TELEDYNE TEST TOOLS
Everywhereyoulook™

T3NFP3

Near Field Probe

User Manual

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Safety Instructions

Symbols

These symbols alert you to important safety considerations.

WARNING, HIGH VOLTAGE. Risk of electric shock or burn.

CAUTION of damage to probe or instrument, or **WARNING** of hazard to health. Attend to the accompanying information to protect against personal injury or damage. Do not proceed until conditions are fully understood and met.

General Precautions

To avoid personal injury or damage to your equipment:

Use only as specified. Using the probes and/or the equipment it is connected to in a manner other than specified may impair the protection mechanisms.

Keep the probe body and output cable away from the circuits being measured. Only tips are intended for contact with electrical sources.

Do not use the probe for measurements on Mains circuits. The probes do not have a CAT rating for use on these types of circuits.

Use only indoors. Do not use in wet or explosive atmospheres.

Keep product surfaces clean and dry.

Do not operate with suspected failures. Before each use, inspect the probes and accessories for damage such as tears in insulation or other defects in the body, cable jacket, etc. If any part is damaged, cease operation immediately and sequester the probes from inadvertent use.

WARNING

Do not use the probes to make measurements on circuits with voltages higher than 70 V DC or 46.7 V peak AC.

Probes are insulated with solder mask, conformal coating and rubber coating. Avoid probing devices with sharp metal edges that might damage the probe insulation and result in lethal electric shock.

Product Description

The T3NFP3 probe set comprises of a set of three magnetic field probes (H) and an electric field probe (E) for radiated emissions pre-compliance tests of printed circuit boards and other devices including components, connectors, wiring, power supplies, etc.

The T3NFP3 probe set is used to measure the magnetic fields and electric fields in the area of the device to determine the source and level of disturbance emissions.

The probes act similar as wide bandwidth antennas, picking up radiated emissions from components, PCB traces, housing openings or gaps and from any other parts that could be emitting RF.

Scanning the probe over the surface of a PCB assembly or housing quickly identifies locations which emit electromagnetic radiation. By changing to a probe with smaller size, the origination of the emissions can be further narrowed down. Rotating the probe over the device will enable the orientation of the magnetic fields to be determined.

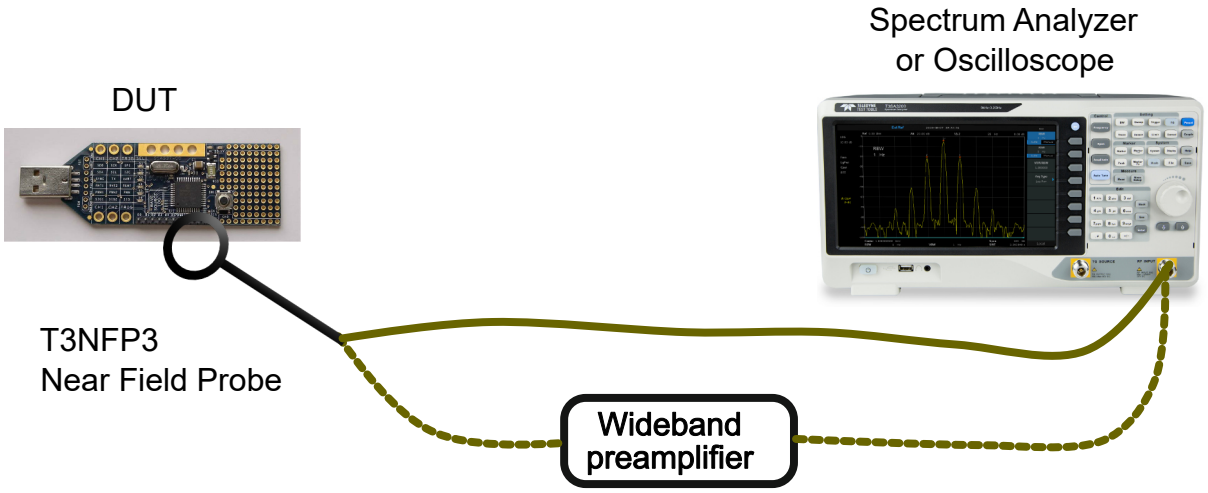
Additional applications are RF immunity tests by feeding a RF signal into the probe and radiating it into potentially susceptible circuit sections. Furthermore the probes can be used in the field of repair or debugging to track down issues in RF signal chains by contactless measurement of RF signal levels. One more application is non-invasive measurement of RF building blocks such as modulators or oscillators. Frequency, phase noise and spectral components can be measured in conjunction with a low noise preamplifier.

