

**ANTENNA PRODUCTS**

**DATA SHEET**


**3216 Ceramic Chip Antenna  
for Bluetooth/WLAN Application**

July, 2009 V6

R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>	C.T.Lee Yageo Taiwan	Page 1	sheet 190-1 A4

## 3216 Ceramic Chip Antenna for Bluetooth/WLAN Application

### Quick Reference Data

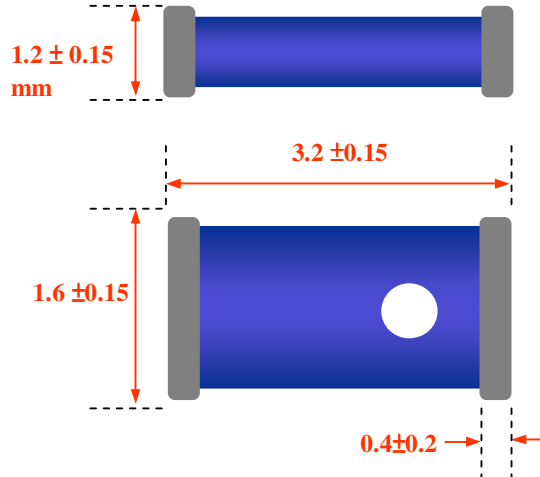
Centre Frequency	2.45 GHz*1	
Bandwidth	at least 100 MHz*2	
VSWR	2.5 (Max.)*2	
Polarization	Linear	
Azimuth Beamwidth	Omni-directional	
Peak Gain	5 dBi*2	
Impedance	50Ω	
Operating Temperature	-25~85 °C	
Termination	Ni / Sn (Environmentally-Friendly Leadless)	
Resistance to soldering heats	260°C , 10sec.	
Maximum Power	1W	

<sup>1</sup> All the technical data and information contained herein are subject to change without prior notice

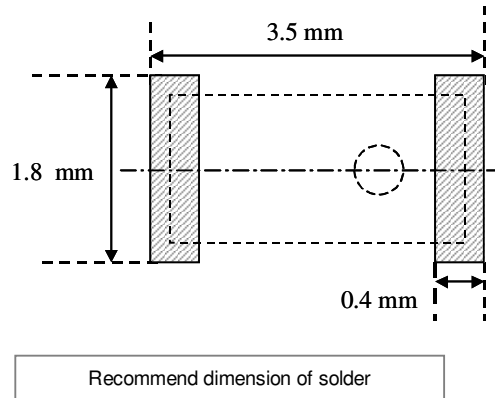
<sup>2</sup> Testing under evaluation board of page2

R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>	C.T.Lee Yageo Taiwan	Page 2	sheet 190-2     A4

