High Efficiency EMC Pretest Solution

EMI Test - Faster - Easier!

Spectrum Analyzer GSP-9330:
- Frequency Range : 3.25GHz
- EMC Pretest dedicated functions
- Peak, QP, Average detectors

GKT-008 EMI Probe Set:
Sensing probes: ANT-04, ANT-05
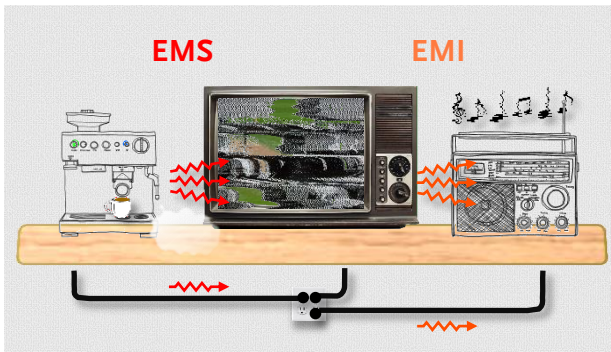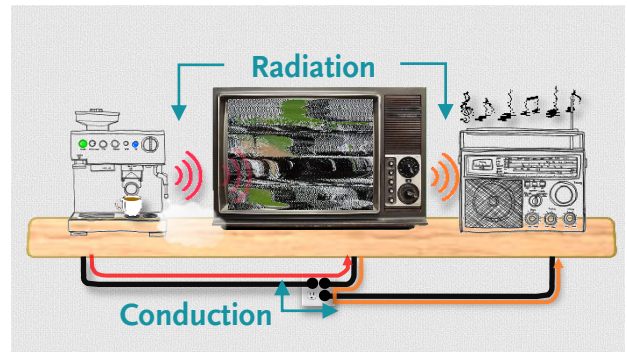Contact probes: AC & RF probes

Transient Limiter

LISN　　　　**Isolation Transformer**

EMC and Coupling Paths

EMC = EMS + EMI

EMS　　　EMI

Radiation via air & Conduction via power

Radiation

Conduction

GSP-9330 EMC Pretest Dedicated Functions

Built-in EMI test standards

Log scale frequency axis and peak table

![GW INSTEK logo] **GWINSTEK**
Simply Reliable

Key features of GKT-008

1. Small size, high sensitivity

GKT-008 vs conventional probes

GKT-008		Conventional probes	
ANT-04	ANT-05	H probes	E probes
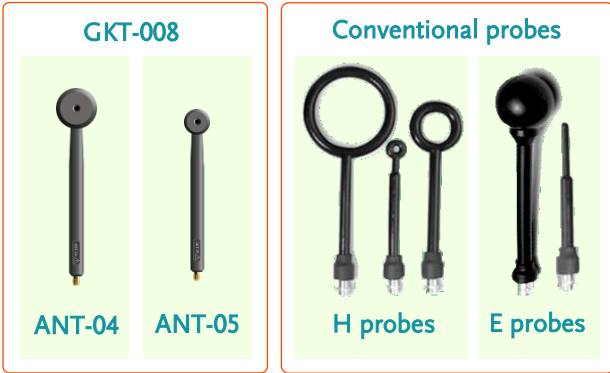
Identify EMI source better by small size
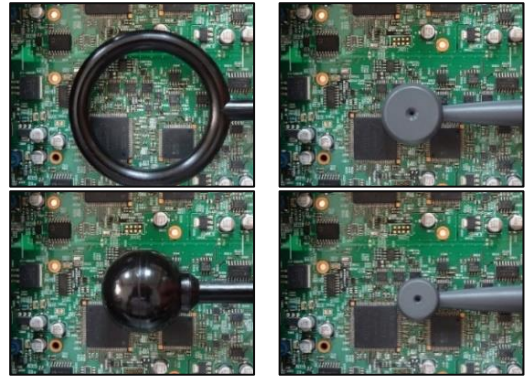
ANT-04: higher sensitivity than H probe
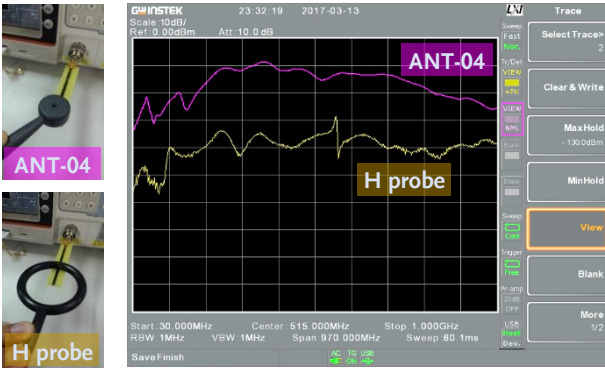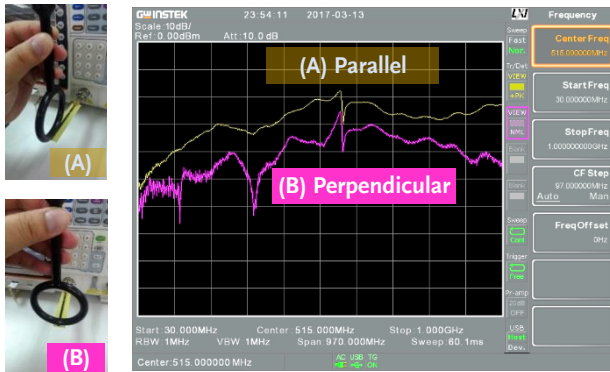