The passive near field probes are connected to the 50 Ohm input of a spectrum Analyzer such as the Teledyne Test Tools T3SA3200 or T3SA3100, or to the input of a VNA such as the Teledyne Test Tools T3VNA1500 or T3VNA3200, or to the input of a high sensitivity oscilloscope such as the Teledyne LeCroy high definition 12 bit HDO and WavePro HD families, or to a regular oscilloscope such as the Teledyne Test Tools T3DSO range. The probes can also be used with other brands of spectrum Analyzer or oscilloscope.

The probes can then make comparative measurements of magnetic fields and disturbance currents in the frequency range from 300 kHz to 3 GHz, though they can be used well beyond 6 GHz.

Application

The probes are used to detect magnetic field intensity and detect disturbance emissions sources.



There are two methods of connecting the probes to the spectrum Analyzer or oscilloscope, either directly or via a wideband preamplifier (not supplied) as shown above. If a wideband preamplifier is used then ensure that the model chosen covers the 300 kHz to 3 GHz bandwidth.

If the probes are used without a wideband preamplifier, then set the spectrum Analyzer input attenuation to 0dB and turn on the internal preamplifier if available on your spectrum analyzer. Furthermore you can increase the dynamic range and sensitivity by reducing frequency span, resolution bandwidth and video bandwidth.

If the probes are used with an oscilloscope then adjust the oscilloscope's input sensitivity to give a suitable waveform amplitude on the oscilloscope display.

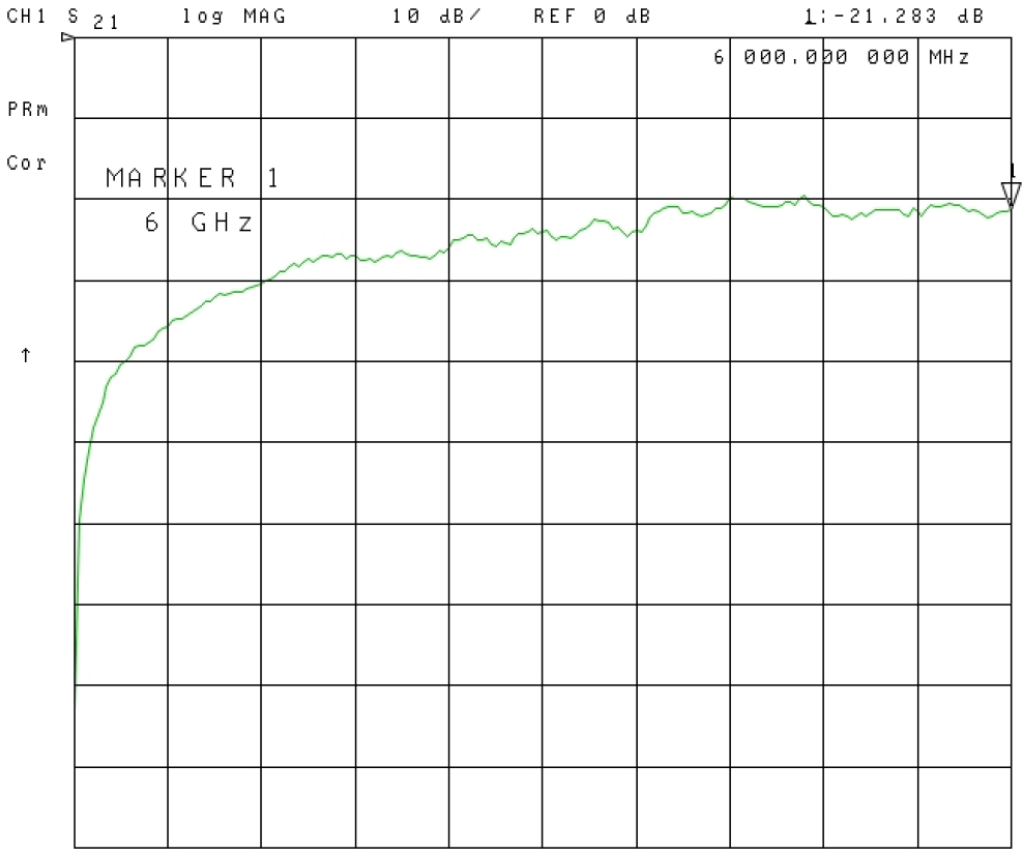
Note that if the spectrum Analyzer or oscilloscope does not cover the entire 3 GHz bandwidth then the results will be limited by the bandwidth limit of the spectrum Analyzer or oscilloscope.

