C&U
CREATIVE
& UNIQUE

Making creative and unique products
is our motto.

MICRONIX Products

DIGEST

- Spectrum analyzer
  Signal analyzer
- EMC test system
- Electromagnetic
  anechoic box/Shield box
- Variable attenuator
- Signal generator
- ETC/DSRC
  inspection system
- Test accessories

Spectrum analyzer/Signal analyzer

MSA300 series spectrum analyzer

Realized the world's first and inexpensive handheld type.

GOOD DESIGN AWARD

- Compact 162(W)×70(H)×260(D)mm and lightweight 1.8kg
- 150 minutes battery operation
- Abundant functions comparable to a bench type
  - Marker measurement and peak search function
  - Measuring functions: Channel power, Adjacent channel power, Occupied bandwidth, Electric field strength and Magnetic field strength measurement
  - Calculation functions: Max hold, Min hold, Averaging, OverWrite
- Electric field strength measurement from 300MHz to 6.2GHz
- AUTO tuning
- Abundant options
- Hard copy with an optional printer

3.3GHz band
MSA338

Frequency range: 50kHz to 3.3GHz

The most popular and inexpensive model.

Center frequency accuracy: ±82kHz
@sweep 100ms, span 10MHz, RBW 3kHz
RBW: 3kHz to 3MHz (1-3 step)
SSB phase noise: -90dBc/Hz @100kHz offset
Reference level: +10 to -60dBm (1dB step)
Average noise level: -117dBm @1GHz
Sweep time: 10ms to 30s

CE

8.5GHz band
MSA358

Frequency range: 50kHz to 8.5GHz

Broadband model with same functions as MSA338.

Center frequency accuracy: ±82kHz
@sweep 100ms, span 10MHz, RBW 3kHz
RBW: 3kHz to 3MHz (1-3 step)
SSB phase noise: -90dBc/Hz @100kHz offset
Reference level: +10 to -60dBm (1dB step)
Average noise level: -117dBm @1GHz
Sweep time: 10ms to 30s

CE

3.3GHz band with TG
MSA338TG

Frequency range: 50kHz to 3.3GHz

〈Tracking generator〉
Output frequency range: 5MHz to 3.3GHz
Output level: -10dBm

- A spectrum analyzer being equipped with a tracking generator and keeping the functions of MSA338.
  Enables the measurement of the amplitude frequency characteristics of electronic component and circuit.
- By connecting VSWR bridge MVS300B, the return loss can be measured.

CE

3.3GHz band for EMI
MSA338E

Frequency range: 50kHz to 3.3GHz

〈EMI measurement〉
Detection mode: PK, QP and AV detections
Resolution bandwidth: 9kHz/120kHz @6dB

There are mainly three applications.

- Radiated emission measurement by connecting antenna
- Conducted emission measurement by connecting LISN MPW201B
- Noise measurement on PCB by connecting magnetic field probe CP-2S < applied to all models >

CE

MSA400 series spectrum analyzer

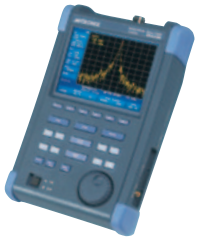
Upgrading MSA300 series further

Comparison between MSA300 and MSA400

Item	MSA300 series	MSA400 series
LCD	mono 4.7inch QVGA(320×240)	color 5.7inch VGA(640×480)
Battery operation	2.5 hour	4 hour
Battery remainder display	Not displayed	Displayed
Communication	RS-232C	USB
External memory	No	USB memory
Average noise level	–117dBm	–127dBm
Waveform data points	251(H)×201(V)	501(H)×381(V)
Display dynamic range	8div/80dB	10div/100dB
Display scale	10,2dB/div	10,5,2dB/div
Freq. setting resolution	100kHz	20kHz
External trigger	No	Yes
RF input connector	SMA(J)	N(J)
Protection bumper	No	Yes

※The dimensions and weight are almost same.

3.3GHz band
MSA438

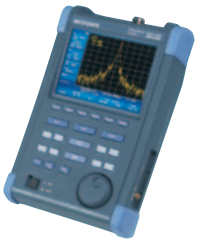


Frequency range：50kHz to 3.3GHz

Upgrade model of MSA338.

Center frequency accuracy：±52kHz
@sweep 100ms, span 10MHz, RBW 3kHz
RBW：3kHz to 3MHz (1-3 step)
SSB phase noise：-90dBc/Hz @100kHz offset
Reference level：+10 to -60dBm (1dB step)
Average noise level：-127dBm @1GHz
Sweep time：10ms to 30s

8.5GHz band
MSA458

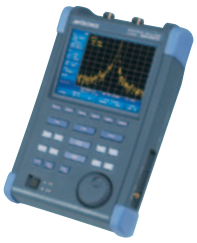


Frequency range：50kHz to 8.5GHz

Upgrade model of MSA358.

Center frequency accuracy：±52kHz
@sweep 100ms, span 10MHz, RBW 3kHz
RBW：3kHz to 3MHz (1-3 step)
SSB phase noise：-90dBc/Hz @100kHz offset
Reference level：+10 to -60dBm (1dB step)
Average noise level：-123dBm @1GHz
Sweep time：10ms to 30s

3.3GHz band with TG
MSA438TG



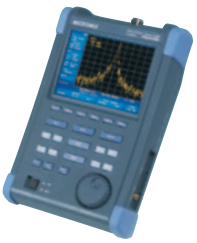
Frequency range：50kHz to 3.3GHz

〈Tracking generator〉
Output frequency range：5MHz to 3.3GHz
Output level：-10dBm

Upgrade model of MSA338TG.

- The desired characteristics data is obtained because frequency setting resolution is improved to 20kHz and 5dB/div is added to the display scale.
- By connecting VSWR bridge MVS300B, the return loss can be measured.
- By connecting DTF adapter MA430, the distance to discontinuity point of cable can be measured.

3.3GHz band for EMI
MSA438E



Frequency range：50kHz to 3.3GHz

〈EMI measurement〉
Detection mode：PK, QP and AV detections
Resolution bandwidth：9kHz/120kHz @6dB

Upgrade model of MSA338E.

Provides a wider dynamic range and enables a lower noise measurement, because average noise level is improved 10dB.

