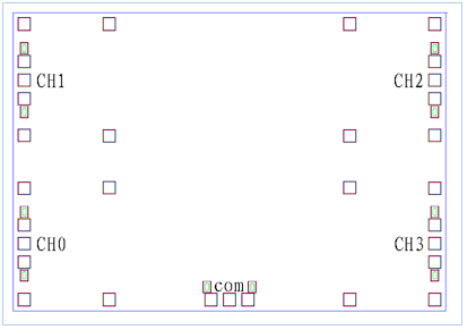
AMT1703A

4 Channel 33-37GHz Vector Modulation Chip



Key Features :

- Frequency range : 33 – 37GHz
- Type : single balanced
- Phase modulation range : 360°
- Amplitude modulation range : -30dB ~ -16dB
- Output standing wave : 1.3
- Input standing wave : 1.3
- Voltage bias : -1.5V ~ 0.5V
- Chip dimensions : 3.5mm x 2.4mm x 0.1mm
- Applications : wireless communication, transceiver module, radio telecommunication etc.

Description :

AMT1703A chip is a 4 channel outputs single balanced analog modulation device, it realizes signal amplitude and phase joint modulation. It is designed by Gallium Arsenide (GaAs) pHEMT process. This chip is designed with ground through metal vias on the back technology. All chip products p are 100% RF tested.

Absolute Maximum Ratings (Ta = 25°C)

Symbol	Parameter	Value	Remark
Vi, Vq	Control Voltage	0.6V/-5V	
Pin	Input Power	20dBm	
Tm	Sintering Temperature	310°C	30s, N_2 protection
Tstg	Storage Temperature	-65 ~ +150°C	

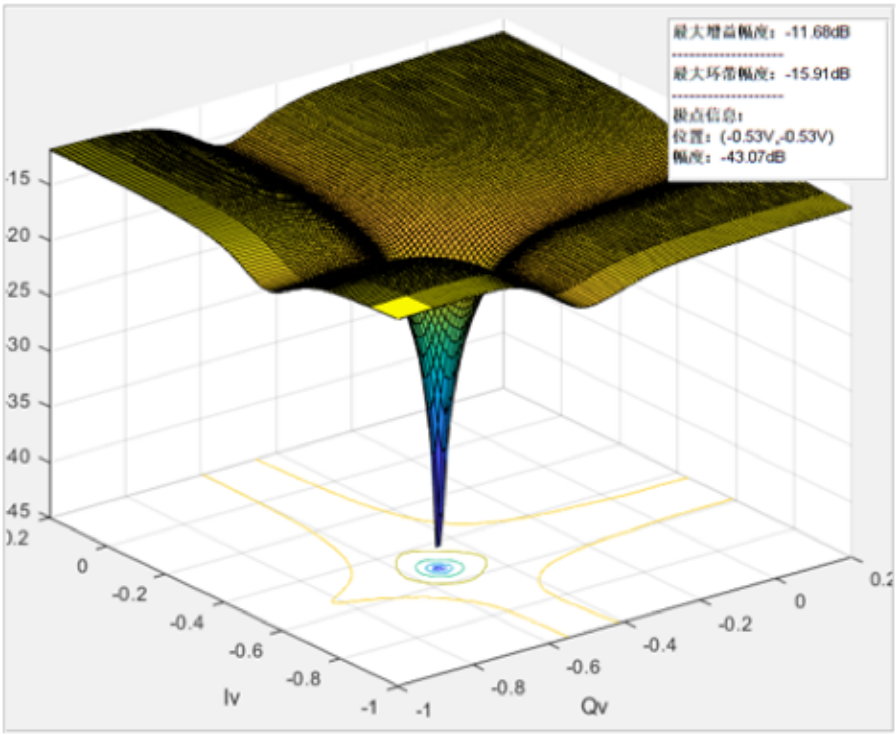
[1] Operation outside any of the Absolute Maximum Ratings may cause permanent device damage.