### 1. Mechanical Data (3.2 x 1.6 x 1.2 mm<sup>3</sup>)

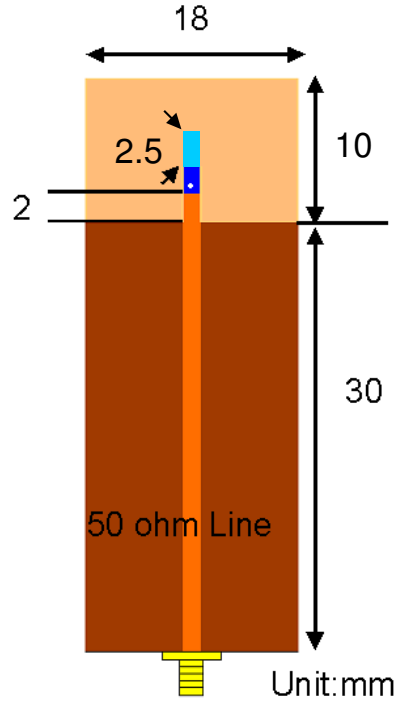


### 2. Dimension of Footprint



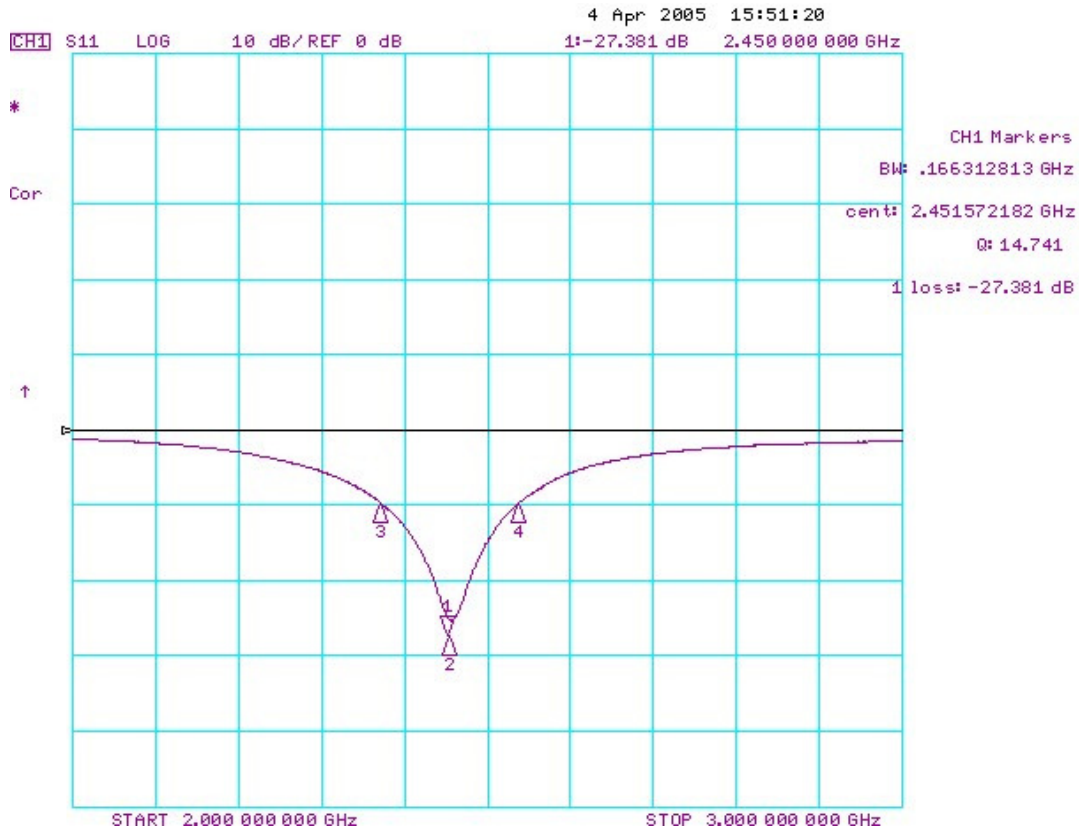
R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>		C.T.Lee Yageo Taiwan	Page 3
			A4