- Radiated emission measurement by connecting antenna
- Conducted emission measurement by connecting LISN MPW201B
- Noise measurement on PCB by connecting magnetic field probe CP-2S < applied to all models >

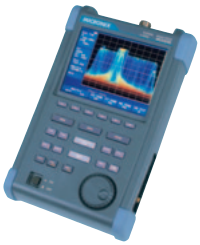
Spectrum analyzer/Signal analyzer

MSA500 series signal analyzer

The world's first signal analyzer with real time plus sweep system.

For offering both the real time system based on Fast Fourier Transform (FFT) and the conventional sweep system, each strong points of both systems are effectively usable.
By real time system, unsteady signal can be measured, and time domain analysis and modulation analysis can be performed. By sweep system, the wide frequency range can be observed at a glance.

3.3GHz band
MSA538

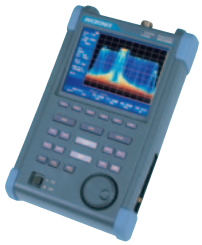


Frequency range：20kHz to 3.3GHz

The most popular model of MSA500 series.

- ■Real time mode
  - •8 types of analysis functions
    [Spectrum, Spectrogram,OverWrite,
    Time domain (5 types)]
  - •20MHz maximum span
  - •Fast OverWrite analysis
  - •Large memory of 16K frames and high speed USB communication of 19ms/frame
- ■Sweep mode：300Hz minimum RBW
- ■Average noise level：-162dBm/Hz
- ■Four hour battery operation

8.5GHz band
MSA558

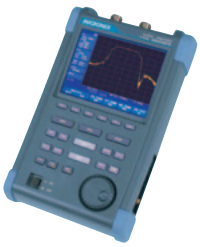


Frequency range：20kHz to 8.5GHz

Covering almost all applications of wireless communication systems because of 8.5GHz band.

- ■The specifications are almost same as MSA538 excepting frequency range.
- ■Since the frequency range is wider, 5GHz band wireless LAN and 5.8GHz band DSRC can be measured. Moreover, three times more spurious signal of 2.4GHz band equipment.
- ■Real time processing up to 8.5 GHz
- ■Average noise level：-157dBm/Hz
- ■Four hour battery operation

3.3GHz band with TG
MSA538TG



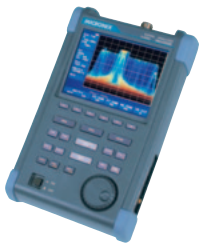
Frequency range：20kHz to 3.3GHz

〈Tracking generator〉
Output frequency range：5MHz to 3.3GHz
Output level：-10dBm

By being equipped with a tracking generator and keeping the functions of MSA538, it is possible to perform the measurement and evaluation of the amplitude frequency characteristics of filter, amplifier, electronic component and circuit.
Moreover, the following options are available.

- ■DTF adapter MA430
  Enables to measure the distance to discontinuity point of cable and the length of normal cable.
- ■VSWR bridge MVS300B
  Enables to measure the return loss of electronic component and circuit. The measuring frequency range is 5MHz to 3GHz.

8.5GHz band for EMI
MSA558E



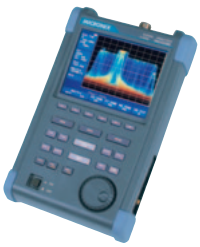
Frequency range：20kHz to 8.5GHz

〈EMI measurement〉
Detection mode：PK, QP and AV detections
Resolution bandwidth(6dB)：9kHz,120kHz,1MHz

A model being equipped with EMI measurement function and keeping the functions of MSA558.
Capable of EMI measurement up to 8.5 GHz.

- ■Radiated emission measurement by connecting antenna
- ■Conducted emission measurement by connecting LISN MPW201B
- ■Noise measurement on PCB by connecting magnetic field probe CP-2S < applied to all models >

3.3GHz band for EMI
MSA538E



Frequency range：20kHz to 3.3GHz

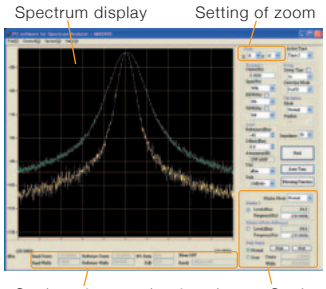
〈EMI measurement〉
Detection mode：PK, QP and AV detections
Resolution bandwidth(6dB)：9kHz,120kHz,1MHz

A model being equipped with EMI measurement function and keeping the functions of MSA538.

- ■Radiated emission measurement by connecting antenna
- ■Conducted emission measurement by connecting LISN MPW201B
- ■Noise measurement on PCB by connecting magnetic field probe CP-2S < applied to all models >

Spectrum analyzer/Signal analyzer Option

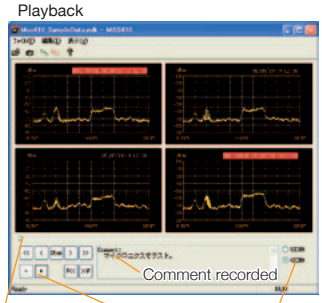
PC software MAS300/400/500



This is a software that controls the spectrum analyzer or signal analyzer by the PC and displays the spectrum waveform on PC screen.

MAS300: for MSA300 series
MAS400: for MSA400 series
MAS500: for MSA500 series

Logging software MAS310/410/510



This is a PC software that collects the measurement data by uninhabited. Optimum for watching an abnormal signal at night and recording the data by uninhabited for a long time.

MAS310: for MSA300 series
MAS410: for MSA400 series
MAS510: for MSA500 series

DTF adapter MA430

Option: 50Ω measurement kit
75Ω measurement kit

Enables to measure the distance to discontinuity point of cable and the length of normal cable.

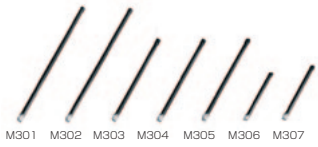
Distance range: 0.3 to 1000m @50Ω cable
1 to 400m @75Ω cable
Cable characteristics list:
111types of cables @50Ω cable
11types of cables @75Ω cable
Applied models: MSA438TG/538TG

VSWR bridge MVS300B

Enables to measure the return loss of electronic component and circuit.

