**ANTENNA PRODUCTS**

# DATA SHEET

# 3216 Ceramic Chip Antenna for Bluetooth/WLAN Application

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R&D | Print date 05/09/06 | | | | | | | |
| | **3216 Ceramic Chip Antenna for Bluetooth/WLAN Application** | | | **CAN4311712002453K** | | | 2005.4.4 | |
| Mars Liu | C.T.Lee | | | Page 1 | sheet 190-1 | | | A4 |
| spec.doc | Yageo Taiwan | | | | | | | |

# 3216 Ceramic Chip Antenna for Bluetooth/WLAN Application

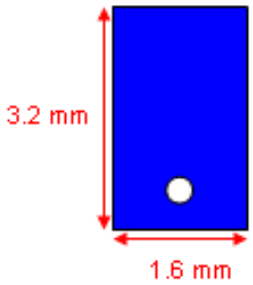
**Preliminary Product Specification**

## 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 | 3.1 dBi*[2] |
| Impedance | 50Ω |
| Operating Temperature | -25~85 $^{o}$C |
| Termination | Ni / Sn (Environmentally-Friendly Leadless) |
| Resistance to soldering heats | 260℃ , 10sec. |
| Maximum Power | 1W |

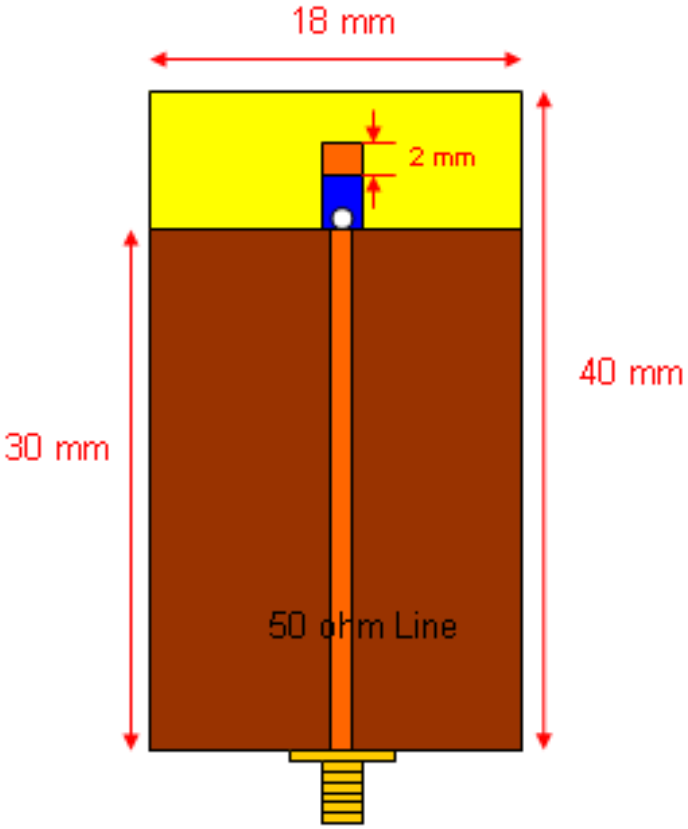
[1] All the technical data and information contained herein are subject to change without prior notice
[2] Testing under evaluation board of page2

