

# Radiated emission measures with signal analyzer

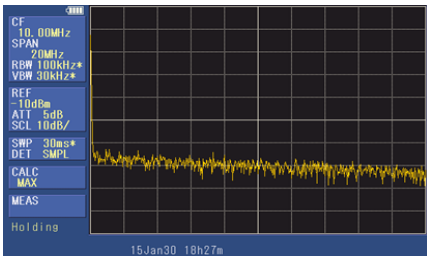
◇ Searching noise source using a real time function of handheld signal analyzer

## [\*Application\*]

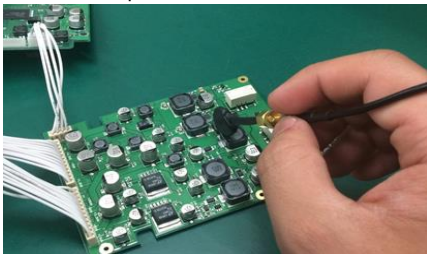
In order to deal with EMI, it is essential to specify the frequency and location of radiated noise. When measuring with a spectrum analyzer of sweep system, the time loss will occur because burst noise may be missed. By using our handheld signal analyzer MSA500 series, more accurate noise measurement becomes possible and working efficiency can be improved.

## [\*Solution\*]

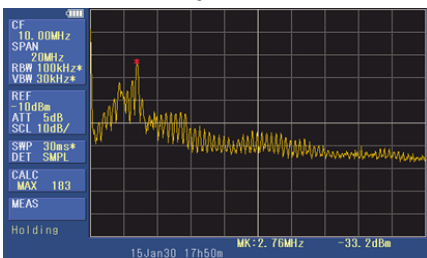
### ■ Flow to measure noise generated on a printed circuit board using a signal analyzer



Set the signal analyzer in the frequency band where noise countermeasures are required and perform measurement.



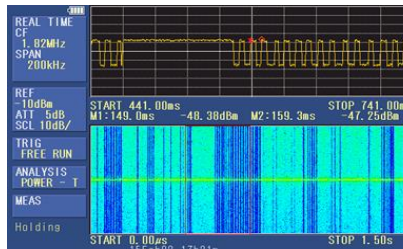
Using small loop antenna, it's searched from which circuit or parts on PCB the noise is generated.



If using the MAX HOLD function, the peak value is fixed and what noise is generated on PCB is specified.

Sweep system mode

### 1. Analysis of noise source using spectrogram analysis function

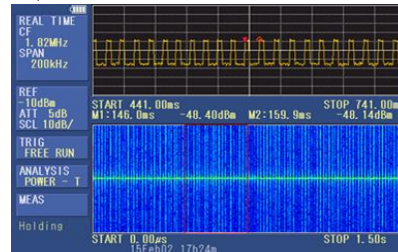


• Using the dual marker function on the measurement screen of "power vs. time", the noise generation cycle and frequency are specified.

Generation cycle=10.3ms  
Frequency of occurrence=

Noises generated during operation with AC power supply  
Switch from AC power to battery operation

Formula  
• Generation cycle  
= M2(marker2)-M1(marker1)  
• Noise source frequency  
= 1 ÷ Generation cycle

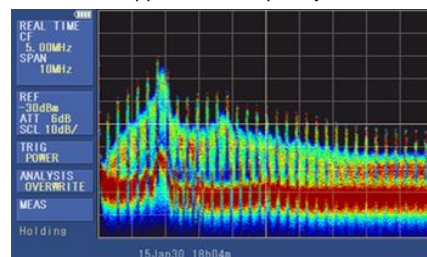


Result  
Knowing the noise generation cycle helps to identify the radiation source.

Generation cycle  
159.9-146.0=13.9ms  
Frequency of occurrence  
1 ÷ 13.9ms=approx 72Hz

Noises generated during operation with battery

### 2. Check the appearance frequency of noise of each frequency with overwrite function



With overwrite function, the higher the appearance rate is, the redder color becomes, and the lower, the bluer it becomes. So it is easy to visualize the noise.

Real time mode

## [\*System configuration\*]

- Handheld signal analyzer (MSA538E)
- Lithium ion battery (MB400)
- N→SMA Coaxial Cable 1.5m
- Small Loop antenna (One pair of large and small)
- Magnetic field probe (CP-2SA)



Magnetic field probe CP-2SA



Handheld signal analyzer MSA538E  
Frequency range: 20kHz to 3.3GHz  
QP(quasi-peak), AV(average) is installed.  
RBW: 9kHz • 120kHz • 1MHz (6dB)

※ In the case of measurement up to 6 GHz, MSA 558 E  
Frequency range: 20kHz to 8.5GHz

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