Frequency range: 5 to 3000MHz
Directivity: more than 40dB @50 to 3000MHz
more than 25dB @5 to 50MHz
Insertion loss: less than 7dB @SOURCE to DUT
less than 8dB @DUT to REFLECTED
Applied models: MSA338TG/438TG/538TG

Dipole antenna



Antenna for electric field strength measurement

Model	Freq. range
M301/401	0.8 to 1GHz
M302/402	1.25 to 1.65GHz
M303/403	1.7 to 2.2GHz
M304/404	2.25 to 2.65GHz
M305/405	300 to 500MHz
M306/406	4.8 to 6.2GHz
M307/407	470 to 770MHz

Connector: SMA(P) @M300, N(P) @M400
Applied models: M301 to M307: MSA300 series
M401 to M407: MSA400/500 series

Magnetic field probe CP-2S

Measures the magnetic field strength at pattern on PCB and terminals of device. The probe is calibrated in the instrument.

Frequency range: 10MHz to 3GHz
Space resolution: approx.0.25mm
(depending on objects)
Applied models: MSA300/400/500 series

Wideband passive probe MP300

A passive probe with low input capacitance and wide frequency band.

Frequency range: DC to 6GHz
Attenuation ratio: 10:1, ±2%
Input resistance: 500Ω±2%
Input capacitance: 0.25pF(typ)
Applied models: MSA300/400/500 series

Printer

(With AC adapter and one rollpaper)

※Option: Rollpaper (10 rolls)

Enables a hard copy of the screen.

Interface: RS-232C @MSA300 series
USB @MSA400/500 series
Printing method: Thermal line dot method
Paper: 80mm width thermal paper
Power source: internal: AA-sized alkaline battery(4pcs)
external: 7.5VDC/3A(dedicated AC adapter)
Applied models: MSA300/400/500 series

Frequency counter (factory option)

Item	Specifications
Frequency range	1MHz to 3.3GHz @excepting MSA358/458 1MHz to 8.5GHz @MSA358/458
Measured level	+10 to -70dBm @1MHz to 2GHz, RBW100kHz +10 to -60dBm @2 to 8.5GHz, RBW100kHz
Measurement resolution	100Hz
Display digits	8 digits max
Reference X'tal	Accuracy: ±2ppm @23°C Temp.characteristics: ±5ppm @0 to 40°C
Applied models	MSA300/400 series

Battery

Ni-MH battery MB300

4.8V/4200mAh
Applied models: MSA300 series

Lithium-ion battery MB400

7.4V/5000mAh
Applied models: MSA400/500 series

Charger MBC300

A charger for battery MB300 used in MSA300 series.

Input voltage: DC5V±0.25V(using AC adapter MA300)
Input current: 4A max
Charging time: roughly two hours
Applied models: MSA300 series

Interface cable

RS-232C cable MI180

Connector: D-sub 9pins
Length: 1.5m
Applied models: MSA300 series

USB cable MI400

Connector: A plug/B plug
Length: 1m
Applied models: MSA400/500 series

RS-232C/GP-IB converter ZS-6144TM

(with AC adapter and 25p/9p conversion connector)

RS-232C interface of MSA300 series is converted to GP-IB.

Buffer memory: 8K bytes (both of input/output)
Dimensions: 130(W)×40(H)×200(D)mm
Applied models: MSA300 series

Option compatibility table

Option	MSA300 series	MSA400 series	MSA500 series
PC software	MAS300	MAS400	MAS500
Logging software	MAS310	MAS410	MAS510
DTF adapter MA430	×	○	○
VSWR bridge MVS300B	○	○	○
Dipole antenna	M300 series	M400 series	M400 series
Magnetic field probe CP-2S	○	○	○
Wideband passive probe MP300	○	○	○
Printer	RS-232C printer	USB printer	USB printer
Frequency counter	○	○	×
Battery	MB300	MB400	MB400
Charger MBC300	○	×	×
Interface cable	MI180	MI400	MI400
RS-232C/GP-IB converter ZS-6144TM	○	×	×

※Other options are listed in Test accessories.

EMC test system

EMI test system
MR2300

MR2300 is a first EMI total test system in the world for “Precompliance” that measures the radiated and conducted emission noise.
The miniaturization of the system is realized by small and broadband antenna MAN101/102 developed by ourselves.
The whole system is calibrated.
In addition, four types of anechoic boxes MY5310/5310S/5310SU/5410 are available according to the EUT.

EMS test system
MR2350

A precompliance EMS test system with which the radiation immunity test (IEC/EN61000-4-3) can be done.

Electric field strength: 1, 3, 10V/m

The malfunction of the EUT can be observed on the PC screen through the EUT camera monitor MEC235 put in the anechoic box.
In addition, three types of anechoic boxes MY5310/5310S/5410 are available according to the EUT.

LISN (Line impedance stabilization network)
MPW201B

LISN is used to make constant the power source impedance observed from EUT and to measure noise with reproducibility when the conducted emission discharged through the power supply line is measured.

Frequency range: 150kHz to 30MHz

Circuit type:
50Ω/50μH and V type based on CISPR16-1

Rated current: 15A

Power supply: single phase, 50/60Hz, 250VACmax

Power amplifier
MAP202

Frequency range: 30 to 1000MHz

Gain: 46dB typ @30 to 600MHz
44.5dB typ @600 to 1000MHz

1dB compression level:
42.5dBm typ @30 to 600MHz
41dBm typ @600 to 1000MHz

Modulation output:
1kHz/2Vp-p square wave

Low noise amplifier
MAP301/302

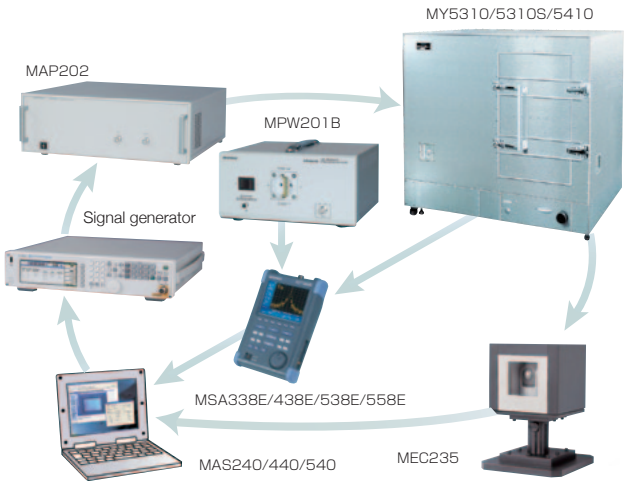
MAP301 is optimum for emission noise measurement of CISPR25 in combination with loop antenna MAN120.
MAP302 is optimum for emission noise measurements of both horizontal and vertical polarizations in combination with biconical antenna MAN150.