### 3. Dimension and Outlook of Evaluation Board



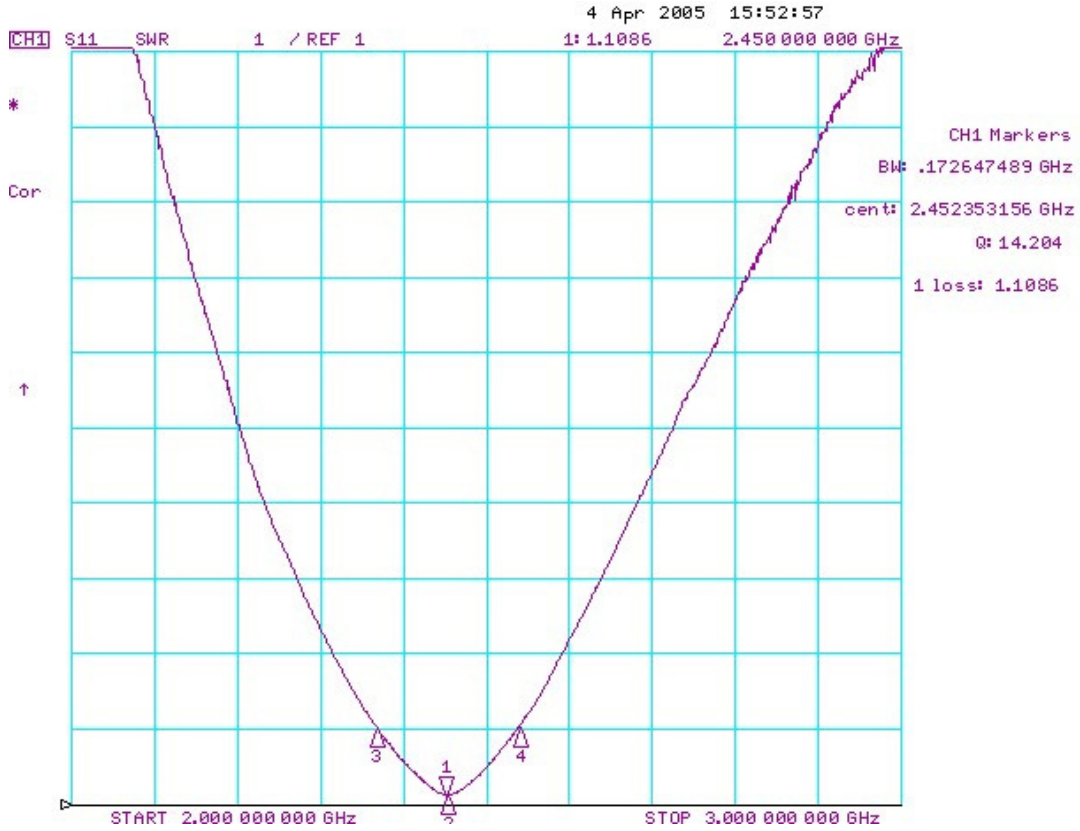
R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>	C.T.Lee Yageo Taiwan	Page 4	sheet 190-4      A4

### 4. Return Loss



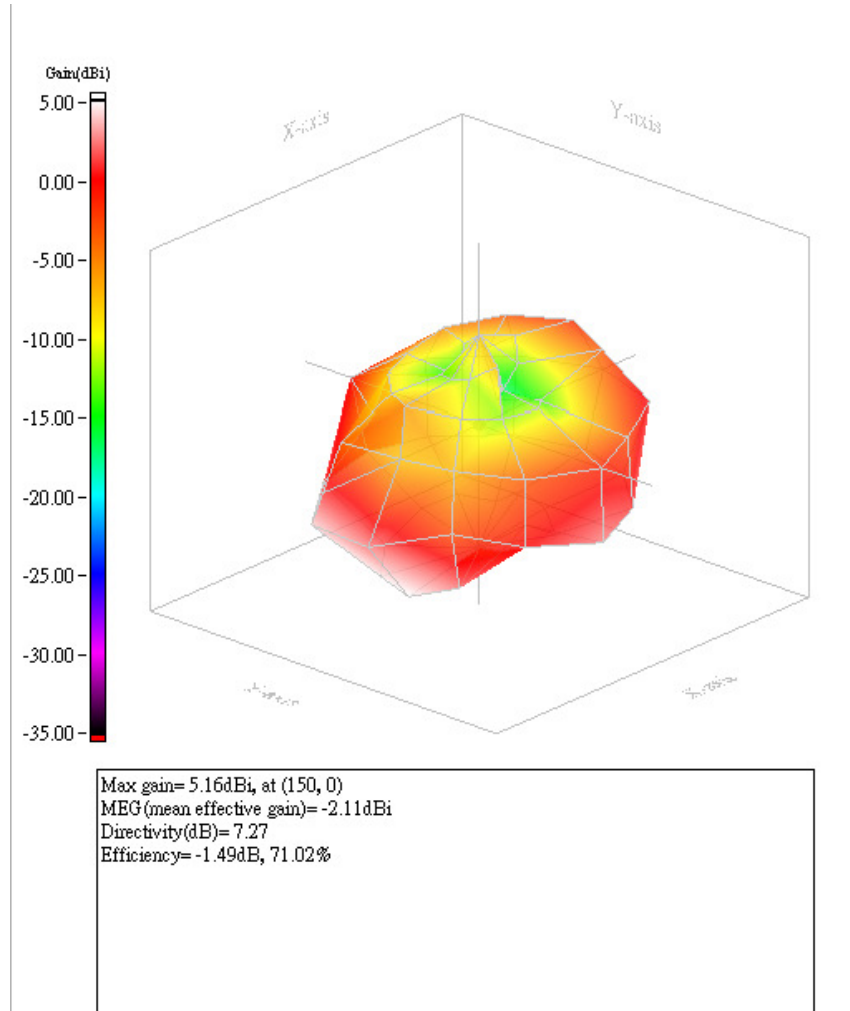
R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>		C.T.Lee Yageo Taiwan	Page 5

