Antenna Gain (Peak Value)

	Extended (Whip)	Retracted (Helical)
CDMA	1.5	0.7

(Unit:dBd)

Antenna Specifications

Record table of revised edition

Name of Specification	MPA-0002SA-01 Specification of delivery	classification	Specification of delivery	1/6
		number of classified	CSA2792-022	

edition	Date	revised contents		Issue	Check	Approval	Copy of issue	Return of confirmation from customer	Approval of Qualification manager	
		revised point	page							
0		1st issue of specification	all				copy	copy		
		Item								
		Item								
		Item								
		Item								

1. General

This document is applied to supply retractive antenna for mobile telephone.

2. Product Name and No.

Item	Customer Name / No.	Tokin Name / No.
Name	Whip Antenna	
No.	1AV4L90B0610N	MPA-0002SA-01

3. Dimensions

Dimensions : Refer to mechanical envelope (Fig.1)
Refer to tray envelope (Fig.2)

4. Ability

4-1 Radiation power from bottom helical antenna is come out when whip antenna is retracted.

4-2 Radiation power from whip antenna and bottom helical antenna is come out when whip antenna is extended.

5. Electrical Characteristics

5-1 Resonant Frequency at Retracted Position
Resonant frequency is 920(f_o)±15MHz (300×300mm ground plane, using HP 8753D network analyzer or equivalent, measured by TOKIN), and VSWR is under 2.
Center frequency(f_o) is controlled by using standard sample.

5-2 Resonant Frequency at Extended Position
Resonant frequency is 755(f_o)±25MHz (300×300mm ground plane, using HP 8753D network analyzer or equivalent, measured by TOKIN), and VSWR is under 2.5.
Center frequency(f_o) is controlled by using standard sample.

5 3 Contact Resistance
Contact Resistance between holder and stopper is under 1Ω when whip antenna is extended.

6. Dimensions
The dimensions conform to fig.1(No.5850-A261-002). The antenna is no visual deterioration.
The screw of antenna holder is JIS M5-0.5 and is passed inspection of JIS-class 2.

7. Mechanical Characteristics

7-1 Retraction/Extension Force

The Antenna's are pushed down from their extended position or pulled up from their retracted position. Retraction/Extension force of stopper side shall be 2.45 to 3.92 N. Retraction/Extension force of dummy antenna side shall be 1.47 to 2.94 N.

7-2 Consistency of Retraction/Extension Force

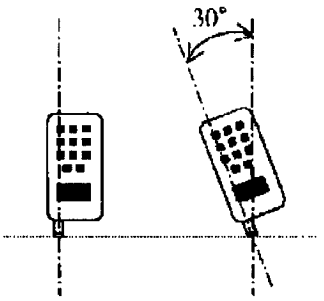
The Antenna are fully extended/retracted (1 cycle) with a speed of 30 cycles/min. These extension/retraction cycles are repeated for a total of 10000 cycles.
No Visual deterioration shall occur, and the retraction/extension force of stopper side must not be less than 1.47N, the retraction/extension force of dummy antenna side must not be less than 0.98N, after the test.
The Antenna's shall satisfy the electrical demand according to section 5-1.

7-3 Pull Test

The part of a screw of the Antenna shall be fixed downward on the test equipment in extended position. A static load of 98 N is applied to the top of the Antenna for 10 seconds.
The wire shall remain mechanically bonded, and the Antenna's shall satisfy the electrical demand according to section 5-1 and 7-1, after the test.

7-4 Drop Test

The Antenna's shall be assembled to the phone (or equivalent phone model) and Antenna shall be dropped a total of two times from a height of 1.5 meters above the ground, onto a surface of concrete.
The angle of impact for one of the drop shall be such that the helix axis is orthogonal to the impact surface (90°) for Antenna retracted position. For the other drops, the angle of impact shall be a 30° from vertical for Antenna retracted positions.
No Visual deterioration shall occur after the test. The Antenna's shall satisfy the electrical demands according to 5-1 and 7-1 after the test.



7-5 Torque Test

The Antenna's are assembled to the test equipment. A torque instrument is attached to the helical antenna. The Antenna's are exposed to torque of 44.1Ncm between fitting and plastic in clockwise direction.
No Visual deterioration shall occur, and the fitting and plastic shall occur, and the fitting and plastic shall remain mechanically bonded, after the test. The broken torque is 53.9 to 56.84 Ncm.

7-6 Vibration Test

The vibration is done in extended and retracted position. Tests shall be performed at ambient temperature and humidity. Test conditions shall be as specified below.

