

Host Unit Antenna Information

for

ThinkPad R40 Series

ThinkPad T40 Series

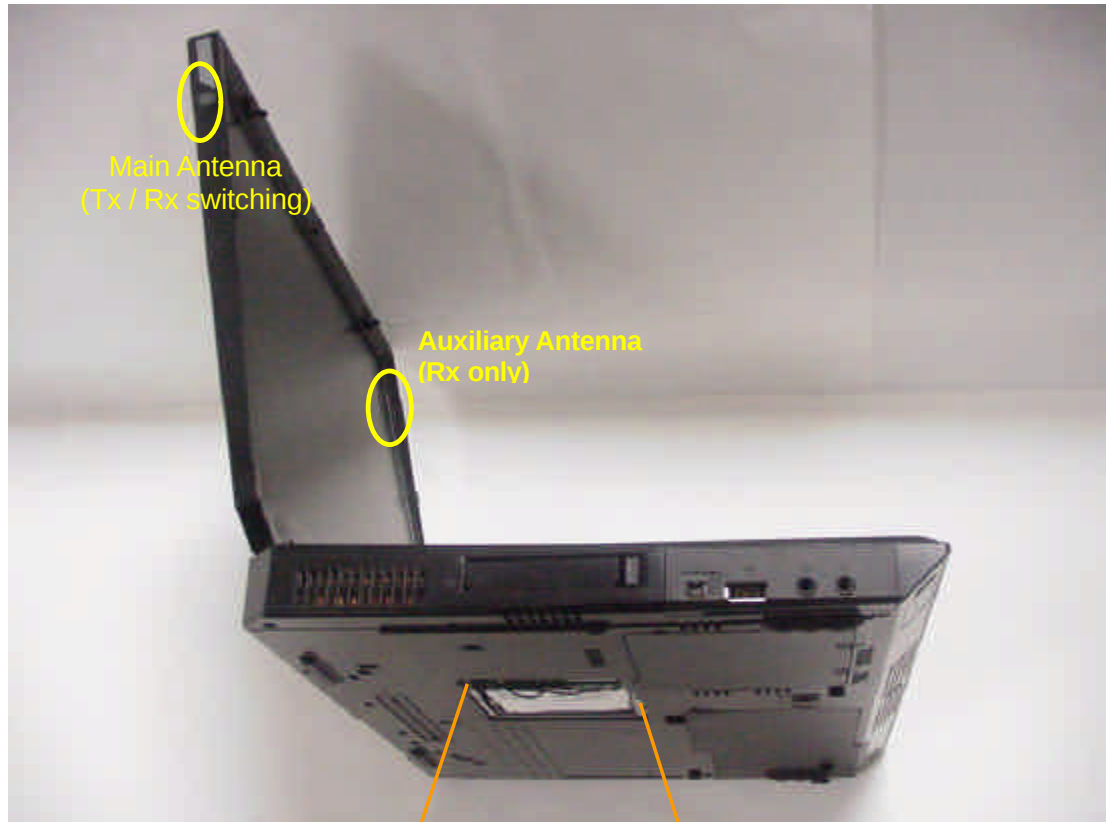
ThinkPad X30 Series

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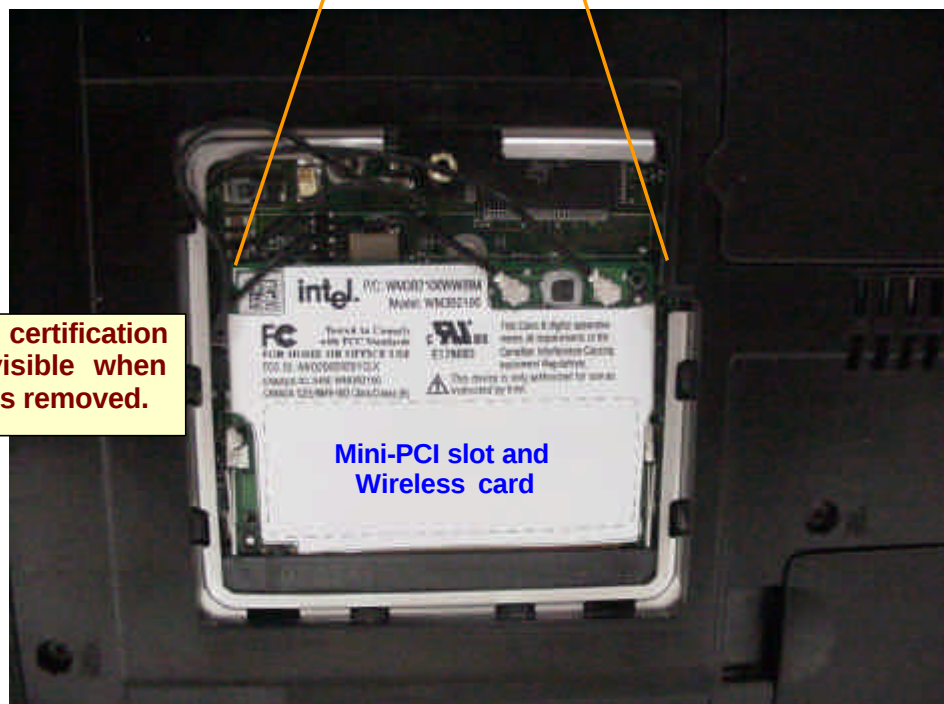
1. Host PC Information

1.1 IBM ThinkPad R40 Series

The main antenna in left side of LCD is used for both RF transmission and receiving with half duplex switching mode. The auxiliary antenna in right side of LCD is used for RF receiving only. The RF receiving antenna is selected automatically to have a good quality of radiocommunication



FCC ID and IC certification number are visible when the slot cover is removed.



**IBM ThinkPad R40 Series
supports three size of LCD.**

LCD 15 inch Model



LCD 14 inch Model

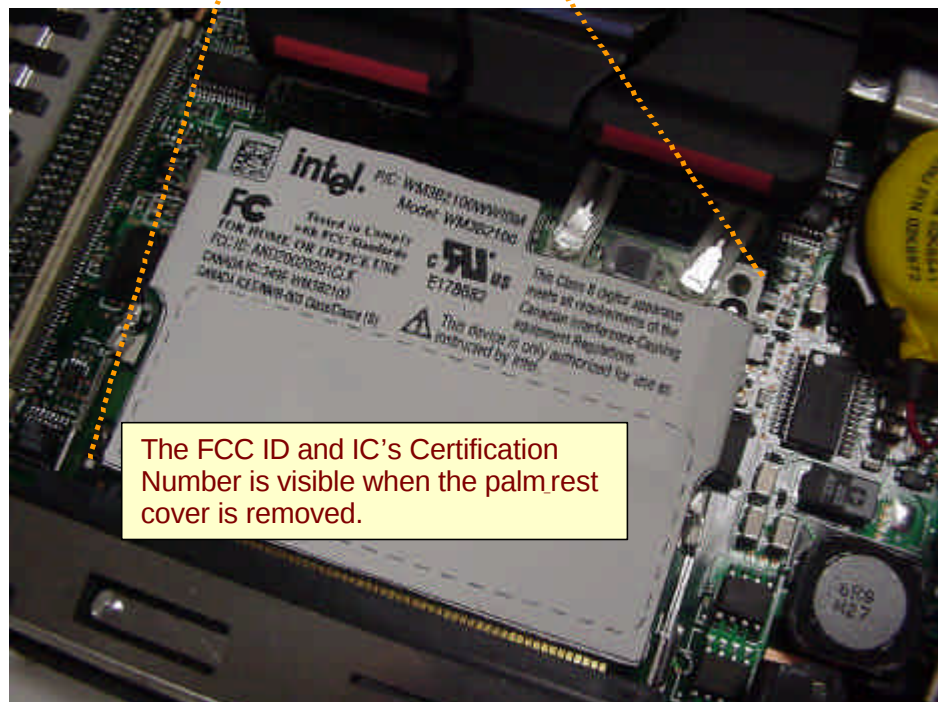
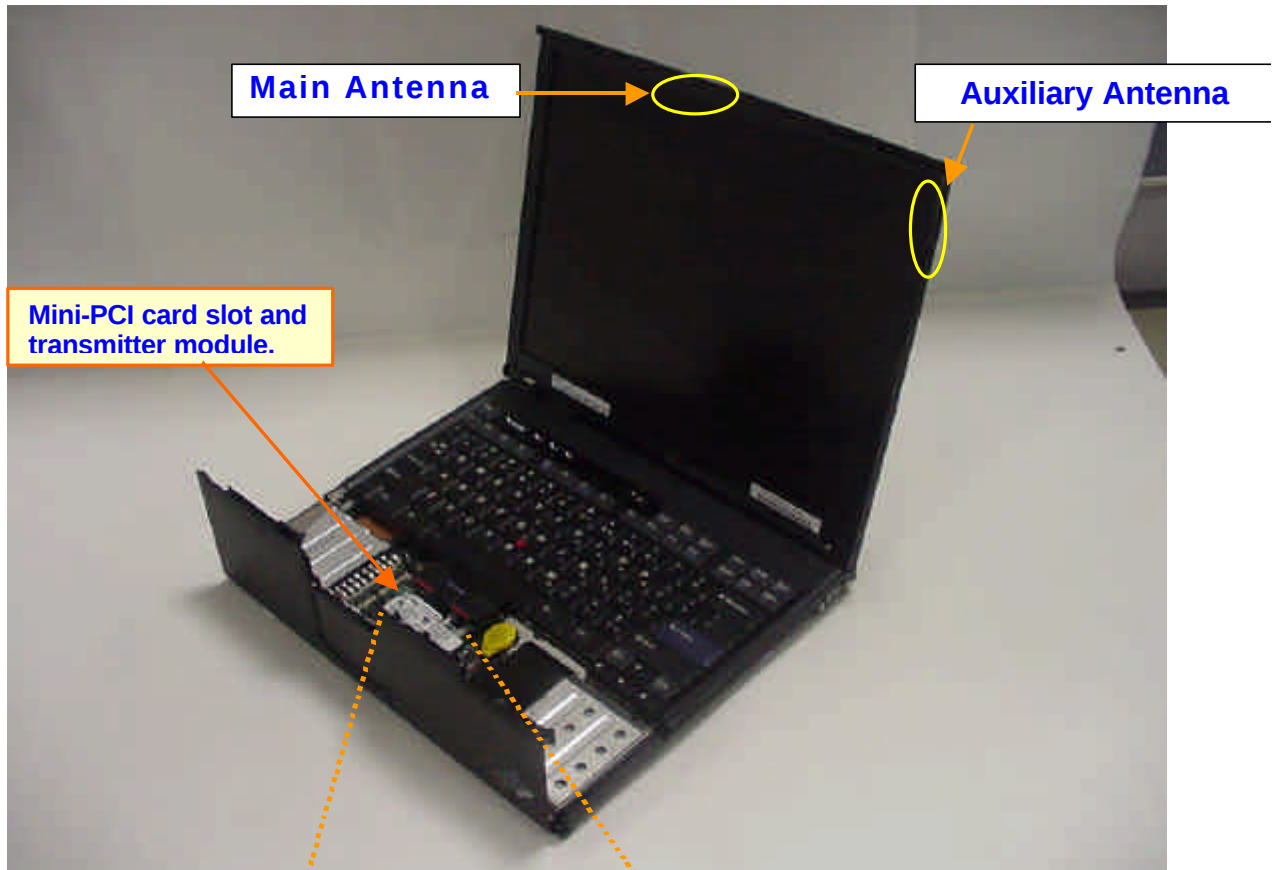


