



MICRONIX

Application Notes

Electromagnetic Anechoic Box (shielding box)



ME8661A



ME8661B



ME8662N/E



ME8669

*Produced by a specialist
in test & measurements.*



ME8668



MY5220



MY5310



MY5410

MICRONIX CORPORATION

Products line-up

■ ME8661A

Versatile type applicable to every test.



Applications	<ul style="list-style-type: none"> • Wireless system test for technical standard. • Receiving sensitivity test • Antenna characteristics measurement
Shielding characteristics	$\geq 65\text{dB}@2.4\text{GHz}$
Reflection loss	$\geq 20\text{dB}@1.2\text{GHz}$
Outside dimensions	830(W)×608(H)×503(D)mm (excluding projection)
Inside dimensions	700(W)×380(H)×380(D)mm
Structure	Triple structure composed of radio wave absorber, copper plate and aluminium plate.
Connectors	SMA (3pcs) (reference side 1pc, receiving side 2pc) 25-pins D-sub connector(1pc)
Weight	approx.38kg (excluding antenna)
Option	<ul style="list-style-type: none"> • Turn table • Caster

■ ME8661B

Large shield box covering even UHF band.



Applications	<ul style="list-style-type: none"> • Wireless system test for technical standard. • Receiving sensitivity test • Antenna characteristics measurement
Shielding characteristics	$\geq 65\text{dB}@2.4\text{GHz}$
Reflection loss	$\geq 20\text{dB}@600\text{MHz}\sim$
Outside dimensions	1500(W)×1100(H)×900(D)mm (excluding projection)
Inside dimensions	1200(W)×600(H)×600(D)mm
Structure	Triple structure composed of radio wave absorber, copper plate and aluminium plate.
Connectors	SMA (3pcs) (reference side 1pc, receiving side 2pc) 25-pins D-sub connector(1pc)
Weight	approx.176kg
Option	<ul style="list-style-type: none"> • Caster

■ ME8662N/ ME8662E

Available for demonstration use because of being portable.



Applications	<ul style="list-style-type: none"> • Wireless system inspection for compact equipments. • Demo of wireless communication equipments.
Shielding characteristics	TypeN $\geq 60\text{dB typ}@2.4\text{GHz}$ TypeE $\geq 55\text{dB typ}@2.4\text{GHz}$
Reflection loss	TypeE approx. -11dB @ 1GHz, approx. -18dB @ 2GHz approx. -24dB @ 5GHz, approx. less than -24dB @ more than 5GHz
Outside dimensions	360(W)×166(H)×340(D)mm (exclude handle and projection)
Inside dimensions	TypeN 354(W)×129(H)×334(D)mm TypeE 293(W)×98.5(H)×273(D)mm
Structure	Triple structure composed of radio wave absorber, copper plate and aluminum plate.
Connectors	SMA(2pcs) 9pins D-sub connector(1pc)
Weight	TypeN approx.6.7kg TypeE approx.7.5kg

■ ME8668

With an automatic conveyer suited for mass production line.



Applications	<ul style="list-style-type: none"> • Mass production line • Wireless system test for technical standard. • Receiving sensitivity test. • Antenna characteristics measurement
Shielding characteristics	$\geq 70\text{dB}@2.4\text{GHz}$
Reflection loss	$\geq 20\text{dB}@1.2\text{GHz}$
Outside dimensions	922(W)×731(H)×731(D)mm (excluding automatic conveyer)
Inside dimensions	790(W)×605(H)×605(D)mm
Structure	Double structure composed of radio wave absorber and stainless steel.
Connectors	SMA (2pcs), Available for D-sub and etc.
Weight	approx. 94kg (including conveyer)
Automatic conveyer	
Dimensions	634(W)×436(H)×260(D)mm
Test device	110(W)×150(H)×150(D)mm 2kg load Capable of changing DUT mounting part in conveyer.

■ ME8669

Available for measurement at low frequency with ferrite absorber.



