

Anritsu envision : ensure

ElectroMagnetic Field Measurements

Isotropic EMF Antennas

2000-1800-R

9 kHz to 300 MHz, H-Field

2000-1792-R

30 MHz to 3 GHz, E-Field

2000-1791-R

700 MHz to 6 GHz, E-Field



Introduction

Anritsu's EMF Measurements are designed to be easy to use while providing the user with numerous automated features that enable them to do their job quickly and more efficiently. Electromagnetic field measurements (EMF, Option 444) are available on the following Anritsu handheld instruments:¹

- Field Master Pro™: MS2090A
- Spectrum Master™: MS2711E, MS2712E, MS2713E, MS2720T
- Cell Master™: MT8212E and MT8213E
- LMR Master™: S412E
- Site Master™: S332E and S362E

In order to conduct EMF measurements, an Anritsu isotropic antenna is required. Anritsu offers three isotropic antennas covering a frequency range from 9 kHz up to 6 GHz. Refer to your instrument data sheet for compatible models and additional related options and accessories.

Isotropic Antenna Highlights

- Each antenna contains a tri-axis sensor with an integrated RF switch device, microcontroller and memory. Each of the three sensors is situated orthogonally inside the antenna housing to transmit and receive a spherical radiation pattern. In this way, all radiation at the antenna's geographical position is measured, regardless of direction of arrival.
- Each isotropic antenna is characterized over its entire frequency range. The antenna factors are stored in the antenna's memory and automatically downloaded into the Spectrum Analyzer once the antenna USB cable is inserted.
- The RF switch, microcontroller, and memory inside the antenna are controlled by firmware in the Spectrum Analyzer via a USB cable. The microcontroller operates the RF switch, controlling which probe is active. Once all three probes are switched, a composite RMS calculation is made. The memory inside the antenna is used to store parameters associated with that particular antenna. This includes serial number, date of compliance testing, antenna frequency range, and antenna factors.

1. Option 444 required for EMF field measurements; Firmware version requirements:
MS2090A: v2020.4.2 or later
MS2711E/12E/13E and MT8212E/13E: v1.56 or later
MS2720T and S412E: v1.12 or later
S332E and S362E v2.40 or later

Dimensions



2000-1800-R
9 kHz to 300 MHz



2000-1792-R
30 MHz to 3 GHz



2000-1791-R
700 MHz to 6 GHz

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Definitions

Typical Specifications

Typical specifications are not tested and not warranted. They are generally representative of characteristic performance.

All specifications subject to change without notice. For the most current data sheet, please visit www.anritsu.com

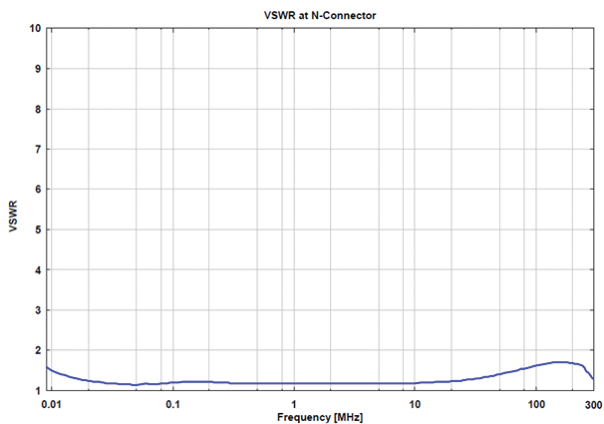
2000-1800-R

The 2000-1800-R isotropic antenna is a tri-axis H-Field sensor with an integrated RF switch. The RF switch is controlled by the analyzer via a USB port.

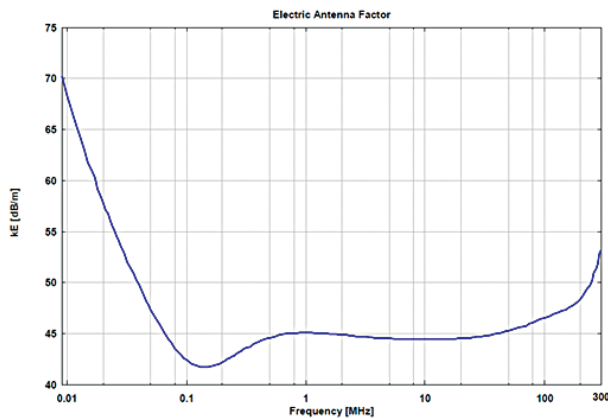
Electrical Characteristics

Sensor	Three axis sensor with scanned axes, H-Field
Frequency Range	9 kHz to 300 MHz
1 dB Compression Point at Output	118 dB μ V typical
Decoupling of the axis	> 20 dB typical
VSWR	< 1.5 (20 kHz to 50 MHz) typical
RF Connector	N-Connector Male, 50 Ω
Supply and Control	USB connection to Anritsu Handheld Instrument