LCD 13 inch Model



1.2 IBM ThinkPad T40 Series

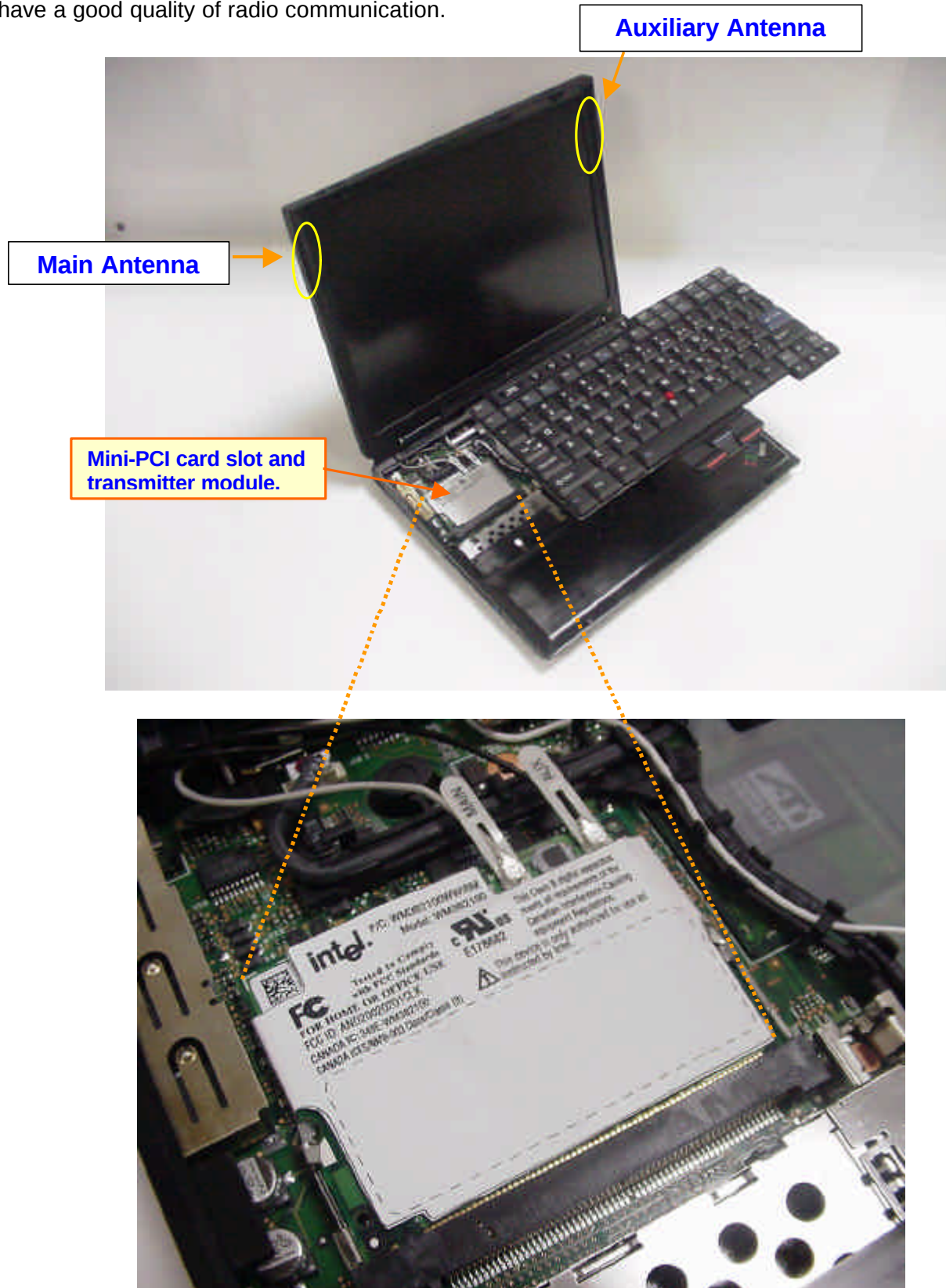
The main antenna is used for both RF transmission and receiving with half duplex switching mode. The auxiliary antenna is used for RF receiver only. When the Wireless LAN card is in RF receiving state, one of the antennas is selected automatically to have a good quality of radio communication.



1.3 IBM ThinkPad X30 Series

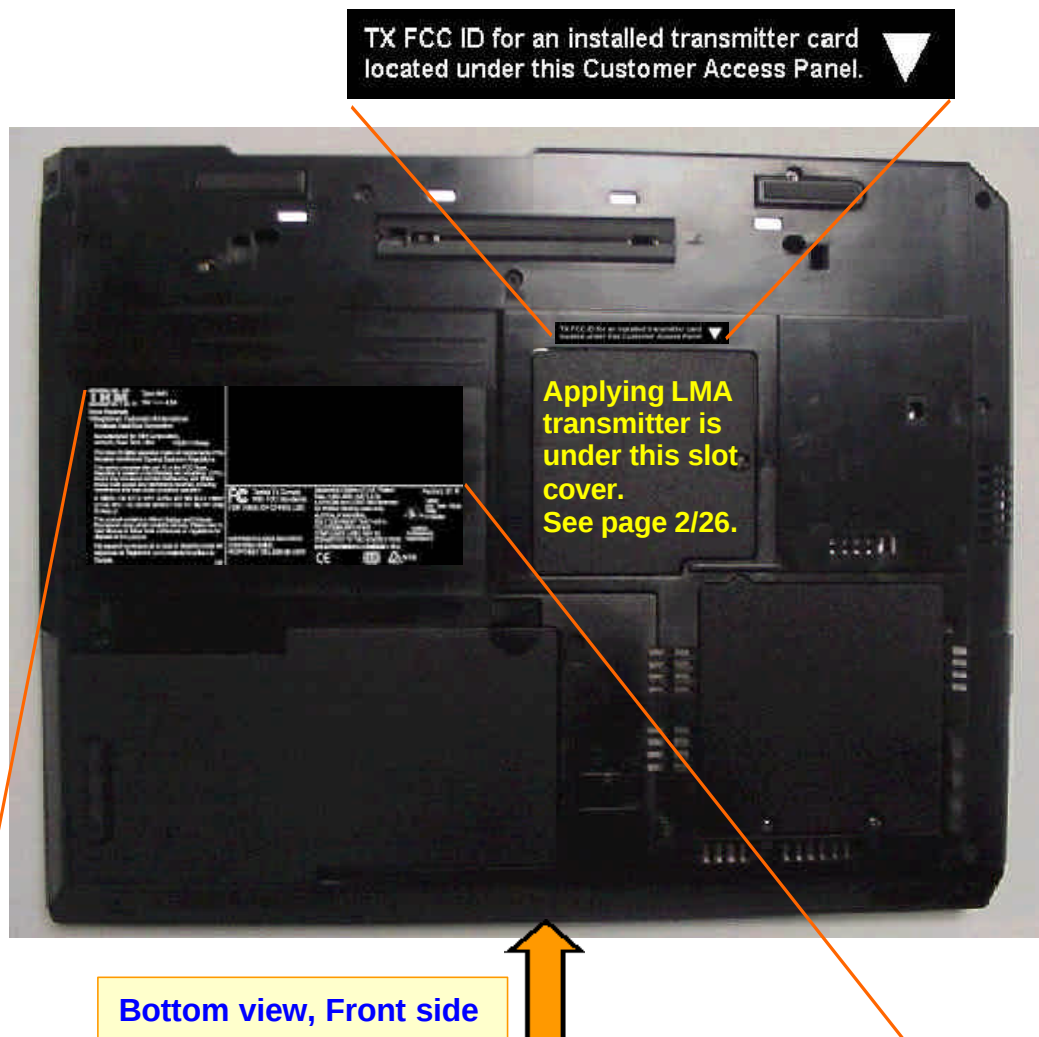
The left antenna in LCD is used for both RF transmission and receiving with half duplex switching mode. The right antenna is used for RF receiver only.

When the Wireless LAN card is in RF receiving state, one of the antennas is selected automatically to have a good quality of radio communication.



2. Host PC Labeling

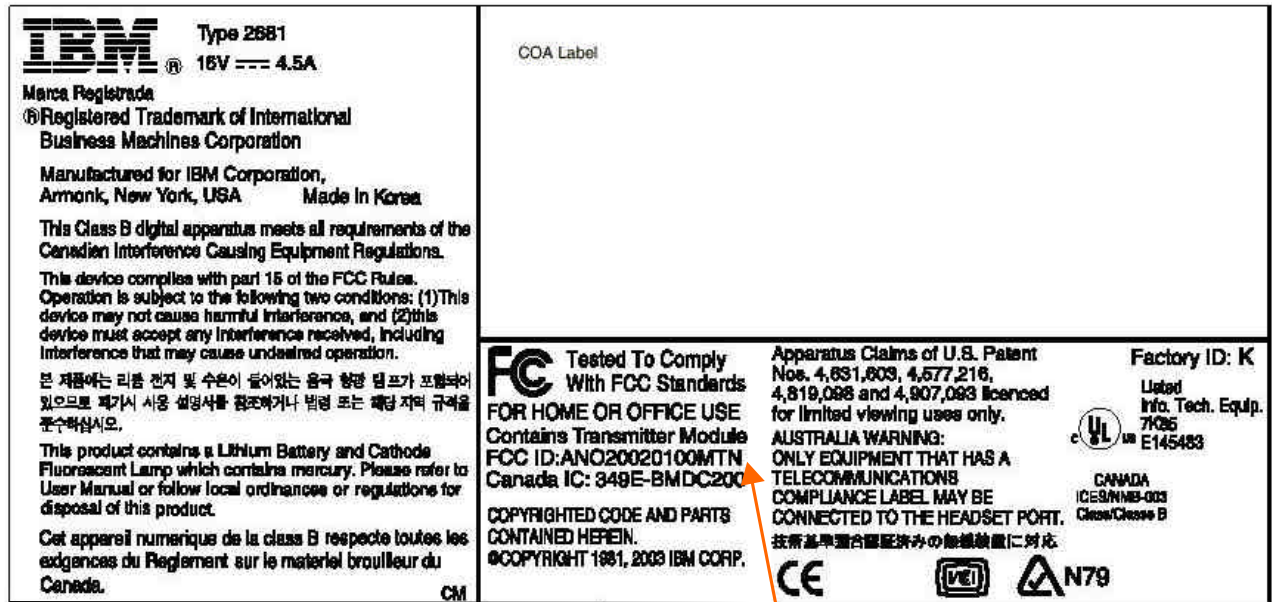
2.1 Labeling of R40 Series



IBM Type 2681 16V --- 4.5A Marca Registrada ®Registered Trademark of International Business Machines Corporation Manufactured for IBM Corporation, Armonk, New York, USA Made In Korea This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. 본 제품은 리튬 전지 및 수은이 들어있는 음극 형광 램프가 포함되어 있으므로 폐기시 사용 설명서를 참조하거나 법령 또는 해당 지역 규제를 준수하십시오. This product contains a Lithium Battery and Cathode Fluorescent Lamp which contains mercury. Please refer to User Manual or follow local ordinances or regulations for disposal of this product. Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. CM	FC Tested To Comply With FCC Standards FOR HOME OR OFFICE USE Apparatus Claims of U.S. Patent Nos. 4,831,603, 4,577,216, 4,819,088 and 4,907,083 licensed for limited viewing uses only. AUSTRALIA WARNING: ONLY EQUIPMENT THAT HAS A TELECOMMUNICATIONS COMPLIANCE LABEL MAY BE CONNECTED TO THE HEADSET PORT. 技術基準適合認定済みの無線装置に対応 Factory ID: K Listed Info. Tech. Equip. 7K26 E145483 CANADA ICES/NMB-003 Class/Classe B COPYRIGHTED CODE AND PARTS CONTAINED HEREIN. ©COPYRIGHT 1981, 2003 IBM CORP. CE (V) N79
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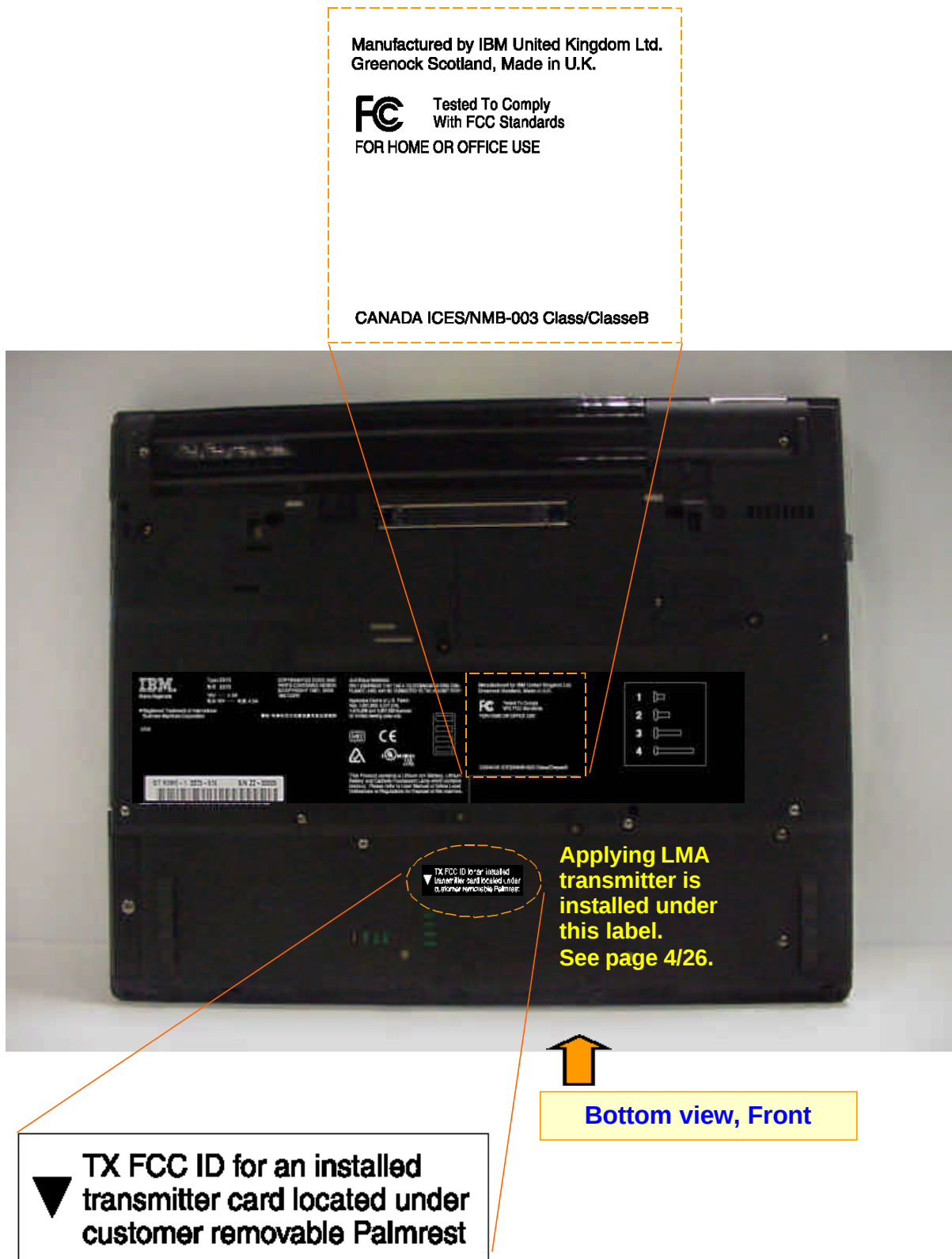
Label for a different model of the applying equipment (ThinkPad R40 Series)