Item	MAP301	MAP302
Frequency range	100kHz to 500MHz	20MHz to 3GHz
Gain	50dB	20dB
Noise figure	3.5dB	3.5dB

EUT camera monitor
MEC235

Since the main body of camera is covered with the radio wave absorber and the pedestal is made of plastic, the unnecessary reflection by the camera is suppressed.
The camera can be zoomed up to 42 times, and the view range can be controlled within ±29° on the right and left, up to 23° upward and up to 35° downward. This control can be done with PC, and the image is displayed on the PC screen.

EMI+EMS test system
MR2400



A system combining the EMI test system MR2300 and the EMS test system MR2350. PC software is MAS240/440/540. The price of MR2400 becomes much lower than purchasing MR2300 and MR2350 separately because the anechoic box and the broadband antenna are common to two systems.
In addition, three types of anechoic boxes MY5310/5310S/5410 are available according to the EUT.

Electric turntable (factory option)
MT106

An electric turntable of 220mm in diameter and 15kg in load. This is controlled by the PC and can be installed only in the anechoic box MY5310/5310S.

Control software (option):
Manual control software MAS20T
Automatic control software MAS240T

Spectrum analyzer for EMI test
MSA338E/438E/538E/558E

- Used in MR2300 system for the radiated emission test and the conducted emission test.
- Measures the conducted emission by using with LISN MPW201B and PC software MAS230/430/530.
- Measures the noise on PCB by connecting a magnetic field probe CP-2S.

Magnetic field probe
CP-2S

Frequency range:10MHz to 3GHz
A probe to measure the magnetic field strength of the noise on PCB.
This is used connecting to spectrum analyzer or signal analyzer of MSA300/400/500 series.
The measured value is calibrated in the instrument.

Electromagnetic anechoic box lineup

The following four types of anechoic boxes MY5310/5310S/5310SU/5410 are selectable according to the EUT.

MY5310

An anechoic box for a small EUT and of the lowest price.
The maximum size of EUT will be approx. 220mm cube.

Outside dimensions:1340(W)×1210(H)×1030(D)mm
Inside dimensions:1230(W)×920(H)×920(D)mm
Weight:approx.460kg
Manual turntable:220mmϕ/load 10kg
Antenna:MAN101, fixed in an anechoic box

MY5310S/SU

A separation type of MY5310.
It is easy to carry it with a small elevator and to install in the narrow space because divided into two.

Outside dimensions:1350(W)×1220(H)×1080(D)mm
Inside dimensions:1230(W)×920(H)×920(D)mm
Weight:approx.460kg
Manual turntable:220mmϕ/load 10kg
Antenna:MAN101, fixed in an anechoic box

MY5310SU is a type inserting a spacer unit of 610mm width between two parts of MY5310S divided.

MY5410

An anechoic box for large EUT and of the biggest size.
The maximum size of EUT will be approx. 756mm cube.

Outside dimensions:2310(W)×1790(H)×1390(D)mm
Inside dimensions:2140(W)×1450(H)×1220(D)mm
Weight:approx.1000kg
Manual turntable:756mmϕ/load 100kg
Antenna:MAN102, movable up and down up to 90cm in 10cm step by hand.

Broadband antenna

MAN101/102

Compact, broadband and high power antenna.

Frequency range:30MHz to 3GHz
Polarization:Linear
Ground plate size:
700(W)×900(D)mm @MAN101
800(W)×950(D)mm @MAN102

Loop antenna
MAN120

A small antenna suitable for low frequency measurement. Optimum for the radiated emission measurement at low frequency.

Frequency range:50kHz to 33MHz
Connector:N(P)
Impedance:50Ω
Dimensions:
420ϕ(outside)×320ϕ(inside)×13mm(thickness)
Weight:1.2kg

Biconical antenna
MAN150

Broadband, compact and lightweight antenna.

Frequency range:20MHz to 3GHz
Gain:-45 to +1dBi (nominal)
Antenna factor:20 to 51dB/m
Dimensions:350(L)×160(W)×140(D)mm
Weight:approx.350g

Electromagnetic anechoic box/Shield box

Taurus series

MY1510/1510N — Small size

Outside dimensions:380(W)×165(H)×380(D)mm
Inside dimensions:315(W)×100(H)×315(D)mm
(N) Inside dimensions:375(W)×160(H)×375(D)mm
Shielding effectiveness:70dB typ @2.4GHz
(N) Shielding effectiveness:60dB typ @2.4GHz
Reflection loss:≧20dB @≧2.4GHz, urethane①
MY1510N has no absorber.
Connector:SMA(2 pcs) @back
I/F module:1 module max @back
Weight:approx.3.5kg @excluding I/F module
(N) Weight:approx.1.9kg @excluding I/F module

MY1515 — With ventilation fan

Outside dimensions:465(W)×214(H)×465(D)mm
Inside dimensions:400(W)×150(H)×400(D)mm
Shielding effectiveness:70dB typ @2.4GHz
Reflection loss:≧20dB @≧2.4GHz, urethane①
Connector:SMA(8 pcs) @back
I/F module:1 module max @back
Fan:0.56 cubic m/min(max flow rate) @back
Intake @left side
Weight:approx.10kg @excluding I/F module

MY1520/1520N — Medium size

Outside dimensions:520(W)×520(H)×520(D)mm
Inside dimensions:460(W)×460(H)×460(D)mm
(N) Inside dimensions:515(W)×515(H)×515(D)mm
Shielding effectiveness:70dB typ @2.4GHz
(N) Shielding effectiveness:60dB typ @2.4GHz
Reflection loss:≧20dB @≧2.4GHz, urethane①
MY1520N has no absorber.
Connector:SMA(2 pcs) @back
I/F module:2 modules max @back
Weight:approx.15kg @excluding I/F module
(N) Weight:approx.12.3kg @excluding I/F module
Option •Wooden table MT104