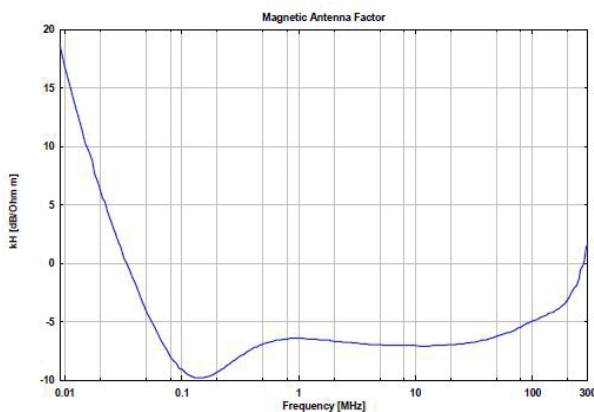
Plots (all plots typical)



VSWR



Antenna Factor



Magnetic Antenna Factor

Mechanical Characteristics

Color	Body: B-39047, Light Gray Handle: Black
Weight	850 g
Environmental Conditions	-10 °C to +50 °C, IP54
Mechanical Compliance	Operating: 7M3 (IEC 60721-3)
Dimensions	550 mm x 146 mm

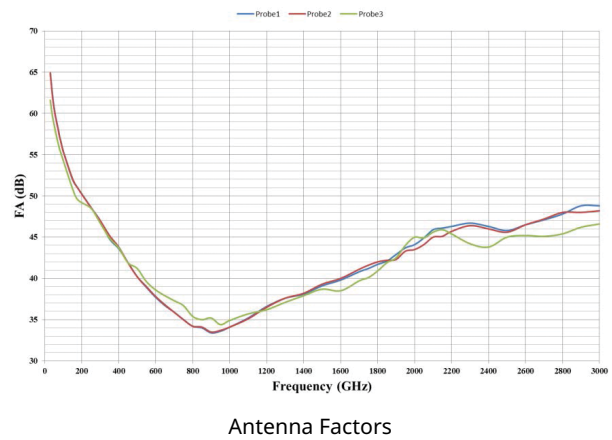
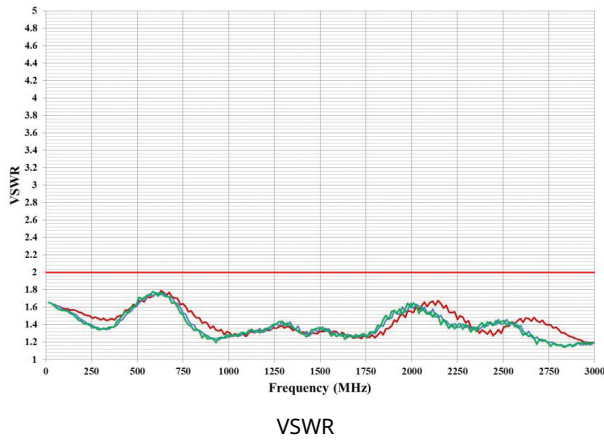
2000-1792-R

The 2000-1792-R isotropic antenna is a tri-axis E-Field sensor with an integrated RF switch. The RF switch is controlled by the analyzer via a USB port.

Electrical Characteristics

Sensor	Three axis sensor with scanned axes, E-Field
Frequency Range	30 MHz to 3 GHz
Typical 3D Isotropy	< ± 1.5 dB (300 MHz to 1 GHz) < ± 2.3 dB (1 GHz to 3 GHz)
Dynamic Range (1 kHz RBW)	0.1 mV/m to 200 V/m typical 25 µV at 900 MHz 35 µV at 1800 MHz 50 µV at 3000 MHz
Maximum Field Strength	500 V/m (destruction limit)
Switching Time	< 10 µs
RF Connector	N-Connector Male, 50 Ω
Supply and Control	USB connection to Anritsu Handheld Instrument

Plots (all plots typical)



Mechanical Characteristics

Radome Material	ABS
Color	Body: B-39047, Light Gray Handle: B-39042, Dark Gray
Weight	800 g
Climatic Compliance	Operating: 7K3 (IEC 60721-3)
Mechanical Compliance	Operating: 7M3 (IEC 60792-3)
Temperature Range	Operating: -25 °C, +70 °C
Humidity	100 % at +40 °C for up to 96 hours
Dimensions	450 mm x 150 mm