The host device (ThinkPad R40 Series) supports the applying transmitter and a built-in type Bluetooth LMA which is to be certified separately with FCC ID: ANO20020100MTN.



**FCC ID of a separate application
granted on Jan/21/2003
(Not user installable)**

2.2 Labeling of T40 Series



Label for a different model of the host PC (ThinkPad T40 Series)

The model (T40) supports the applying transmitter and a built-in type Bluetooth LMA which is to be certified separately as the FCC ID: ANO20020100MTN.

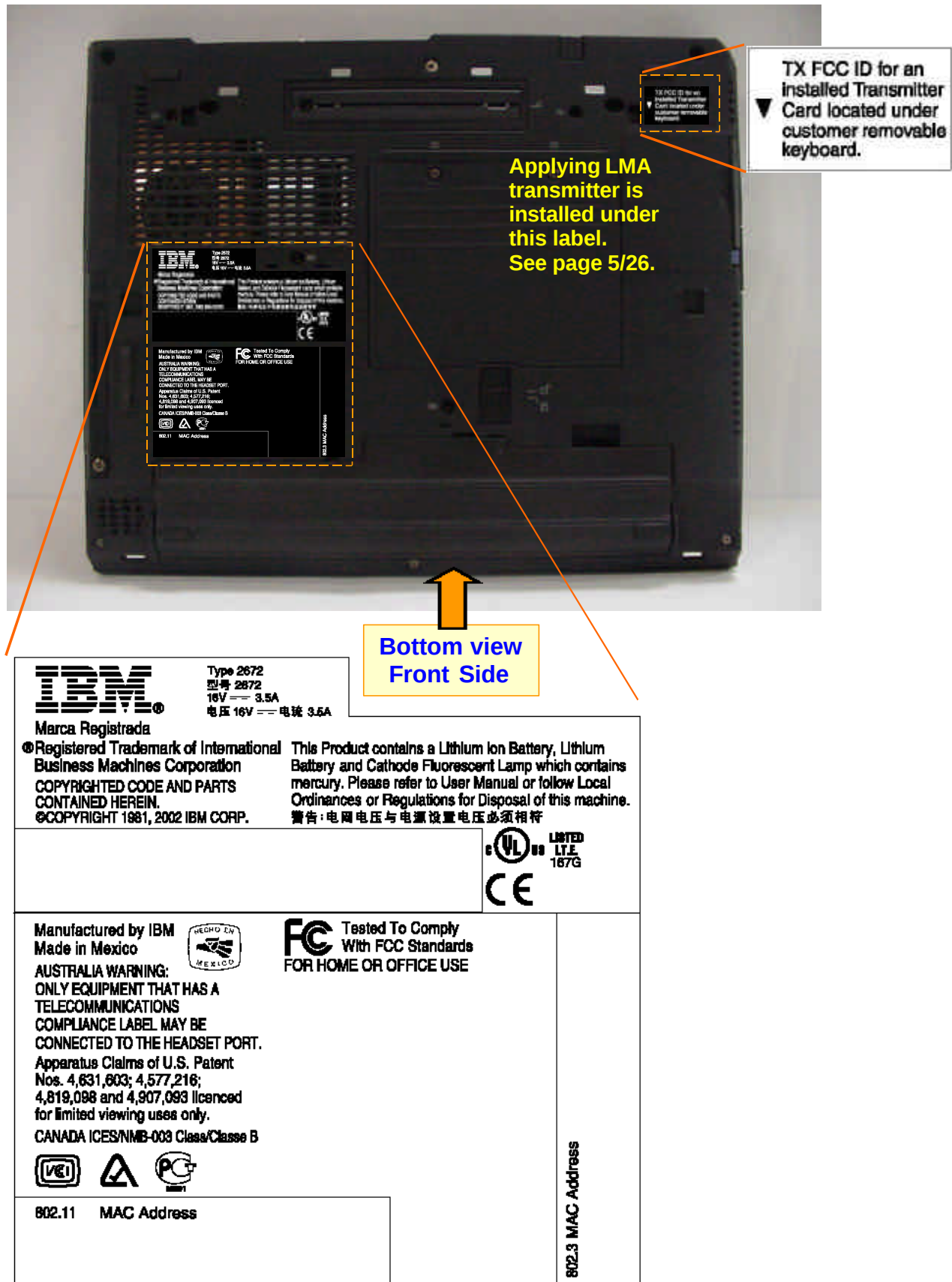


**TX FCC ID for an installed CDC
transmitter card located under
customer removable Keyboard**



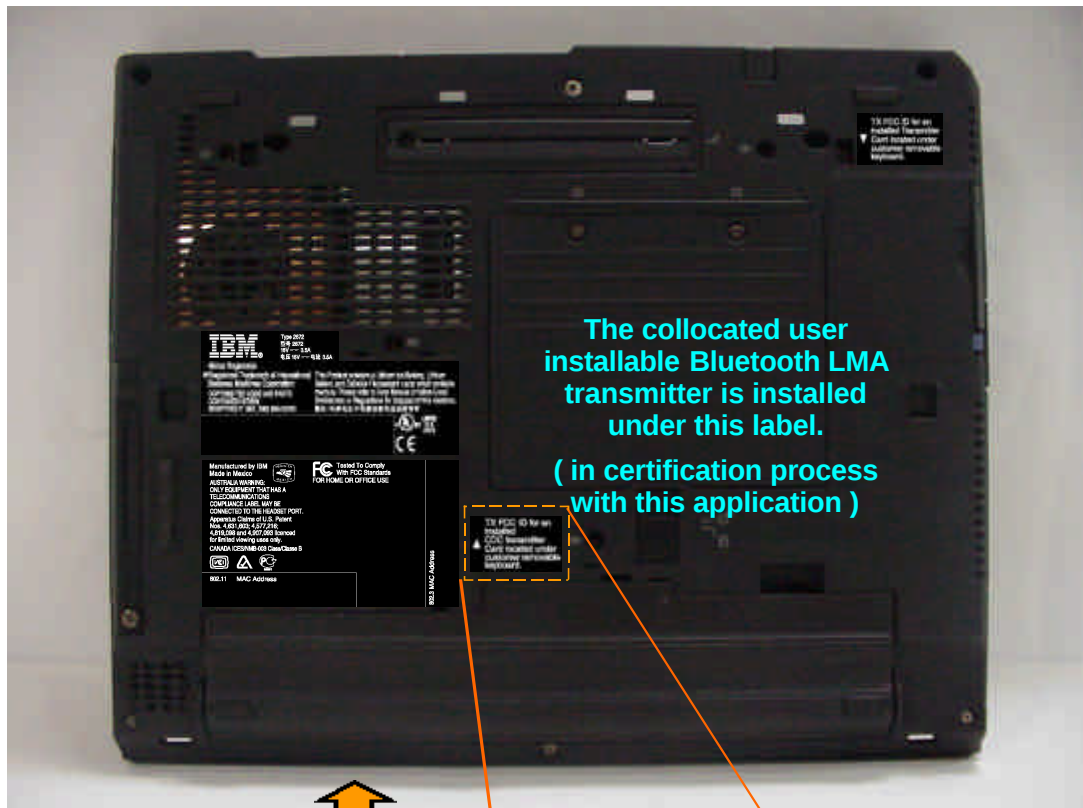
Bottom view, Front side

2.3 Labeling of X30 Series



Label for a different model of the host PC (ThinkPad X30 Series)

The model (X30) supports the applying transmitter and a built-in type Bluetooth LMA module which is to be certified separately as the FCC ID: ANO20020100MTN.



**Bottom view
Front Side**

**TX FCC ID for an
installed
CDC transmitter
Card located under
customer removable
keyboard.**

3. Antenna Specifications

3.1 Transmission Antenna assembly overview

IBM ThinkPad R40 Series

Designator	Manufacture	Antenna type	Cable type and length	Gain (dBi) Note 1)
3301BZ9078A 15 inch LCD model Main antenna	Hitachi Cable Ltd. (Japan)	Inverted F type Dual Band Antenna	coax 530mm	0.46 dBi (peak)
3301BZ9079A 15 inch LCD model Auxiliary antenna			coax 640mm	-1.06 dBi (peak)
3301BZ9076A 13/14 inch LCD model Main antenna			coax 530mm	-0.37 dBi (peak)
3301BZ9077A 13/14 inch LCD model Auxiliary antenna			coax 640mm	0.83 dBi (peak)

IBM ThinkPad T40 Series

Designator	Manufacture	Antenna type	Cable type and length	Gain (dBi) Note 1)
62P4204 Main antenna	Foxconn Electronics Inc. (R.O.C.)	Dual Band Inverted F type Antenna	coax 745mm	0.99 dBi (peak)
62P4203 Auxiliary antenna	Foxconn Electronics Inc. (R.O.C.)	Dual-Band Coupled Floating Element Antenna	coax 845mm	-0.48 dBi (peak)

IBM ThinkPad X30 Series

Designator	Manufacture	Antenna type	Cable type and length	Gain (dBi) Note 1)
08K4083 Main antenna	Nissei Electric Ltd. (Japan)	Dual Band Inverted F type Antenna	Coax 394mm	0.62 dBi (peak)
08K4084 Auxiliary antenna	Nissei Electric Ltd. (Japan)	Dual Band Inverted F type Antenna	coax 534mm	1.28 dBi (peak)

Notes:

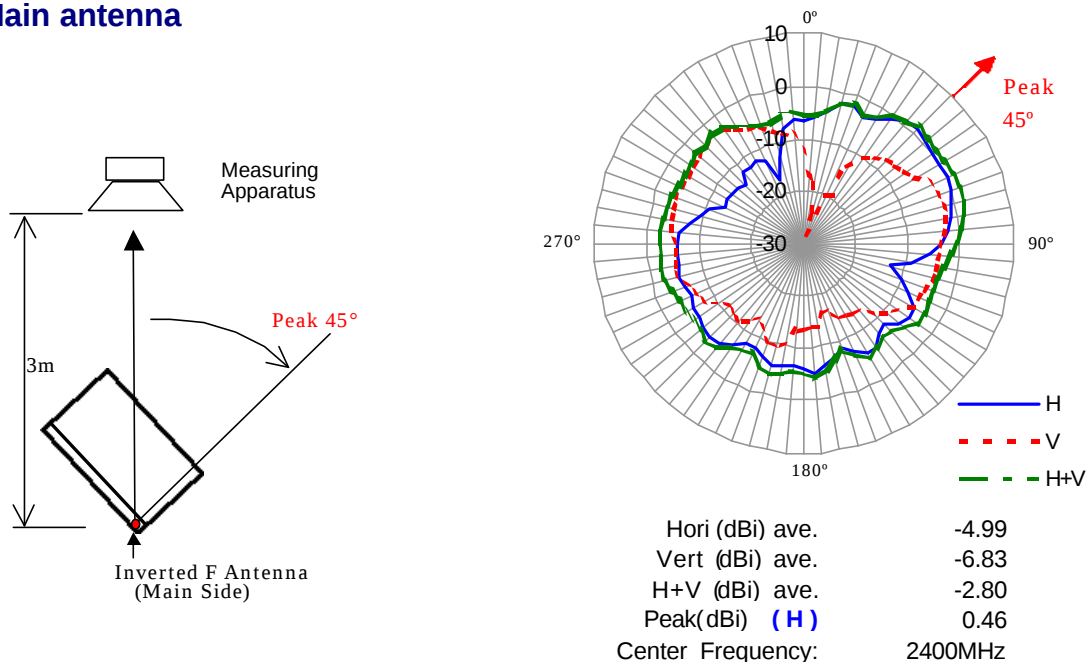
1a. Includes all cable losses.