Applications	<ul style="list-style-type: none"> • Wireless system test for technical standard. • Receiving sensitivity test • Antenna characteristics measurement
Shielding characteristics	$\geq 70\text{dB}@300\text{MHz}$
Reflection loss	$\geq 20\text{dB}@50\text{MHz to } 800\text{MHz}$
Outside dimensions	915(W)×580(H)×585(D)mm (excluding projection)
Inside dimensions	810(W)×506(H)×506(D)mm
Structure	Triple structure composed of radio wave absorber, copper plate and aluminium plate.
Connectors	SMA (2pcs) 25-pins D-sub connector(1pc)
Weight	approx.205kg

■ MY5220

Newest type of anechoic box with high shield characteristics.



Applications	<ul style="list-style-type: none"> • Mass production line • Shield box • Antenna characteristics measurement
Shielding characteristics	$\geq 75\text{dB}@2.4\text{GHz}$
Reflection loss	$\geq 20\text{dB}@2.4\text{GHz}$
Outside dimensions	456(W)×416(H)×416(D)mm (exclude handle and projection)
Jig mount Dimensions	350(W)×16(H)×300(D)mm
Inside dimensions	390(W)×340(H)×340(D)mm
Structure	Double structure composed of radio wave absorber and
Connectors	SMA(3pcs)
Weight	approx.25kg
Option	Connector box ((LAN connector(3pcs), USB(1pc), 9 pins D-sub connector (1pc), AC power 1pc (with power cable)

■ MY5310

Optimum for EMI test because equipped with turntable for small EUT.



Applications	<ul style="list-style-type: none"> • EMI test • Wireless system test for technical standard. • Antenna characteristics measurement
Shielding characteristics	$\geq 65\text{dB typ}$
Reflection loss	$\geq 20\text{dB}@35\text{MHz to } 2.2\text{GHz}$
Outside dimensions	1340(W)×1210(H)×1030(D)mm (excluding casters and projections)
Inside dimensions	1230(W)×920(H)×920(D)mm
Structure	Double structure composed of radio wave absorber and stainless steel.
Connectors	N(J)@antenna out N(J)@for EUT 25-pins D-sub connector(1pc)
Weight	approx.460kg
Option	Broadband antenna

■ MY5410

Optimum for EMI test because equipped with turntable for large EUT.



Applications	<ul style="list-style-type: none"> • EMI test • Wireless system test for technical standard. • Antenna characteristics measurement
Shielding characteristics	$\geq 65\text{dB typ}$
Reflection loss	$\geq 20\text{dB}@35\text{MHz to } 2$
Outside dimensions	2364(W)×1902(H)×1424(D)mm (excluding projection)
Inside dimensions	2170(W)×1450(H)×1230(D)mm
Structure	Double structure composed of radio wave absorber and stainless steel.
Connectors	N(J)@antenna out N(J)@for EUT
Weight	approx.1000kg
Option	Broadband antenna