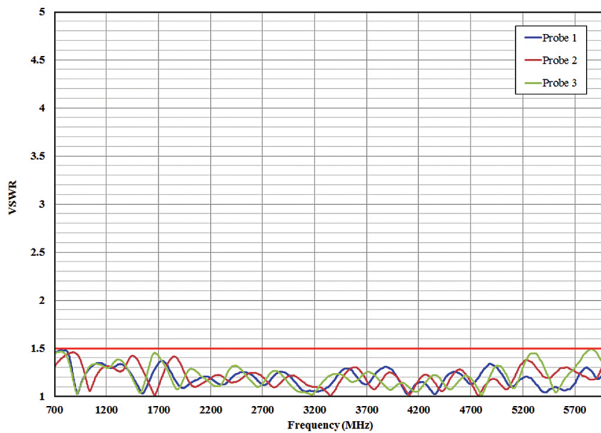
2000-1791-R

The 2000-1791-R isotropic antenna is a tri-axis E-Field sensor with an integrated RF switch. The RF switch is controlled by the analyzer via a USB port.

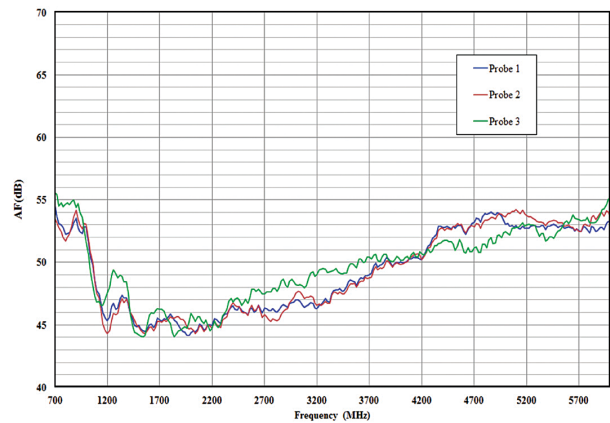
Electrical Characteristics

Sensor	Three axis sensor with scanned axes, E-Field
Frequency Range	700 MHz to 6 GHz
Typical 3D Isotropy	$\leq \pm 2$ dB (0.7 GHz to 2 GHz) $\leq \pm 2.5$ dB (2 GHz to 3.6 GHz) $\leq \pm 3.5$ dB (3.6 GHz to 6 GHz)
Dynamic Range (1 kHz RBW)	0.2 mV/m to 200 V/m (typical)
Maximum Field Strength	500 V/m (destruction limit)
Switching Time	< 10 μ s
RF Connector	N-Connector Male, 50 Ω
Supply and Control	USB connection to Anritsu Handheld Instrument

Plots (all plots typical)



VSWR



Antenna Factors

Mechanical Characteristics

Radome Material	ABS
Color	Body: B-39047, Light Gray Handle: B-39042, Dark Gray
Weight	450 g
Climatic Compliance	Operating: 7K3 (IEC 60721-3)
Mechanical Compliance	Operating: 7M3 (IEC 60792-3)
Temperature Range	Operating: -25 °C, +70 °C
Humidity	100 % at +40 °C for up to 96 hours
Dimensions	320 mm x 87 mm

Ordering Information

Isotropic Antennas**Part Number Description**

2000-1800-R	Isotropic Antenna, 9 kHz to 300 MHz, N Connector (male), 50 Ω
2000-1792-R	Isotropic Antenna, 30 MHz to 3 GHz, N Connector (male), 50 Ω
2000-1791-R	Isotropic Antenna, 700 MHz to 6 GHz N Connector (male), 50 Ω

Required Instrument Options and Accessories**Part Number Description**

MS2090A-0444	EMF Option 444 for MS2090A
MS2711E-0444	EMF Option 444 for MS2711E
MS2712E-0444	EMF Option 444 for MS2712E
MS2713E-0444	EMF Option 444 for MS2713E
MS2720T-0444	EMF Option 444 for MS2720T
MT8212E-0444	EMF Option 444 for MT8212E
MT8213E-0444	EMF Option 444 for MT8213E
S412E-0444	EMF Option 444 for S412E
S332E-0444	EMF Option 444 for S332E
S362E-0444	EMF Option 444 for S362E

Manuals (available at www.anritsu.com)**Part Number Description**

10580-00444	MS2090A Field Master Pro User Guide
10580-00349	Spectrum Analyzer Measurement Guide (for E-Series instruments)
10580-00455	EMF, Option 444 Measurement Guide (for E-Series instruments)

Refer to your instrument user guide and technical data sheet for additional product information and lists of related manuals.