1b. Antenna type should be Omni Directional and have gain of 2.0 dBi or less for IEEE802.11b (2.4GHz band), regarding the IBM internal specification.

3.2 Radiation characteristics of antennas

3.2.1 R40 Series, LCD 15 inch model

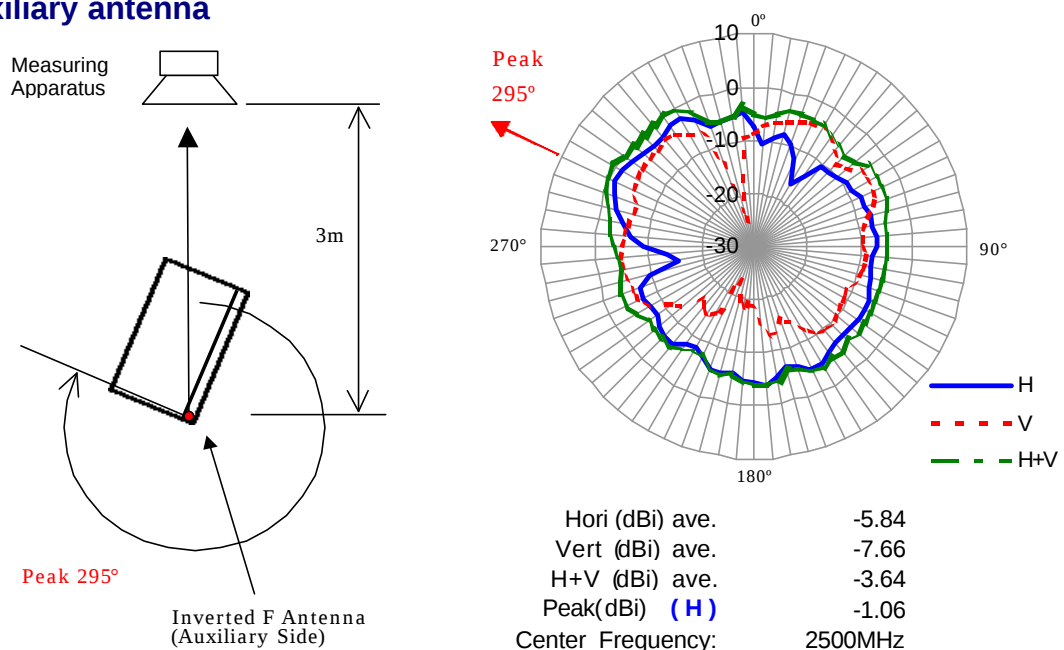
Main antenna



Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **45 degree** angle from measuring apparatus in **horizontal** polarization at the middle frequency (2400MHz).

Auxiliary antenna

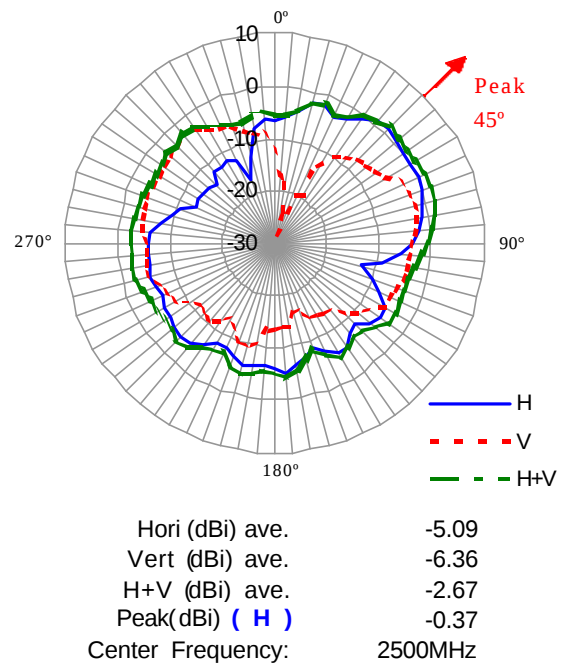
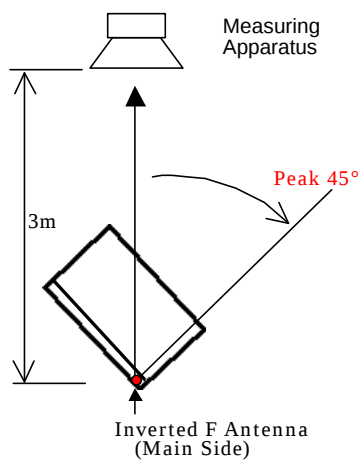


Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **295 degree** angle from measuring apparatus in **horizontal** polarization at the middle frequency (2500MHz).

3.2.2 R40 Series, LCD 13/14 inch models

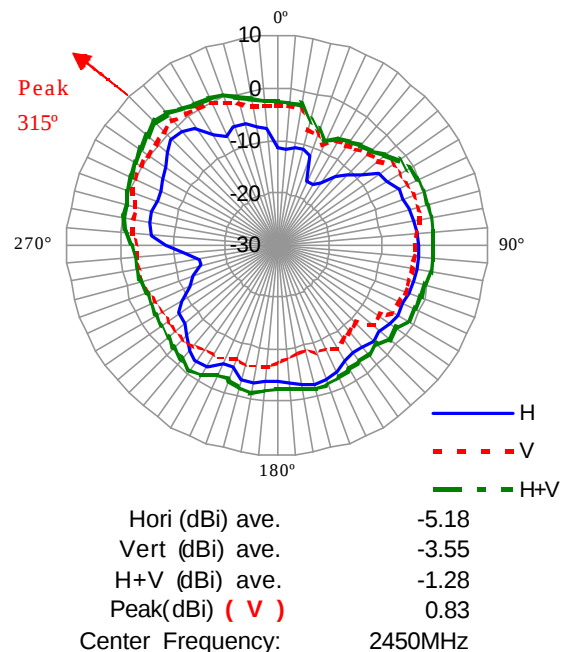
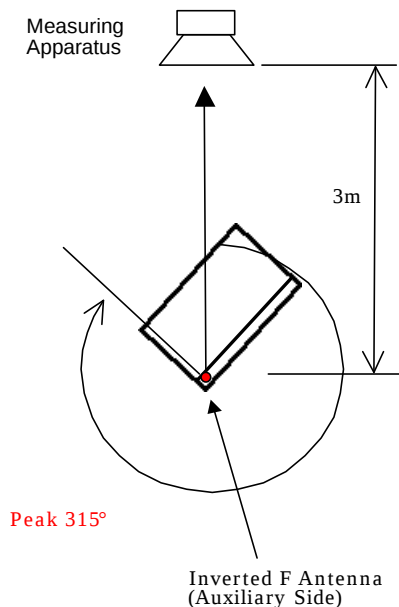
Main antenna



Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **45 degree** angle from measuring apparatus in **horizontal** polarization at the middle frequency (2500MHz).

Auxiliary antenna

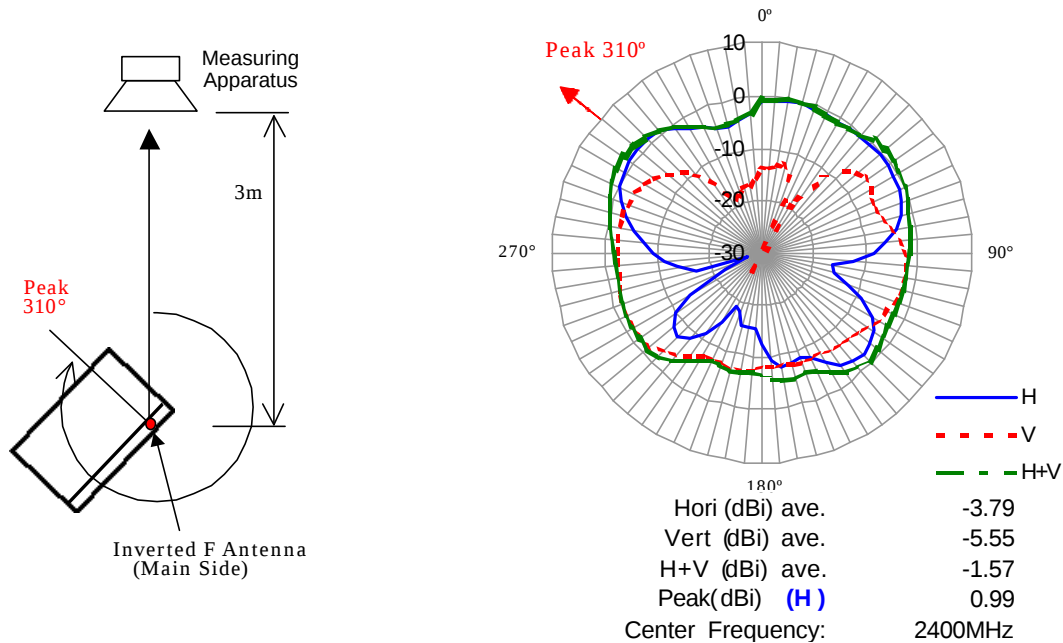


Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **315 degree** angle from measuring apparatus in **vertical** polarization at the middle frequency (2450MHz).

3.2.3 T40 Series

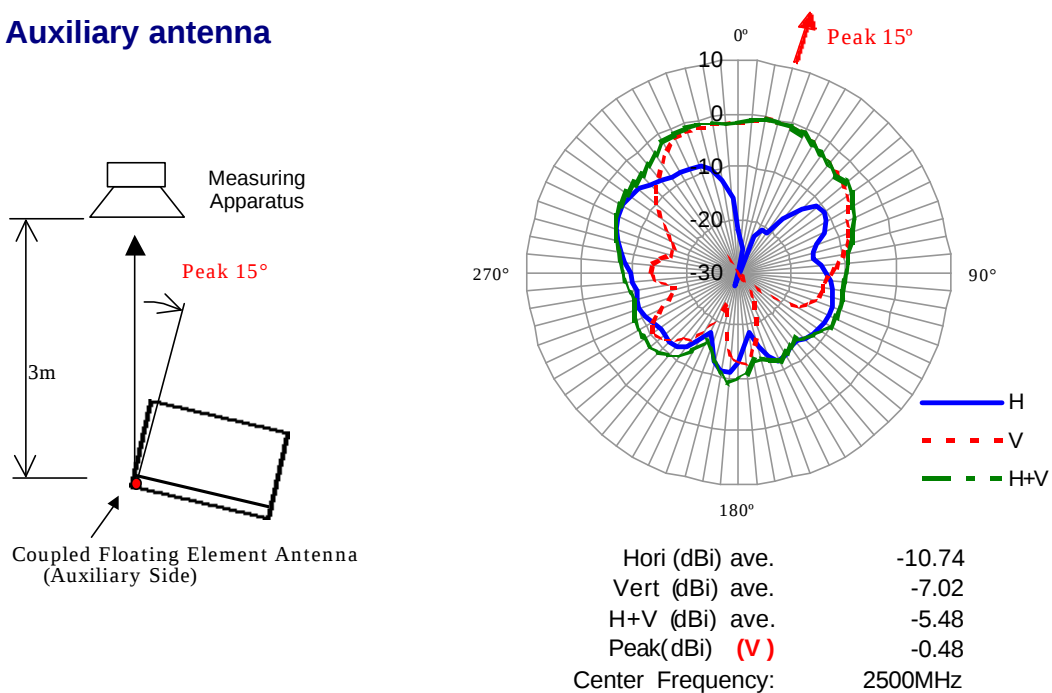
Main antenna



Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **310 degree** angle from measuring apparatus in **horizontal** polarization at the low frequency (2400MHz).