Electrical Characteristics (Ta = 25°C)

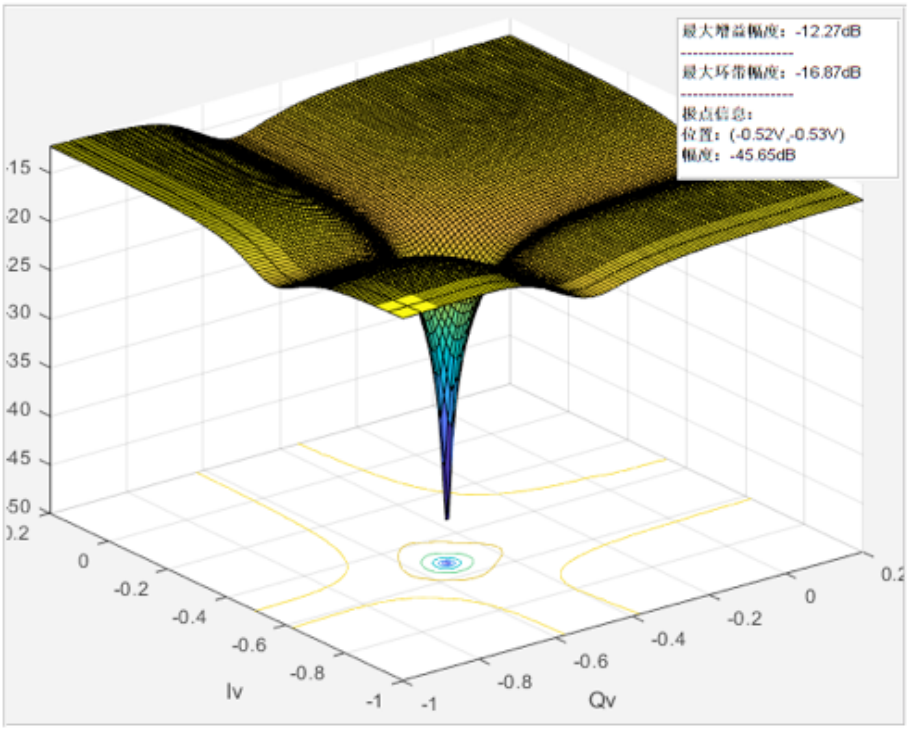
Symbol	Parameter	Test Conditions	Value			Unit
			Min	Typical	Max	
VSWRin	Input Standing Wave	F : 28 ~ 37GHz	-	1.3	1.6	-
VSWRout	Output Standing Wave		-	1.3	1.6	-
IL	Insertion Loss		-	13	15.5	dB

Typical Test Curve

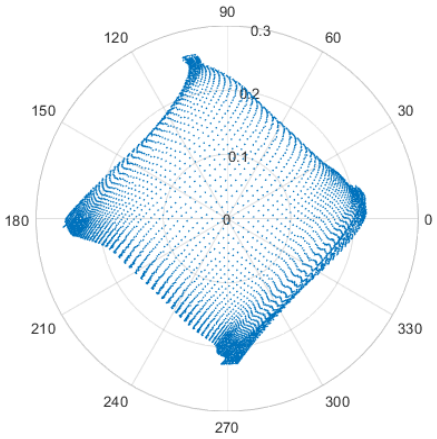
CH2 Amplitude Phase Modulation Curve (F = 35GHz)



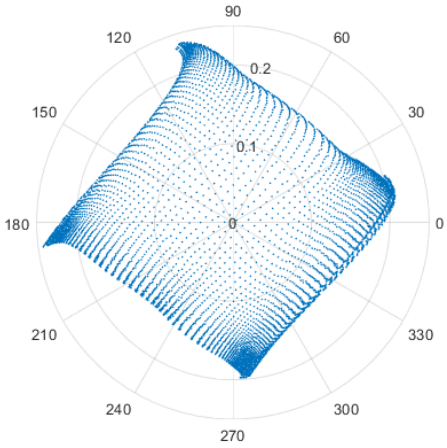
CH3 Amplitude Phase Modulation Curve (F = 35GHz)



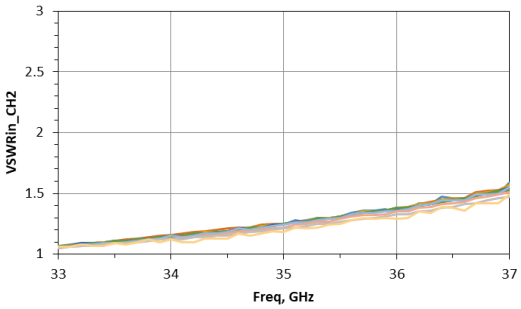
CH2 Constellation (F = 35GHz)



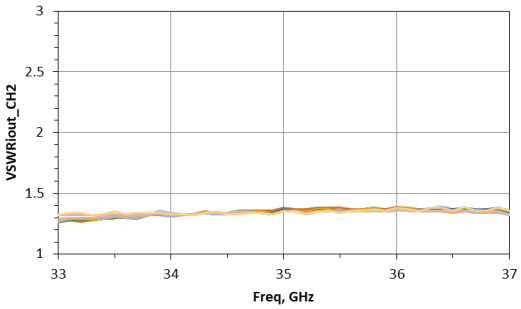
CH3 Constellation (F = 35GHz)