## 5. VSWR



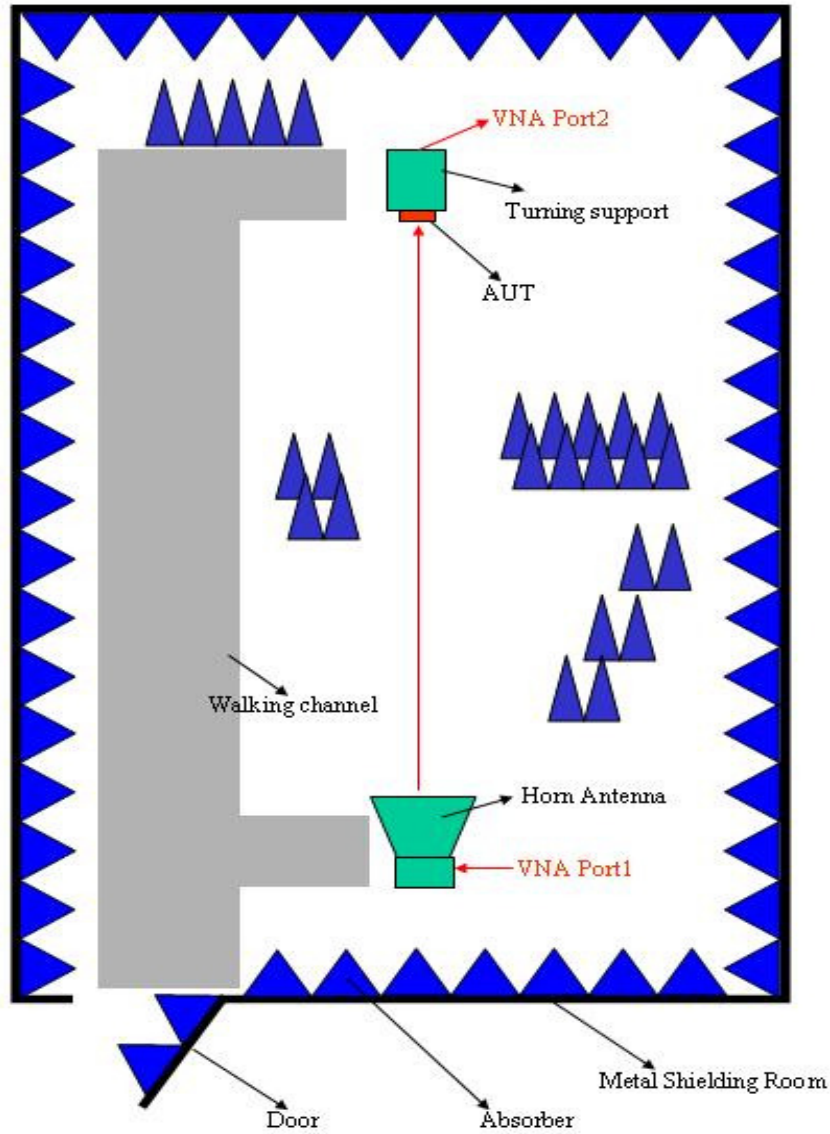
R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>		C.T.Lee Yageo Taiwan	Page 6
			A4