MY1525 — With ventilation fan & 90dB shielding

Outside dimensions:460(W)×570(H)×582(D)mm
Inside dimensions:340(W)×340(H)×400(D)mm
Shielding effectiveness:90dB typ @2.4GHz
Reflection loss:≧20dB @≧1.2GHz, urethane②
Connector:SMA(2 pcs) @back
I/F module:1 module max @floor
Dedicated I/F module (IFM10,IFM11)
Fan:0.56 cubic m/min(max flow rate) @back
Intake @right side
Weight:approx.17kg @excluding I/F module

MY1530/1530N — Large size

Outside dimensions:1120(W)×705(H)×620(D)mm
Inside dimensions:1000(W)×500(H)×500(D)mm
(N) Inside dimensions:1115(W)×615(H)×615(D)mm
Shielding effectiveness:70dB typ @2.4GHz
(N) Shielding effectiveness:60dB typ @2.4GHz
Reflection loss:≧20dB @≧1.2GHz, urethane②
MY1530N has no absorber.
Connector:SMA(4 pcs) @back(2 pcs) and both sides
I/F module:4 modules max @back
Weight:approx.56kg @excluding I/F module
(N) Weight:approx.42kg @excluding I/F module
Option •Wooden table MT105

MY1520SW — With shield window for monitoring the inside

(Ex) Monitoring PC put inside

Outside dimensions:520(W)×520(H)×520(D)mm
Inside dimensions:460(W)×460(H)×460(D)mm
Shielding effectiveness:70dB typ @2.4GHz
Reflection loss:≧20dB @≧2.4GHz, urethane①
Connector:SMA(2 pcs) @back
I/F module:2 modules max @back
Shield window:300(W)×200(H)mm @front
Weight:approx.15kg @excluding I/F module

Taurus series Option

I/F module IFM1 to IFM6

A module equipped with AC power supply, DC power supply, LAN, USB, SMA, BNC, N, Triaxial, D-sub connectors and Through pipe.
Six types of modules are available in the combination of these connectors.

Ex. IFM2:AC(1), LAN(2), USB(2), D-sub9pin(1)

Turntable unit MT103

Turntable unit for **MY1530/1530N**

〈Table specifications〉
Diameter:200mmϕ
Withstand load:10kg
Material:Acrylic resin
Rotation angle:360°

Small / Medium type

ME8662E

Outside dimensions:360(W)×166(H)×340(D)mm
Inside dimensions:293(W)×98.5(H)×273(D)mm
Shielding effectiveness:60dB typ @2.4GHz
Reflection loss:Absorber urethane①
approx.-11dB @1GHz
approx.-18dB @2GHz
approx.-24dB @5GHz
approx.≦-24dB @>5GHz
Connector:SMA(2pcs), D-sub9pin @back
Weight:approx.7.5kg

ME8662N

Outside dimensions:360(W)×166(H)×340(D)mm
Inside dimensions:354(W)×129(H)×334(D)mm
Shielding effectiveness:55dB typ @2.4GHz
Connector:SMA(2pcs), D-sub9pin @back
Weight:approx.6.7kg

MY5220

Outside dimensions:456(W)×416(H)×416(D)mm
Inside dimensions:390(W)×340(H)×340(D)mm
Shielding effectiveness:75dB typ @2.4GHz
Reflection loss:≧20dB @≧2.4GHz, urethane①
Connector:SMA(3pcs) @back(2pcs)
and right side
Weight:approx.25kg
Option:Connector box @back

ME8661A

Outside dimensions:830(W)×608(H)×503(D)mm
Inside dimensions:700(W)×380(H)×380(D)mm
Acrylic resin table:200×200mm
Shielding effectiveness:65dB typ @2.4GHz
Reflection loss:≧20dB @≧1.2GHz, urethane②
Connector:
SMA(3pcs) @left side(2pcs) and right side
D-sub25pin @right side
Weight:approx.38kg
Option:Manual turntable MT101

Large type

ME8661B

Outside dimensions:1500(W)×1100(H)×900(D)mm
Inside dimensions:1200(W)×600(H)×600(D)mm
Shielding effectiveness:65dB typ @2.4GHz
Reflection loss:≧20dB @≧600MHz, urethane③
Connector:
SMA(3pcs) @left side(2pcs) and right side
D-sub25pin @right side
Weight:approx.230kg
Option:Manual turntable MT102

MY5310

Outside dimensions:1340(W)×1210(H)×1030(D)mm
Inside dimensions:1230(W)×920(H)×920(D)mm
Manual turntable:220mmϕ/load 10kg
Shielding effectiveness:70dB typ @2.2GHz
Reflection loss:≧20dB @35MHz to 2.2GHz, ferrite②
Connector:
N(J) (2pcs) @front and right side
D-sub25pin, LAN, Three pin power plug @front
Weight:approx.460kg
Option:Antenna MAN101
Electric turntable MT106

MY5310S/5310SU

Outside dimensions:1350(W)×1220(H)×1080(D)mm
※1960(W) @MY5310SU
Inside dimensions:1230(W)×920(H)×920(D)mm
※1840(W) @MY5310SU
Manual turntable:220mmϕ/load 10kg
Shielding effectiveness:70dB typ @2.2GHz
Reflection loss:≧20dB @35MHz to 2.2GHz, ferrite②
Connector:
N(J) (2pcs) @front and right side
D-sub25pin, LAN, Three pin power plug @front
Weight:approx.460kg @MY5310S
approx.650kg @MY5310SU
Option:Antenna MAN101
Electric turntable MT106

MY5410

Outside dimensions:2310(W)×1790(H)×1390(D)mm
Inside dimensions:2140(W)×1450(H)×1220(D)mm
Manual turntable:756mmϕ/load 100kg
Shielding effectiveness:55dB typ @2.2GHz
Reflection loss:≧20dB @35MHz to 2.2GHz, ferrite②
Connector:
N(J) (2pcs) @both sides
LAN, Three pin power plug @front
Weight:approx.1000kg
Option:Antenna MAN102