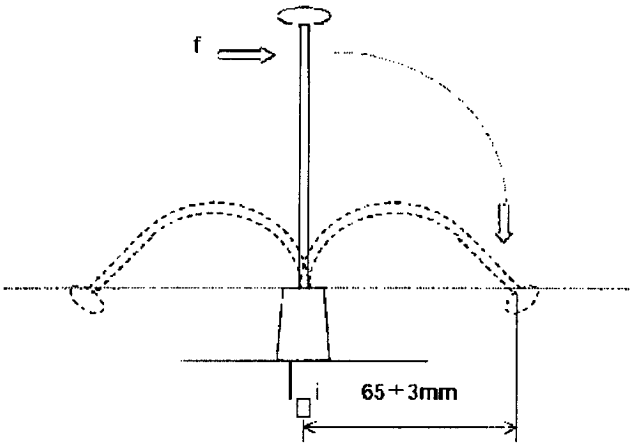
- 2G swept sine curve
- 10-150Hz
- swept for 20 minutes
- Test in three mutually perpendicular axes

No Visual deterioration shall occur after the test. The Antenna's shall satisfy the electrical demands according to 5-1 and 7-1 after the test.

7-7 Bending Test

The Antenna's are assembled to the test equipment in vertical extended position, according to Figure. The Antenna's are bent 90° left and 90° right (1 cycle) for 1000 cycles.

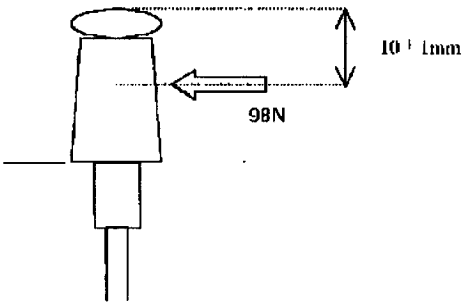
No Visual deterioration shall occur after the test. The Antenna's shall satisfy the electrical demands according to section 5-1 and 7-1 after the test.



7-8 Torque Test

The Antenna's are assembled to the test equipment in retracted position, according to Figure. A static load of 98 N is applied to the bottom of the Antenna for 10 seconds.

The bottom shall remain mechanically bonded, and the Antenna's shall satisfy the electrical demand according to section 5-1 and 7-1, after the test.



8. Mechanical Characteristics

8-1 Humidity Test

The Antenna's are placed in an environment chamber with a temperature of +40℃±2℃ and a humidity of 90–95%RH for 96 hours. The Antenna's are taken out from chamber, and are placed at room temperature and humidity for 1 hour.
No Visual deterioration shall occur after the test. The Antenna's shall satisfy the electrical demands according to section 5-1 and 7-1 after the test.
But, it is not permanent deformation when it can be modified easily by hands at the room temperature (+25℃+5℃).

8-2 High Temperature Test

The Antenna's are placed in an environment chamber at +80℃±2℃ for 96 hours. The Antenna's are taken out from chamber, and are placed at room temperature and humidity for 1 hour.
No Visual deterioration shall occur after the test. The Antenna's shall satisfy the electrical demands according to section 5-1 and 7-1 after the test.
But, it is not permanent deformation when it can be modified easily by hands at the room temperature (+25℃+5℃).

8-3 Low Temperature Test

The Antenna's are placed in an environment chamber at –40℃±3℃ for 96 hours. The Antenna's are taken out from chamber, and are placed at room temperature and humidity for 1 hour.
No Visual deterioration shall occur after the test. The Antenna's shall satisfy the electrical demands according to section 5-1 and 7-1 after the test.
But, it is not permanent deformation when it can be modified easily by hands at the room temperature (+25℃±5℃).

8-4 Temperature Cycle Test

The Antenna's are placed in an temperature cycling chamber at –40℃ for 1 hour. The temperature is increased to +85℃ during 1 hour and kept constantly +85℃ for 1 hour. The temperature is then decreased to –40℃ for 1 hour and kept constantly –40℃ for 1 hour. This procedure is repeated 10 times and ending at room temperature. The Antenna's are taken out from chamber, and are placed at room temperature and humidity for 2 hours.
No Visual deterioration shall occur after the test. The Antenna's shall satisfy the electrical demands according to section 5-1 and 7-1 after the test.
But, it is not permanent deformation when it can be modified easily by hands at the room temperature (+25℃±5℃).

8-5 Operational Temperature Test

The Antenna's are placed in an environment chamber at –30℃ for 1 hour. The Antenna's are taken out from chamber, and are placed at room temperature and humidity for 1 hour. The Antenna's are placed in an environment chamber at +60℃ for 1 hour. The Antenna's are taken out from chamber, and are placed at room temperature and humidity for 1 hour.
The Antenna's shall satisfy the electrical demands according to section 5-1 and 7-1 after the test.

9. Package and Label

The antennas is delivered by the way of packing in the following.

