Rx	N/C
0	0	0	0	0	0	0	0	1	0	N/C	N/C	5Tx
0	0	0	0	0	0	0	0	0	1	N/C	N/C	2Tx

"2Rx" = 2.4 GHz Rx path.
"2Tx" = 2.4 GHz Tx path.
"5Rx" = 5 GHz Rx path.
"5Tx" = 5 GHz Tx path.

"A1" = "ANT 1" = Antenna 1 path.
"A2" = "ANT 2" = Antenna 2 path.
"0" = 0 to + 0.2 V.
"1" = 2.7 to +5 V.

Pin Out (Top View)