Specifications

Probe	Field	Resolution	Frequency
E5	E-Field	5 mm	300 kHz - 3 GHz
H5	H-Field	5 mm	300 kHz - 3 GHz
H10	H-Field	10 mm	300 kHz - 3 GHz
H20	H-Field	20 mm	300 kHz - 3 GHz

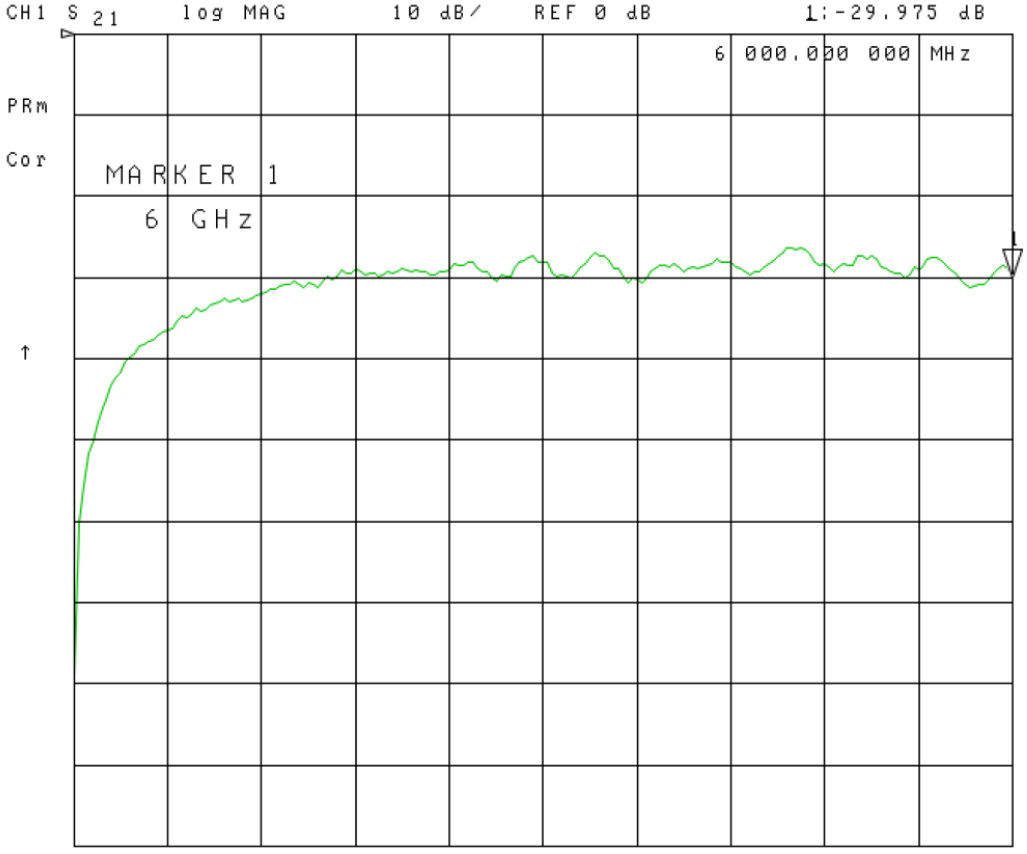
Probe Performance Characteristics

E5



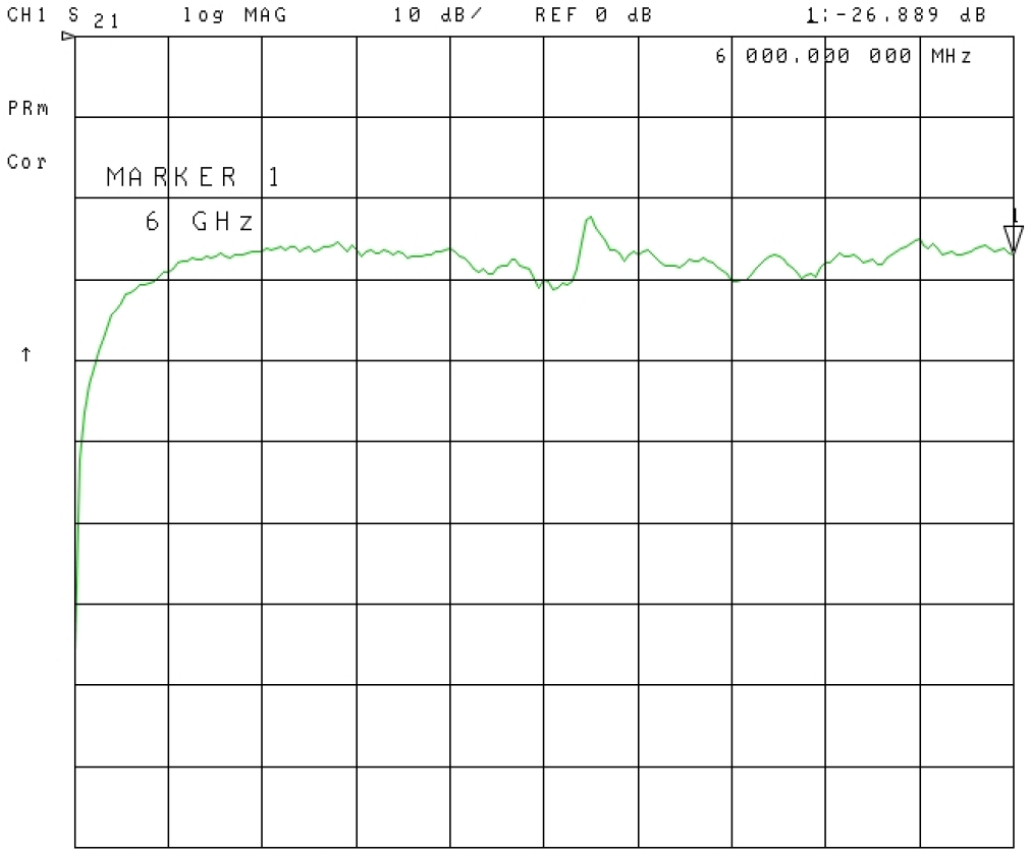
Start 30 kHz Stop 6 GHz

H5



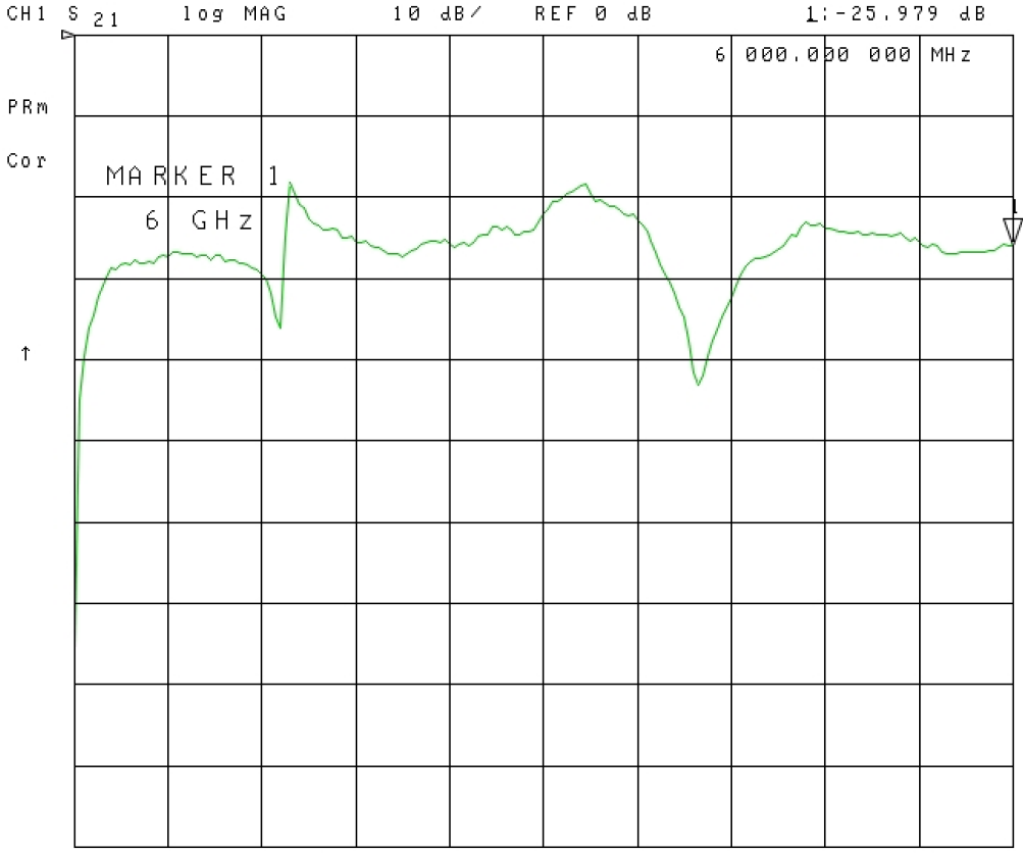
Start 30 kHz Stop 6 GHz

H10



Start 30 kHz Stop 6 GHz

H20



Start 30 kHz Stop 6 GHz

The T3NFP3 kit comprises of:

1. Four Near Field Probes with SMB output connectors.
2. An SMB to SMA connecting cable.
3. An SMA to N Type adaptor.

Near Field Probes

Probe Sensing End

SMB Output Connectors

SMB(F) to SMA(M) Connecting Cable, 100 cm

SMA to N Type Adaptor

If the probes are to be used with an oscilloscope then a SMA to BNC adaptor may be required (not supplied) since most oscilloscopes below 4 GHz use BNC input connectors.

Compliance and Certifications

EC Declaration of Conformity – Low Voltage

The probes meet the intent of EC Directive 2014/35/EU for Product Safety. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

IEC/EN 61010-031:2015 Safety requirements for electrical equipment for measurement, control and laboratory use – Part 031: Safety requirements for handheld probe assemblies for electrical measurement and test.

Restriction of Hazardous Substances (RoHS)

