Relationship between Electric field strength and Antenna factor
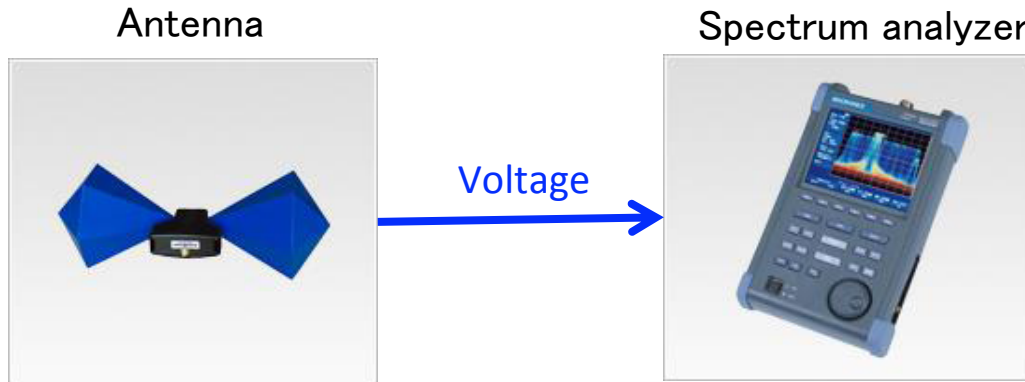
◇A brief description of the relationship between Electric field strength and Antenna factor.

[〜*Application*〜]

Antenna

Spectrum analyzer

Voltage

Convert Electric field strength to voltage
（Conversion factor = Antenna factor）

Measure Voltage

An antenna converts radio waves in the air into electrical signals flowing through the cable
(or electric signals flowing through the cable into air). The conversion factor is the Antenna factor.
The relationship between Electric field strength and Voltage can be expressed as follows in using Antenna factor.

Electric field strength（V/m）＝Voltage（V）×Antenna factor（1/m）・・・(1)
Electric field strength（μV/m）＝Voltage（μV）×Antenna factor（1/m）・・・(2)

In other words, when considered as a receiver antenna, there is a proportional relationship between
the electric field strength at the position where the antenna is placed and the voltage output by the antenna,
and its proportional constant is the antenna factor.

When measuring electric field strength, a spectrum analyzer is mainly used as a measuring device
connected to the antenna. Since the spectrum analyzer can measure the strength and frequency of the voltage,
if you know the antenna factor, you can know the electric field strength and frequency of the radio wave
at the position where the antenna is placed.
As the notation in decibel (dB) which is the logarithmic unit is often used in the spectrum analyzer,
it is often that the antenna factor is in dB units or the electric field strength is also used in dB units.
In that case, the equations (1) and (2) are expressed as follows.

Electric field strength(dBV/m)＝Voltage(dBV)＋Antenna factor(dB/m)・・・(3)
Electric field strength(dBμV/m)＝Voltage(dBμV)＋Antenna factor(dB/m)・・・(4)

From equations (3) and (4), in the case of dB notation, you can see that

"Electric field strength equal Voltage measured by Spectrum analyzer plus Antenna factor."

[〜*System constitution*〜]

For example,

Signal analyzer（MSA538）	×1
Biconical antenna（MAN150）	×1

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