Application

■ Features and utility of electromagnetic anechoic box

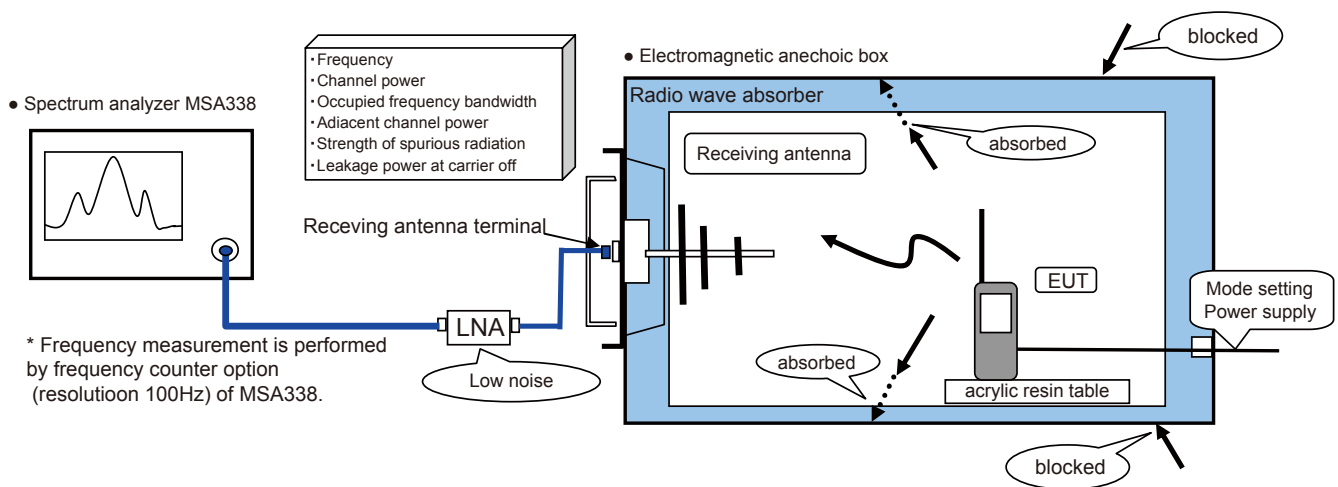
The electromagnetic anechoic box has the features described below and makes the precise measurement of DUT characteristics.

1. The electromagnetic anechoic box provides the circumstances isolated from the outside electromagnetic field.
2. The electromagnetic anechoic box minimizes the leakage of the DUT's electromagnetic wave to the outside.
3. The electromagnetic anechoic box minimizes the radio wave interference in the box.

■ Main application

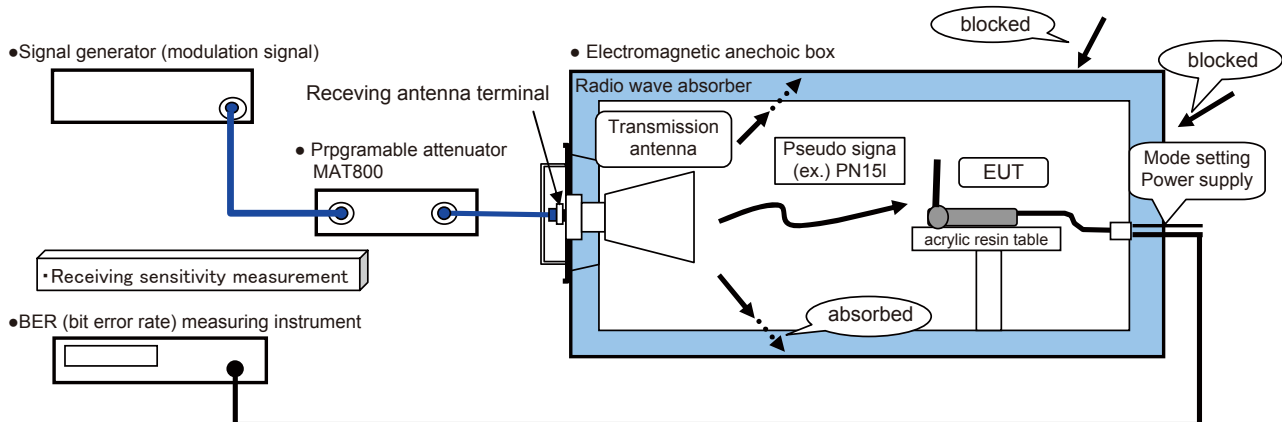
1. Transmission characteristics test of wireless equipment

The receiving antenna installed at the opposite side of DUT receives the radio wave radiated from DUT, which is put on an acrylic resin table, and then the receiving signal is analyzed by Spectrum analyzer MSA338 so that the transmission characteristics of the wireless equipment can be evaluated.



