

Electromagnetic Field Visualization System EPS-02 series



Electromagnetic Field Visualization System

The EPS-02 series are easy to use visualization tools for electromagnetic emission debugging. The system recognizes the position of the hand-held probe/sensor by using a color recognition technique and stores the measured intensities at the relevant positions thus creating an intensity distribution map overlaid on the actual image of the scanned object. The system helps you to locate electromagnetic interference sources and to incorporate optimized solutions.

* Proprietary position detection method to patent application No. 2007-223275 by Kanazawa University and patent No. 5205547 by Noise Laboratory Co., Ltd.

- Simple, easy-to-use and convenient visualization of electromagnetic fields
- Flexible color recognition setting depending on the color of sensor head enables a reliable sensor image tracking
- Intensity distribution map overlaid on the camera picture
- Flexibly covers any size of the target object by using a variety of probes/sensors
- Compensation available by using the built-in factor editor for user owned equipment as system components
- User configurable system
- Reads X, Y, Z-axis value and their composite (R) value and identifies the direction of the magnetic field (EPS-02H)
- Portable and suitable system for on-site measurements

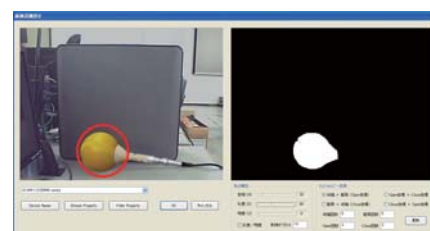
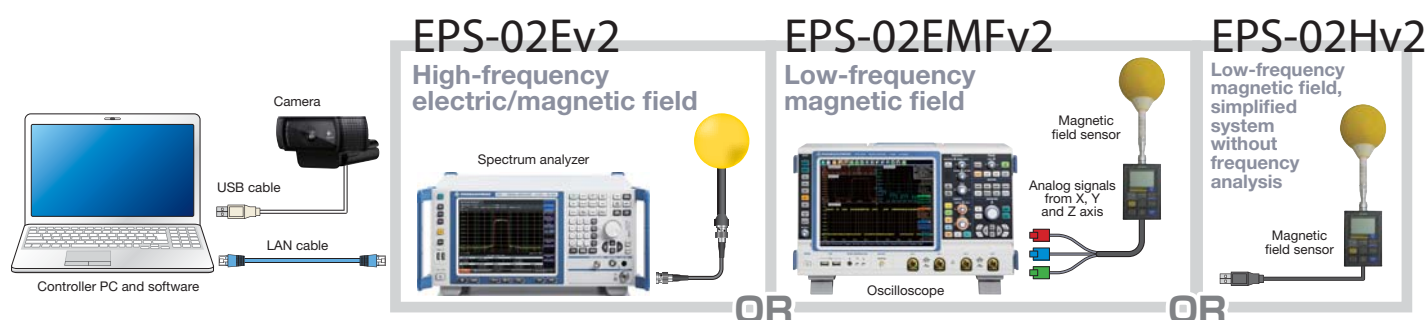
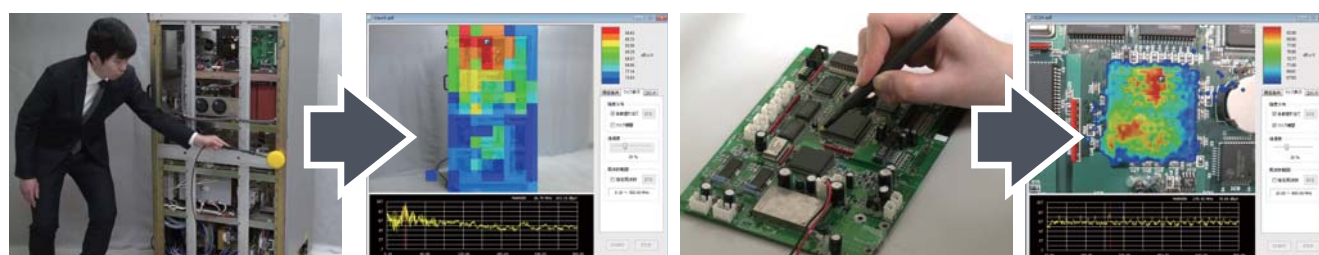


Image-recognized (color-recognized) sensor



The size of the target objects is not an issue

Different size probes can be used for different size target objects ranging from circuit boards to large equipment.