### 6. 3D Radiation Pattern (base on 40x18 mm demo board)



R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>		C.T.Lee Yageo Taiwan	Page 7
			A4

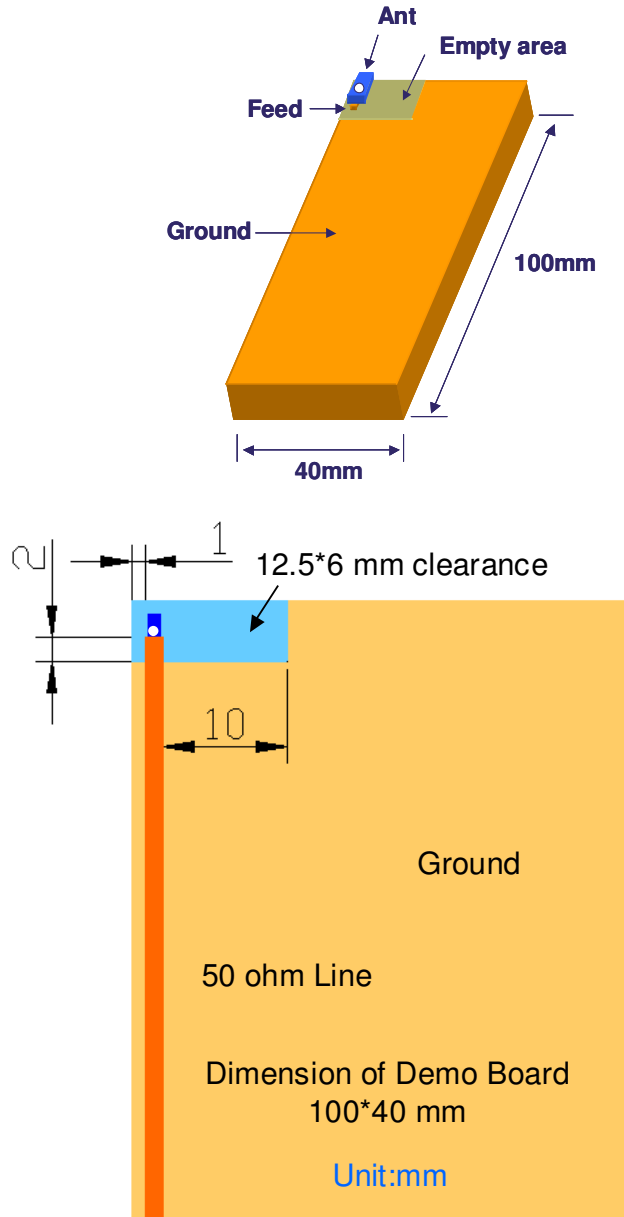
**7. The Environment of Antenna Radiation Pattern**  
**Anechoic Chamber Dimension=8(m) x 4(m) x 4(m)**



R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>		C.T.Lee Yageo Taiwan	Page 8

