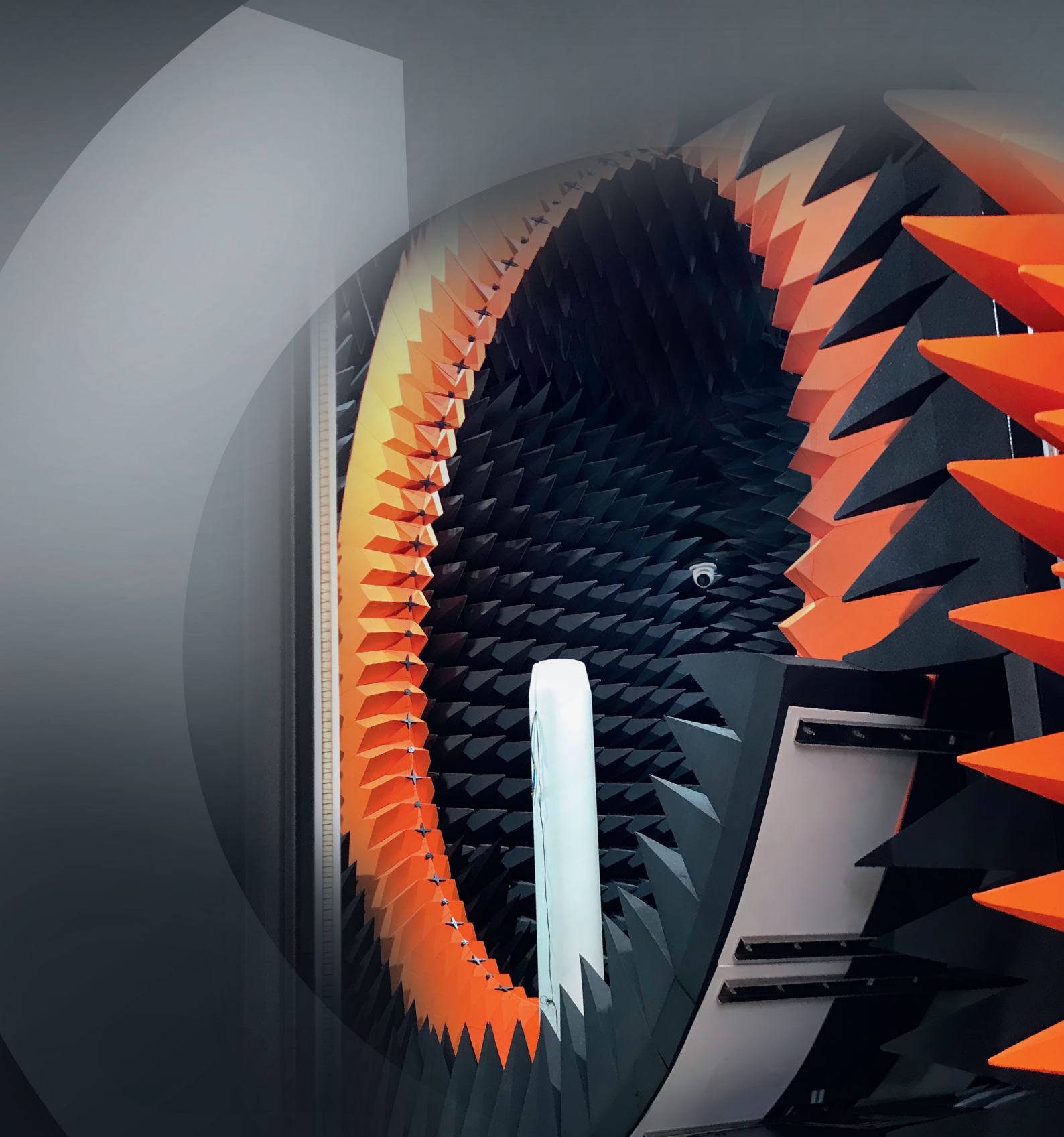


+ SG 32

A Multi-probe Antenna Measurement System for Fast OTA Testing



SG 32 is a smaller version of the SG 64, with 31 probes (+ 1 reference channel). Three models are available: the SG 32 S - 6 GHz, SG 32 S - 18 GHz, SG 32 L - 18 GHz. All have the capacity to switch between the N-PAC for antenna measurements and the radio communications tester for OTA measurements. SG 32 can perform both CTIA comparable TRP and TIS measurements.