Compensation available by using the built-in factor editor for user equipment and devices working as system components

User owned or newly purchased equipment or device can be integrated into as system components thanks to user-editable factors for antenna characteristics, cable-loss and pre-amplifier response and so on.



No.	Frequency [Hz]	Factor [dB]
1	100000	-40.50
2	1000000	-40.10
3	10000000	-37.50
4	100000000	-28.50
5	1000000000	-20.40
6	10000000000	-14.80
7	100000000000	-10.20
8	1000000000000	-8.80
9	10000000000000	-8.00
10	100000000000000	-7.50
11	1000000000000000	-5.90
12	10000000000000000	-3.90
13	100000000000000000	-1.70
14	1000000000000000000	-1.20
15	10000000000000000000	-10.00

Electromagnetic Field Visualization System

Helps you to reduce your engineering time

Compared to conventional methods such as manual probing with no support software or mechanical system, the time required for measurement has been dramatically improved.

A measurement example by EMC Precision Scan
EPS-3007 (PCB scanner)



Measurement time: 4 min 45 sec (285 s)

Measurement by manual probing with no
supporting software



Spectrum charts at each
probing position saved

Measurement time: 30 min 34 sec
(1,834 sec)

A measurement example by EPS-02E



Measurement time: 2 min 6 sec (126 s)

Compared to
EPS-3007

285 s / 126 s = 2.26 times

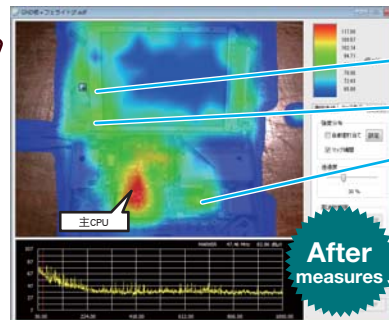
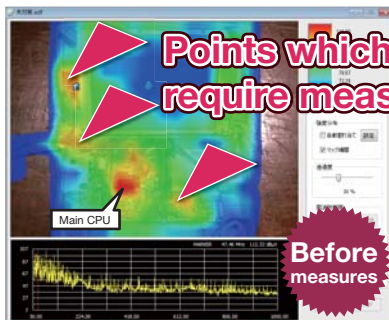
Compared to
the manual
measurement

1834 s / 126 s = 14.55 times

**This is an example as to how
fast the users can get a result.**

Provides an easy pre-and post-measures comparison

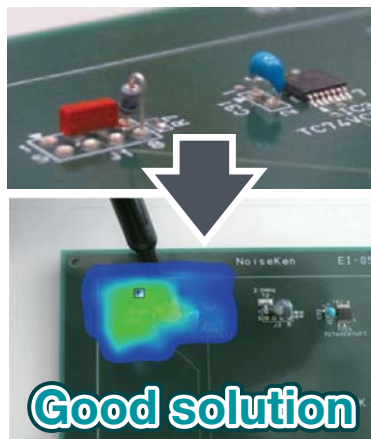
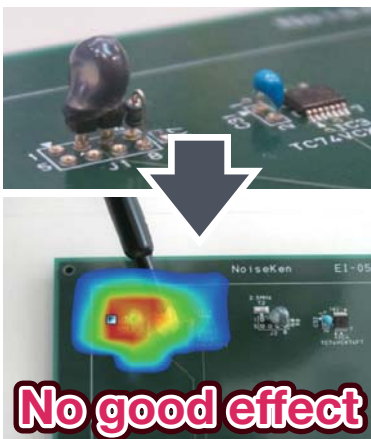
The system stores the relevant spectrum chart at each probe location. This is very helpful to evaluate the effectiveness of the measures newly incorporated.



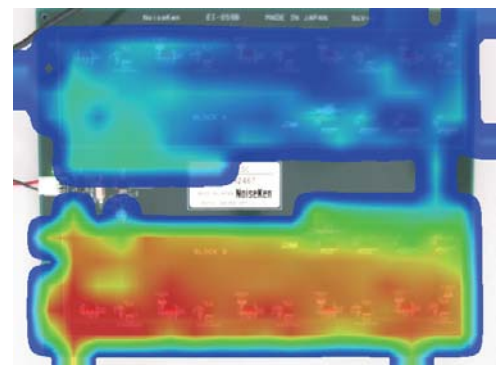
Measures by using ferrite cores
Measures by using ferrite cores
Measures by using a by-pass capacitor

Helpful for the users to design good EMI performance circuit boards and to choose the best suited EMI suppression components

Since all spectrum charts can be saved, the users can evaluate and compare the effectiveness of EMI suppression measures referring to the stored and accumulated data.