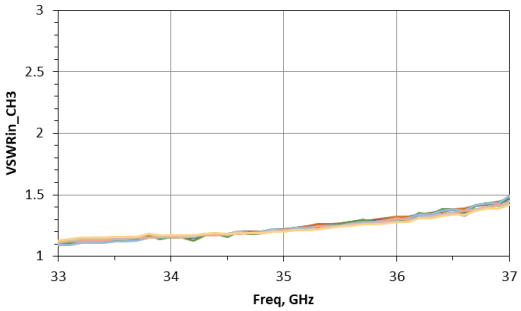
CH2 Input Standing Wave Curve



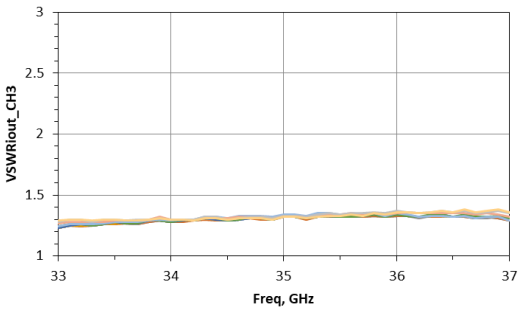
CH2 Output Standing Wave Curve



CH3 Input Standing Wave Curve

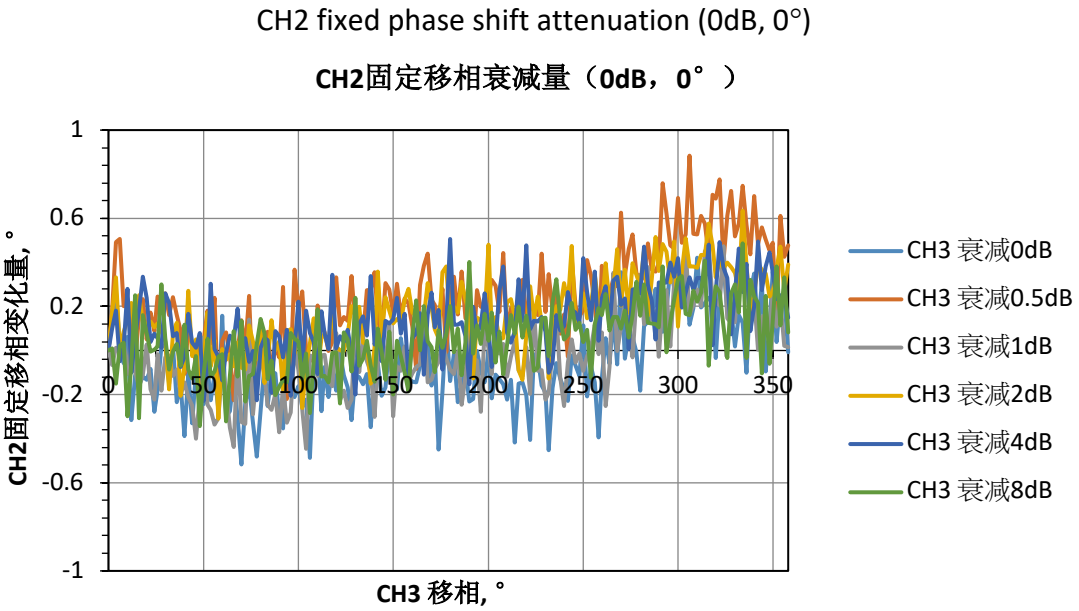


