

APPLICATION NOTE**Evaluation Board : P/N VWA 0000956 AA****QFN : VWA0000948AA****X-band Phase shifter in QFN 5x5mm 24L Evaluation Board**

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I. HISTORIC

Edition	Date	Description of changes	
1.0	13/12/2016	Creation	

II. REFERENCE DOCUMENTS

Document Title	Reference Document	Date	Edition

III. SUMMARY

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IV.INTRODUCTION

IV-1. Description

The VWA0000956AA is a Phase shifter packaged in QFN and reported on a PCB “evaluation board”. It is working in the 7-13GHz frequencies. It uses the VWA0000948AA component (VWA5001000SA die integrated in 5x5mm plastic QFN).

The evaluation board is composed by 2 mains parts:

- A Phase shifter packaged in QFN (VWA0000948AA) (1)
- A test structure support : PCB with SMA connectors (2)

The QFN Phase shifter VWA0000948AA uses the die VWA5001000SA in a 5x5mm plastic QFN. The test structure support uses a RF PCB with SMA connectors, decoupling components, one DC connector to bias and control the component, and a heat sink. Supply cables are also provided.

This document describes the way to use the evaluation board VWA0000956AA.

RF features and results are not included.

IV-2. Evaluation Board PHOTO

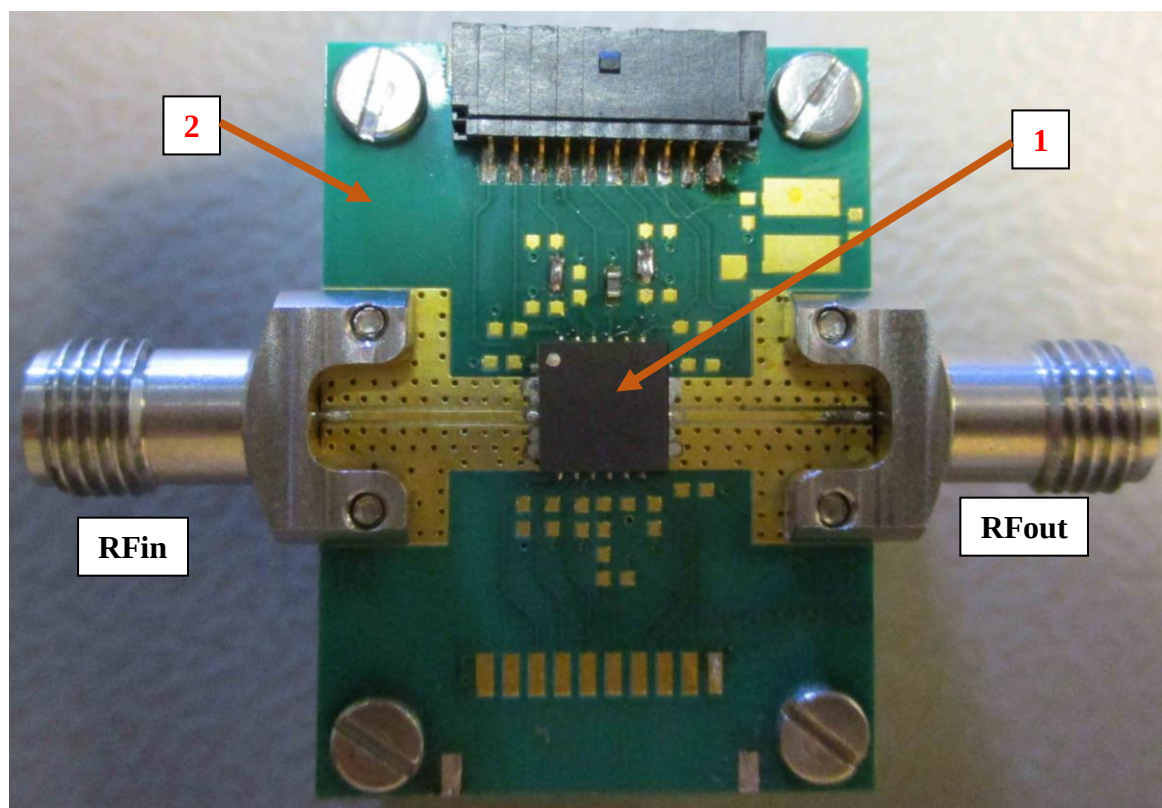


Figure 1: Evaluation board VWA0000956AA photo

V. INTERFACE AND COMPONENTS

V-1. Evaluation board VWA 0000956 AA Interface

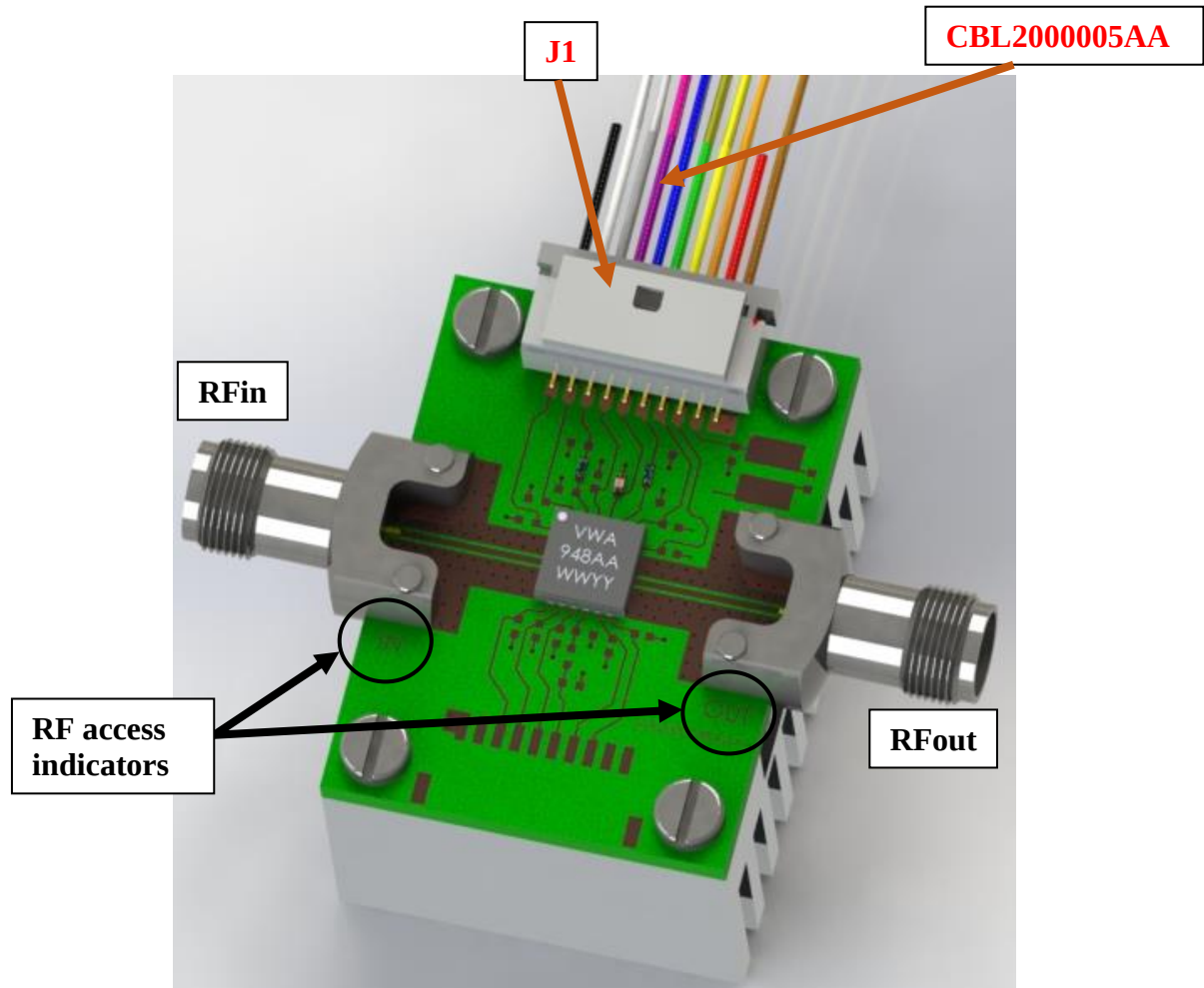


Figure 2: Evaluation board VWA0000955AA interface

Connector	Type	Allocation
J1	SAMTEC T1M-10-F-SH-L	Connect to CBL2000005AA cable : VSS power supply, Vc1 to Vc6 Bit control and GND
RFIN	SMA female	RF Input
RFOUT	SMA female	RF Output

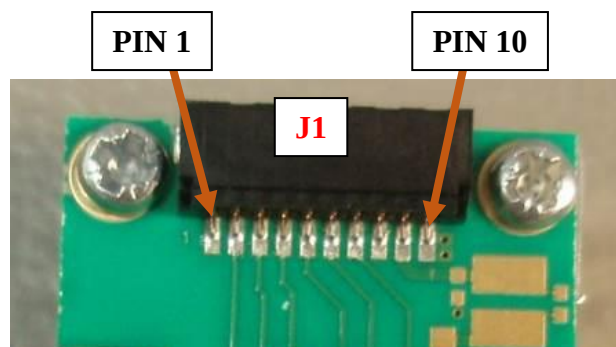


Figure 3: J1 PINOUT

PIN	J1 Identification	PIN	J1 Identification
1	NC	6	Vc4
2	Vc1	7	Vc5
3	Vc2	8	Vc6
4	Vc3	9	NC
5	VSS	10	GND