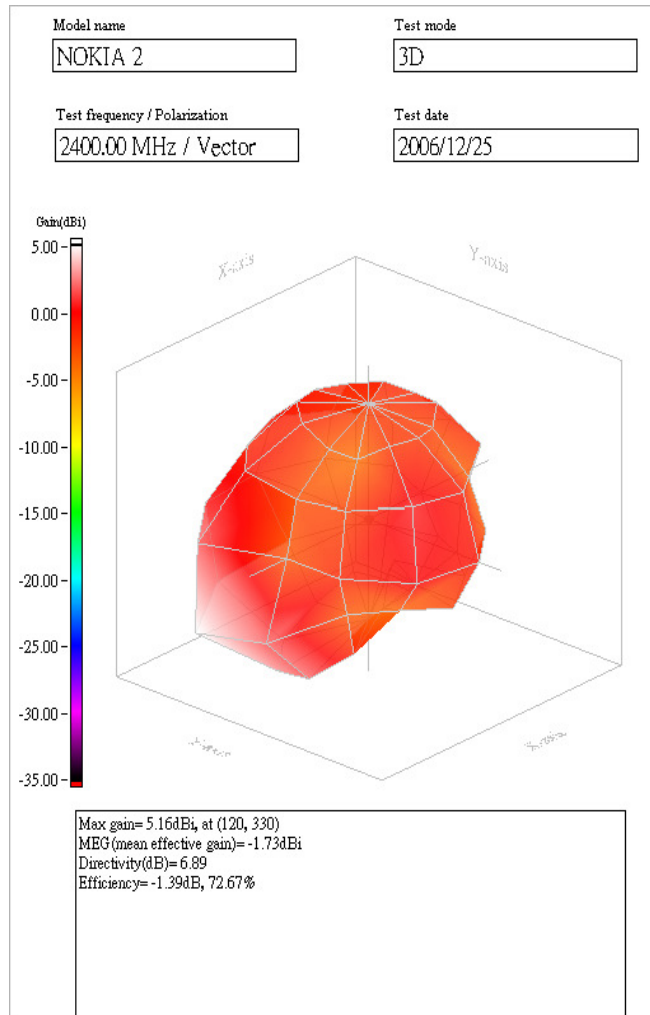


## 8. Layout Recommendation



R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>	C.T.Lee Yageo Taiwan	Page 9	sheet 190-9 A4

### 9. 3D Radiation Pattern (base on 100x40mm demo board)



R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>		C.T.Lee Yageo Taiwan	Page 10

## 10. Reliability

IEC 384-10/CECC 32 100 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.4		Mounting	The antenna can be mounted on printed-circuit boards or ceramic substrates by applying wave soldering, reflow soldering (including vapour phase soldering) or conductive adhesive	No visible damage
4.5		Visual inspection and dimension check	Any applicable method using x 10 magnification	In accordance with specification (chip off 4mm)
4.6.1		Antenna	Central Frequency at 20 °C	Standard test board in page 4
4.8		Adhesion	A force of 3 N applied for 10 s to the line joining the terminations and in a plane parallel to the substrate	No visible damage
4.9		Bond strength of plating on end face	Mounted in accordance with CECC 32 100, paragraph 4.4	No visible damage
			Conditions: bending 0.5 mm at a rate of 1mm/s, radius jig. 340 mm, 2mm warp on FR4 board of 90 mm length	No visible damage
4.10	20(Tb)	Resistance to soldering heat	260 ± 5 °C for 10 ± 0.5 s in a static solder bath	The terminations shall be well tinned after recovery and Central Freq. Change ± 6%
		Resistance to leaching	260 ± 5 °C for 30 ± 1 s in a static solder bath	Using visual enlargement of x 10, dissolution of the termination shall not exceed 10%

R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>	C.T.Lee Yageo Taiwan	Page 11	sheet 190-11 A4

IEC 384-10/ CECC 32 100 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.11	20(Ta)	Solderability	Zero hour test, and test after storage (20 to 24 months) in original atmosphere; un-mounted chips completely immersed for $2 \pm 0.5$ s in $235 \pm 5^\circ\text{C}$ .	The termination must be well tinned, at least 75% is well tinned at termination
4.12	4(Na)	Rapid change of temperature	$-25^\circ\text{C}$ (30 minutes) to $+85^\circ\text{C}$ (30 minutes); 100 cycles	No visible damage Central Freq. Change $\pm 6\%$
4.14	3(Ca)	Damp heat	$500 \pm 12$ hours at $60^\circ\text{C}$ ; 90 to 95 % RH	No visible damage 2 hours recovery Central Freq. Change $\pm 6\%$
4.15		Endurance	$500 \pm 12$ hours at $85^\circ\text{C}$ ;	No visible damage 2 hours recovery Central Freq. Change $\pm 6\%$

R&D	Print date 10/12/08	<b>CAN4311 712 00 2453K</b> <b>CAN4311 712 02 2453K</b> <b>CAN4311 712 03 2453K</b> <b>CAN4311 712 04 2453K</b> <b>CAN4311 712 05 2453K</b> <b>CAN4311 712 06 2453K</b> <b>CAN4311 712 07 2453K</b> <b>CAN4311 712 08 2453K</b> <b>CAN4311 712 09 2453K</b>	V4, Mar,2007	
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007	
			V6, Jul, 2009	
<b>Justin Liu</b>	C.T.Lee	Page 12	sheet 190-12	A4
	Yageo Taiwan			