Item	Package	Label
Minimum Package	These 40 products are arranged in 1 tray, and it is made packing of protecting this as a minimum packing at the time of the conveyance, the storage and so on.	
Exterior	Put 1000 pieces in the exterior box as 1 package, and make 26 tray packing of protecting minimum packing at the time of the conveyance, the storage and so on. ※ Exterior box No.621	(1) Customer Name or No. (2) Tokin Name (No.) (3) Quantity (4) Lot No. (5) Inspection pass mark "Pass"

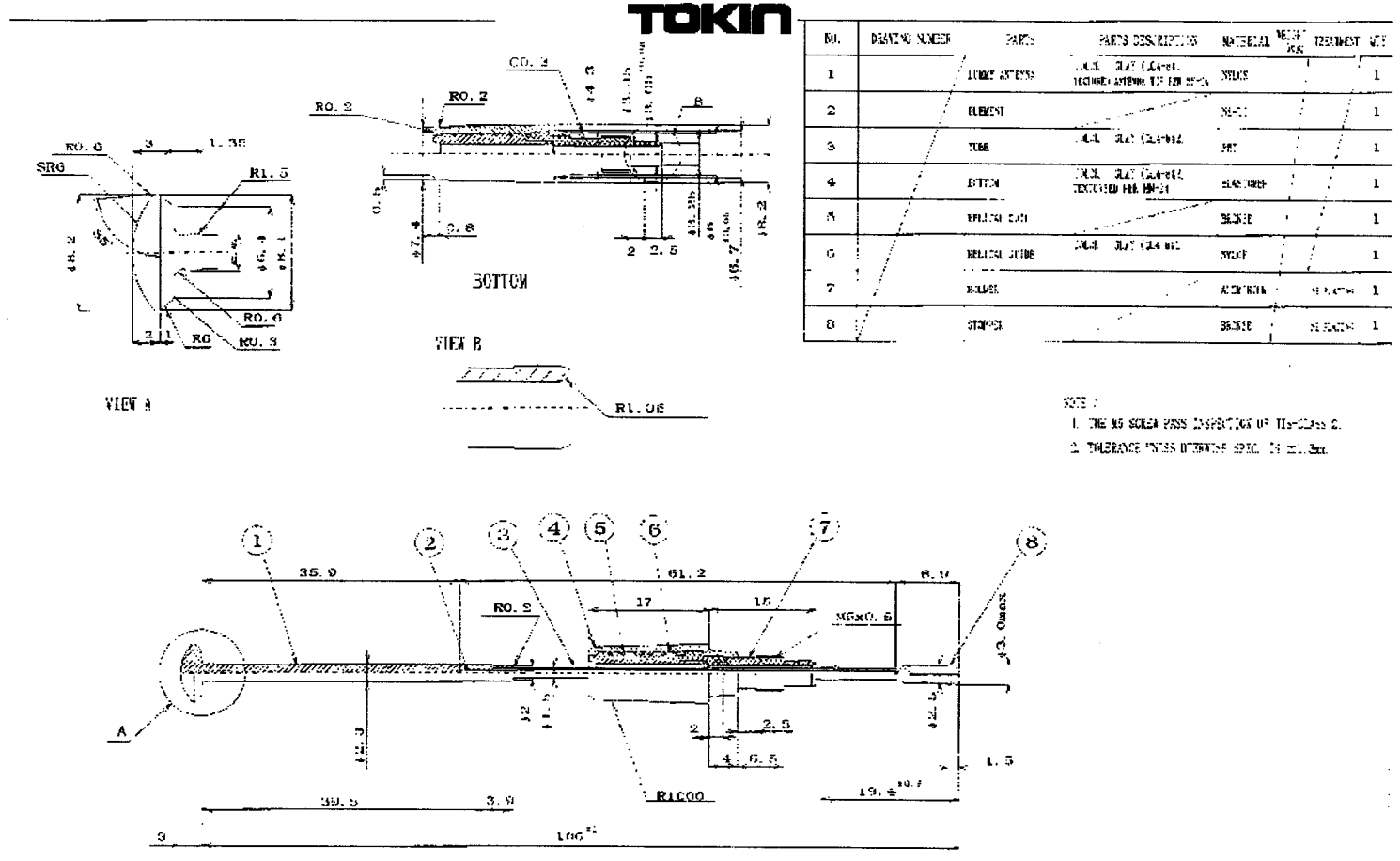
※When order quantity is under the exterior packing unit, the antennas shall be delivered to reduce buffer material not to give the packing and this product a hindrance due to the deficiency.

10. Inspection Data Sheet

The inspection is done on dimensions, visualization, electrical characteristics and retraction /extension force.

The number of inspection samples is JISZ-9015 I :AQL1.0% at visual inspection and is n=5 at other inspection.

The inspection data sheet is recorded on values of resonant frequencies, retraction forces of stopper side, insertion forces of dummy antenna side and dimensions, and on results of M5 screw inspection.



NO.	DRAWING NUMBER	PARTS	PARTS DESCRIPTION	MATERIAL	WEIGHT (g)	TREATMENT	QTY
1		ANTENNA					1
2		ELEMENT					1
3		TUBE					1
4		BOTTOM					1
5							1
6							1
7							1
8							1

NOTE :

1.

2.

REV	DATE	REVISED CONTENTS	NAME

APPROVED		SCALE	
CHECKED		UNIT	mm
DESIGNED			
DRAWN			

MPA-00025A-01

MECHANICAL ENVELOPE

TOKIN CORPORATION

5850-A261-002

Appendix: Fig.1