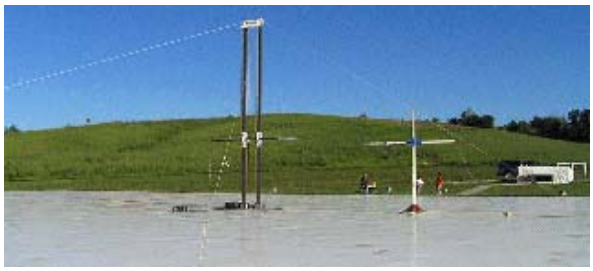
Total evaluation / Calibration for chamber and EMC measurement equipments

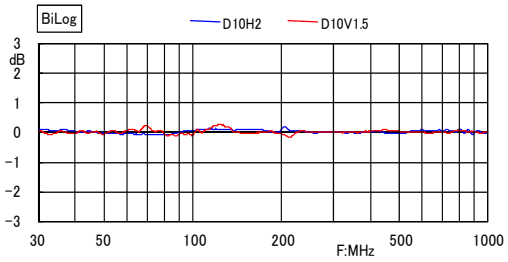
・NIST traceable calibration system audited by A2LA for Measuring equipments and antennas
・NSA/SVSWR, etc evaluation and consulting, periodic calibration of measuring system at customer's Site.

1. Antenna calibration

① Bi-con / LPD / Bi-Log antenna for EMI measurement ：30MHz～2GHz
Comparison measurement using reference factor that was calibrated by ANSI 3 antenna method at Liberty Lab. reference open test site (50x80m) where is used for conduction of ANSI free space factor.

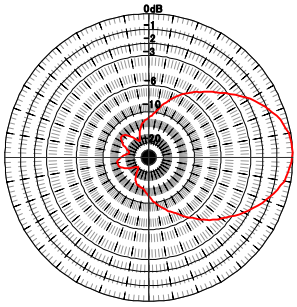
- **Free space antenna factor** / Factor calibration at several height / SAE factor (D=1.0m/h=3.0m) for Autmotive products.
- **NSA measurement factor**：D=10m/3m, h=1.0/1.5/2.0m, Horizontal / Vertical：by customer's specified frequency step





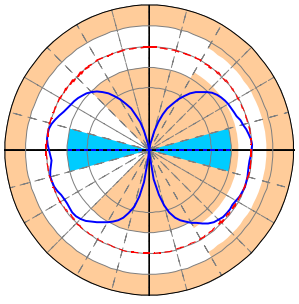
② Horn antenna：1GHz～40GHz
3 antenna method under the free space condition
- Providing antenna factor：D=3.0/1.0m Sweep method
- VSWR：Checking connector and Wave guide characteristic
- Radiation pattern: 2°/0.5GHz step data

＊Factor ①②：Also applicable to compare with reference antenna at customer's Site



③ Loop antenna ：10Hz～9KHz～30MHz IEEE Std. 291-1991Reference magnetic field method
- Magnetic factor：AFH, Magnetic strengh factor：AFpT, E-field factor：AFE,

④ Loop sensor for MIL test：10Hz～1MHz
- Center magnetic field NIST method



⑤ POD for SVSWR：1GHz～18GHz Under free space condition
- Radiation pattern: CISPR 16-1-4
- Antenna factor：D=3.0m, Possible for over 1GHz NSA evaluation
- VSWR: ：Checking connector characteristic
-

2. Calibration for E-field sensor

Comparison method with NIST traceable reference probe complying with IEEE STD 1309 (2005), IEC61000-4-3 Ed3

① Calibration factor Mx：Specified axis or X,Y,Z axis
- 10kHz～1GHz：G-TEM Cell method 6V/m～200V/m
- 1-6-18GHz：Anechoic chamber free space condition 6V/m～120V/m ・ Linearity：-6～+6dB

② Isotropic Pattern： 400MHz or specified frequency

3. EMC measurement equipments calibration

Traceable calibration system audited by A2LA

① Test receiver / Spectrum analyzer：CISPR16-1-1 9KHz-1000MHz-18GHz
- Level accuracy, Input impedance, CISPR QP/AV response, IF band, impulse-sign wave response

② Power analyzer：IEC61000-4-7 Ed2, IEC61000-4-15, IEC61000-3-3 Ed2, EN61000-3-12
- Voltage：1000V / Current ： 20A / Electrical power ： 20KVA / phase factor
- Pst/d(t)/dc(%) accurate calibration
- 40th Harmonic current / Inter harmonic / PWHD / Voltage･current deformation ： comply with new standard

③ Telecommunication portISN：CISPR22 Ed.5
- LCL=55/65/75dB calibration by accurate LCL probe, coupling factor, impedance

④ AMN/ RIN/ CDN：CISPR16-1-1 9KHz-100MHz including MIL / Automotive products

⑤ EMI clamp / Injection clamp：CISPR 16-1-3, IEC6100-4-6 10KHz-30MHz-1GHz

⑥ Current prove / Injection probe：10Hz-9KHz-3GHz

⑦ EFT Burst / Surge / Dip test equipments, CVCF

⑧ SG, Pre / Power amp：9KHz-18GHz

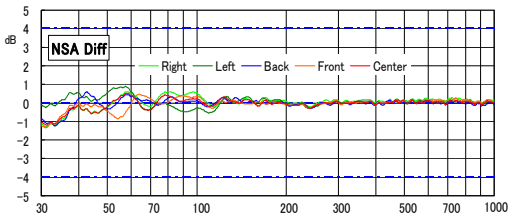
⑨ ESD generator(Ed.2), Oscilloscope：10GHz, Digital multi meter, etc

＊①, ③-⑧：Available calibration at customer's Site

4. NSA / SVSWR On-site periodical calibration, Countermeasure consulting

① NSA：30-1000M Hz CISPR16-1-4, ANSI C63.4, VCCI
- Comparison with Liberty Lab. Reference site
- High speed sweep measurement by accurate NA/laser marker、Antenna set up, our expert engineer
- Best Axis alingment、consulting for antenna mast/reflection

② SVSWR：1GHz-6(18)GHz CISPR16-1-4, VCCI
- Sweep measurement by Low reflective POD moving system
- Consulting for Floor layout / Maximum test volume



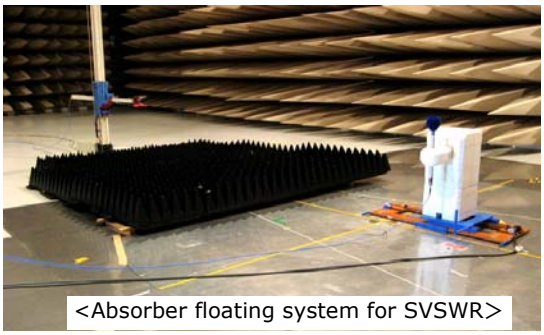
<Chamber NSA>

☐ Uniformity：80MHz-6(18)GHz IEC61000-4-3
- Ssweep measurement by 4Ch E-field sensor and Low reflective sensor moving system
- Auto calculation for apply level by One time pre-measurement
- Best choice and layout of floor absorber

＊☐☐：possible to rotate TT by absorber floating system

☐FAC NSA：30MHz-18GHz CISPR16-1-4 SmallBicon/LP

☐FAC NSA：1GHz～40GHz ETSI TS 102 321


<Absorber floating system for SVSWR>

5. Measurement system calibration and Countermeasure consulting

① Periodic calibration and maintenance for test site performance, measuring system factor correction.

② Best choice of cable / pre-amp for low floor noise

③ Technical training for EMI test and product development

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