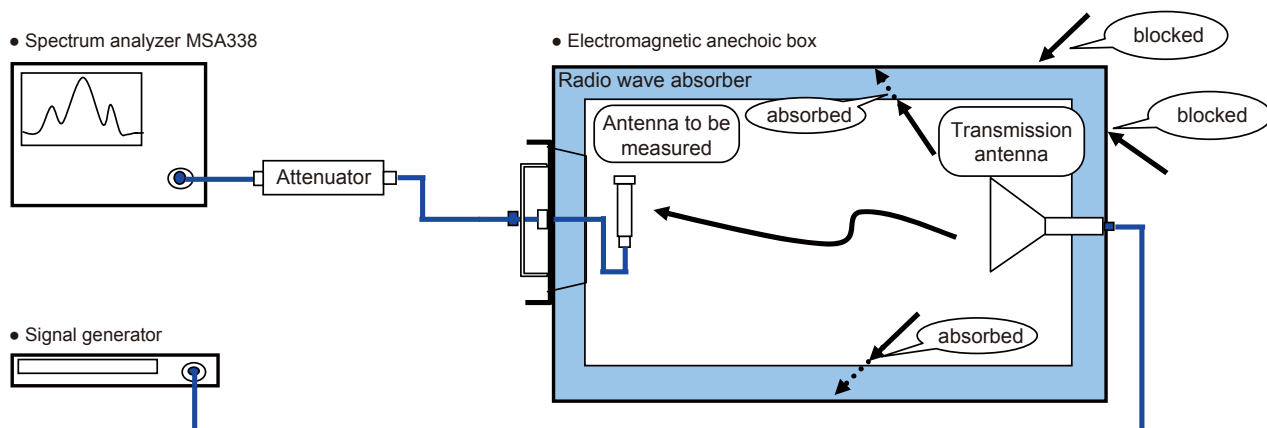
2. Receiving sensitivity test of wireless equipment

Such a pseudo signal as PN15 is radiated from the transmission antenna through the programmable attenuator MAT800. The DUT receives this signal and outputs the base band signal to BER measuring instrument. The receiving sensitivity is precisely measured according to BER value set.



3. Antenna characteristics measurement

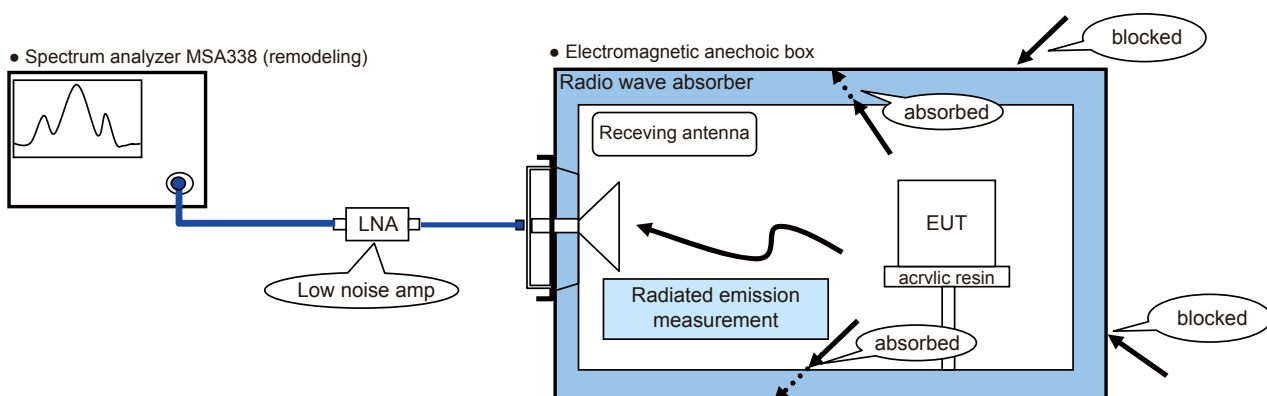
The antenna characteristics is analyzed by the method that the antenna to be measured receives the radio wave radiated by the transmission antenna and then Spectrum analyzer MSA338 measures this receiving signal.