ANT-04

H probe

ANT-04: higher sensitivity than E probe
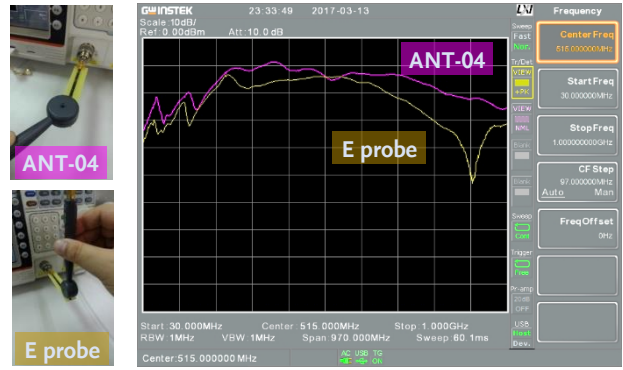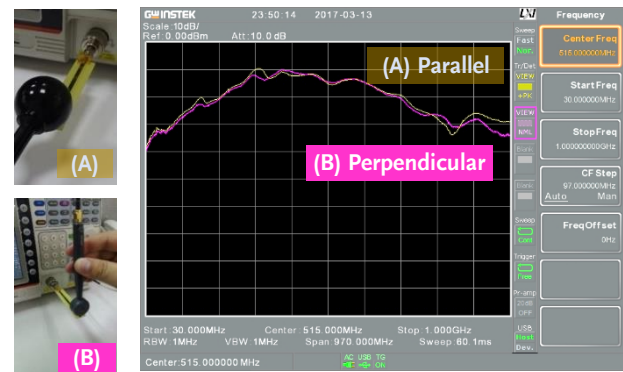

ANT-04

E probe

2. No directivity issues for ANT-04, ANT-05

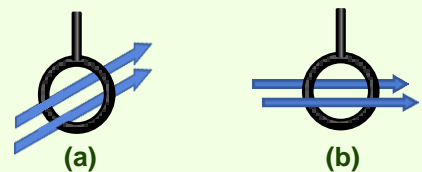### H probe: Different results with different angles

(A)
(B)

