

ScanEM® Probes—

near-field probes for easy detection and measurement of electromagnetic emission



Specifications

		ScanEM Model CTK010	ScanEM-C Model CTK015	ScanEM-Q Model CTK017	ScanEM-QC Model CTK019
Content	E Field Probe	ScanEM-E	ScanEM-EC	ScanEM-EQ	ScanEM-EC
	H Field Probe	ScanEM-H	ScanEM-HC	ScanEM-HQ	ScanEM-HC
Fields	E Field Probe	Electric	Electric	Electric Radiated	Electric Radiated
	H Field Probe	Magnetic	Magnetic	Magnetic Conducted	Magnetic Conducted
Frequency Response	E Field Probe	2MHz–2GHz	2MHz–2GHz	2MHz–1GHz	2MHz–1GHz
	H Field Probe	100kHz–100MHz	1MHz–1GHz	150kHz–30MHz	150kHz–30MHz
RF Output			Yes	Yes	
DC Output to a Multimeter			Yes	Yes	
Sensitivity (typical)	E Field Probe		-10dBm/(V/m)		-10dBm/(V/m)
	H Field Probe		-20dBm/mA		-12dBm/mA
Dimension (approx.)		5.75"x1.21"x0.76" 146mmx31mmx20mm	6.18"x1.21"x0.76" 157mmx31mmx20mm	6.88"x1.21"x0.76" 175mmx31mmx20mm	7.31"x1.21"x0.76" 186mmx31mmx20mm
	Weight (approx.) each probe	2.25oz (65g)	2.25oz (65g)	2.3oz (70g)	2.3oz (70g)
Battery (each probe)		2xAAA (included)	2xAAA (included)	2xAAA (included)	2xAAA (included)
Indication:					
LED Bar Graph	5-LED color level bar				
Audio Indication	Speaker (tone pitch proportional to the field strength)				



Applications

PC Board Level EMC Diagnostics	Yes	Yes		
Product Level EMC Diagnostics			Yes	Yes
Signal Integrity		Yes		
Repair & Service	Yes	Yes		
Production & QA			Yes	Yes
EMI Location			Yes	Yes
ESD Event Analysis				Yes

ScanEM-C/QC Accessories

Model CTA101



Includes:
Cable SMB/BNC 6' (1.8m)
BNC to Male N Adapter
BNC to Banana Plug Adapter

Every ScanEM kit includes:

- One E field probe
- One H field probe
- Plastic storage case
- Batteries
- User's Guide
- 6' (1.8m) cable (models CTK015 and CTK019 only)

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ScanEM probes come with a one year limited warranty. Made in the U.S.A. All specifications are subject to change without notice.

What is ScanEM®?

Shorten your development schedule and eliminate the need for product redesign by using proper EMC tools from the beginning of the project. ScanEM probes are diagnostic instruments for detecting, locating and measuring electromagnetic emission. They are professional tools that don't require you to be an EMC expert to competently address emission compliance. Small and large companies all over the world use ScanEM probes to efficiently solve EMC, signal integrity and interference problems.

ScanEM probes can reliably predict electromagnetic behavior of your product, and can locate emission sources in a matter of seconds. They detect the presence of an electromagnetic field and provide audio and visual indication of its relative strength.

ScanEM probes work by themselves, or as broadband active probes with any spectrum analyzer, oscilloscope or multimeter.

ScanEM Features

Pinpoint Exact Sources of EMI
Due to their high spatial resolution, ScanEM probes can identify the exact source of electromagnetic emission down to a single component.

Detect Electric and Magnetic Fields Separately

Knowing the type of EM radiation is critical for solving emission problems. ScanEM probes can detect electric (E) and magnetic (H) fields.

Small Size
ScanEM probes fit in the palm of a hand and are easy to operate. Their small size allows scanning for EMI in very tight areas.

Self-Contained
ScanEM needs nothing else to operate as a self-contained probe: no cords, no power supply, no amplifier.

Audio Output
Tone pitch changes with field strength. Detect the slightest difference in the field strength without taking your eyes off the DUT.

LED Color Bar

5-LED Green/Yellow/Red light bar instantly shows relative field strength.

Will Not Disturb Circuit Operation
ScanEM probes do not touch the circuit and will not disturb normal operation of a tested product.

Level/Squelch Dial

Adjust ScanEM to detect EMI in a wide dynamic range with the level dial. The squelch feature keeps ScanEM quiet until it locates "hot" areas above a preset level.

RF Output to Spectrum Analyzer and Oscilloscope

With their high gain and broad, flat frequency response, ScanEM-C/QC probes provide RF signal into any spectrum analyzer or oscilloscope.

DC Output to a Multimeter

Monitor field strength with your multimeter: ScanEM-C/QC provides DC voltage as a function of field strength.



ScanEM®
Model CTK010

ScanEM®-C
Model CTK015

ScanEM®-Q
Model CTK017

ScanEM®-QC
Model CTK019



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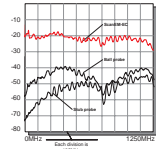
ScanEM®—a little probe that is many things in one

Connectivity

...to a spectrum analyzer

Equip your spectrum analyzer with ScanEM probes and open its eyes to signals it has never seen before. Each ScanEM probe covers the entire EMC bandwidth, and has a broadband amplifier built in. Due to its high spatial resolution, ScanEM-C can pinpoint a source of emission down to a trace or component.