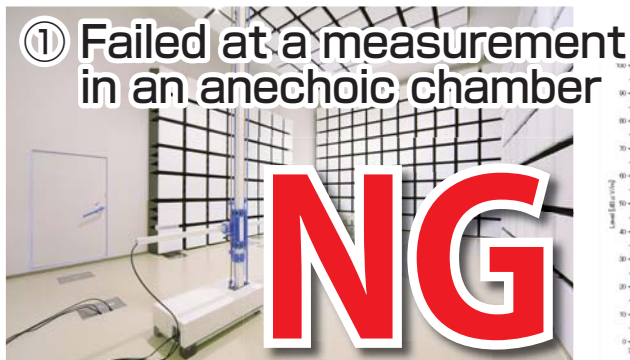
Comparison between a ground trace and
a solid ground



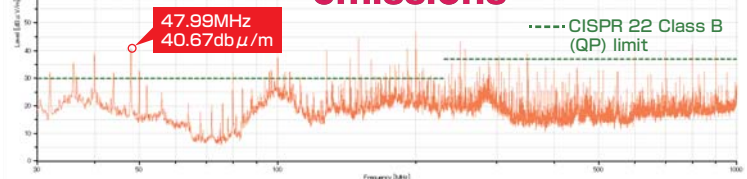
Electromagnetic Field Visualization System

Locates possible interference sources for pre- and post-compliance measurements

A product failed in a compliance measurement at some frequencies. The frequency of 47.99 MHz is one of the target frequencies to which a solution is looked for.



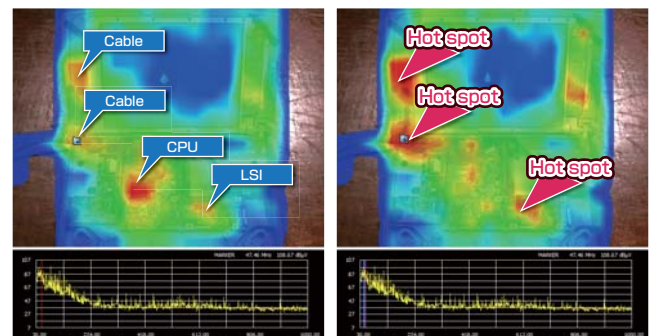
The frequencies at which the amplitudes are over the limit are known but far field measurement cannot identify the sources of emissions



② Near-field measurement by EPS-02

An intensity distribution map shows "hot spots", which are the target areas. Furthermore, narrowing down to the desired range of frequencies lets you know the relevant spots of the frequencies in interest.

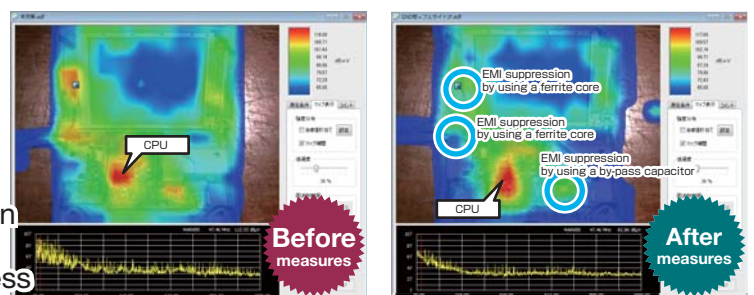
- Incorporating suppression measures and verifying their effectiveness
- An amplitude versus frequency plot for each probe position gives the users the power to evaluate the EMI properties in depth.



③ Incorporating suppression measures and verifying their effectiveness

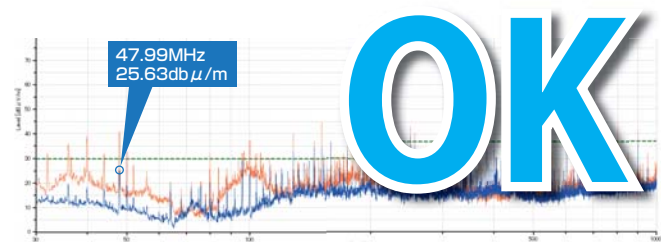
Measurement after modification indicated that the emission level lowered. This makes it easier to establish the countermeasure strategy for problem areas such as circuit traces, components, cables and housing

- Enables the users to evaluate suppression methodologies
- Enables the users to verify the effectiveness of the selected methodology



④ Far-field measurement

A compliance measurement after debugging verified the product emission was within the limit. Data can be saved, accumulated and shared for future occasions.