Compact dimensions - perfect for test labs with low ceiling heights

SOLUTION FOR

- Antenna Measurement
- OTA Testing
- MIMO Measurement

MAIN FEATURES

Technology

- Near-field / Spherical

Measurement capabilities

- Gain
- Directivity
- Beamwidth
- Cross polar discrimination
- Sidelobe levels
- Front to back ratio
- 1D, 2D and 3D radiation patterns
- Radiation pattern in any polarization (linear or circular)
- Antenna efficiency
- TRP, TIS, EIRP and EIS

Frequency bands

- SG 32 S - 6 GHz: 650 MHz to 6 GHz
(*Extension to 10 GHz optional*)
- SG 32 S - 18 GHz: 650 MHz to 18 GHz
- SG 32 L - 18 GHz: 400 MHz to 18 GHz

Max. size of DUT

- 84 cm for SG 32 S
- 134 cm for SG 32 L

Max. weight of DUT

- 5 kg on polystyrene mast
- 25 kg on fiberglass mast
- 50 kg on metal mast*

Typical dynamic range

- 70 dB

Oversampling

- Elevation tilt of the DUT

SYSTEM CONFIGURATIONS

Software

Measurement control, data acquisition and post processing

- MVG WaveStudio

Near-field/far-field transform

- MV-Sphere

OTA measurement suite

- MVG WaveStudio

Advanced post processing

- Insight

Equipment

- Amplification unit
- Mixer unit
- N-PAC
- Uninterruptible power supply
- Instrumentation rack
- DUT positioner
- Primary synthesizer
- Auxiliary synthesizer

Add-ons

- Shielded anechoic chamber**

OTA Equipment

- Radio communication tester
- Active switching unit
- MIMO upgrade

Accessories

- Styrofoam mast
- Acquisition PC & touch screen PC
- Hand and head phantoms
- Laptop interface
- Ultra rigid mast
- Positioning laser pointer
- Reference antennas (horns, sleeve dipoles, loops)

Services

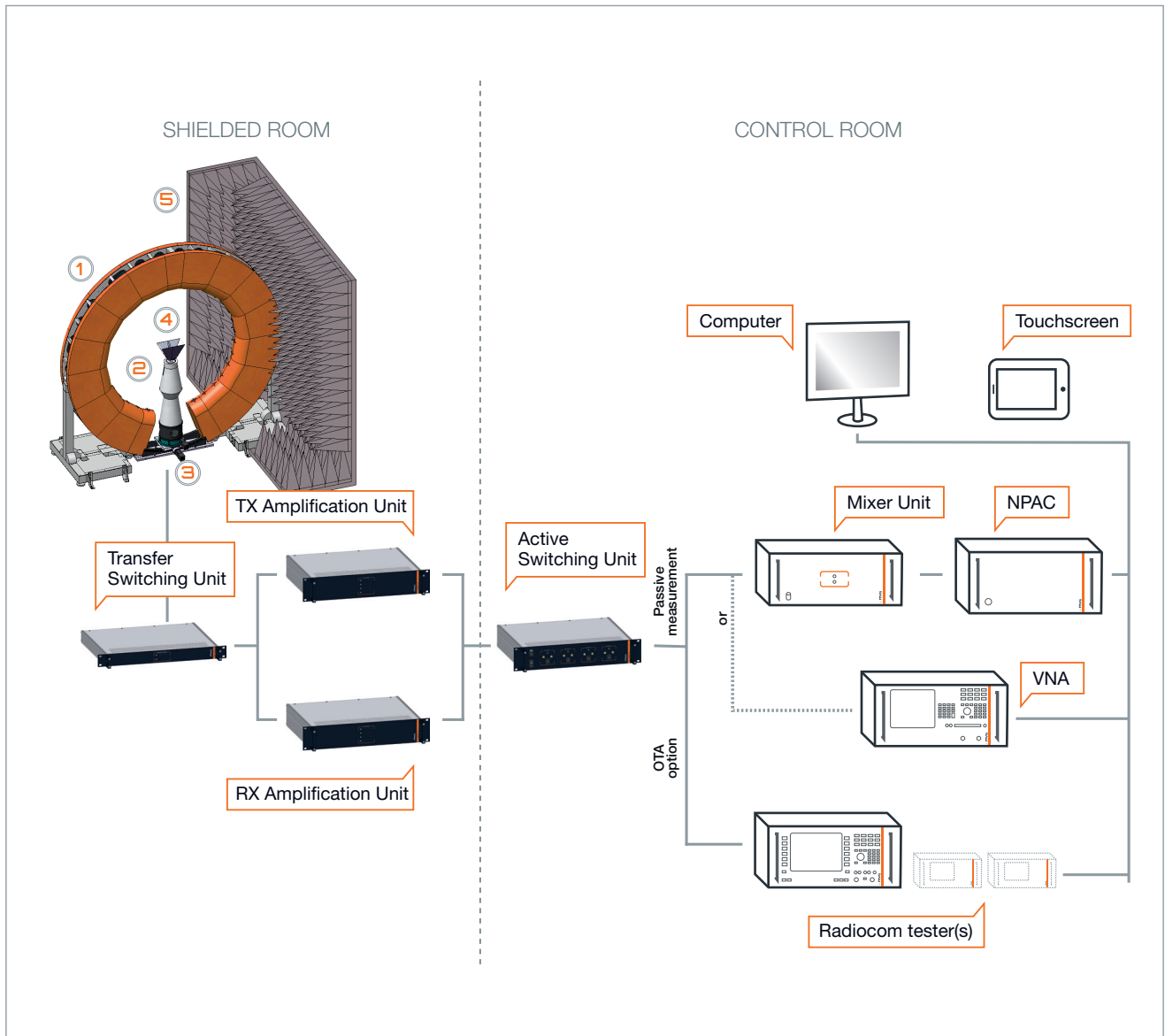
- Installation and calibration
- Warranty
- Project management
- Training
- Post warranty service plans