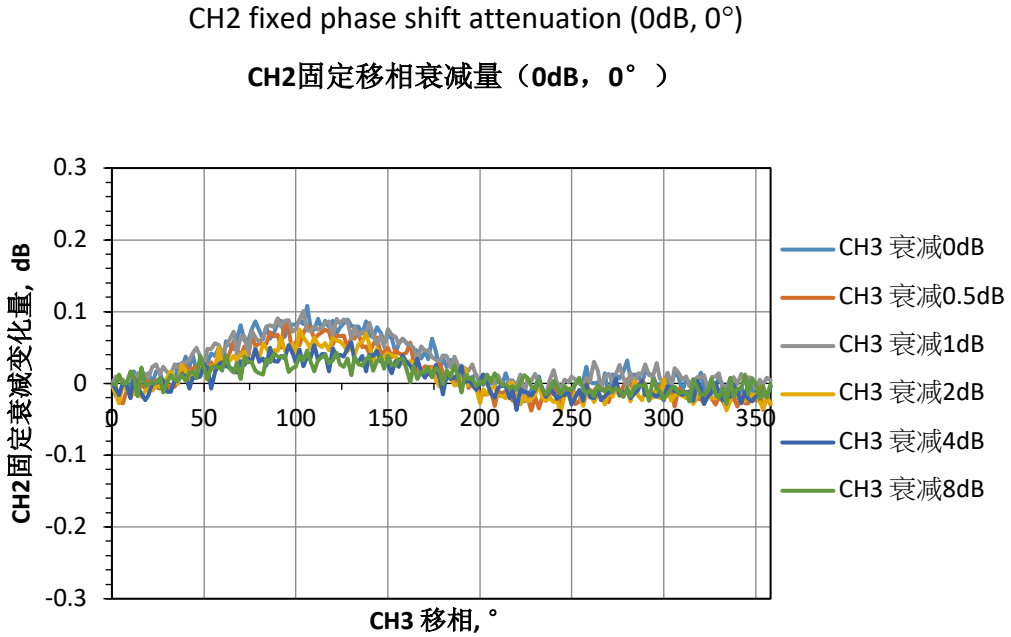
CH3 Output Standing Wave Curve

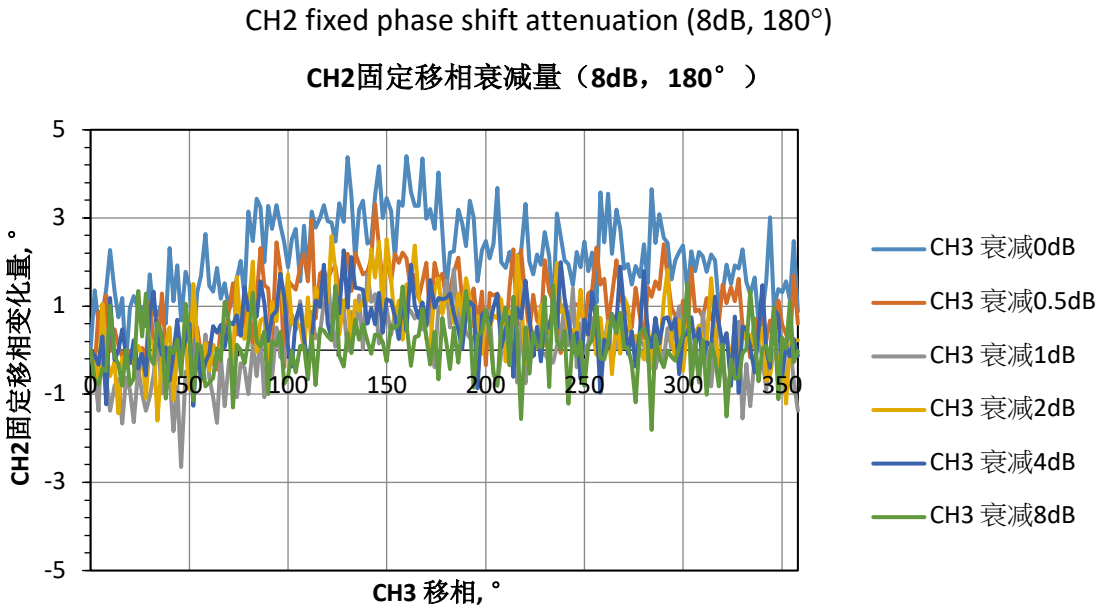


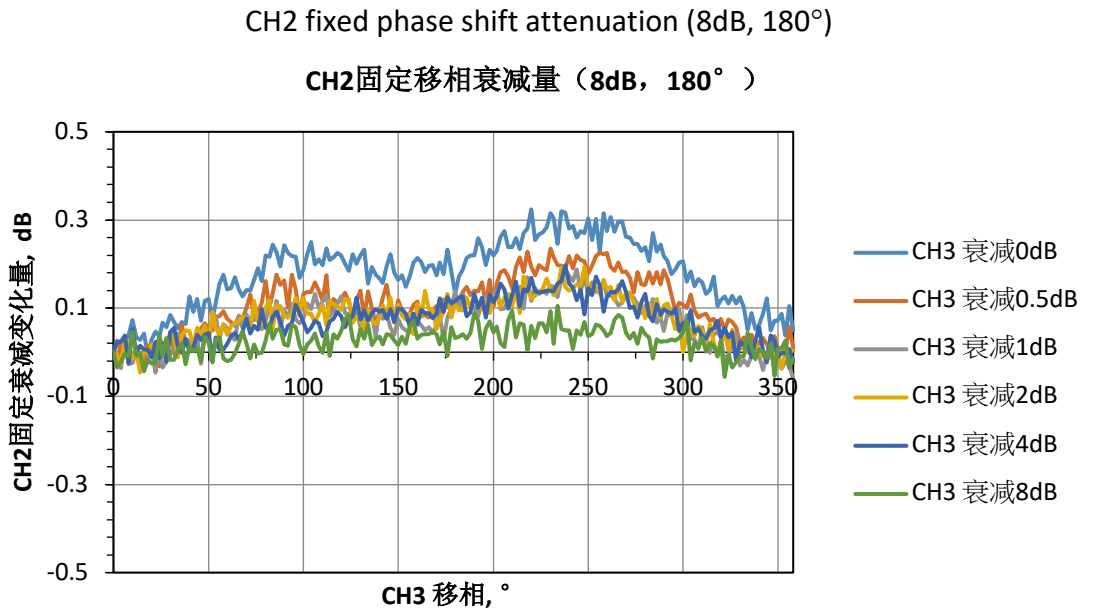
Adjacent Channel Coupling Effect

(1) Variation of CH2 fixed phase shift attenuation, when CH3 changes.