## 1. Mechanical Data (3.2 x 1.6 x 1.2 mm³)



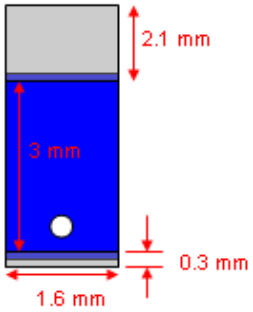

**Unit: mm**

## 2. Evaluation Board Dimension and Outlook



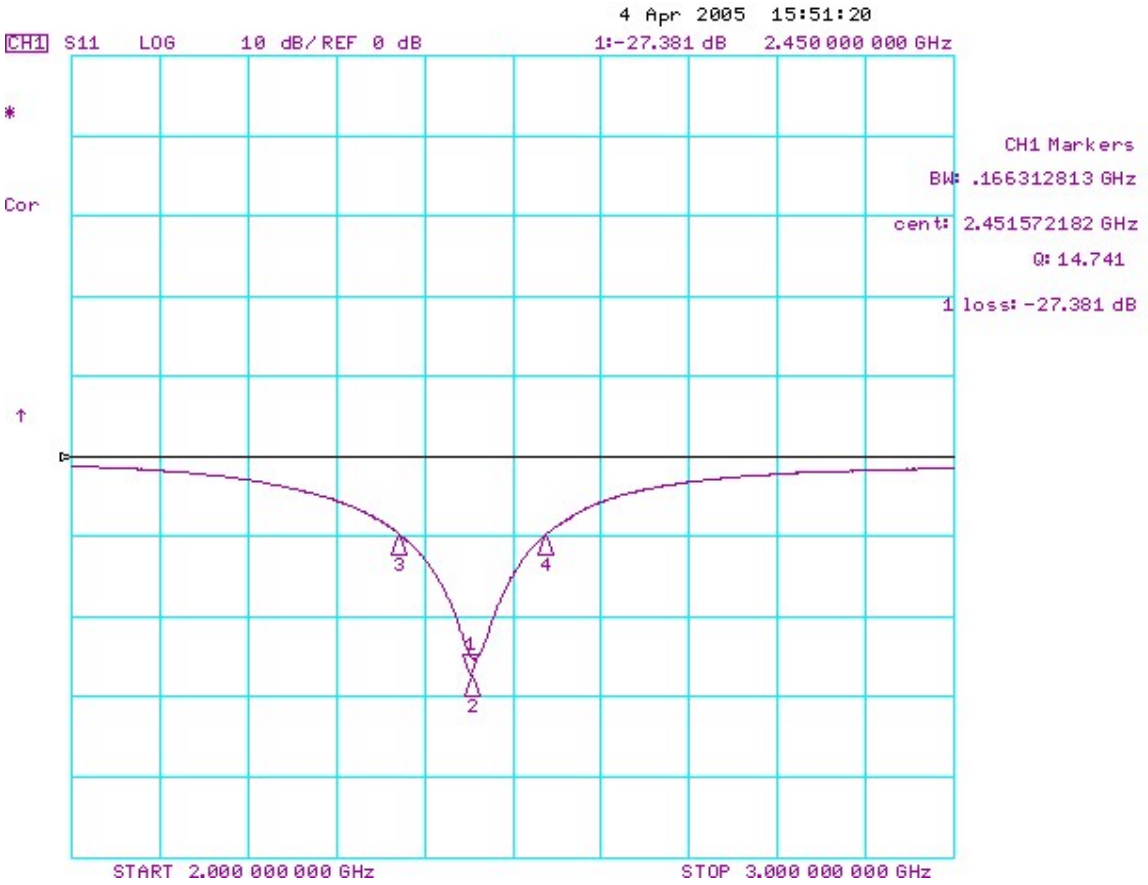