Auxiliary antenna

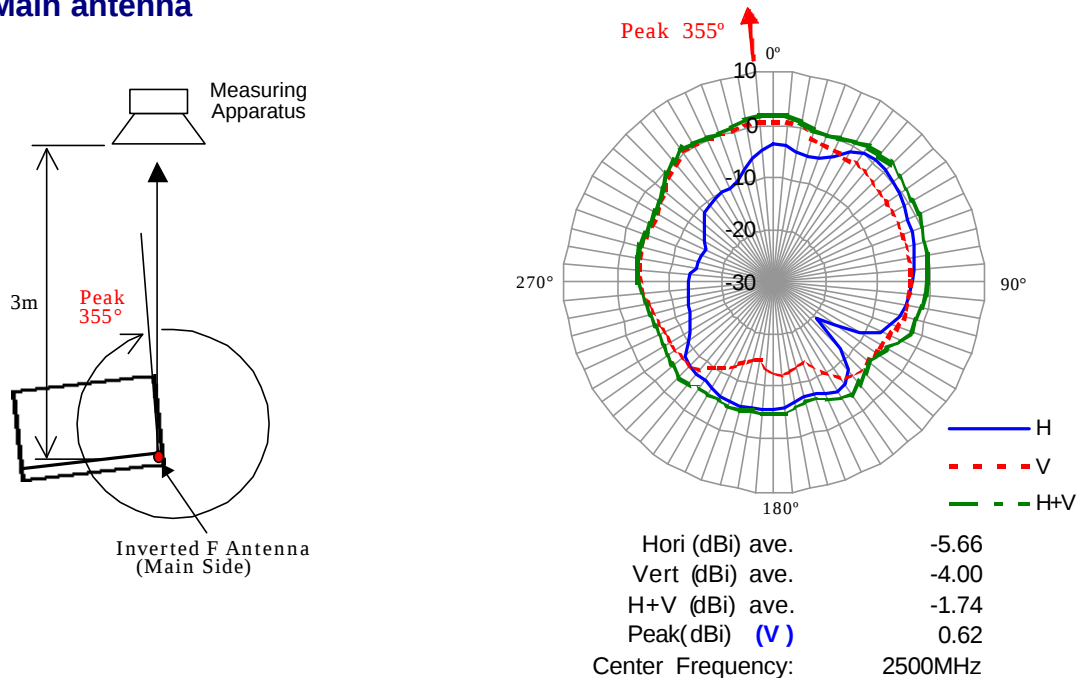


Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **15 degree** angle from measuring apparatus in **vertical** polarization at the high frequency (2500MHz).

3.2.4 X30 Series

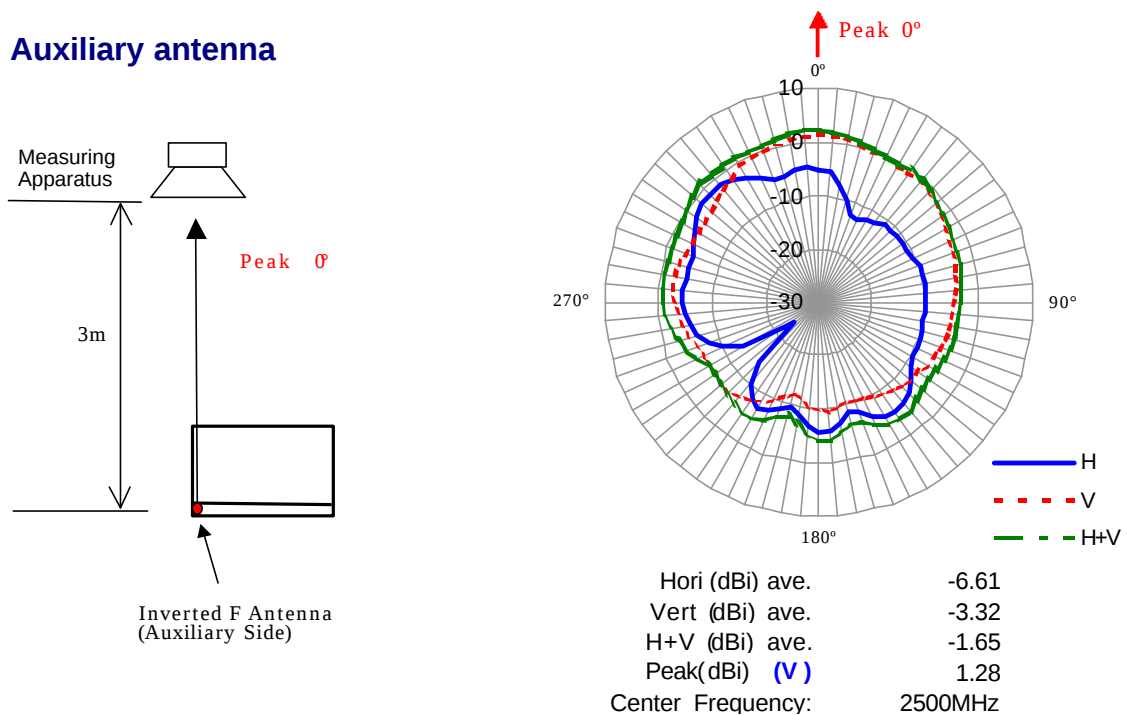
Main antenna



Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **355 degree** angle from measuring apparatus in **vertical** polarization at the high frequency (2500MHz).

Auxiliary antenna



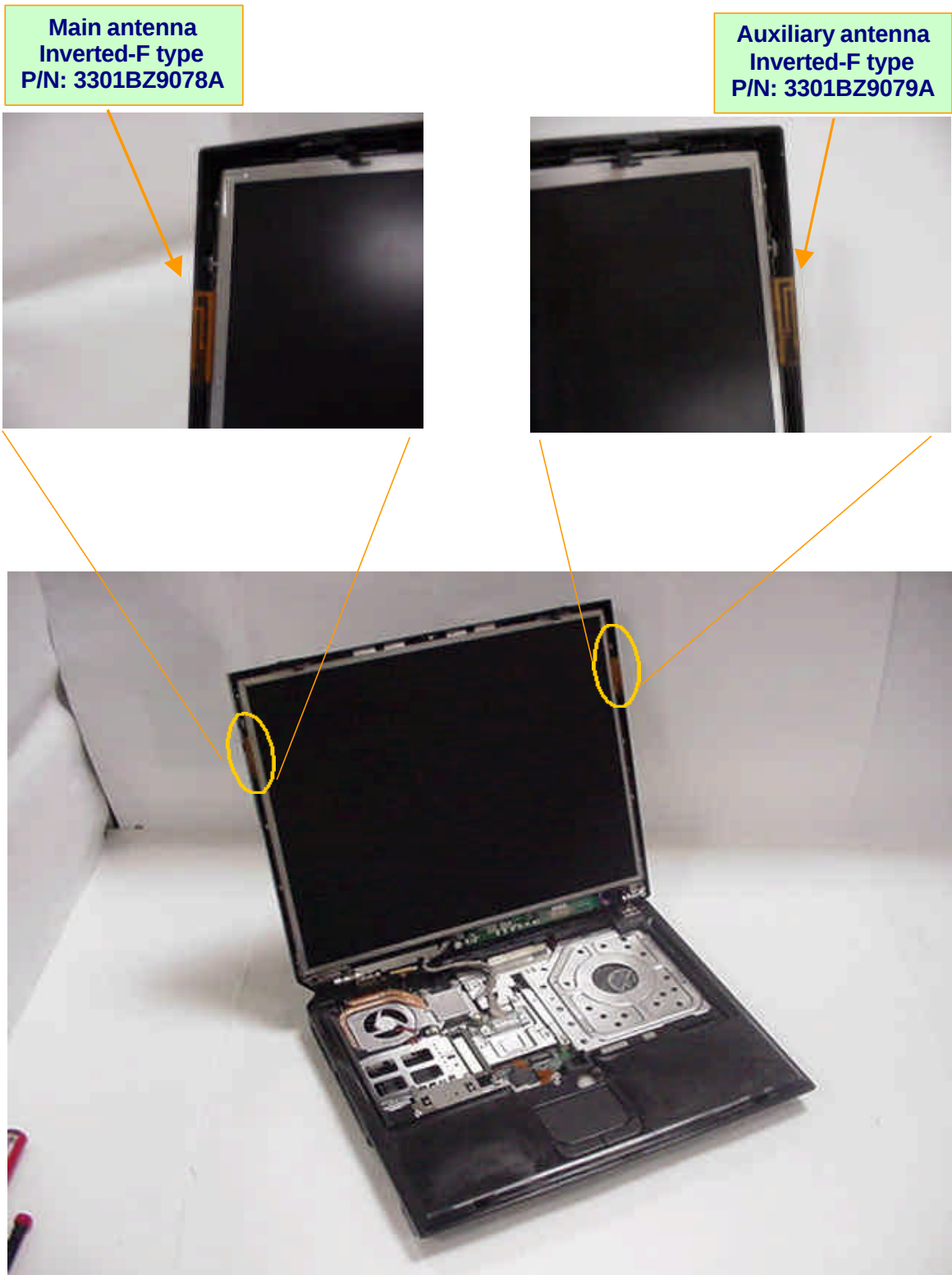
Note1) The measurement was performed at 3 frequencies (2400, 2450, 2500MHz).

Note2) The maximum antenna gain was found around **0 degree** angle from measuring apparatus in **vertical** polarization at the high frequency (2500MHz).

3.3 Antenna Photos

3.3.1 R40 Series, Antenna Photos

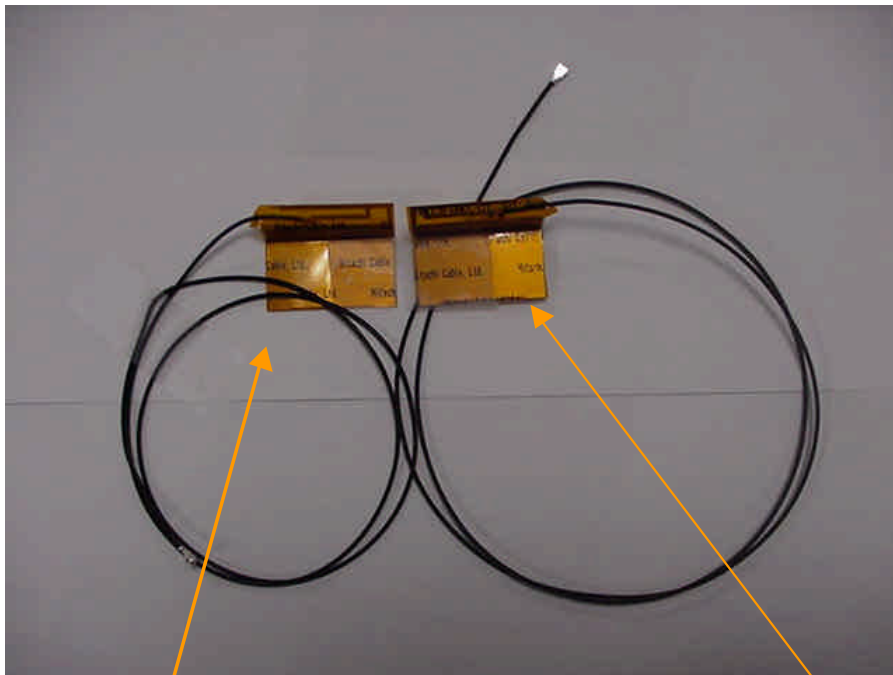
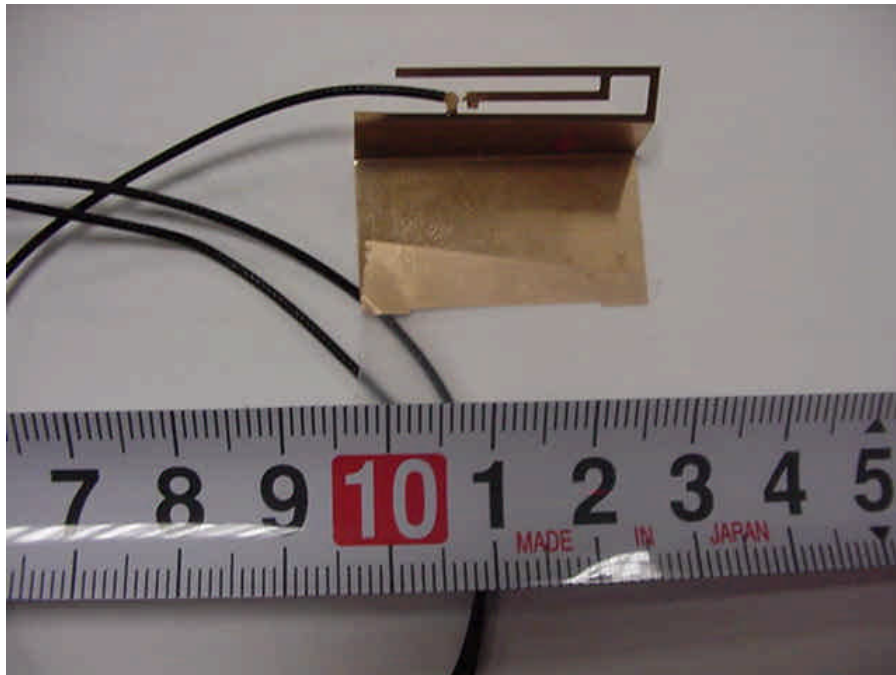
R40: LCD 15 inch Model, Antenna locations