Electromagnetic anechoic box/Shield box

Special type

With automatic conveyer
ME8668

Outside dimensions: 922(W)×731(H)×731(D)mm
Inside dimensions: 790(W)×605(H)×605(D)mm
Automatic conveyer
Dimensions: 634(W)×436(H)×260(D)mm
Test device: 110(W)×150(H)×150(D)mm
Shielding effectiveness: 70dB typ @2.4GHz
Reflection loss:
≧20dB @≧1.2GHz, urethane②
Connector: SMA(2pcs) @front and back
Weight: approx.94kg

For low frequency
ME8669

Outside dimensions: 915(W)×580(H)×585(D)mm
Inside dimensions: 810(W)×506(H)×506(D)mm
Shielding effectiveness: 70dB typ @300MHz
Reflection loss:
≧20dB @50 to 800MHz, ferrite①
Connector: SMA(2pcs) @both sides
D-sub25pin @right side
Weight: approx.205kg

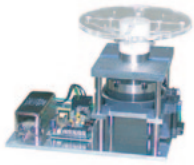
For low frequency
MY5305

Outside dimensions: 1150(W)×765(H)×635(D)mm
Inside dimensions: 1000(W)×500(H)×500(D)mm
Shielding effectiveness: 75dB typ @300MHz
Reflection loss:
≧20dB @35MHz to 2.2GHz, ferrite②
Connector: N(J) (2pcs) @front and right side
D-sub25pin, LAN, Three pin power plug @front
Weight: approx.195kg

Option

Electric turntable

MT106

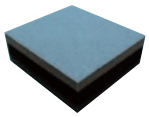


An electric turntable of 220mm in diameter and 15kg in load.
This is controlled by the PC and can be installed in anechoic box MY5310/5310S.

Control software:
Manual control software MAS20T
Automatic control software MAS240T

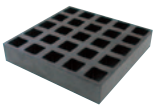
Radio wave absorber

■ **Urethane foam ① to ③**



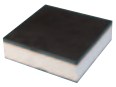
Item		Urethane ①	Urethane ②	Urethane ③
Thickness		29mm	57mm	114mm
Reflection loss	10dB	1GHz	350MHz	250MHz
	15dB	1.9GHz	700MHz	370MHz
	20dB	2.5GHz	1.2GHz	600MHz
	24dB	≧5.6GHz	≧2.5GHz	≧1.2GHz

■ **Ferrite ①**



Item	Specifications
Thickness	19mm
Reflection loss	20dB@30MHz 30dB@150MHz 40dB@260MHz 30dB@430MHz 20dB@930MHz

■ **Ferrite ②**



Item	Specifications
Thickness	28mm
Reflection loss	17dB@30MHz ≧20dB@35MHz to 2.2GHz ≧10dB@2.2 to 2.7GHz

Antenna

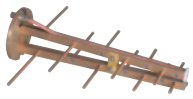
■ **Dipole antenna**
M301 to M307

The seven kinds of antennas cover the frequency band from 300MHz to 6.2GHz.
Connector is SMA(P).

■ **Spiral antenna**
M212/212R

A right circular polarization antenna with frequency band from 2 to 18GHz.
The reference antenna M212R is mounted on the acrylic resin stand, and is with an antenna gain & VSWR data and a semi-rigid cable.

■ **Log periodic antenna**
M213/213R



A linear polarization antenna with frequency band from 750MHz to 2GHz.
The reference antenna M213R is with an antenna gain & VSWR data.

■ **Biconical antenna**
MAN150

Broadband, compact and lightweight antenna.
Frequency range: 20MHz to 3GHz
Gain: -45 to +1dBi (nominal)
Antenna factor: 20 to 51dB/m
Dimensions: 350(L)×160(W)×140(D)mm

Variable attenuator

High-speed programmable attenuator
MAT800

By reading out the attenuation data stored in the built-in memory of 128k words, it is possible to generate the arbitrary attenuation pattern. That is, the amplitude curve of a microwave signal can be generated freely. The readout speed is 2μs/word maximum, and the spike won't be generated at the moment of switching the attenuation.
The attenuation pattern is transferred to the program memory in the MAT800 after made using a standard accessory "Software for making attenuation program MAS800" on the PC.

Suitable for the air simulation of such wireless communication as a handover test of mobile communication equipment and a dynamic motion test of ETC/DSRC.

Five models are available for each frequency band.

model A 1.5 to 4.5GHz
model B 3 to 9GHz
model C 4.5 to 13.5GHz
model D 1.95 to 5.85GHz
model E 0.75 to 2.25GHz

Maximum attenuation 80dB

Minimum step of attenuation 0.05dB

High-speed programmable attenuator
MAT810

A multifunctional programmable attenuator which can switch the attenuation of a microwave signal at high speed (2μs).The attenuation pattern is transferred to the program memory in the MAT810 after being made using a software of standard accessory on the PC. Suitable for the evaluation of communication quality of such wireless communication devices as mobile phone, WiMAX, PHS, ETC/DSRC and wireless LAN.

Frequency range 300MHz to 6.6GHz

Maximum attenuation 60dB

Minimum step of attenuation 0.05dB

Step attenuator
MAT850

A compact and lightweight step attenuator in which the attenuation can be changed confirming the value by LED display. The chattering and spike won't be generated at the moment of switching the attenuation.
Suitable for the evaluation of communication quality of such wireless communication devices as mobile phone, WiMAX, PHS, ETC/DSRC and wireless LAN.

Frequency range 300MHz to 6.1GHz

Maximum attenuation 60dB

Minimum step of attenuation 0.1dB

Signal generator

Arbitrary & function synthesizer
MFG206

- 1mHz to 20MHz/30Vp-p (output open)
- High accuracy and high stable frequency based on synthesized method
- Sine, triangle, square, arbitrary wave and DC
- Arbitrary wave: 10M words/s, 12bits and 128k words
  ※Software for making arbitrary waveform MAS206 is a standard accessory.
- Functions: Burst, Gate, Frequency sweep (linear, log) and VCF
- Interface: RS-232C
- Option: GP-IB board (MFG206-GP-IB)
  GP-IB cable (MI200)
  Coaxial cable (MC314)

Standard signal generator
MSG700 series

※Now under development.

- Lineup by 3 models of 3GHz, 6GHz and 9GHz
- With vector signal generation function (IQ modulation option is needed)
- Switching speed 100μs (ALC off)
- Large color LCD screen (5.7 inches)
- Low cost and high performance
- Suitable for development, production line and school in wireless communication field.