4. EMC precompliance test

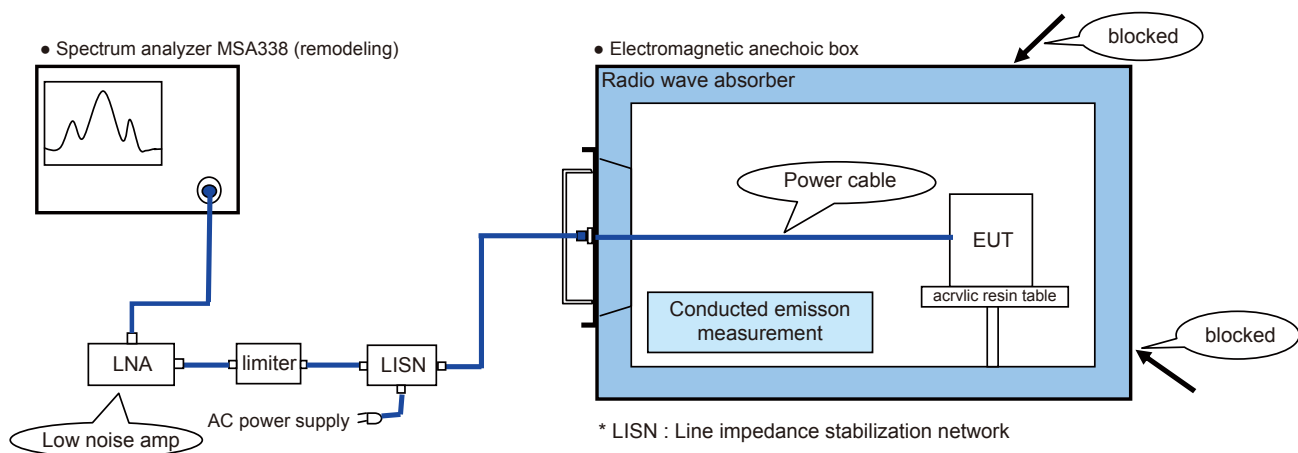
4.1 Radiated emission measurement

The radiated emission from DUT is measured by Spectrum analyzer MSA338 (remodeling) after received by the receiving antenna.



4.2 Conducted emission measurement

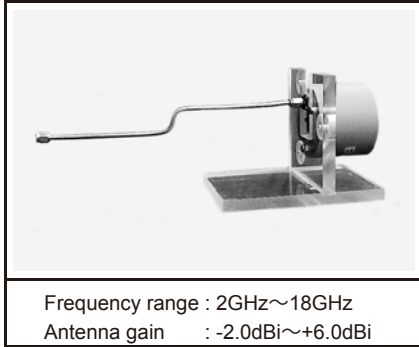
The conducted emission from DUT to the power cable is measured through LISN by Spectrum analyzer MSA338 (remodeling).



Options

■ Antenna

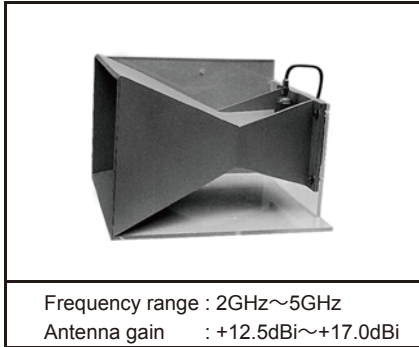
Spiral antenna



Dipole antenna

M301	M302	M303	M304	M305	M306
Model	Frequency range		Antenna gain		
M301	0.8 to 1GHz		>1dBi		
M302	1.25 to 1.65GHz		>1dBi		
M303	1.7 to 2.2GHz		>1dBi		
M304	2.25 to 2.65GHz		>1dBi		
M305	390 to 410MHz		>1dBi		
M306	4.7 to 602GHz		>1dBi		