R40: LCD 13/14 inch Model, Antenna locations



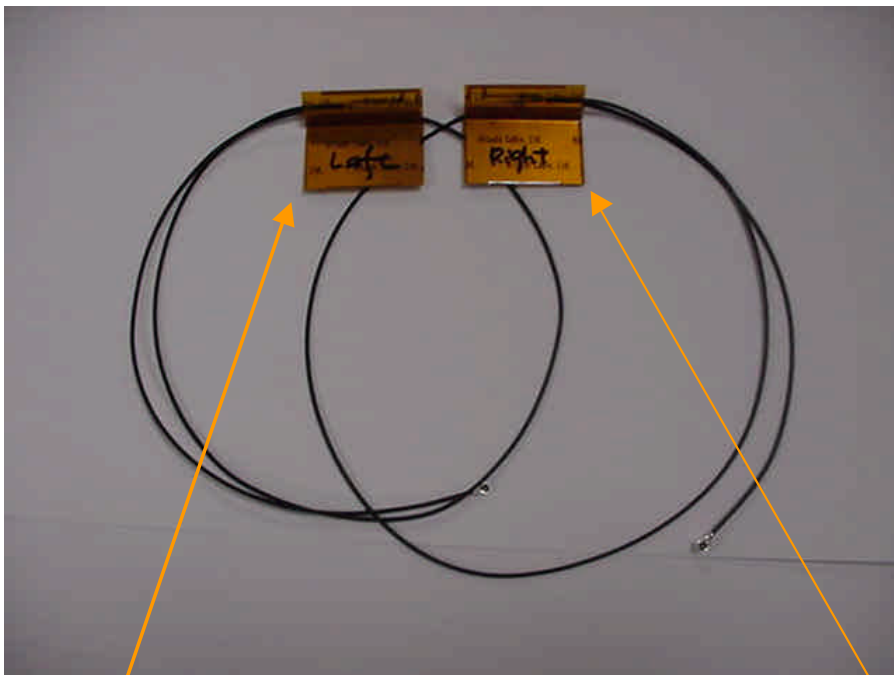
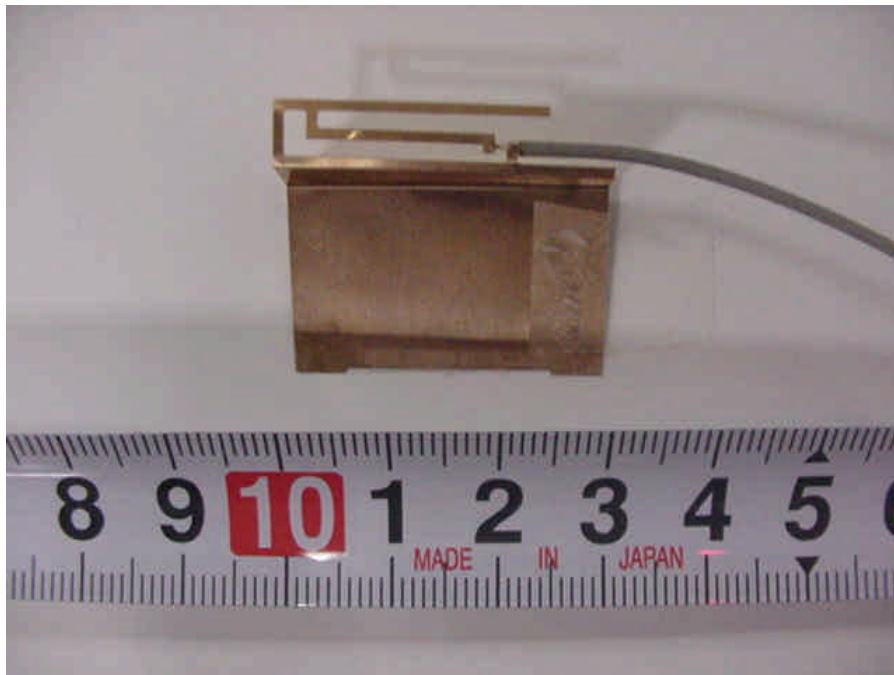
R40: LCD 13/14 inch Model, Antenna Exterior Photos



Main Antenna (Left)
Manufacturer: Hitachi Cable Ltd.
Parts number: 3301BZ9076A
Inverted-F type antenna
Cable : coax 530 mm

Auxiliary Antenna (Right)
Manufacturer: Hitachi Cable Ltd.
Parts number: 3301BZ9077A
Inverted-F type antenna
Cable : coax 640 mm

R40: LCD 13/14 inch Model, Antenna Exterior Photos

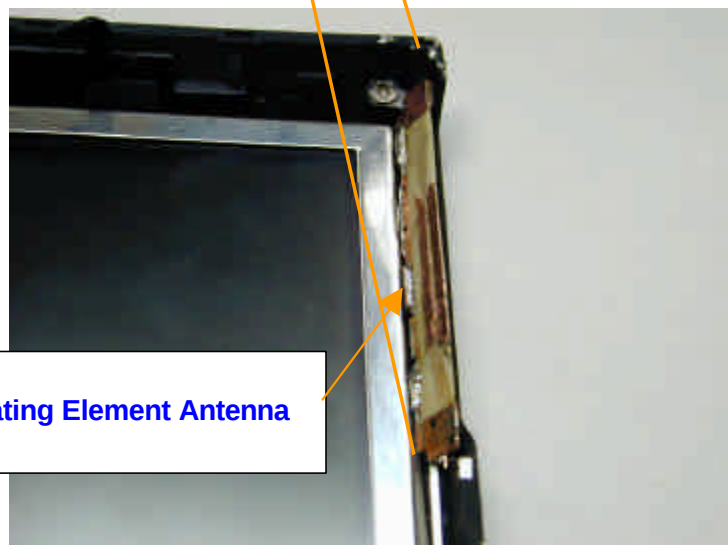
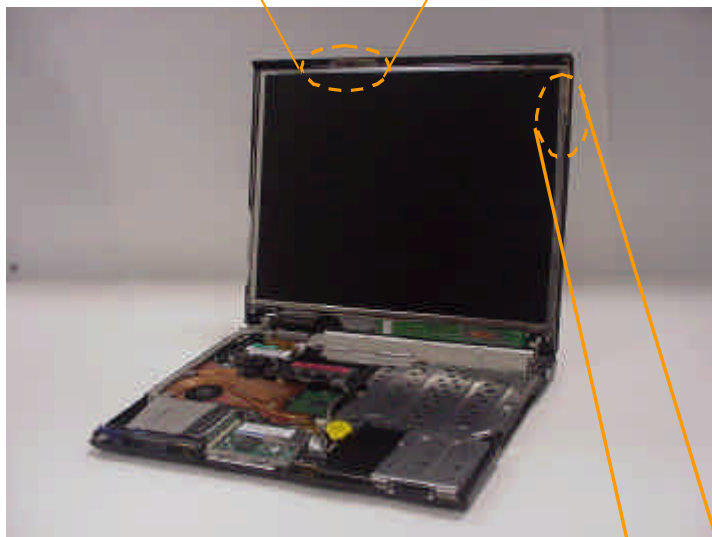
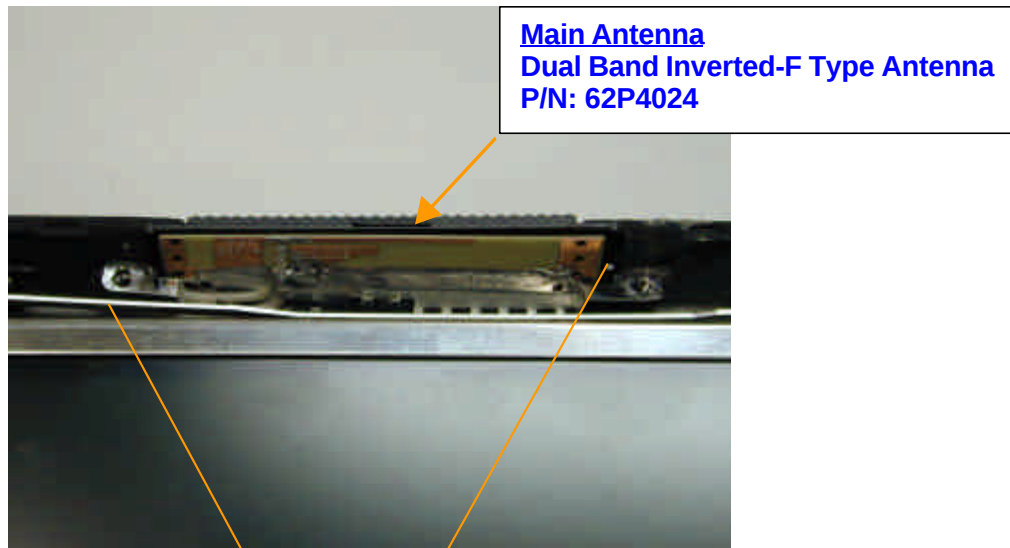


Main Antenna (Left)
Manufacturer: Hitachi Cable Ltd.
Parts number: 3301BZ9078A
Inverted-F type antenna
Cable : coax 530 mm

Auxiliary Antenna (Right)
Manufacturer: Hitachi Cable Ltd.
Parts number: 3301BZ9079A
Inverted-F type antenna
Cable : coax 640 mm

3.3.2 T40 Series, Antenna Photos

T40: Antenna locations



T40: Antenna Exterior Photos

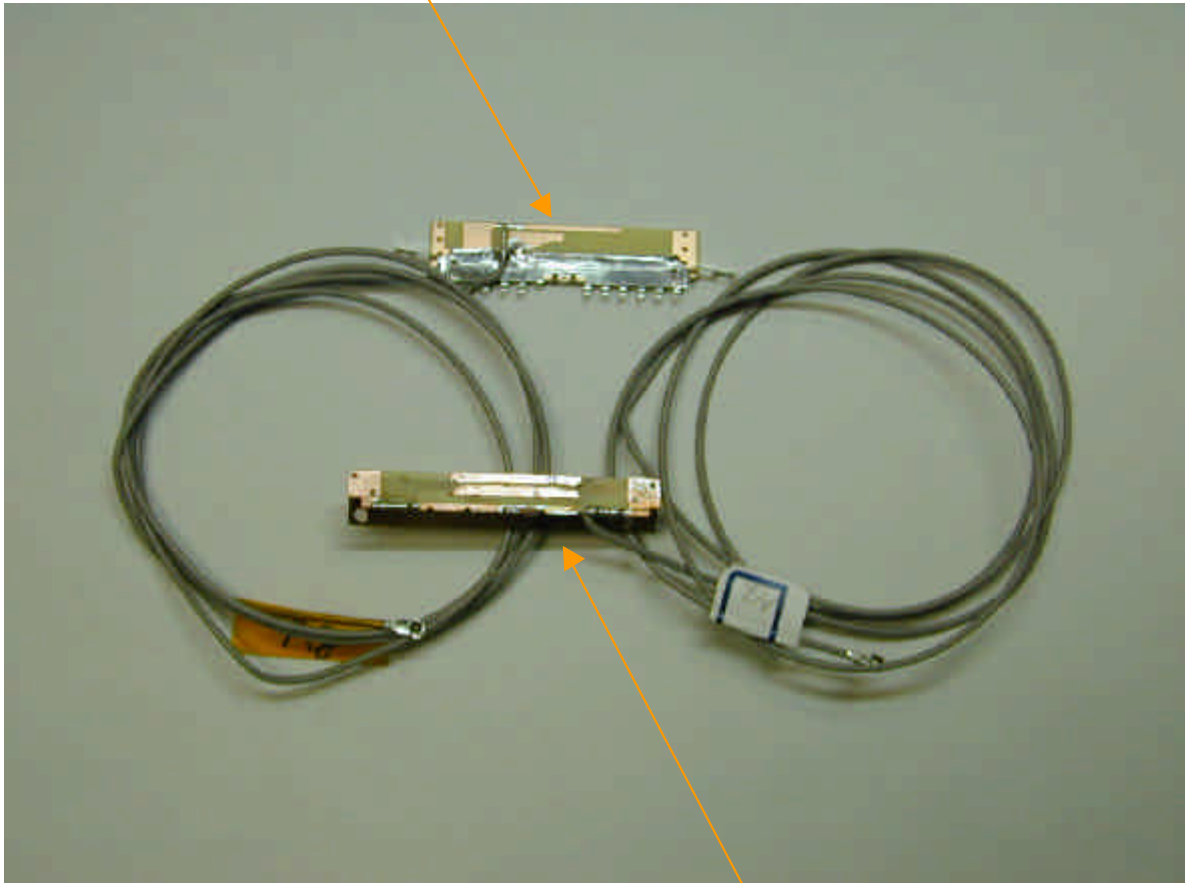
Main Antenna

Manufacturer: Foxconn Electronics Inc.