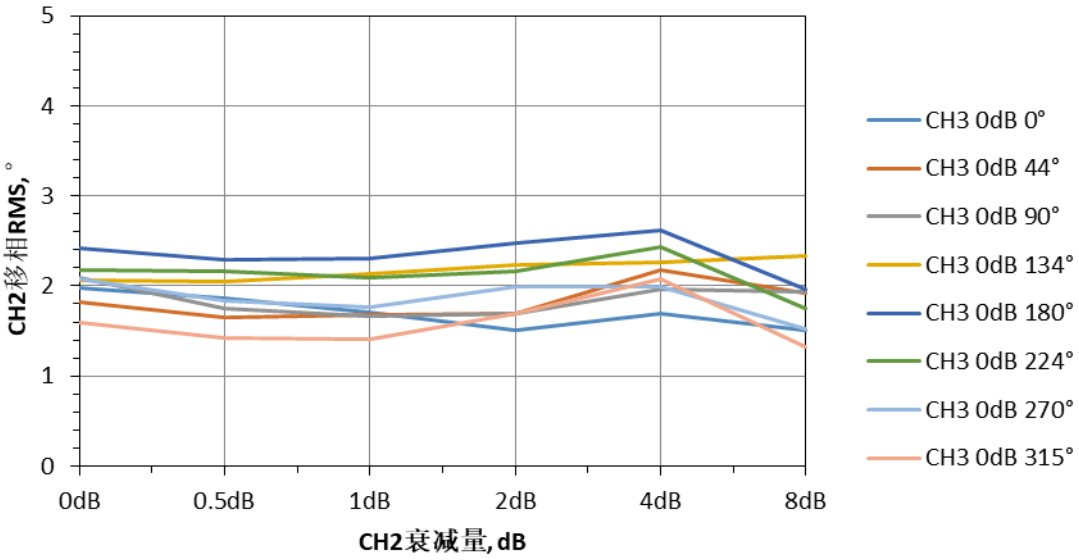




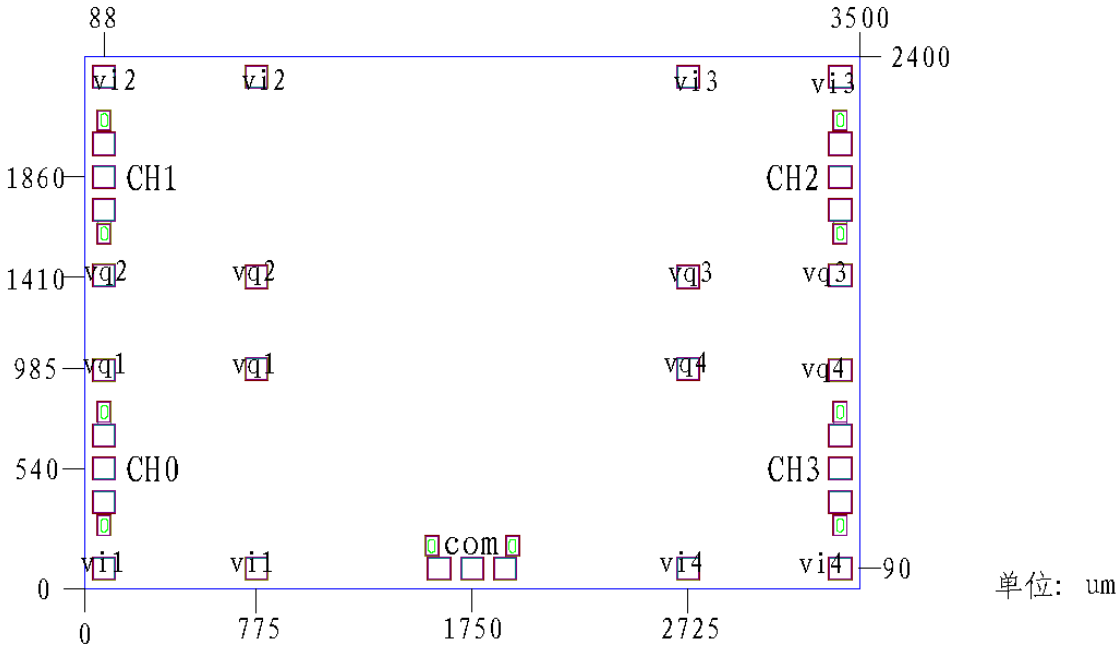




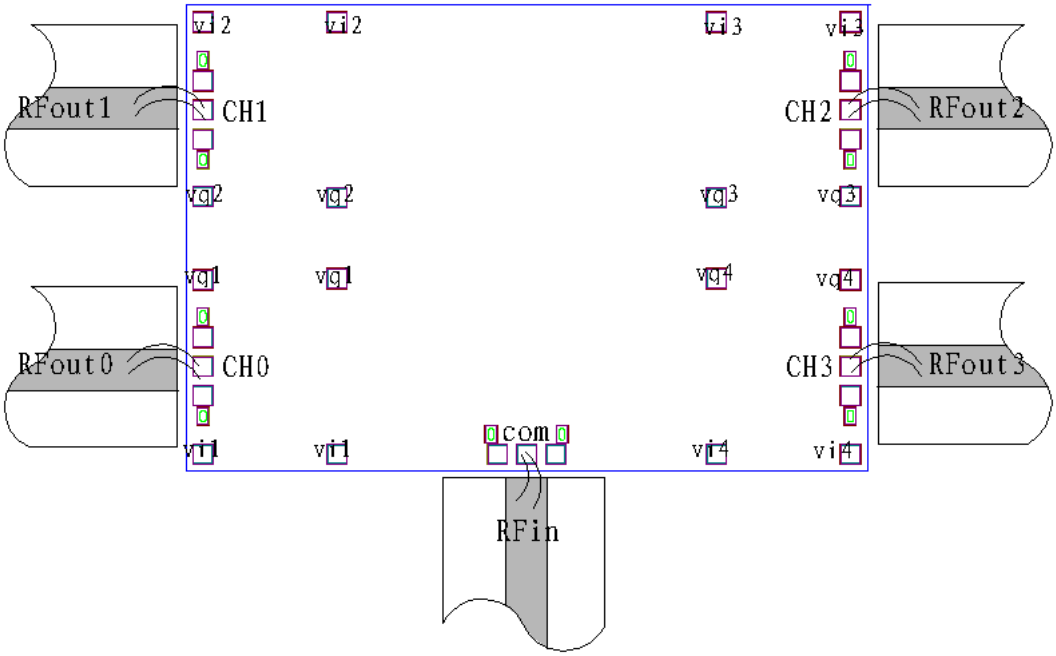
(2) Variation of phase shift RMS at different CH2 fixed attenuation, when CH3 changes.



Chip Dimensions (Unit : μm)



Chip Layout Diagram



Pad Definition

Symbol	Function	PAD dimension
RFin	RF signal input port, external connect to 50 Ω system, no DC blocking capacitor	100μm*100μm
RFout1/2/3	RF signal output port, external connect to 50 Ω system, no DC blocking capacitor	100μm*100μm
Vi1/Vq1	RFout0 control	100μm*100μm
Vi2/Vq2	RFout1 control	100μm*100μm
Vi3/Vq3	RFout2 control	100μm*100μm
Vi4/Vq4	RFout3 control	100μm*100μm

Please see Appendix A for details.