Spiral antenna

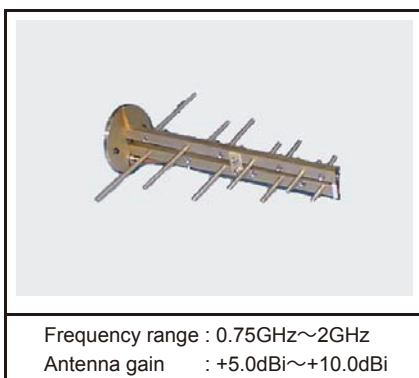


■ Antenna

size	φ 200mm
weight	approx. 3kg
rotation angle	360deg
rotation step	10deg

※This option is mounted on ME8661A/ME8669.

Spiral antenna



*Reference antenna Contain antenna gain and RF coupling degree data

■ Accessory

•Microwave coaxial cable	0.5m 3m 4m
•Fixed microwave attenuators (1~10,12,13,15,20dB)	
•50ohm termination (SMA)	
•Coaxial adapter	BNC(P)/BNC(J) BNC(P)/N(J) BNC(P)/N(P) BNC(P)/F(J) BNC(P)/F(P)

Radio wave absorber

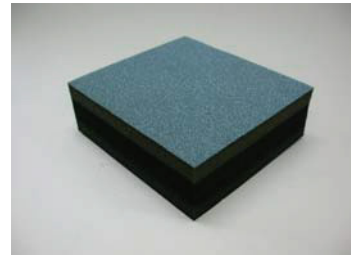
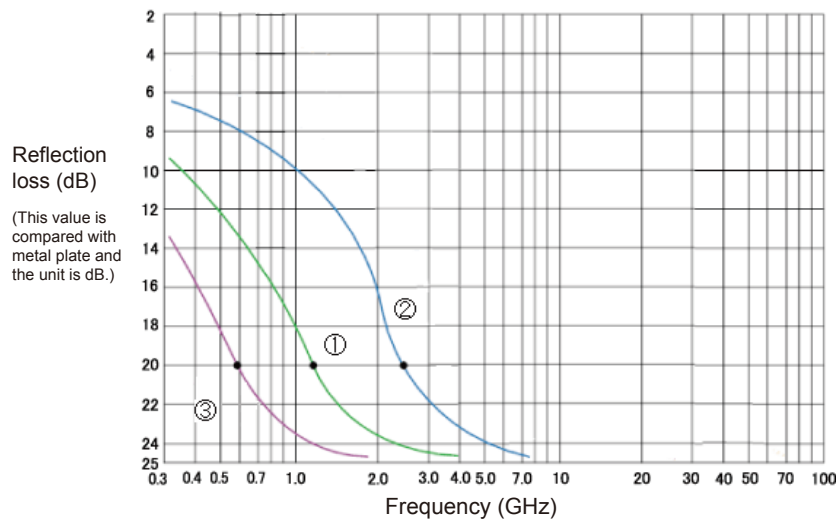
Type of absorber

Model	Absorber	Reflection loss	Features	Utility
ME866A ME8668	polyurethane absorber ①	$\geq 20\text{dB}@1.2\text{GHz}\sim$	Absorber correspond all polarized wave.	<ul style="list-style-type: none"> Wireless LAN Bluetooth Cellular phone
ME8662E ME8668B MY5220	polyurethane absorber ②	$\geq 20\text{dB}@2.4\text{GHz}\sim$	Absorber correspond all polarized wave.	<ul style="list-style-type: none"> Wireless LAN GPS ETC
ME8661B	polyurethane absorber ③	$\geq 20\text{dB}@600\text{MHz}\sim$	Absorber correspond all polarized wave.	<ul style="list-style-type: none"> RF-ID tag Cellular Phone
ME8669	ferrite absorber ①	$\geq 20\text{dB}$ $@50\text{MHz}\sim 800\text{MHz}$	Available for measurement at low frequency.	<ul style="list-style-type: none"> Keyless Entry RF-ID tag Medical system
MY5310 MY5410	ferrite absorber ②	$\geq 20\text{dB}$ $@50\text{MHz}\sim 430\text{MHz}$	Available for measurement at low frequency.	<ul style="list-style-type: none"> RF-ID tag Other Frequency band 30MHz to 400MHz