Parts Number: 62P4204

Dual Band Inverted-F type antenna

Cable: coax 740mm



Auxiliary Antenna

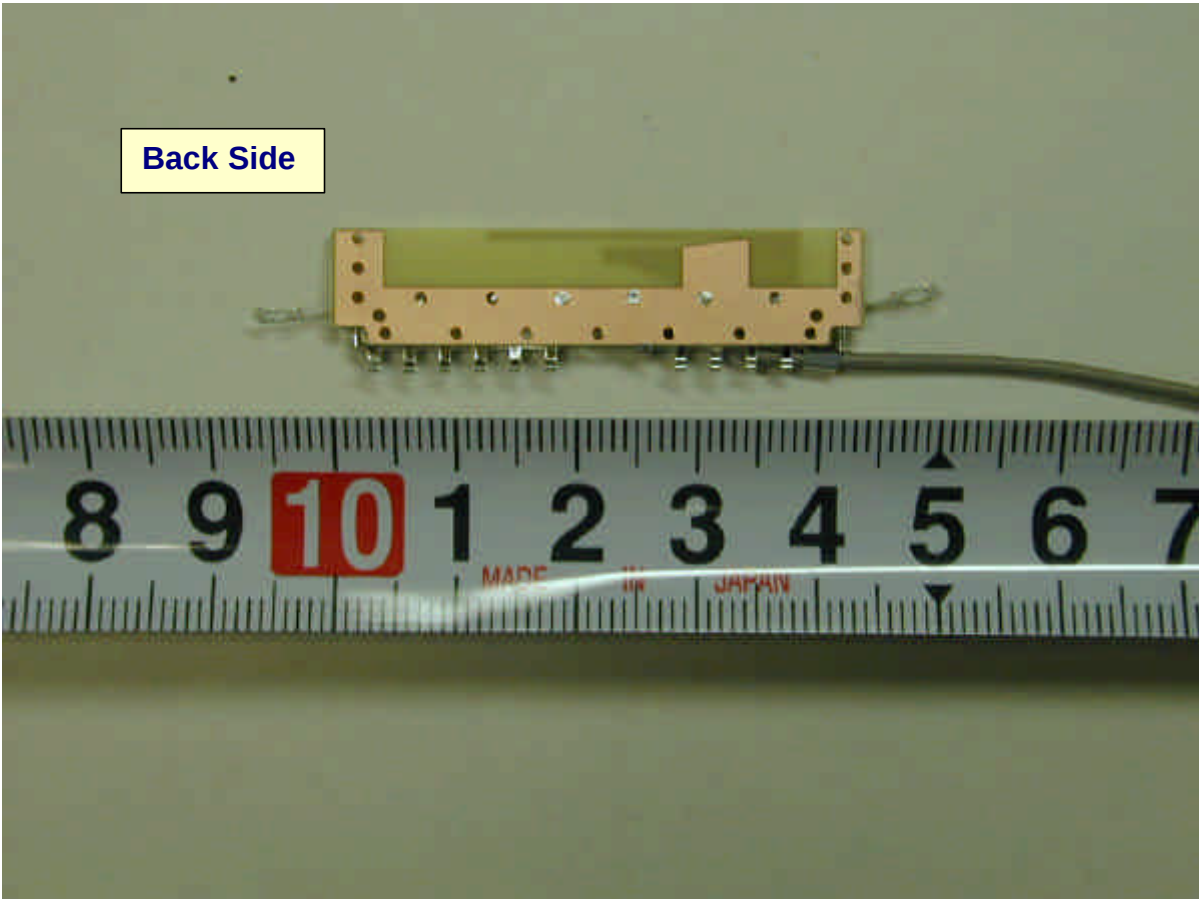
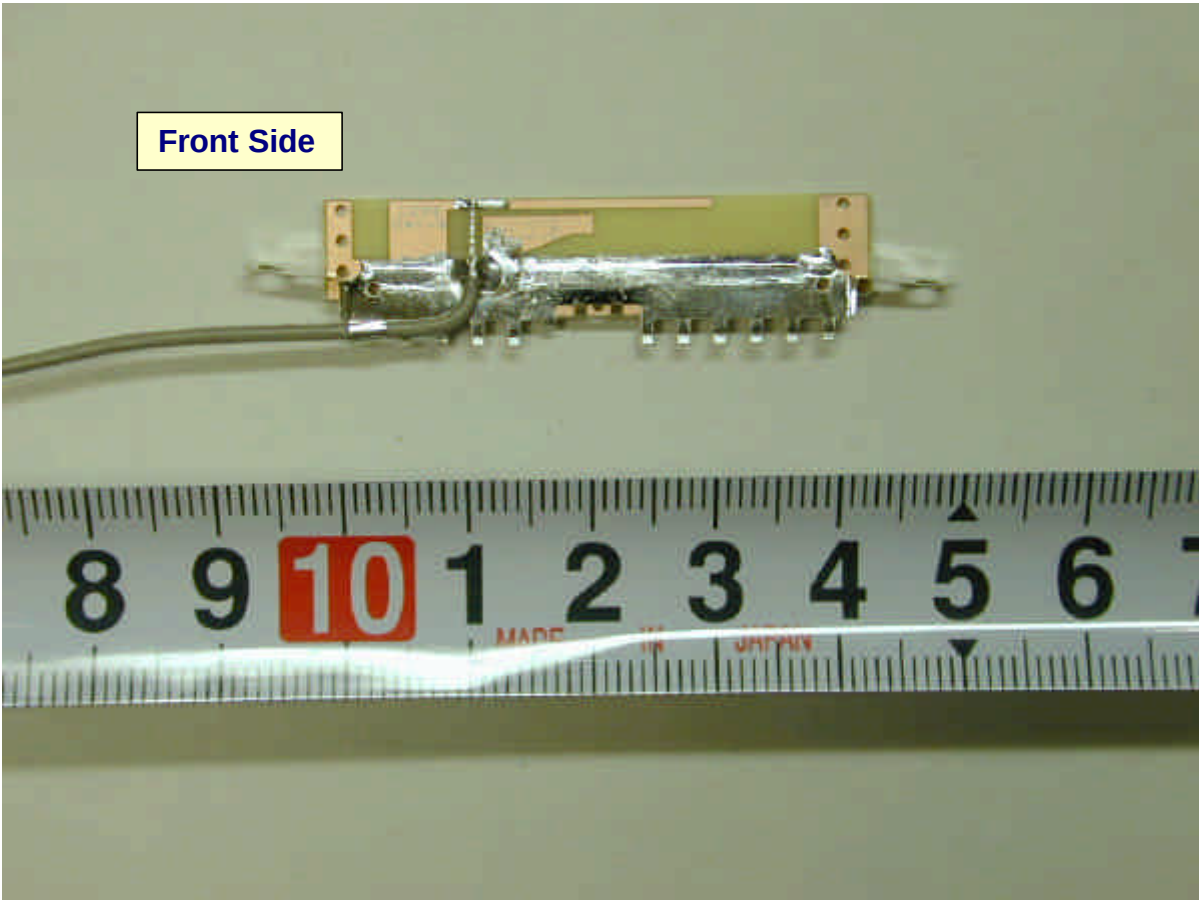
Manufacturer: Foxconn Electronics Inc.

Parts Number: 62P4203

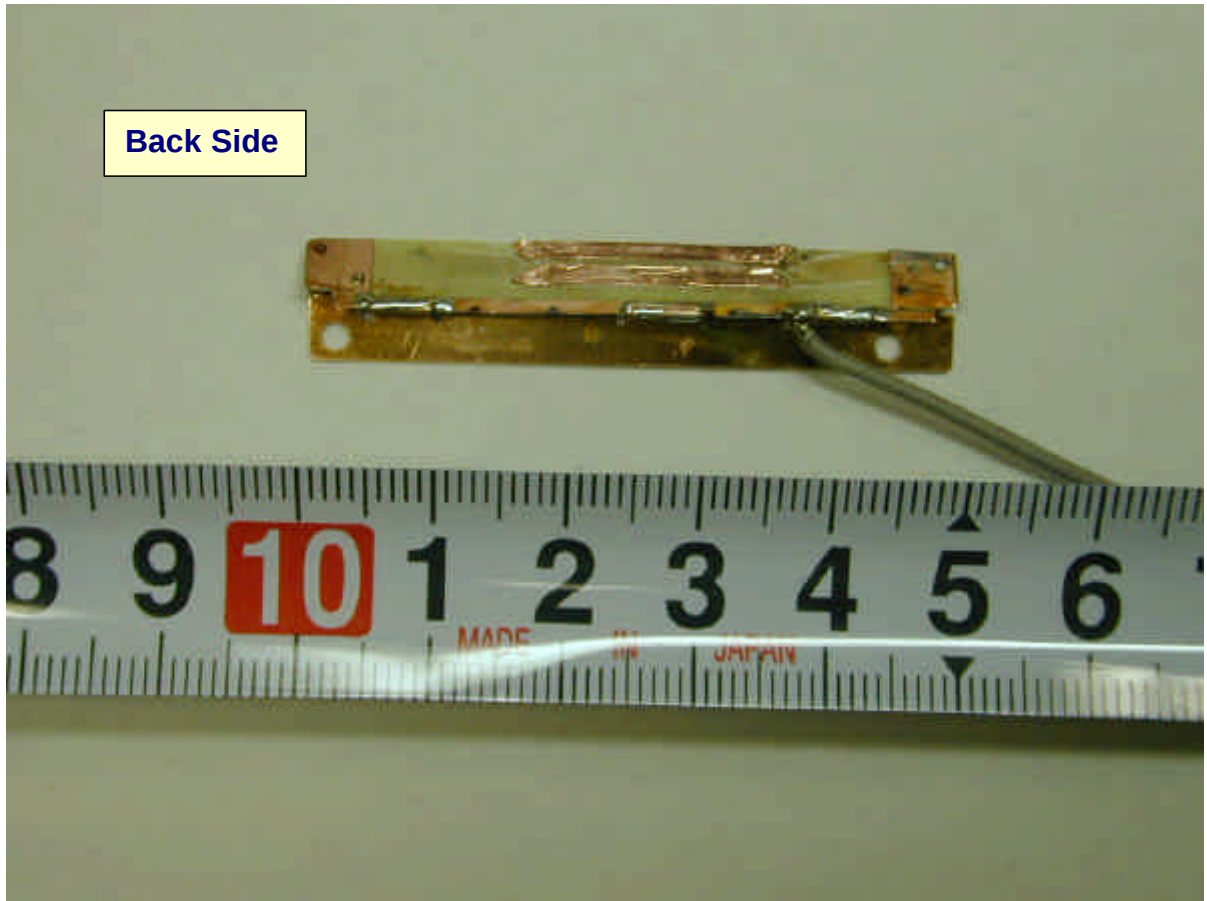
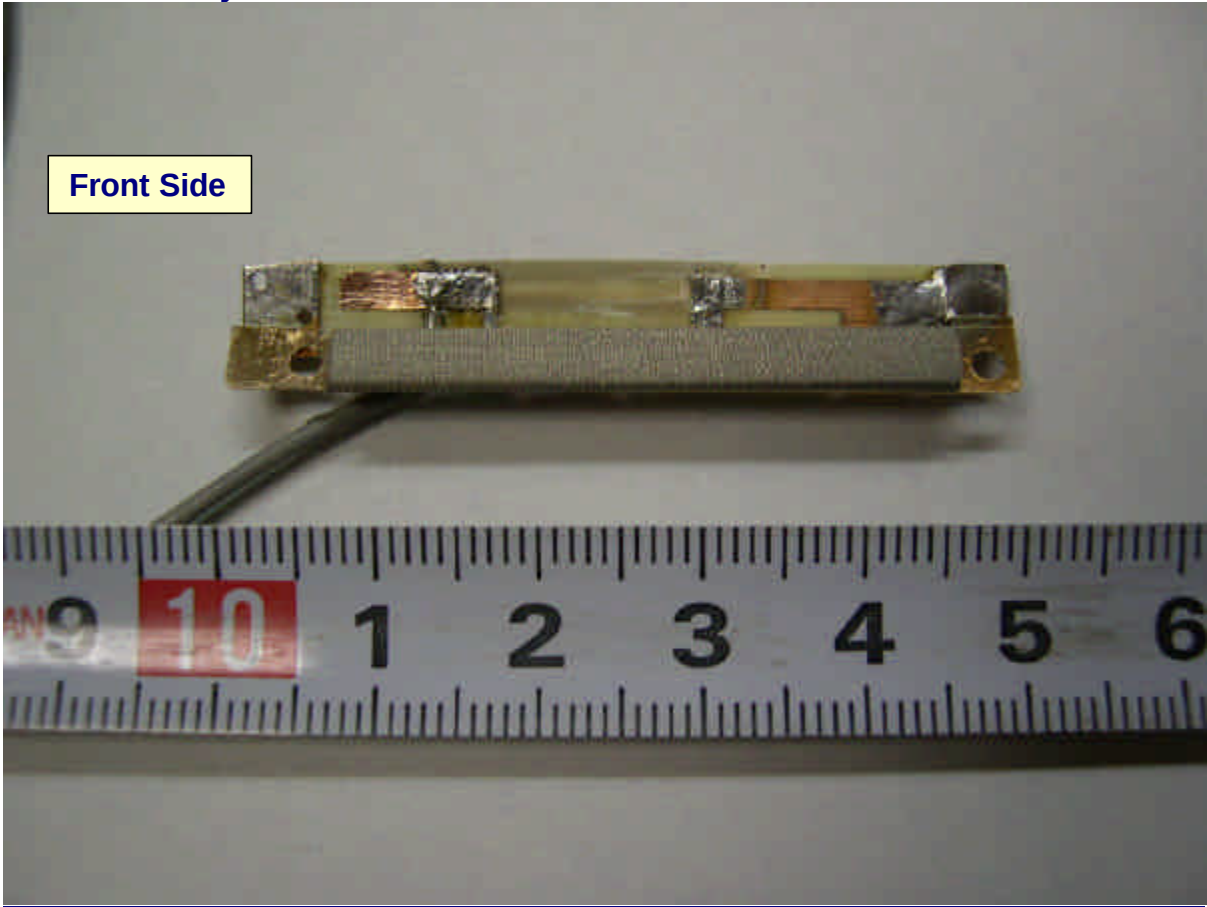
Dual-Band Coupled Floating Element Antenna