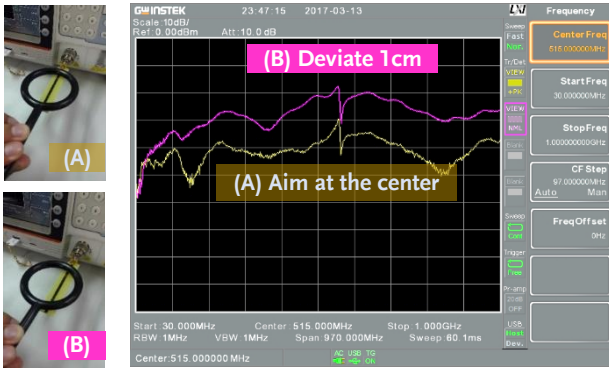### ANT-04: Similar results with different angles

(A)
(B)

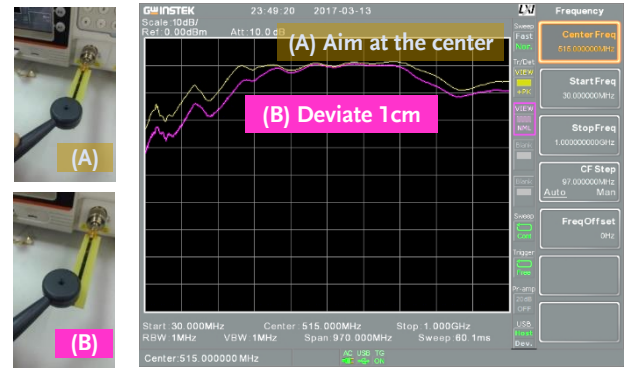### Working principle of conventional H probe (I)

H probe works as a loop antenna. If more magnetic field passes through loop, more signal is detected as shown in fig. (a). If it is parallel to loop surface, magnetic field can't be detected.

(a)   (b)

## H probe detects much more while deviating 1cm


ANT-04 detects more while aiming the center

Why H probe aiming at center detects less signal?

According to the working principle, H probe deviates from the PCB center shown in fig. (b) will detect more passing magnetic field. In fig. (a) H probe aims at the center will detect less magnetic field. This will leave incorrect clue to engineer.
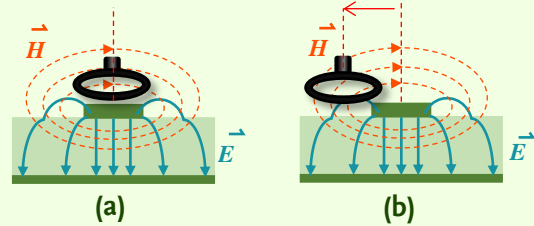
3. Detecting separate H field and E field vs Sensing EMI energy

H probe's results differ from E probe
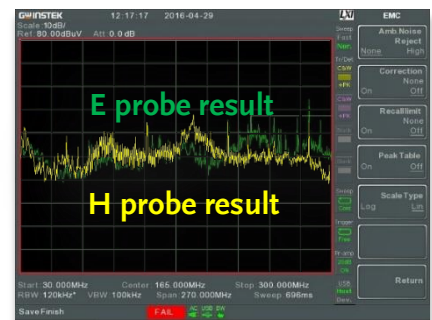
H field & E field are two components of EMI

The actual electromagnetic energy is the vector outer product of E and H fields. This operation can't be done by the measurement of spectrum analyzer. The information is not complete for engineers to identify the EMI source.

$$\mathbf{S} = \mathbf{E} \times \mathbf{H} = \begin{bmatrix} i & j & k \\ E_1 & E_2 & E_3 \\ H_1 & H_2 & H_3 \end{bmatrix}$$

ANT-04 and 05 directly sense EMI energy

Patent designed ANT-04 & ANT-05 can directly detect EMI energy, no any intermediate operation is necessary. With the compact size and high sensitivity, the EMI source spots can be easily discovered.