Figure 4: J1 PINOUT identification

V-2. PCB layout

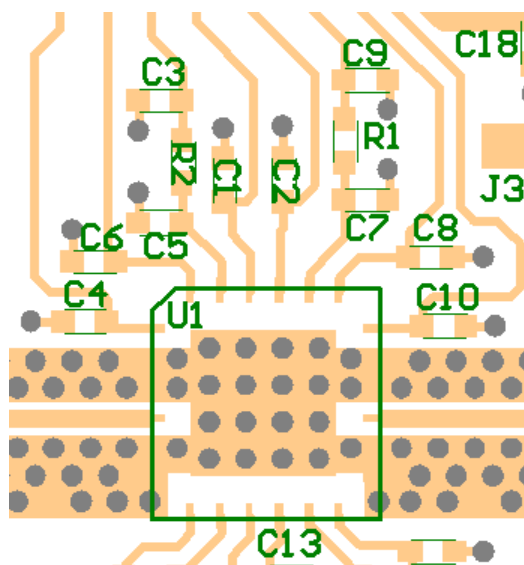


Figure 5: PCB layout

Components	Value	Type
C2	1μF/16V	0402
R1, R2	0 Ohms	0402

V-3. Interface cable overview

Evaluation board VWA0000956AA interface cable:

- CBL2000005AA on J1 (Vc1 to Vc6 / VSS power supply and GND)



Figure 6: CBL2000005AA

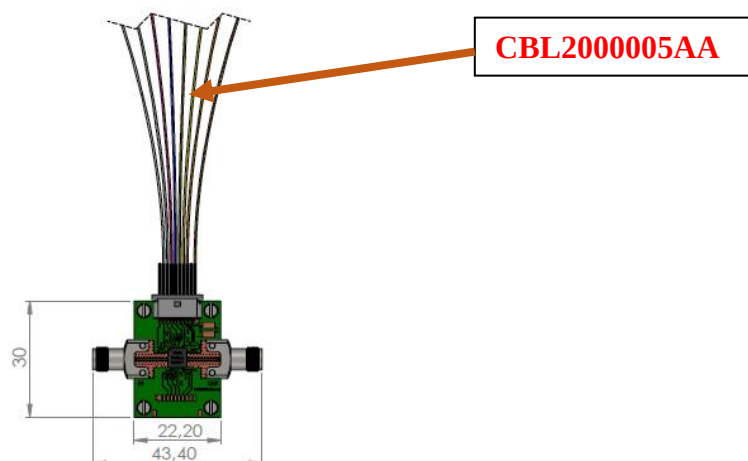
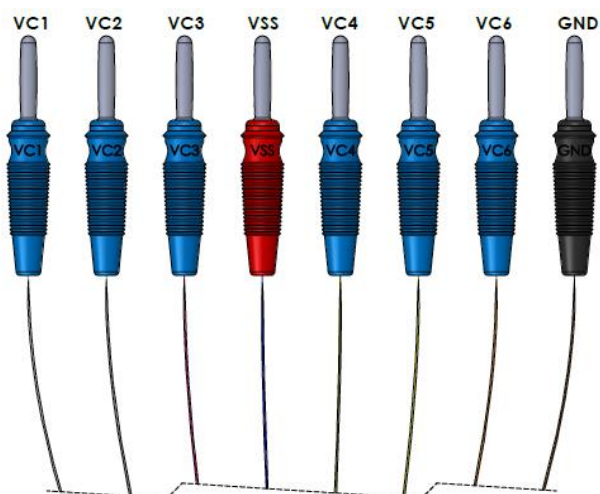


Figure 7: Cable interface

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VI. OPERATING CONDITIONS AND TRUTH TABLE

Operating conditions	Symbols	Min	Typ.	Max	Units
Supply voltage	VSS		-7.5		V
Supply current (@VSS=-7.5V)	ISS		10		mA
Control voltage High	(Vc1 to Vc6) High	2.0		5.0	V
Control voltage Low	(Vc1 to Vc6) Low	0.0		0.8	V

Figure 8: Operating conditions

Phase Shift (Degrees)	Vc1	Vc2	Vc3	Vc4	Vc5	Vc6
0	0	0	0	0	0	0
5.625	1	0	0	0	0	0
11.25	0	1	0	0	0	0
22.5	0	0	1	0	0	0
45	0	0	0	1	0	0
90	0	0	0	0	1	0
180	0	0	0	0	0	1
354.375	1	1	1	1	1	1

Figure 9: Logic truth table

VII. ABSOLUTE MAXIMUM RATINGS

Maximum ratings	Symbols	Min	Max	Units
Supply voltage	VSS	-15		V
Supply current	ISS		12	mA
CW Input Power	Pin		+30	dBm

Operation of this device above any of these parameters may cause permanent damages.

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