**Unit: mm**

## 3. Soldering Pads Dimension

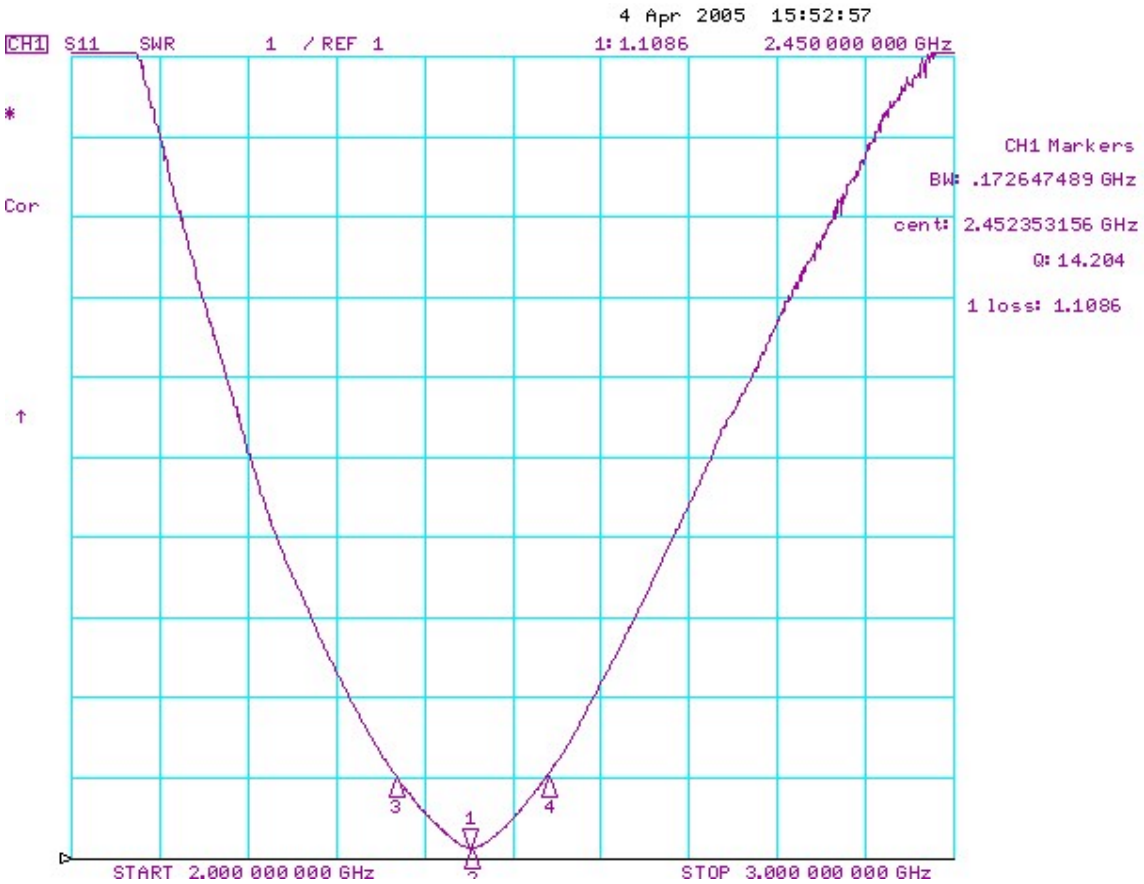



**Unit: mm**

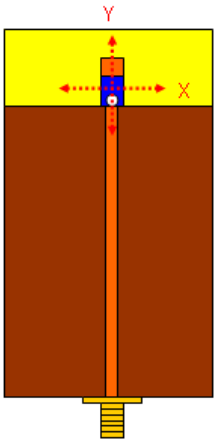
## 4. Return Loss

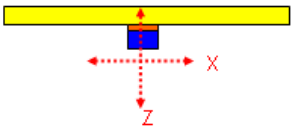


## 5. VSWR

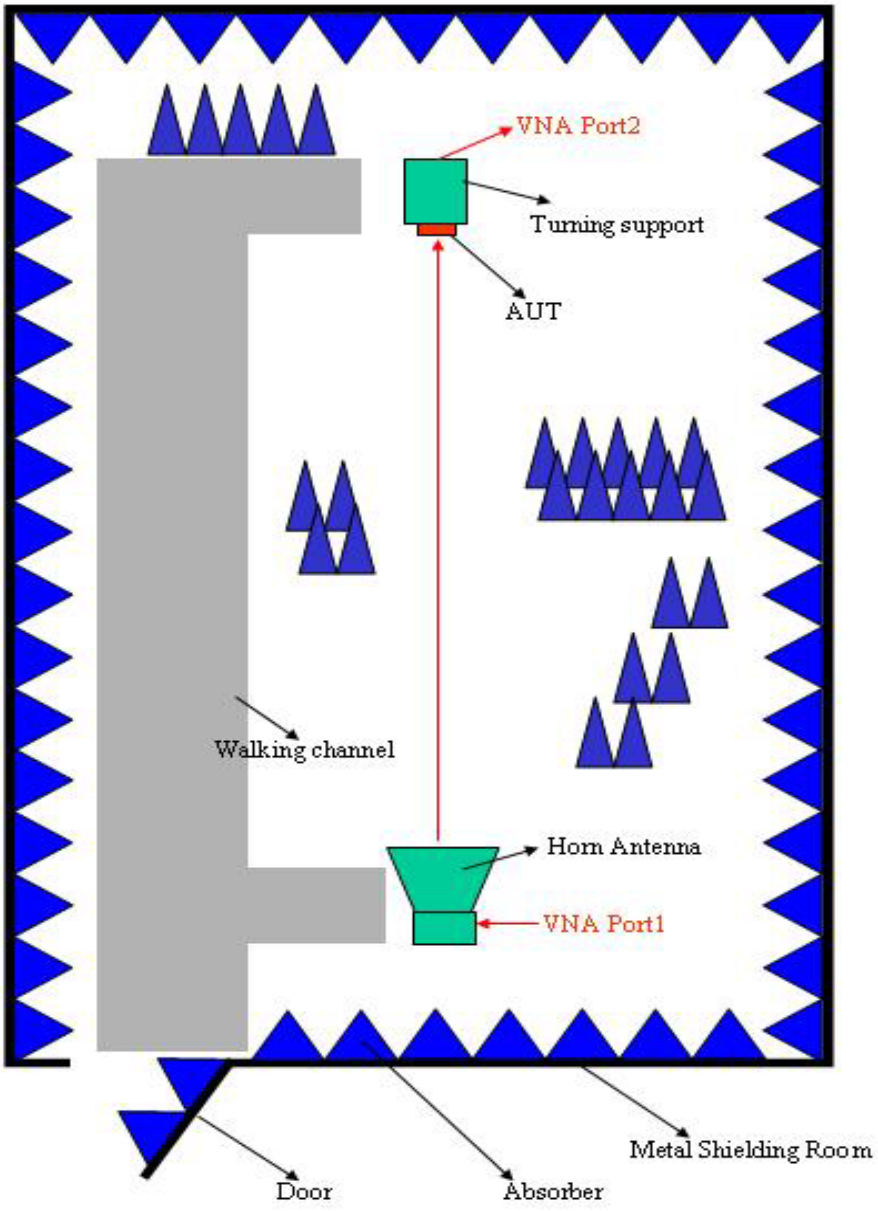

4 Apr 2005 15:52:57
CH1 S11 SWR 1 / REF 1
1: 1.1086
2.450 000 000 GHz
CH1 Markers
BW: .172647489 GHz
cent: 2.452353156 GHz
Q: 14.204
1 loss: 1.1086
Cor
START 2.000 000 000 GHz
STOP 3.000 000 000 GHz