Electrical characteristic

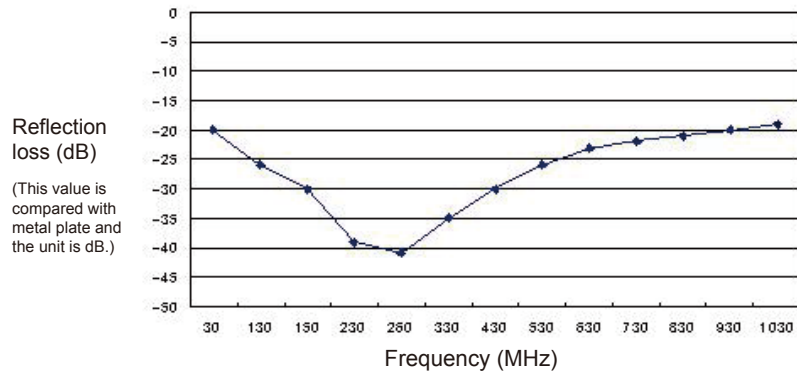
Urethane absorber

Characteristic data

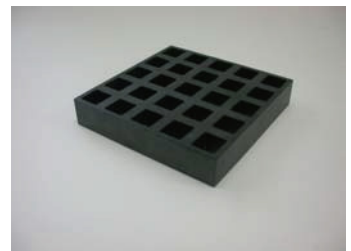
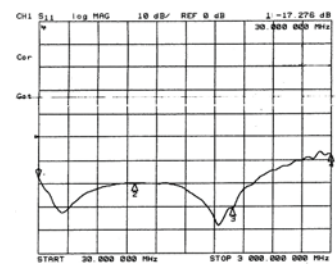


Ferrite absorber

① Characteristic data



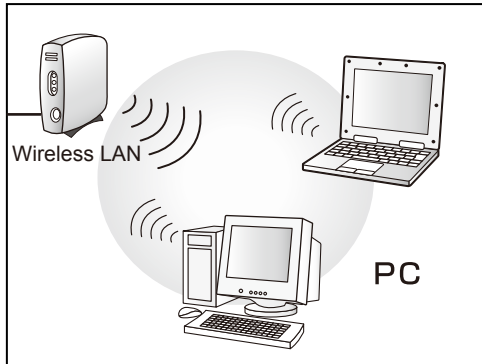
① Characteristic data



Equipment Under Test

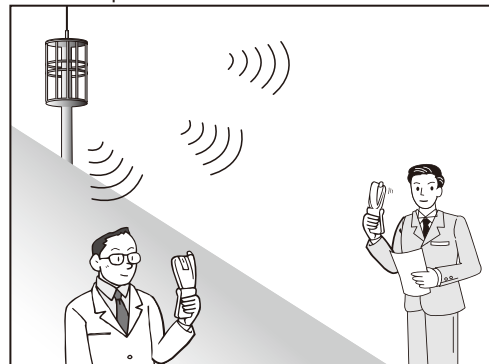
Electromagnetic anechoic box is used to test, measure and check in multi-directional field.