* Consult us for higher load capacities

** See MVG-EMC product pages: mvg.link/EMC for more information

■ Included □ Optional ○ Required

+ System Overview

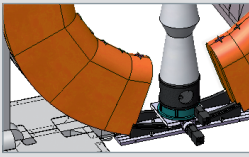


The SG 32 system switches between the NPAC (New Probe Array Controller) for antenna measurements and the radio communication tester for OTA measurements. The NPAC is an RF source and receiver for antenna measurements and controls the electronic scanning of the probe array. For antenna measurements, it uses analog RF signal generators to emit from the probe array to the Device Under

Test (DUT) or vice versa. For OTA measurements, the tests are performed through several different radio communication testers. The amplification unit has RF amplifiers for each of the RX and TX channels. They are used to communicate with the DUT and measure the Total Radiated Power (TRP) and Total Isotropic Sensitivity (TIS).

+ Standard system components

1 Arch



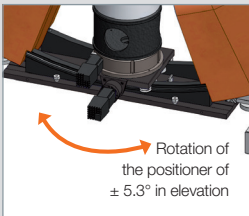
- A choice of 2 sets of probes can be interleaved (DP 400-6000, DP 6000-18000) or distributed on each half side of the arch

2 Mast



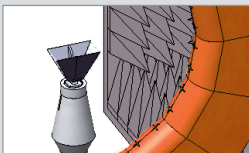
- 2 masts according to max. weight of DUT
- Laptop interface

3 Unlimited sampling



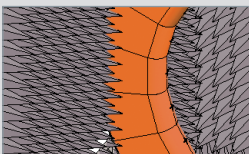
- For measurement sampling and calibration, to complete the measurement sphere between probes, the goniometer repositions the DUT mast $\pm 5.3^\circ$.
- The choice of goniometer depends on the size of the arch, the max weight of the DUT, and the frequency range.

4 Antennas



- A choice of reference antennas (horns, dipoles and loops)
- See Antenna Product Overview www.mvg.link/antennas

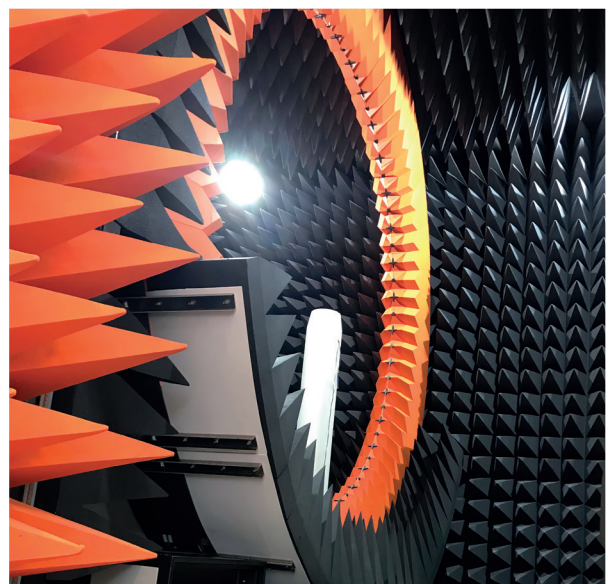
5 Absorbers and anechoic chambers



- A choice of standard, adapted and specialty absorbers
- Anechoic chambers with integrated design, production, installation and testing services
- See Absorber Product Overview www.mvg.link/absorbers



SG 32 with head phantom



SG 32 18 GHz version

SG 32 S - 18 GHz

For the 0.65 GHz to 18 GHz version, two probe arrays are interleaved, one with 0.65 - 6 GHz probes and the other with 6 - 18 GHz probes.