Cable : coax 845mm

T40: Main Antenna



T40: Auxiliary Antenna



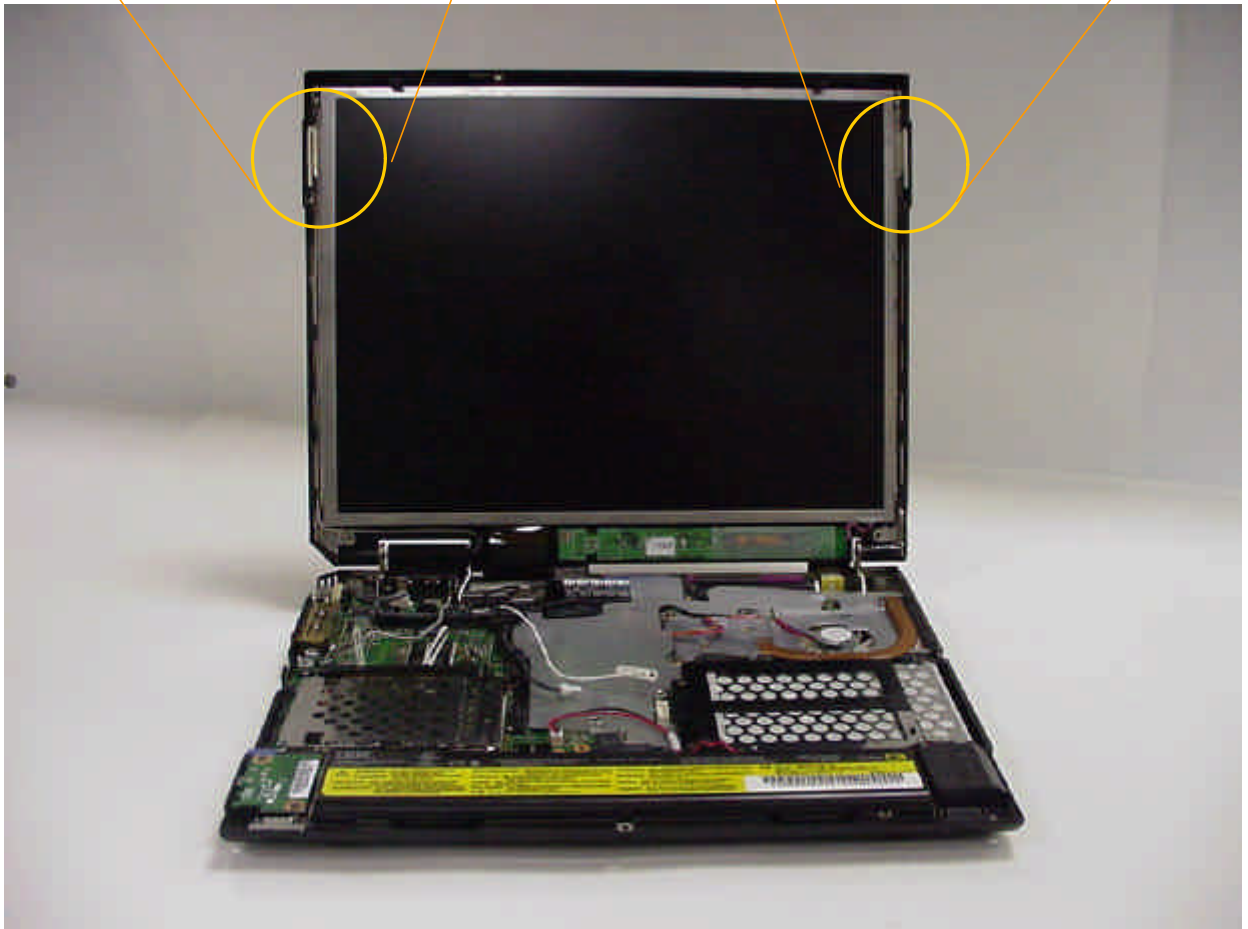
3.3.3 X30 Series, Antenna Photos

X30: Antenna location

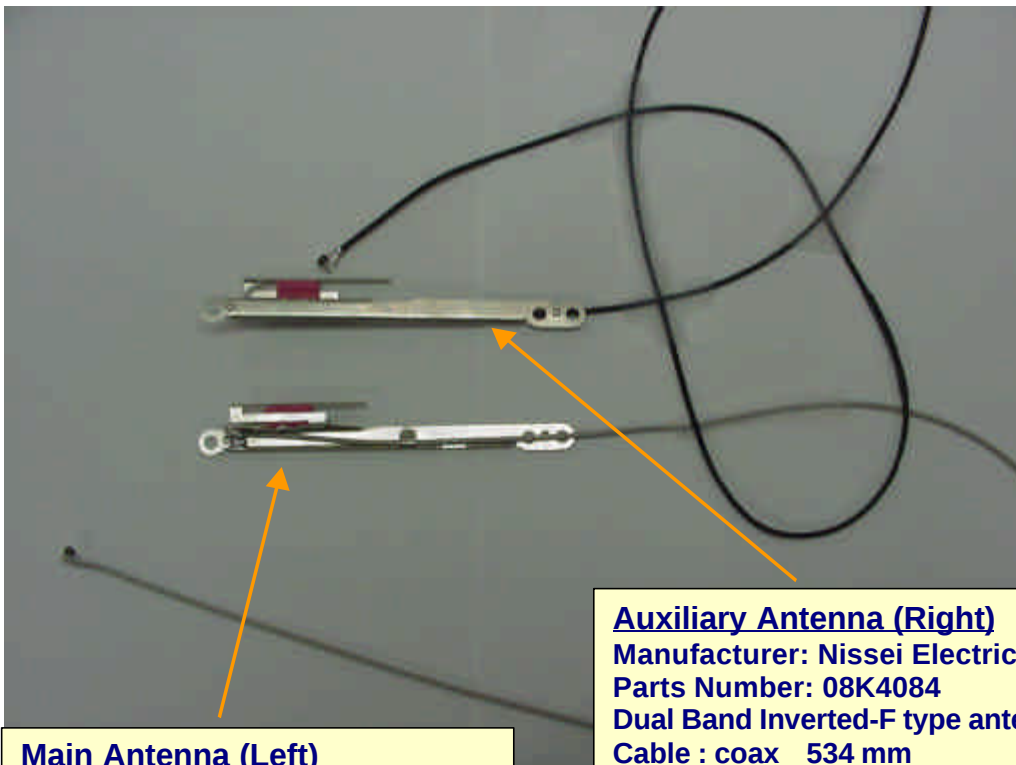
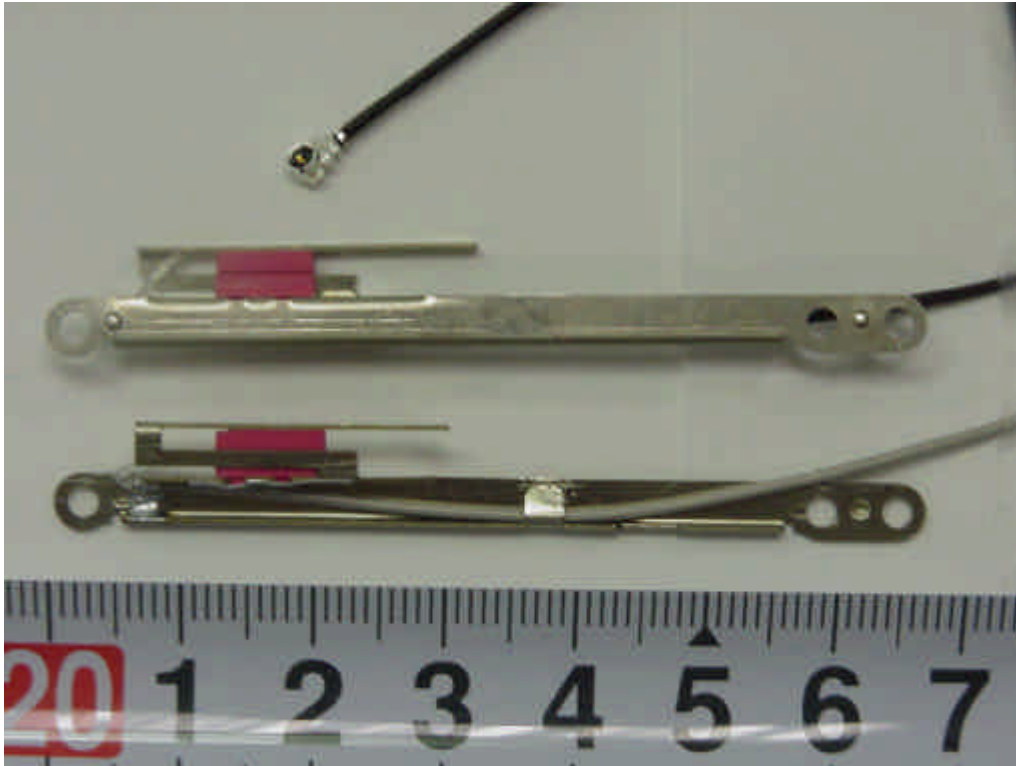
Main antenna
Dual Band Inverted-F type
P/N: 08K4083



Auxiliary antenna
Dual Band Inverted-F type
P/N: 08K4084



X30: Antenna Exterior Photos



Main Antenna (Left)
 Manufacturer: Nissei Electric Ltd.
 Parts Number: 08K4083
 Dual Band Inverted-F type antenna
 Cable : coax 394 mm

Auxiliary Antenna (Right)
 Manufacturer: Nissei Electric Ltd.
 Parts Number: 08K4084
 Dual Band Inverted-F type antenna
 Cable : coax 534 mm