■ Wireless LAN



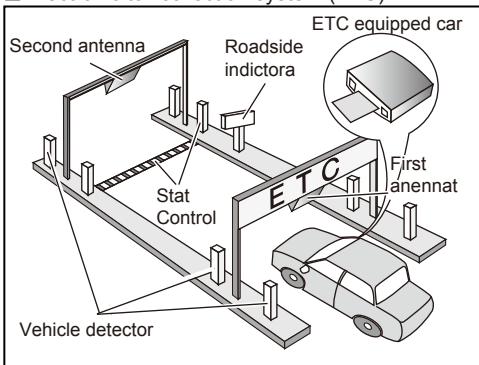
Frequency band 2.4GHz/5.1GHz

■ Cellular phone



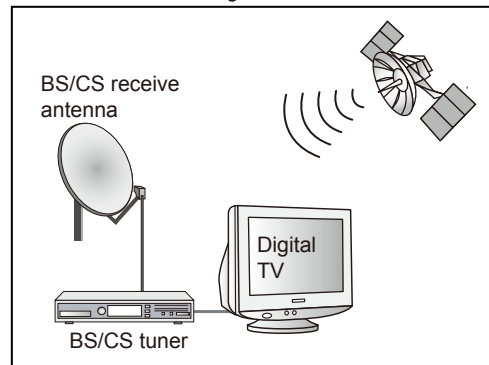
Frequency band 800MHz/900MHz/1.8GHz/2.2GHz

■ Electronic toll collection system (ETC)



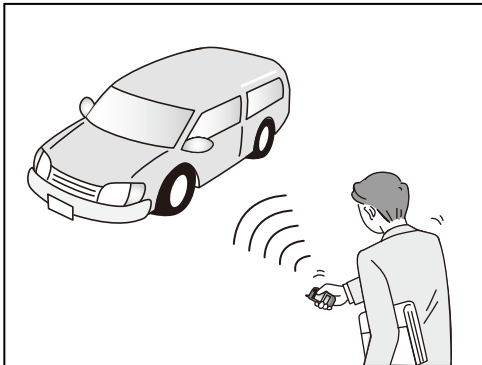
Frequency band 5.8GHz

■ Satellite broadcasting



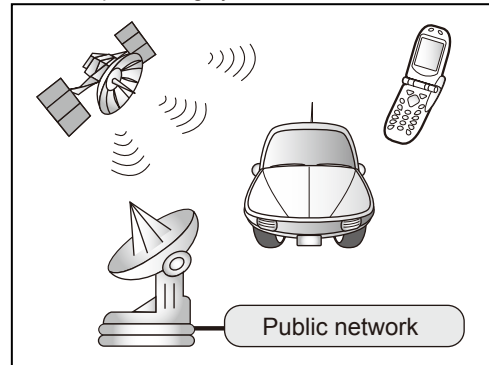
Frequency band 11.7GHz

■ Keless entry



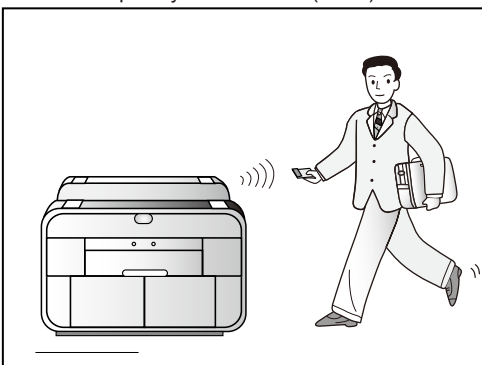
Frequency band 300MHz to 500MHz

■ Global positioning system



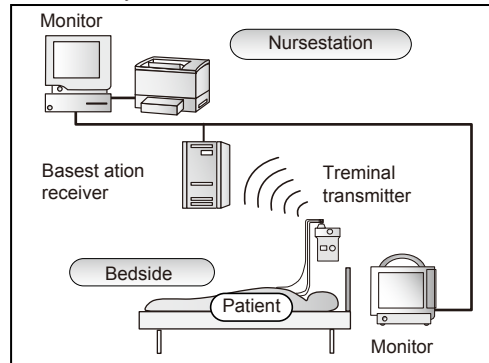
Frequency band 1.5GHz/5.1GHz

■ Radio frequency identification (RFID)



Frequency band UHF(950MHz)/2.4GHz

■ Medical system



Frequency band 420MHz to 450MHz