SG 32 L - 18 GHz

For the 0.4 GHz to 18 GHz version, two probe arrays are interleaved, one with 0.4 - 6 GHz probes and the other with 6 - 18 GHz probes.

System specifications*

	SG 32 S - 6 GHz			SG 32 S - 18 GHz			SG 32 L - 18 GHz		
Measurement time for 11 frequencies**	< 2 min			< 2 min			< 2 min		
Typical dynamic range	70 dB			70 dB			70 dB		
	10 dBi AUT	20 dBi AUT	30 dBi AUT	10 dBi AUT	20 dBi AUT	30 dBi AUT	10 dBi AUT	20 dBi AUT	30 dBi AUT
PEAK GAIN ACCURACY									
0.4 - 0.8 GHz	-	-	-	-	-	-	± 1.1 dB	± 1.0 dB	-
0.65*** GHz - 0.8 GHz	± 1.5 dB	-	-	± 1.5 dB	-	-	-	-	-
0.8 GHz - 1 GHz	± 0.9 dB	± 0.7 dB	-	± 0.9 dB	± 0.7 dB	-	± 0.6 dB	± 0.6 dB	-
1 GHz - 6 GHz	± 0.8 dB	± 0.7 dB	± 0.6 dB	± 0.68 dB	± 0.7 dB	± 0.6 dB	± 0.6 dB	± 0.6 dB	± 0.5 dB
6 GHz - 18 GHz	-	-	-	± 0.8 dB	± 0.7 dB	± 0.6 dB	± 0.8 dB	± 0.7 dB	± 0.6 dB
Peak gain repeatability	± 0.3 dB	± 0.3 dB	± 0.3 dB	± 0.3 dB	± 0.3 dB	± 0.3 dB	± 0.3 dB	± 0.3 dB	± 0.3 dB
- 10 dB SIDELOBES ACCURACY									
0.4 - 0.8 GHz	-	-	-	-	-	-	± 1.1 dB	± 0.7 dB	-
0.65*** GHz - 0.8 GHz	± 1.6 dB	-	-	± 1.6 dB	-	-	-	-	-
0.8 GHz - 1 GHz	± 1.0 dB	± 0.6 dB	-	± 1.0 dB	± 0.6 dB	-	± 0.9 dB	± 0.6 dB	-
1 GHz - 6 GHz	± 0.8 dB	± 0.5 dB	± 0.4 dB	± 0.8 dB	± 0.5 dB	± 0.4 dB	± 0.7 dB	± 0.5 dB	± 0.4 dB
6 GHz - 18 GHz	-	-	-	± 0.7 dB	± 0.5 dB	± 0.4 dB	± 0.7 dB	± 0.5 dB	± 0.4 dB
- 20 dB SIDELOBES ACCURACY									
0.4 - 0.8 GHz	-	-	-	-	-	-	± 3.5 dB	± 1.1 dB	-
0.65*** GHz - 0.8 GHz	± 4.5 dB	-	-	± 4.5 dB	-	-	-	-	-
0.8 GHz - 1 GHz	± 3.0 dB	± 1.0 dB	-	± 3.0 dB	± 1.0 dB	-	± 2.7 dB	± 0.9 dB	-
1 GHz - 6 GHz	± 2.4 dB	± 0.8 dB	± 0.5 dB	± 2.4 dB	± 0.8 dB	± 0.5 dB	± 2.1 dB	± 0.7 dB	± 0.5 dB
6 GHz - 18 GHz	-	-	-	± 2.2 dB	± 0.7 dB	± 0.5 dB	± 2.2 dB	± 0.7 dB	± 0.5 dB
- 30 dB SIDELOBES ACCURACY									
0.4 - 0.8 GHz	-	-	-	-	-	-	-	± 3.5 dB	-
0.65*** GHz - 0.8 GHz	-	-	-	-	-	-	-	-	-
0.8 GHz - 1 GHz	-	± 3.0 dB	-	-	± 3.0 dB	-	-	± 2.7 dB	-
1 GHz - 6 GHz	-	± 2.4 dB	± 0.8 dB	-	± 2.4 dB	± 0.8 dB	-	± 2.1 dB	± 0.7 dB
6 GHz - 18 GHz	-	-	-	-	± 2.2 dB	± 0.7 dB	-	± 2.2 dB	± 0.7 dB
* Specifications given according to the following assumptions:				** No oversampling, no averaging					
• Controlled temperature and humidity during measurement				*** 0.65 GHz specifications can go down to 600 MHz for a chamber equipped with 18-inch absorbers.					
• Specifications on radiation pattern are given for a normalized pattern									
• Measurements inside an anechoic chamber									
• Peak gain is given for a ± 0.3 dB of gain error on the reference antenna									
• DUT phase center does not exceed 15 cm from arch center									
• Measurement performed with a suitable mast depending on the load and directivity of the DUT									