## 6. The Definition of X-Y-Z Plane and Angle



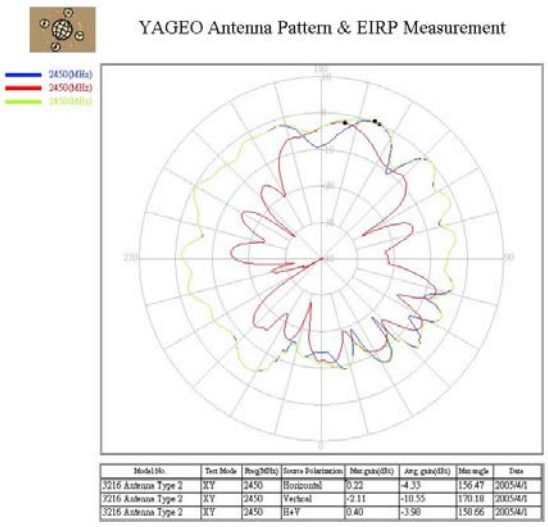




## 7. The Environment of Antenna Radiation Pattern
## Anechoic Chamber Dimension=8(m) × 4(m) × 4(m)

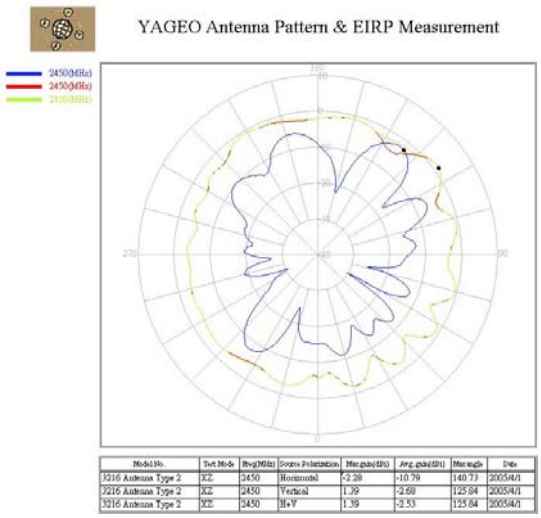


## 8. Radiation Pattern

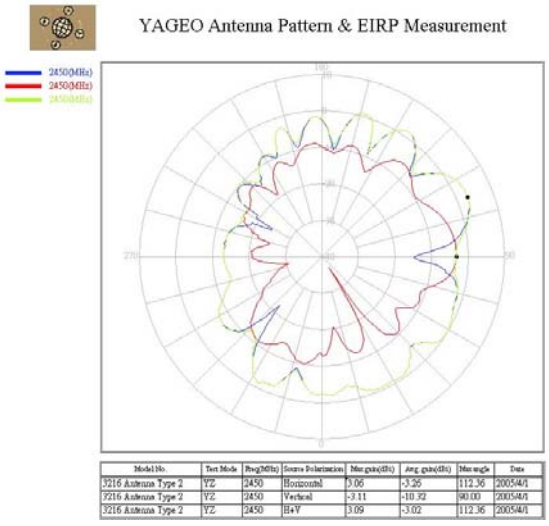
### 2450 MHz




| Model No. | Test Mode | Freq(MHz) | Source Polarization | Max.gain(dBi) | Avg.gain(dBi) | Max.angle | Date |
|---|---|---|---|---|---|---|---|
| 3216 Antenna Type 2 | XY | 2450 | Horizontal | 0.22 | -4.33 | 156.47 | 2005/4/1 |
| 3216 Antenna Type 2 | XY | 2450 | Vertical | -2.11 | -10.55 | 170.18 | 2005/4/1 |
| 3216 Antenna Type 2 | XY | 2450 | H+V | 0.40 | -3.98 | 158.66 | 2005/4/1 |




| Model No. | Test Mode | Freq(MHz) | Source Polarization | Max.gain(dBi) | Avg.gain(dBi) | Max.angle | Date |
|---|---|---|---|---|---|---|---|
| 3216 Antenna Type 2 | XZ | 2450 | Horizontal | -2.28 | -10.79 | 140.73 | 2005/4/1 |
| 3216 Antenna Type 2 | XZ | 2450 | Vertical | 1.39 | -2.68 | 125.84 | 2005/4/1 |
| 3216 Antenna Type 2 | XZ | 2450 | H+V | 1.39 | -2.53 | 125.84 | 2005/4/1 |




| Model No. | Test Mode | Freq(MHz) | Source Polarization | Max.gain(dBi) | Avg.gain(dBi) | Max.angle | Date |
|---|---|---|---|---|---|---|---|
| 3216 Antenna Type 2 | YZ | 2450 | Horizontal | 3.06 | -3.26 | 112.36 | 2005/4/1 |
| 3216 Antenna Type 2 | YZ | 2450 | Vertical | -3.11 | -10.32 | 90.00 | 2005/4/1 |
| 3216 Antenna Type 2 | YZ | 2450 | H+V | 3.09 | -3.02 | 112.36 | 2005/4/1 |