The product and its accessories conform to the (EU) 2015/863 RoHS3 Directive.

End-Of-Life Handling

The product and its accessories comply with the applicable European Union requirements to Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE).
The probes are subject to disposal and recycling regulations that vary by country and region. Many countries prohibit the disposal of waste electronic equipment in standard waste receptacles. For more information about proper disposal and recycling of your Teledyne LeCroy product, visit teledynelecroy.com/recycle.

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ABOUT TELEDYNE TEST TOOLS

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Company Profile

Teledyne LeCroy is a leading provider of oscilloscopes, protocol analyzers and related test and measurement solutions that enable companies across a wide range of industries to design and test electronic devices of all types. Since our founding in 1964, we have focused on creating products that improve productivity by helping engineers resolve design issues faster and more effectively. Oscilloscopes are tools used by designers and engineers to measure and analyze complex electronic signals in order to develop high-performance systems and to validate electronic designs in order to improve time to market.

The Teledyne Test Tools brand extends the Teledyne LeCroy product portfolio with a comprehensive range of test equipment solutions. This new range of products delivers a broad range of quality test solutions that enable engineers to rapidly validate product and design and reduce time-to-market. Designers, engineers and educators rely on Teledyne Test Tools solutions to meet their most challenging needs for testing, education and electronics validation.

Location and Facilities

Headquartered in Chestnut Ridge, New York, Teledyne Test Tools and Teledyne LeCroy has sales, service and development subsidiaries in the US and throughout Europe and Asia. Teledyne Test Tools and Teledyne LeCroy products are employed across a wide variety of industries, including semiconductor, computer, consumer electronics, education, military/aerospace, automotive/industrial, and telecommunications.

Distributed by:

Teledyne LeCroy (US Headquarters)

700 Chestnut Ridge Road
Chestnut Ridge, NY. USA 10977-6499

Phone:	800-553-2769 or 845-425-2000
Fax Sales:	845-578-5985
Phone Support:	1-800-553-2769
Email Sales:	contact.corp@teledynelecroy.com
Email Support:	support@teledynelecroy.com
Web Site:	http://teledynelecroy.com/

World wide support contacts can be found at:
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https://teledynelecroy.com/support/service.aspx

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T3 stands for Teledyne Test Tools.

932668-00 RevA