Accumulated measurement data can be the basis of optimized design and debugging method rules, and improving and sharing how-hows, which contributes to engineering time and cost reduction, and reliability and safety improvements.

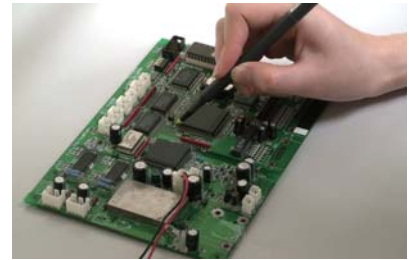
Electromagnetic Field Visualization System

Customer Credentials

The frequency of failures at measurements in a chamber has been reduced

"Our company chamber is used only for a complete finished product testing stressing there is no meaning for PCB or internal unit testing. PCB and unit basis measurements were R&D department's objective. As a valuable pre-compliance tool, this system helps us to visualize quickly and locate problems areas, thus dramatically improve debugging works. Before the introduction of this system, one prototype sample failed 4 to 5 times at chamber measurements. Now the number has dropped to 2."

Design Engineer, R&D Department, "T" company



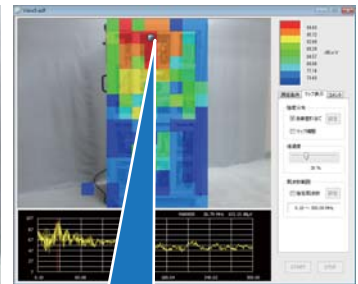
Now EMI debugging is my job

"The situation was like that before: when a product failed at a test house, the person in charge of the product asked for help from a trained and skillful engineer. Now the situation has dramatically changed like that: Even untrained or inexperienced engineers intensively tackle EMI debugging by using the EPS-02 system providing the visualization of the EMI properties of the test object. This can-do attitude is the greatest result of the introduction of the system."

Quality Assurance Engineer, Quality Assurance Dept, "A" company



On-site measurement



Locating hot spots

An amplitude versus frequency plot for each probe position is helpful for effective EMI debugging

"The objective is pre-compliance measurement. Only a combination of near-field probes and a spectrum analyzer was available before, which I thought was a time consuming debugging tool, if I can do it anyway. With the EPS-02, the way the data is stored and reviewed is much more convenient, as an amplitude versus frequency plot for each probe position can be seen. The benefits we are enjoying now are smoother EMI debugging, and the resultant reduced failures at a compliance measurement."

Design Engineer, Electrical Engineering Dept. "S" company



Quick results are very helpful.

"Our department is a user of the NoiseKen EPS-3000 EMI Board Scanner System. Compared to EPS-3000, this newly introduced EPS-02E provides a faster result. Portability is also a point. I'm very satisfied with measurement data, which I think, are more accurate than I expected."

Design Engineer, Electrical Engineering Dept. "N" company

Drawings are for image only. (Not for actual use)

Electromagnetic Field Visualization System

EPS-02 series specifications

Model Number	EPS-02Ev2	EPS-02EMFv2	EPS-02Hv2
Frequency range	100kHz to 3GHz in case of ETS-Lindgren probes set *varies depending on the probe used	10Hz to 400kHz	10Hz to 400kHz 10Hz to 2kHz 2kHz to 400kHz
Frequency setting	Available	Available	Unavailable
Measurement mode	Electric / magnetic	Magnetic field (flux density)	Magnetic field (flux density)/Exposure level
Measurement unit	dBuV,dBm	dBuV,dBm	T, G, A/m, %
Direction	-	X, Y, Z	X, Y, Z, composition
Sensor/probe	φ60/30/10mm loop coil (magnetic field), φ36mm ball (electric field), φ6mm tip (electric field)	phi100 mm loop coil phi 30 mm loop coil	phi 100 mm loop coil phi 330p coil
Probe cable length	2 m coaxial, N male to BNC male	5 m, dedicated	5 m, dedicated
Image/Cell size	picture : 640×480dot / Cell size : 10~120dot		
Trace mode	Single/Free run/Peak hold		Peak hold
File handling	Save/readout/print/export/comment input		
Compatible operating system	Windows vista / 7 / 8 / 8.1		
System configuration	Near field probe PN7415, Coaxial cable 02-00150A Probe head cover 03-00079A RF pre-amplifier 00-00013A Spectrum analyzer (customer supply) Controller PC (customer supply)	Magnetic field meter (FT3470-91/92: by Hioki Electric) Oscilloscope (R&S RTO1004/1024-NSL by Rohde & Schwartz Japan) PC (customer supply)	Magnetic field meter (FT3470-91/92: by Hioki Electric) PC (customer supply)
Included accessories common to the three products	Camera, 2m USB cable for camera, tripod, software, USB protect key, instructions manual		
Included accessories	LAN cable (cross) NI-GPIB-USB-HS GPIB controller	LAN cable (straight) EPS-02H software	USB cable

