

# Calibration Certificate

Certificate number **34-20**

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## Calibration is performed by using

Model	Model Description	Equipment ID	Cal Due Date	Certificate Number	Trace Value
M 523	Reference power meter	162	24 March 2022	1/111-172-20	RF Power
M 514	Reference power meter	165	24 March 2022	1/111-176-20	RF Power
02	Frequency multiplier	02	23 January 2020	02-19	RF Power
RG4-14	Signal generator	22	10 July 2020	24-19	RF Power
V7-34	Universal voltmeter	0067787	27 September 2020	1994-42	DC Voltage
RCH3-72	Frequency meter	931200	13 September 2020	2261-43	Frequency
P6-32	Measuring horn antenna	115671	23 September 2021	2369-43	Gain

## Calibration conditions

Temperature: 22.5 °C.  
Humidity: 43.0 %.  
Pressure: 101.0 kPa.

## Calibration results are given in the measurement report # 34-20

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	140 – 220 GHz	Corresponds
2	Antenna Gain	22.6* dBi	Corresponds (Table 1)
3	Antenna Factor	52.5 dB/m	Corresponds (Table 1)

\* – Expanded uncertainty of measurements 3.0 dB.

*The uncertainty evaluation has been performed in accordance with ISO/IEC Guide 98-3:2008 (GUM). The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k$  such that the coverage probability corresponds to approximately 95 %. This probability corresponds to a coverage factor of  $k=2$  for a normal distribution.*

Signature of the person who has performed calibration



/ Engineer

**Calibration Laboratory of  
Microwave Measuring Equipment**

Accreditation certificate

No. BY/112 5.0065

Address: 6, P. Brovki str., Minsk  
220013, Belarus

Phone/Fax: +375 17 2938496



**MEASUREMENT REPORT # 34-20**

July 10, 2020

Customer:	SPORTON INTERNATIONAL (SHENZHEN) INC. 1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen, 518055, People's Republic of China
Item calibrated:	Antenna QWH-GPRR00 # 01
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	09.06.2020
Date of calibration:	From 09.06.2020 to 10.07.2020

## MEASUREMENT CONDITIONS

Temperature: 22.5 °C	Humidity: 43 %	Pressure: 101.0 kPa
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## MEASUREMENT EQUIPMENT

Model	Model Description	Equipment ID	Cal Due Date	Certificate Number	Trace Value
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## MEASUREMENT RESULTS

Distance between the testing and generating antennas was 1 m at 140 GHz, 0.6 m at 180 GHz and 0.3 m at 220 GHz.

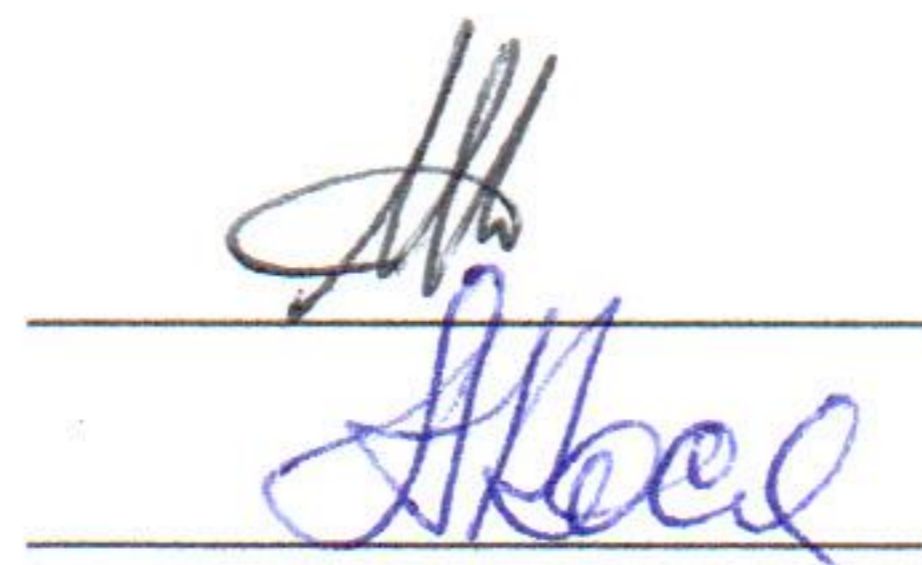
Table 1

Frequency, GHz	140	180	220
Power density of electromagnetic field, W/m <sup>2</sup>	0.311	0.369	0.327
Maximum level of measured power, dBm	-17.1	-18.1	-20.2
Gain, dBi	22.3	22.8	22.9
Expanded uncertainty, dB	2.5	3.0	3.0
Antenna Factor, dB/m	50.8	52.5	54.2

*The uncertainty evaluation has been performed in accordance with ISO/IEC Guide 98-3:2008 (GUM). The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k$  such that the coverage probability corresponds to approximately 95 %. This probability corresponds to a coverage factor of  $k=2$  for a normal distribution.*

Engineer

Quality Manager



This measurement report issued in duplicate and sent to:

1. SPORTON INTERNATIONAL (SHENZHEN) INC. 1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen, 518055, People's Republic of China

2. Calibration Laboratory of Microwave Measuring Equipment

Duplication of Measurement report (complete or partial) must be authorized by the laboratory.