Mechanical characteristics*

	SG 32 S - 6 GHz	SG 32 S - 18 GHz	SG 32 L - 18 GHz
Probe array diameter (int/ext)	1.5 / 2.5 m	1.5 / 2.5 m	2.4 / 3.52 m
Shielded anechoic chamber size [L x W x H]	3.5 x 3.5 x 2.7 m	3.5 x 3.5 x 2.7 m	4.0 x 4.0 x 4.0 m
Angle between probes in the same frequency band	10.59°	10.59°	10.59°
Azimuth accuracy	0.02°	0.02°	0.02°
Azimuth max. speed	30°/s	30°/s	30°/s
Oversampling capability	Goniometer	Goniometer	Goniometer
DUT MAX. WEIGHT			
Styrofoam mast	50 kg	50 kg	50 kg
Ultra rigid mast	200 kg	200 kg	200 kg

* Centered load without oversampling

RF equipment characteristics

Number of probes	31 + 1 ref. channel	16 x LF (6 GHz) probes + 16 x HF (18 GHz) probes + 1 ref channel	31 x LF (6 GHz) probes + 30 x HF (18 GHz) probes + 1 ref channel
Frequency range	650 MHz to 6 GHz	650 MHz to 18 GHz	400 MHz to 18 GHz

Maximum diameter of the DUT (m)*

FREQUENCY (GHz)	NUMBER OF OVERSAMPLING				
	x 1	x 2	x 3	x 5	x 10
0.65	0.75	0.75	0.75	0.75	0.75
1	0.75	0.75	0.75	0.75	0.75
2	0.81	0.84	0.84	0.84	0.84
3	0.54	0.84	0.84	0.84	0.84
4	0.41	0.81	0.84	0.84	0.84
5	0.32	0.65	0.84	0.84	0.84
6	0.27	0.54	0.81	0.84	0.84
7	0.23	0.46	0.70	0.84	0.84
8	0.20	0.41	0.61	0.84	0.84
9	0.18	0.36	0.54	0.84	0.84
10	0.16	0.32	0.49	0.81	0.84
11	0.15	0.30	0.44	0.74	0.84
12	0.14	0.27	0.41	0.68	0.84
13	0.12	0.25	0.37	0.62	0.84
14	0.12	0.23	0.35	0.58	0.84
15	0.11	0.22	0.32	0.54	0.84
16	0.10	0.20	0.30	0.51	0.84
17	0.10	0.19	0.29	0.48	0.84
18	0.09	0.18	0.27	0.45	0.84

* based on SG 32 S - 18 GHz

+ OTA performance testing

SG 32 can perform both CTIA comparable TRP and TIS measurements.

OTA performance measurement specifications*

ACCORDING TO CTIA SPECIFICATIONS

TRP accuracy free space	<± 1.6 dB
TRP accuracy talk position	<± 1.7 dB
TRP repeatability	± 0.3 dB
Typical TRP measurement time**	< 90 s
TIS accuracy free space	<± 1.7 dB
TIS accuracy talk position	<± 1.8 dB
TIS repeatability	± 0.5 dB
Typical TIS measurement time***	15 min > 60 min

CTIA COMPARABLE

GSM/WCDMA protocols:

TIS based on Rx Level accuracy	<± 2.6 dB
TIS based on Rx Level repeatability	<± 1.5 dB
Typical TIS based on Rx level measurement time***	< 5 min

CDMA2000 protocol:

TIS optimized accuracy	<± 1.7 dB
TIS optimized repeatability	<± 0.5 dB
Typical TIS optimized measurement time***	< 10 min

* Specifications given according to the following assumptions:

- Controlled temperature and humidity during measurement
- Measurements inside an anechoic chamber
- DUT phase center does not exceed 15 cm from arch center
- Calibration done with dipole efficiency reference values
- Measurement performed with a suitable mast depending on the load and directivity of the DUT.

Specifications also depend on Radio Communication Tester and Protocol

** One channel, 15 deg sampling, one time each probe, measurement time depends on protocol

*** One channel, 30 deg sampling, one time each probe, measurement time depends on protocol

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