## 11. Ordering Information

The antennas may be ordered by using the Yageo ordering code. These code numbers can be determined by the following rules:

### CAN43 11 7 12 00 245 3K

Family Code

**CAN 43** = Yageo Part No. for Antenna

Packing Type Code

**11** = 180 mm/ 7" reel , blister taping

Materials Code

**7** = High Frequency Material

Size Code

**11** = 3.2 \* 2.5

**12** = 3.2 \* 1.6

**13** = 2.5 \* 2.0

**14** = 2.0 \* 1.2

**15** = 1.6 \* 0.8

Antenna type

**00** = normal type

**02** = Type 2

**03** = Type 3

**04** = Type 4

**05** = Type 5

**06** = Type 6

**07** = Type 7

**08** = Type 8

**09** = Type 9

Working Frequency

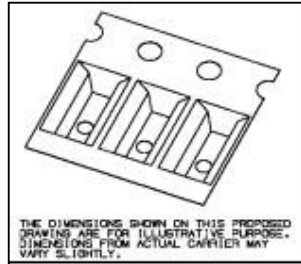
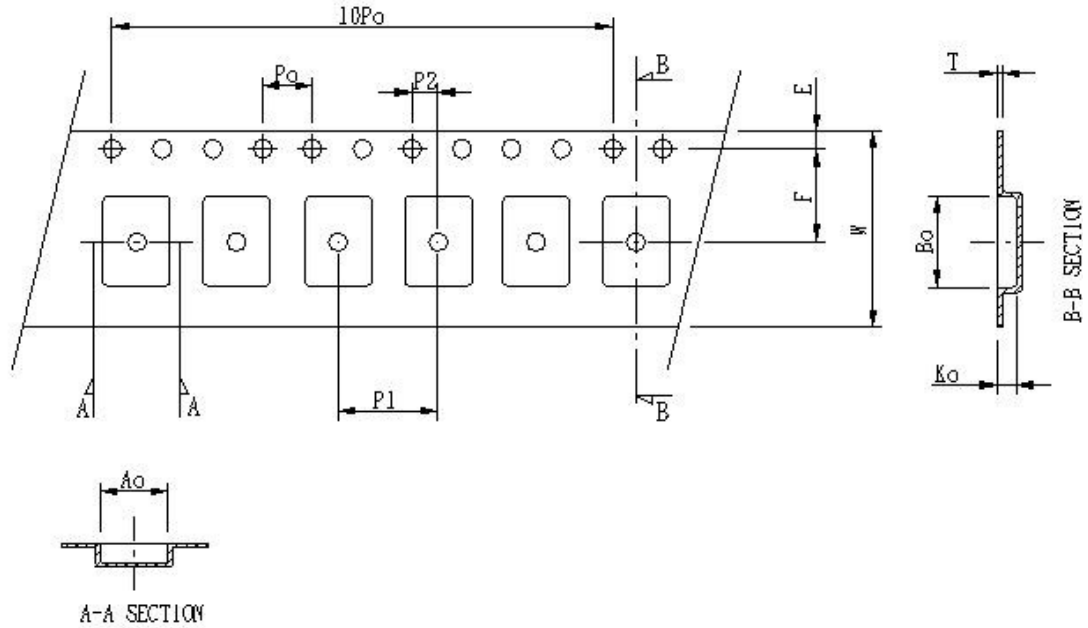
**245** = 2.45 GHz

Packing Type Code

**3K** = 3000 pcs for taping per reel

R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>	C.T.Lee Yageo Taiwan	Page 13	sheet 190-13 A4