Training at Anritsu

Anritsu has designed courses to help you stay up to date with technologies important to your job. For available training courses, visit: www.anritsu.com/training



• United States

Anritsu Americas Sales Company
450 Century Parkway, Suite 190
Allen, TX 75013, U.S.A.
Phone: +1-800-Anritsu (1-800-267-4878)

• Canada

Anritsu Electronics Ltd.
700 Silver Seven Road, Suite 120
Kanata, Ontario K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

• Brazil

Anritsu Eletronica Ltda.
Praça Amadeu Amaral, 27 - 1 Andar
01327-010 - Bela Vista - Sao Paulo - SP
Brazil
Phone: +55-11-3283-2511
Fax: +55-11-3288-6940

• Mexico

Anritsu Company, S.A. de C.V.
Blvd Miguel de Cervantes Saavedra #169 Piso 1,
Col. Granada
Mexico, Ciudad de Mexico, 11520, MEXICO
Phone: +52-55-4169-7104

• United Kingdom

Anritsu EMEA L td.
200 Capability Green
Luton, Bedfordshire, LU1 3LU, U.K.
Phone: +44-1582-433200
Fax: +44-1582-731303

• France

Anritsu S.A.
12 avenue du Québec, Bâtiment Iris 1- Silic 612,
91140 Villebon-sur-Yvette, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

• Germany

Anritsu GmbH
Nemetschek Haus, Konrad-Zuse-Platz 1
81829 München, Germany
Phone: +49-89-442308-0
Fax: +49-89-442308-55

• Italy

Anritsu S.r.l.
Via Elio Vittorini 129, 00144 Roma, Italy
Phone: +39-6-509-9711
Fax: +39-6-502-2425

List Revision Date: 20191126

• Sweden

Anritsu AB
Isafjordsgatan 32C
164 40 Kista, Sweden
Phone: +46-8-534-707-00

• Finland

Anritsu AB
Teknobulevardi 3-5
FI-01530 Vantaa, Finland
Phone: +358-20-741-8100
Fax: +358-20-741-8111

• Denmark

Anritsu A/S
c/o Regus Fairway, Arne Jacobsens Allé 7, 5th floor,
2300 Copenhagen S, Denmark
Phone: +45-7211-2200

• Russia

Anritsu EMEA Ltd.
Representation Office in Russia
Tverskaya str. 16/2, bld. 1, 7th floor
Moscow 125009, Russia
Phone: +7-495-363-1694
Fax: +7-495-935-8962

• Spain

Anritsu EMEA Ltd.
Representation Office in Spain
Paseo de la Castellana, 141.
Planta 5, Edificio Cuzco IV
28046, Madrid, Spain
Phone: +34-91-572-6761

• United Arab Emirates

Anritsu EMEA Ltd.
Dubai Liaison Office
902 Aurora Tower
P O Box: 500311- Dubai Internet City
Dubai, United Arab Emirates
Phone: +971-4-3758479
Fax: +971-4-4249036

• India

Anritsu India Private Limited
6th Floor, Indiqube ETA, No.38/4
Adjacent to EMC2, Doddanekundi, Outer Ring Road
Bengaluru 560048, India
Phone: +91-80-6728-1300
Fax: +91-80-6728-1301

• Singapore

Anritsu Pte. Ltd.
11 Chang Charn Road, #04-01, Shriro House
Singapore 159640
Phone: +65-6282-2400
Fax: +65-6282-2533

• P.R. China (Shanghai)

Anritsu (China) Co., Ltd.
Room 2701-2705, Tower A
New Caohejing International Business Center
No. 391 Gui Ping Road
Shanghai 200233, P.R. China
Phone: +86-21-6237-0898
Fax: +86-21-6237-0899

• P.R. China (Hong Kong)

Anritsu Company Ltd.
Unit 1006-7, 10/F.
Greenfield Tower, Concordia Plaza
No. 1 Science Museum Road
Tsim Sha Tsui East, Kowloon
Hong Kong, P.R. China
Phone: +852-2301-4980
Fax: +852-2301-3545

• Japan

Anritsu Corporation
8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016
Japan
Phone: +81-46-296-6509
Fax: +81-46-225-8352

• South Korea

Anritsu Corporation, Ltd.
5FL, 235 Pangyoeyeok-ro
Bundang-gu, Seongnam-si
Gyeonggi-do 13494, South Korea
Phone: +82-31-696-7750
Fax: +82-31-696-7751

• Australia

Anritsu Pty. Ltd.
Unit 20, 21-35 Ricketts Road
Mount Waverley, Victoria 3149, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

• Taiwan

Anritsu Company Inc.
7F, No. 316, Sec. 1, NeiHu Rd. Taipei 114, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817