| 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 × 10 magnification | In accordance with specification (chip off 4mm) |
| 4.6.1 | | Antenna | Central Frequency at 20 $^{o}$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 × 10, dissolution of the termination shall not exceed 10% |

| 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 ± 0.5 s in 235 ± 5°C. | The termination must be well tinned, at least 75% is well tinned at termination |
| 4.12 | 4(Na) | Rapid change of temperature | -25 °C (30 minutes) to +85 °C (30 minutes); 100 cycles | No visible damage<br>Central Freq. Change ± 6% |
| 4.14 | 3(Ca) | Damp heat | 500 ± 12 hours at 60 °C;<br>90 to 95 % RH | No visible damage<br>2 hours recovery<br>Central Freq. Change ± 6% |
| 4.15 | | Endurance | 500 ± 12 hours at 85 °C; | No visible damage<br>2 hours recovery<br>Central Freq. Change ± 6% |

## Ordering Information

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

**CAN 43 11 7 12 00 245 3K**

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

Family Code
**43** = 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
Tolerance
**00** = at least 200 MHz Impedance Bandwidth
Working Frequency
**245 =** 2.45 GHz
Packing Type Code
**3K =** 3000 pcs for tape

| CAN4311712002453K (Clear Text Code Example) | | | | | | |
|---|---|---|---|---|---|---|
| CAN43 | 11 | 7 | 12 | 00 | 245 | 3K |
| Product | Pacing tape code | Material Code | Size | Tolerance | Working frequency | Packing |
| CAN= Ceramic Antenna | **11** = 180 mm/ 7" blister | **7**= High frequency material | 3.2*1.6 mm | At least 200MHz Impendence Bandwidth | 245 = 2.45GHz | 3= 3 Kpcs<br><br>K=7" plastic<br>F =13" plastic<br>B = Bulk |

# Taping Blister Tape

**DIMENSION:**

| 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 |

## 7”(180mm) Reel Specifications

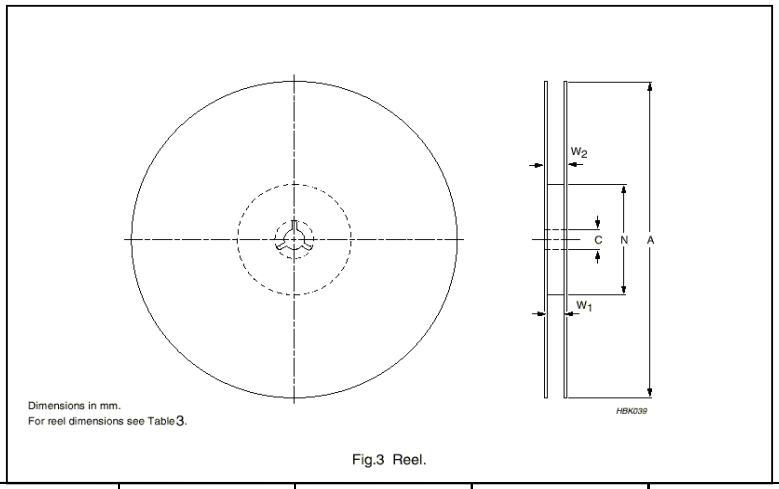



Fig.3 Reel.

| TAPE WEITH (mm) | A (mm) | N (mm) | C (mm) | $W_1$ (mm) | $W_2$ MAX. (mm) |
|---|---|---|---|---|---|
| 12 | 180 | 60±1 | $13^{+0.50}/_{-0.20}$ | $12.4^{+2.0}/_{-0.0}$ | 18.4 |

## Revision Control:

| Revision | Date | Content | Remark |
|---|---|---|---|
| | 4th, April, 2005 | New Issued | |
| | | | |