## 12. Taping Blister Tape

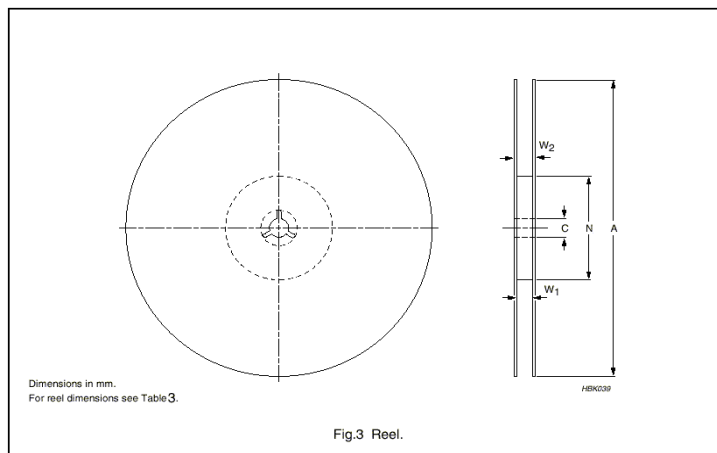


R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>	C.T.Lee Yageo Taiwan	Page 14	sheet 190-14 A4

**Dimension of tape :**

Serial no	Checking note	Index	Spec(mm)
1	Sprocket hole	Do	1.50±0.10
2	Pocket hole	D1	1.0±0.05
3	Distance sprocket hole/sprocket hole	Po	4.0±0.10
4	Distance pocket/pocket	P1	4.0±0.10
5	Distance sprocket hole/pocket	P2	2.0±0.05
6	Tape width	W	12.0±0.30
7	Distance sprocket hole/outside	E	1.75±0.10
8	Distance sprocket hole/pocket	F	5.50±0.05
9	Pocket length	Ao	1.47±0.20
10	Pocket length	Bo	3.4±0.20
11	Pocket depth	Ko	1.8±0.20
12	Thickness of tape	T	0.279±0.02
13	10x sprocket hole pitch	10Po	40.0±0.20

**Specifications of 7"(180mm) Reel**



Tape Width (mm)	A (mm)	N (mm)	C (mm)	W1 (mm)	W2 max. (mm)
12	180	60±1	13 <sup>+0.5/-0.2</sup>	12.4 <sup>+2.0</sup>	18.4

R&D	Print date 10/12/08	CAN4311 712 00 2453K CAN4311 712 02 2453K CAN4311 712 03 2453K CAN4311 712 04 2453K CAN4311 712 05 2453K CAN4311 712 06 2453K CAN4311 712 07 2453K CAN4311 712 08 2453K CAN4311 712 09 2453K	V4, Mar,2007
	<b>3216 Ceramic Chip Antenna for Bluetooth/WLAN Application</b>		V5, Jul, 2007
			V6, Jul, 2009
<b>Justin Liu</b>		C.T.Lee Yageo Taiwan	Page 15

**13. Revision Control:**

Revision	Date	Content	Remark
V1	4 <sup>th</sup> , April, 2005	New Issued	
V2	April, 2006	Add taping description	
V3	July, 2006	Modify the format of part nr.	
V4	March, 2007	Add the 3D radiation pattern	
V5	7 <sup>th</sup> , July, 2007	Modify the dimension of the product and footprint	
V6	21 <sup>st</sup> , July, 2009	Modify the dimension of the product and add tolerance	

R&D	Print date 10/12/08	<b>CAN4311 712 00 2453K</b> <b>CAN4311 712 02 2453K</b> <b>CAN4311 712 03 2453K</b> <b>CAN4311 712 04 2453K</b> <b>CAN4311 712 05 2453K</b> <b>CAN4311 712 06 2453K</b> <b>CAN4311 712 07 2453K</b> <b>CAN4311 712 08 2453K</b> <b>CAN4311 712 09 2453K</b>	V4, Mar,2007	
	<b>3216 Ceramic Chip Antenna</b> <b>for Bluetooth/WLAN</b> <b>Application</b>		V5, Jul, 2007	
			V6, Jul, 2009	
<b>Justin Liu</b>	C.T.Lee	Page 16	sheet 190-16	A4
	Yageo Taiwan			