Item	MSG703	MSG706	MSG709
Frequency range	10MHz to 3GHz	10MHz to 6GHz	10MHz to 9GHz
SSB phase noise	≦-95dBc @20kHz offset		
Output level	+10 to -70dBm @ALC on		
Sweep function	List sweep, Step sweep		
Modulation function	FSK(DC to 1MHz), PSK(0 to 360°)		
Interface	USB (device and host), LAN		
Option	・IQ modulation ・High power output ・Low power output	・High stable time base ・Software for making sweep waveform	

ETC/DSRC inspection system

Automatic inspection system

RSU/OBE inspection system
ME8500

ME8500 was developed for the production or inspection line of RSU and OBE of ETC. This allows to automatically do the wireless system test and the dynamic motion test.
It is possible to perform a test of whole device or only RF circuit.

OBE inspection system
ME8600

ME8600 is a low price automatic inspection system developed for ETC/OBE production line. It is possible of wireless system test, protocol test and dynamic motion test (option).

Option

- Receiving sensitivity test (option A)
- Burst BER measurement (option B)
- Communication test (R/W) (option C)
- Dynamic motion test (option E)

ASK+QPSK OBE inspection system
ME9000

- Based on ARIB STD-T75 and ARIB TR-T16.
- Equipped with both ASK and QPSK modulations.
- Supports profile 9 to 12.
- Capable of protocol test, dynamic motion test and wireless system test.
- Capable of amplitude level calibration and self-check test of system.

ME9000 enables the low price system for reason why the necessary ones can be selected from among abundant test items.

DSRC OBE tester

ME9100

ME9100 is a tester to check the wireless communication of DSRC OBE installed on a car.
After transmitting FCMC from ME9100, it is confirmed whether ACTC and WCNC are returned by OBE correctly. Since the power is automatically turned off after 7 seconds from test start, battery life becomes longer. The number of test times is about 500 times without exchanging the battery.

- Supporting ETC and ITS spot
- Supporting all 7 channels and all 4 profiles
- Complete one piece and handheld type without any connection cable
- Easy operation by one multi-direction switch

Technical standards conformity certification has been obtained. (Radio license is not required.)

DSRC communication unit

ME9115

Lineup by 4 models of A, C, A+C and CN.
It is possible to read WCN of OBE and to measure electric field strength of OBE and RSU.

- model A
  Reads and displays WCN of OBE.
- model C
  Measures electric field strength of OBE and RSU.
- model A+C
  Is a compound equipment of model A and model C.
- model CN
  Measures electric field strength of RSU such as “ITS spot” in a moving car, extending the function of model C.

WCN and electric field strength measurement data can be saved up to maximum 100 data respectively. Moreover, since this operates as a removable disk, the saved data can be transferred to the PC through USB interface.

ETC OBE tester

ME8800Dα

ME8800D on hand is upgraded.

The modulation factor of radio wave of ETC OBE has changed compared with the early stage. For this fact, some OBE needs the distance shorter than 1m in order to communicate with ME8800D which is an initial version of the tester.
So, ME8800D will be returned as ME8800Dα after revised to communicate securely at the distance of 1m.

ETC/ITS spot electric field strength measurement system

ME9200

ME9200 is a system that measures the electric field strength distribution of ETC or ITS spot and makes a graph and map of electric field strength.

- Actual wave or CW is measured in a short time.
- Capable of the measurement by cart type and on-board type.
- Capable of being equipped with maximum 17 antennas (9 pcs at standard).
- If the cart is equipped with 17 antennas at 20cm intervals, the lane width of 3.2m will be measured at one time.
- When some RSUs on the main lane are measured with the on-board type using the automatic mode, the measurement is automatically performed in accordance with the position within the measurement section and the measurement conditions that are registered in advance.

System for car production line

ETC inspection system in car production line
ME8900

ME8900 is used in the production line of car manufacturer to confirm whether the built-in OBE operates correctly.
This supports ETC (profile 9) only.

- System configuration
  Tester part, Main frame, Lamp (green, red, yellow), Tester cable, Lamp cable and Start switch & cable (option)

RSU simulator

ASK+QPSK simulator
ME9010

Equipped with both ASK and QPSK modulations.

ME9010 is based on ARIB STD-T75 and ARIB TR-T16. Moreover, this is RSU simulator equipped with ASK and QPSK modulations and supporting profile 9 to 12.
This is a necessary tool by all means to do Protocol test, Dynamic motion test and Wireless system test of ASK OBE, QPSK OBE or ASK+QPSK OBE.

PC software MAS960 is available for controlling ME9010 and external equipment (spectrum analyzer, high-speed programmable attenuator MAT800/B, microwave AM detector MMD850, digital oscilloscope and power meter), and displaying the test result.

ETC/DSRC related products

Programmable attenuator for dynamic motion test
MAT800/B

The dynamic motion test described in ARIB TR-T16 <2-2-1> to <2-2-3> can be easily done with MAT800/B. The power pattern is created in the way of making arbitrary waveform on the PC using a standard accessory "Software for making attenuation program". And then this power pattern is transferred to the memory of MAT800/B.
The dynamic motion test is performed connecting such ETC/DSRC signal generator as RSU simulator to the input of MAT800/B and connecting antenna or OBE to the output.

Microwave AM detector
MMD850

AM detection with 30dB dynamic range at 2 to 8GHz band.

By adding a microwave amplifier and linearizer, 30dB dynamic range is guaranteed for signal of more than -6dBm at peak level, and in addition, 10MHz bandwidth is guaranteed without being affected by the load.
Optimum for measuring opening eye ratio of ASK modulation and modulation factor.

Electromagnetic anechoic box
ME8661A

Suitable for basic operation test, dynamic motion test and wireless system test of ETC/DSRC OBE by the space coupling.
Various antennas, antenna movable mechanism and turntable are available as options.

Outside dimensions: 830(W)×608(H) ×503(D)mm
Inside dimensions: 700(W)×380(H) ×380(D)mm
Acrylic resin table: 200×200mm

Antenna

Patch antenna
M211/211R

Frequency range: 5820±35MHz

M211 is a transmission & receiving antenna with right circular polarization used in the ETC/DSRC test.
The reference antenna M211R is with an antenna gain & VSWR data and is used when obtaining RF space coupling degree.