Options

Probe head cover (Yellow) Model : 03-00079A



The dedicated covers for the PN7415 Probe set for easier color recognition by the system camera
Supplied in a carry/storage case into which all probes with a head cover can be neatly stored

RF pre-amplifier Model : 00-00013A



Precision pre-amplifier usable also for other applications

Frequency range: 10kHz to 3GHz
Gain 41dB
Connector: N type
Dimensions W160 x D230 x H94 mm/ approx 3 kgs
Accessories: 1m coaxial cable, N(male)-N(male)

Near field probe set Model : PN7415



Near field probe set from ETS-Lindgren
Coaxial cable (Model:02-00150A) required for connection to 00-00013A pre-amplifier.

Spare probe head cover (Yellow) Model : 03-00081A



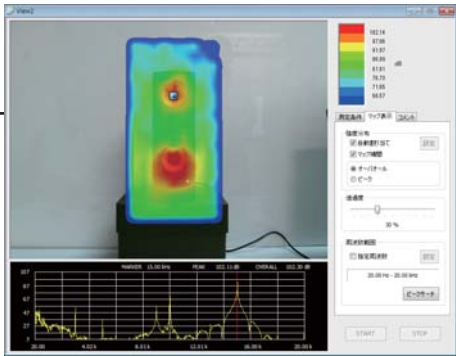
Spare probe head covers for 03-00079A

Sound Source Visualization System

EPS-02S

The Noiseken's EPS-02S Sound Source Visualization System provides an sound pressure distribution map, overlaid on the actual image of the target object, for a scanned area by the supplied hand-held microphone. The system camera recognizes the microphone position by using color recognition* and the signals measured at each position are analyzed for their frequency components.

*Proprietary position detection method to patent application 2007-223275 by Kanazawa University and patent No. 5205547 by Noise Laboratory Co., Ltd.



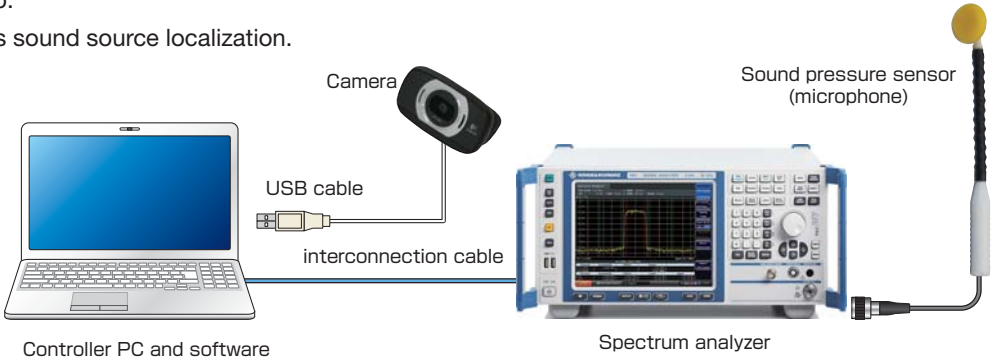
The most common strategy for sound source localization is to use a sound source localization system, which is normally very expensive and shall also be installed in an expensive echo-free chamber. Also, as almost all sound source localization systems cannot be used on-site since they pick-up all sounds in a wide range. As a microphone with directivity nature is used with the EPS-02S, on-site measurements are possible. Prior to final measurement in an echo-free chamber, measurements can be done easily on-site, thus reducing the frequency of use of expensive facilities, and saving the time and cost for noise countermeasures.