GSP-9330 built-in GKT-008 associated functions

Far field response estimation

EMC
None
3m
10m

In 3M Far Field
Near Field with 3M Correction
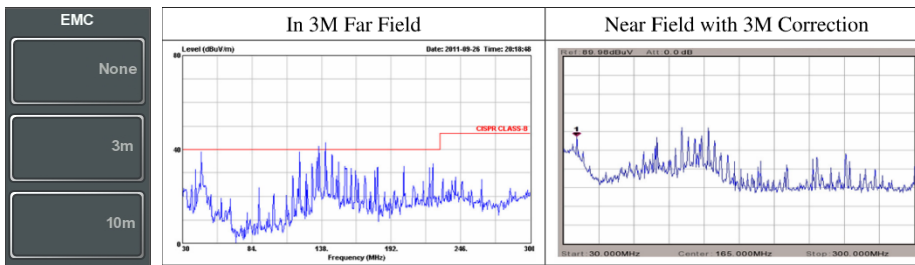
- Convert the near field measurement results to far field response (3m or 10m can be selected).
- Helpful to confirm whether the EMI trimming works or not.

Conducted EMI Test Solution

Test system configuration

Isolation Transformer
LISN
Con. EMI
Transient Limiter
DUT
Spectrum analyzer
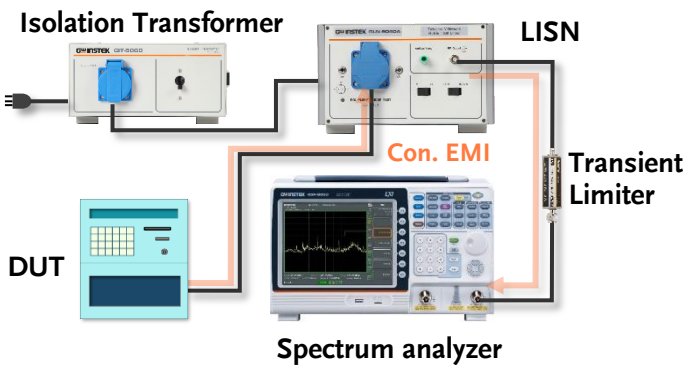
Isolation Transformer: To prevent the main power system from shutdown.

LISN: To filter out the noise from DUT power line.
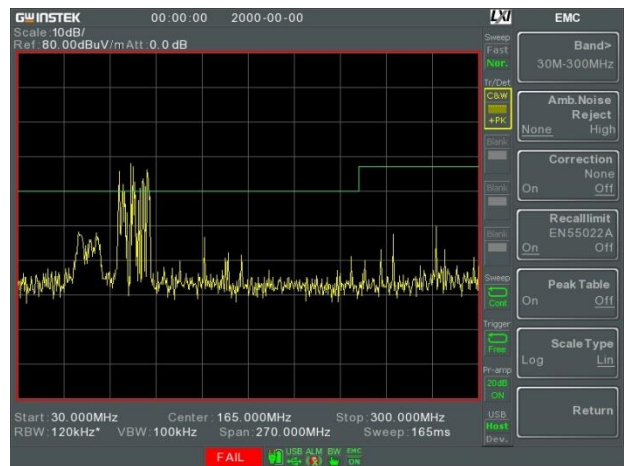
Transient Limiter: To protect the spectrum analyzer.

GSP-9330 Auxiliary Functions

Peak Table: Automatically search 10 peaks
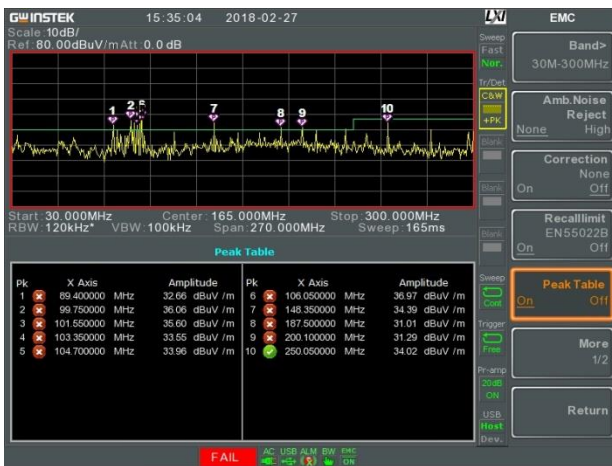
Pass/Fail: Inspection result display

www.gwinstek.com
www.facebook.com/GWInstek

GW INSTEK
Simply Reliable

DSGSPEMI-EN201802-1000