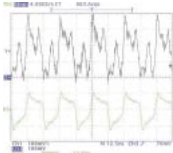
Traditional passive probes have little or no output at the lower end of the spectrum, where most fundamental frequencies are. Compare the frequency response of ScanEM probes versus their passive counterparts on the screen shot shown. ScanEM probes have a flat frequency response across the entire bandwidth.



Frequency response of ScanEM-EC vs. passive probes.

...to an oscilloscope

Connected to an oscilloscope, ScanEM-C lets you see signals without affecting the circuit in any way. The screenshot shows how a conventional 1GHz FET probe (bottom trace) missed signal artifacts that ScanEMEC was able to show (top trace).



High-speed signal as seen by ScanEMEC (top) and FET probe (bottom).

ScanEMEC, an electric field probe, shows the voltage on traces.

ScanEMHC, a magnetic field probe, shows AC currents up to 1GHz on traces and ground planes. Catch those elusive high-speed transients with ScanEMC probes!

As a non-contact field probe, ScanEM-C output depends on the proximity to the source, and on possible strong emissions from adjacent sources.

...to a multimeter

ScanEM probes provide DC output as a function of field strength. Connect a ScanEM probe to any multimeter set to Volts DC and monitor field strength with no additional equipment.



EMC Diagnostics of PC Boards

Use ScanEM probes to shorten your project schedule by eliminating the "EMC surprise factor." Lower product cost and anticipate EMC problems early in the design, rather than reacting to them later, with tools that are useful at any phase of product design.

ScanEM-C probes can pinpoint emission sources down to a single pin or trace on a PC board. Providing separate indication for electric (E) and magnetic (H) fields, each ScanEM probe covers the entire frequency range of EMC compliance requirements.

ScanEM allows for easy identification of emission problems early in your design, and for instant verification of design changes on the spot.



EMC in Production and QA

Now that you have designed a product that complies with the FCC, CE, etc., you can sleep well knowing that your company is shipping only compliant products. Or can you?

A loose screw, misplaced shielding, an absent ferrite clamp, paint covering the ground connections of an enclosure—any of these missteps and more can put you in violation of FCC or CE rules.

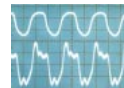
ScanEM/O/C probes provide a quick and reliable way to test each production unit for electromagnetic compliance in seconds and with minimal skills. Test each product the way the FCC does—their agents use ScanEM probes to catch emission violators in the field.



Service and Repair

Circuit boards are getting more and more complex. It is impossible for a repair technician to fully understand the operation of the numerous circuits that he has to service on a component level. The result is an increasing cost of repair and a high ratio of rejected boards.

Each component, especially each IC, generates a specific pattern of electromagnetic emission that changes when this component is malfunctioning. ScanEM probes can help characterize emission patterns and identify defective components and traces, even in the most complex of circuits.



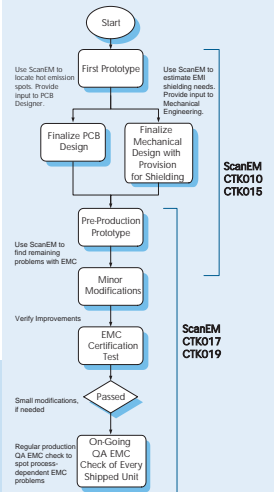
Signal Integrity Diagnostics

High-speed digital circuits often exhibit such problems as ringing, overshoots, undershoots, ground bounce, and a number of other non-digital artifacts. Conventional oscilloscope probes load the circuit and alter signal behavior, making it difficult to diagnose these problems. In fact, often a circuit works only when a probe is attached to it.

As non-contact instruments, ScanEM probes do not load the circuit, and have a very wide frequency bandwidth. ScanEM can reveal signal integrity problems that even the most sophisticated conventional probes miss. ScanEM-C probes will show you the waveform of voltages and currents in traces and ground planes.



ScanEM as Part of the EMC Process



Why Near-Field?

The standard radiated EMC test is done in the far field, 10' (3m) from the product. This test tells if the product fails, but cannot point to the source of the problem. It is similar to identifying from a distance what makes a noise under the hood of a car—you can guess that it is a belt, but which one? And perhaps it's not a belt at all.

To find the source of the problem, why not come closer? As with a car, electronic assemblies also need a "close up" inspection. The right tool for the job is called a near-field probe. With ScanEM near-field probes, the entire product can be quickly scanned, and leaks and problem areas can be identified and characterized.

What about ESD Events and EMI?

Electromagnetic Interference (EMI) and electrostatic discharges (ESD Events) can lead to yield losses, malfunction of electronic equipment, and component damage.

EMI invades your product via radiated (air) and conducted (cables) emission. ScanEM probes can easily identify the presence of EMI and ESD Events, characterize them, and trace them to their sources.

Use ScanEM-EQC for a radiated electric field, and ScanEM-HQC for conducted emission, including ground wires. For EMI diagnostics, use ScanEM with a spectrum analyzer. For ESD Event analysis, connect ScanEM to a high-speed oscilloscope.

A day spent at the beginning of the project preventing EMC problems saves a month of fixing these problems at the end.