- As the microphone has directivity, simple measurements can be conducted in a place without soundproof facilities.
- Measurements can be conducted by scanning the hand-held microphone across the surface of the target.
- No special skill is required for measurements.
- Visualization of the sound pressure levels in composition with the real image of the scanned target can be realized on the screen of the PC in the form of a heat map.
- Sound source visualization enables sound source localization.

System configuration

- USB camera
- Microphone arm
- Microphone + pre-amplifier
- Power supply for microphone
- AC adapter
- Spectrum analyzer
- Control PC



Specifications

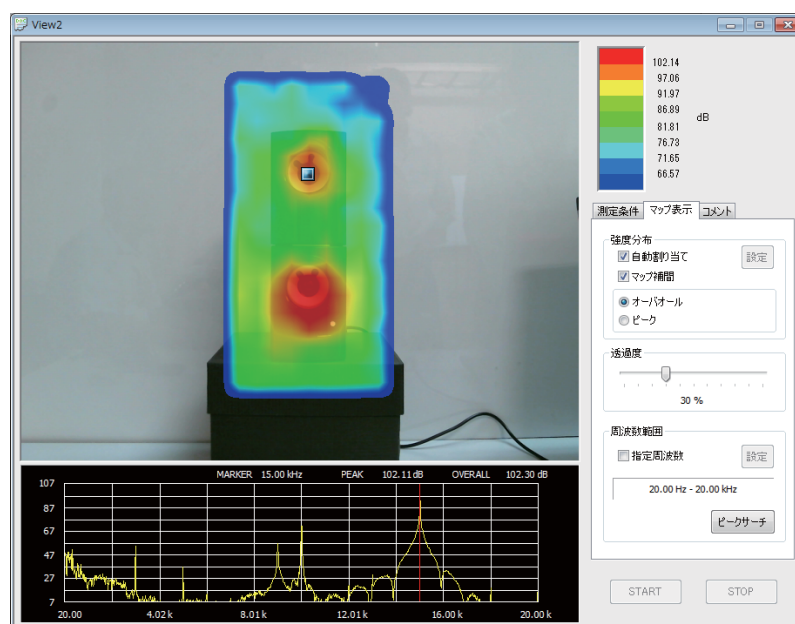
Model No.	EPS-02S
Frequency range	20Hz to 20kHz
Frequency setting	Available
Measurement mode	Sound pressure level
Measurement unit	dB
Measurement axis	-
Sensor	1/2-inch microphone
Sensor cable	coaxial cable (BNC)
Image/cell size	picture : 640 × 480 dots/cell size : 10 to 160dots
Measurement data	Single/Free Run/Peak Hold
Auxiliary function	Save/Read/Print-out/Export/Comment input
Software Operating environments	Windows vista / 7 / 8 / 8.1
Included accessories	USB camera, USB extension cable 2m for camera, tripod for camera, software, USB protect key, instruction manual, microphone head cover set (yellow, red, blue one piece each), microphone arm, microphone + pre-amplifier, power supply for microphone, AC adapter, BNC-P<=>BNC-P 50Ω coaxial cable (3m), BNC-P<=>N-P 50Ω coaxial cable (1.5m)
Options	Spare microphone head cover set (yellow, red, blue one piece each) Microphone check kit (1kHz 94dB calibrator)



Specific functions to EPS-02 software

The EPS-02S can conduct simple noise measurements as the sound pressure measured is digitally converted to noise level with A, C and Z frequency weightings.

Sound pressure level indication with A, C and Z frequency weightings.	Z characteristics A characteristics C characteristics	Flat frequency response Resembles the human ear response Resembles the human ear response for higher sound levels
Color mapping to the overall sound level (Color mapping to the peak levels also available)	Overall level	Composite sound pressure level
Microphone sensitivity input	Microphone sensitivity	Calibrated sensitivity of an individual microphone
GAIN input	Gain	Gain setting for the microphone amplifier



測定条件

区画サイズ: 20 pixel

データの記録: ☐ 測定完了通知 ☒ Z特性 ☐ A特性 ☐ C特性

PEAK HOLD

測定時間経過通知: ☐ 時間経過通知 0.00 s

周波数: START 20.00 Hz STOP 20.00 kHz

スペクトラムアナライザ: FSV 設定

マイク感度: -31.00 dB GAIN: 0.00 dB

GAIN欄にはマイク用電源のGAIN設定値を入力してください。(推奨0dB)

Designs, appearances and specifications are subject to change without notice.

Authorized representative