Spiral antenna
M212/212R

A right circular polarization antenna with frequency band from 2 to 18GHz.
The reference antenna M212R is mounted on the acrylic resin stand, and is with an antenna gain & VSWR data and a semi-rigid cable.

Test accessories

Antenna

■ Dipole antenna
M301 to 307/M401 to 407

M301 to 307

Model	Freq. range
M301/401	0.8 to 1GHz
M302/402	1.25 to 1.65GHz
M303/403	1.7 to 2.2GHz
M304/404	2.25 to 2.65GHz
M305/405	300 to 500MHz
M306/406	4.8 to 6.2GHz
M307/407	470 to 770MHz

M300 series：SMA(P)
M400 series：N(P)

M401 to 407

■ Patch antenna
M211/211R

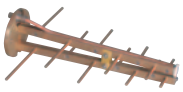
A right circular polarization antenna suitable for ETC/DSRC test.

Frequency range：5820±35MHz

■ Spiral antenna
M212/212R

A right circular polarization antenna with frequency band from 2 to 18GHz.

■ Log periodic antenna
M213/213R



A linear polarization antenna with frequency band from 750MHz to 2GHz.

■ Loop antenna
MAN120

A small and 40cmϕ loop antenna suitable for low frequency measurement.
The noise measurement of the magnetic field radiation from LED lighting and the EMI measurement can be performed.

Frequency range：50kHz to 33MHz
Connector：N(P)
Impedance：50Ω
Dimensions：420ϕ(outside)×320ϕ(inside)
×13mm(thickness)
Weight：1.2kg

■ Biconical antenna
MAN150

Broadband, compact and lightweight antenna.

Frequency range：20MHz to 3GHz
Gain：-45 to +1dBi (nominal)
Antenna factor：20 to 51dB/m
Dimensions：350(L)×160(W)×140(D)mm
Weight：approx.350g

Probe

■ Magnetic field probe
CP-2S

Measures the magnetic field strength at pattern on PCB and terminals of device.
The probe is calibrated in the spectrum analyzer.

Frequency range：10MHz to 3GHz
Space resolution：approx.0.25mm
(depending on objects)
Applied models：MSA300/400/500 series

■ Wideband passive probe
MP300

A passive probe with low input capacitance and wide frequency band.

Frequency range：DC to 6GHz
Attenuation ratio：10:1, ±2%
Input resistance：500Ω±2%
Input capacitance：0.25pF(typ)

VSWR bridge

MVS300B

Enables to measure the return loss of electronic component and circuit.

Frequency range：5 to 3000MHz
Directivity：more than 40dB @50 to 3000MHz
more than 25dB @5 to 50MHz
Insertion loss：less than 7dB @SOURCE-DUT
less than 8dB @DUT-REFLECTED

Interface cable

MI180

Model	Name	Length
MI180	RS-232C cable	1.5m
MI200	GP-IB cable	2m
MI400	USB cable	1m

Coaxial attenuator / Terminator

■ Coaxial attenuator
MG-XXdB

Attenuation:
1 to 15dB (1dB step, excluding 11dB), 20dB and 30dB

Frequency range:
DC to 18GHz (DC to 8GHz @MG-30dB)

Impedance: 50Ω

Connector: SMA(P)/SMA(J)

■ Terminator
MG-50S/-50N

50Ω terminator.

There are SMA(P) type (MG-50S) and N(P) type (MG-50N).

Coaxial cable

Model	Connector	Length	Freq. range
MC102	SMA(P)/BNC(P)	1.5m	DC to 2GHz
MC201	SMA(P)/SMA(P)	0.5m	DC to 18.5GHz
MC202	SMA(P)/SMA(P)	3m	DC to 18.5GHz
MC203	SMA(P)/SMA(P)	4m	DC to 18.5GHz
MC204	SMA(P)/SMA(P)	1.5m	DC to 12.4GHz
MC301	SMA(P)/SMA(P)	0.5m	DC to 10GHz
MC302	SMA(P)/SMA(P)	1m	DC to 10GHz
MC303	SMA(P)/SMA(P)	1.5m	DC to 10GHz
MC304	SMA(P)/N(J)	0.2m	DC to 4GHz
MC305	SMA(P)/N(P)	0.2m	DC to 4GHz
MC306	SMA(P)/BNC(J)	0.2m	DC to 2GHz
MC307	SMA(P)/BNC(P)	0.2m	DC to 2GHz
MC308	N(P)/N(P)	0.5m	DC to 10GHz
MC309	N(P)/N(P)	1m	DC to 10GHz
MC310	N(P)/N(P)	1.5m	DC to 10GHz
MC311	N(P)/SMA(J)	0.2m	DC to 10GHz
MC312	N(P)/BNC(J)	0.2m	DC to 2GHz
MC313	N(P)/BNC(P)	0.2m	DC to 2GHz
MC314	BNC(P)/BNC(P)	1.5m	DC to 2GHz

Adapter

Model	Connector	Impedance	Freq. range
MA301	BNC(P)/BNC(J)	50Ω/75Ω	DC to 2GHz
MA302	BNC(P)/N(J)	75Ω/75Ω	DC to 1.8GHz
MA303	BNC(P)/N(P)	75Ω/75Ω	DC to 1.8GHz
MA304	BNC(P)/F(J)	75Ω/75Ω	DC to 1.8GHz
MA305	BNC(P)/F(P)	75Ω/75Ω	DC to 1.8GHz
MA306	N(P)/SMA(J)	50Ω/50Ω	DC to 12.4GHz
MA307	N(P)/BNC(J)	50Ω/50Ω	DC to 2GHz
MA308	N(P)/BNC(J)	50Ω/75Ω	DC to 2GHz
MA309	N(J)/BNC(P)	50Ω/50Ω	DC to 2GHz

MICRONIX

MICRONIX CORPORATION

2987-2, KOBIKI-CHO, HACHIOJI-SHI, TOKYO 193-0934 JAPAN

TEL.+81-42-637-3667 FAX.+81-42-637-0227

URL : http://www.micronix-jp.com E-mail : micronix_e@micronix-jp.com

AGENCY