

# Calibration Certificate

Certificate number **28-18**

Page 2 of 2

## Calibration is performed by using

#	Measuring equipment	Serial number
1	Wattmeter M 534	161
2	Wattmeter M 546	163
3	Signal generator G4-186	5
4	Signal generator RG4-14	22
5	Voltmeter V7-34	0067787
6	Frequency meter RCH3-72	931200
7	Horn antenna P6-134	14002
8	Horn antenna P6-31A	35864

## Calibration conditions

Temperature: 22.5 °C.

Humidity: 44.0 %.

Pressure: 99.9 kPa.

## Calibration results are given in the Measuring report # 28-18.

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	60 – 90 GHz	Corresponds (Table 1)
2	Waveguide Interface	WR-12	Corresponds
3	Antenna Gain	24 dB	Corresponds (Table 1)
4	Antenna Factor	45 dB/m	Corresponds (Table 1)

**Signature of the person who has performed calibration**



M. Kasperovich/ Engineer

Name and function

**Calibration Laboratory of  
 Microwave Measuring Equipment**  
 Accreditation certificate  
 No. BY/112 02.5.0.0065  
 Address: 6, P. Brovki str., Minsk  
 220027, Belarus  
 Phone/Fax: +375 17 2938496



Technical Manager

M. Svirid

August 17, 2018

**MEASURING REPORT # 28-18**  
 August 17, 2018

Customer:	Sporton International Inc. No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District, TaoYuan City 333, Taiwan, R.O.C.
Item calibrated:	<b>Antenna QWH-EPRR00 # 784600034</b>
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	07/20/2018
Date of calibration:	From 07/23/2018 to 08/17/2018

## MEASURING CONDITIONS

Temperature: 22.5 °C	Humidity: 44 %	Pressure: 99.9 kPa
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## MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 534	161
2	Wattmeter M 546	163
3	Signal generator G4-186	5
4	Signal generator RG4-14	22
5	Voltmeter V7-34	0067787
6	Frequency meter RCH3-72	931200
7	Horn antenna P6-134	14002
8	Horn antenna P6-31A	35864

## MEASURING RESULTS

Distance between the testing and generating antennas was 1.8 m at 60-75 GHz and 1.5 m at 90 GHz.

Table 1

Frequency, GHz	60	75	90
Input Power, mW	10.0	10.0	8.0
Power density of electromagnetic field, W/m <sup>2</sup>	0.063	0.081	0.121
Maximum level of measured power, μW	21.44	21.84	26.14
Gain, dB	22.3	23.3	23.9
Antenna Factor, dB/m	43.5	44.5	45.4
Expanded uncertainty, dB	2.1	2.1	2.1

Engineer



M. Kasperovich

Quality Manager



A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Sporton International INC.

Address: No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District, TaoYuan City 333, Taiwan, R.O.C.

2. Calibration Laboratory of Microwave Measuring Equipment

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



## Calibration certificate

ISO 17025  
ACCREDITED LABORATORY



Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 30-18 Date when calibrated 08/17/2018 Page 1 of 2

Item  
calibrated

Antenna QWH-FPRR00 # 923800008

Description of measurement standard / measuring instrument / identification

Customer

Sporton International Inc.  
No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District,  
TaoYuan City 333, Taiwan, R.O.C.

Name of the customer, address

Method of  
calibration

GOST 20271.1, MK KL 8.2-16

Name of the method / identification

*All measurements are traceable to the SI units which are realized by national measurement standards of NMI and state standards of RF. This certificate shall not be reproduced, except in full. Any publication extracts from the calibration certificate requires written permission of the issuing calibration laboratory of microwave measuring equipment.*

Authorising  
signature



M. Svirid/ Technical manager Date of issue 08/17/2018  
Name and position

# Calibration Certificate

Certificate number **30-18**

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## Calibration is performed by using

#	Measuring equipment	Serial number
1	Wattmeter M 523	162
2	Wattmeter M 534	161
3	Voltmeter V7-34	0067787
4	Frequency meter RCH3-72	931200
5	Signal generator RG4-14	22
6	Signal generator G4-161	282
7	Antenna P6-31A	35864
8	Antenna P6-32	115671

## Calibration conditions

Temperature: 22.5 °C.

Humidity: 44.0 %.

Pressure: 99.9 kPa.

## Calibration results are given in the Measuring report # 30-18.

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	90 – 140 GHz	Corresponds (Table 1)
2	Waveguide Interface	WR-8	Corresponds
3	Antenna Gain	24 dB	Corresponds (Table 1)
4	Antenna Factor	48 dB/m	Corresponds (Table 1)

**Signature of the person who has performed calibration**

  
M. Kasperovich/ Engineer

Name and function

**Calibration Laboratory of  
Microwave Measuring Equipment**

Accreditation certificate

No. BY/112 02.5.0.0065

Address: 6, P. Brovki str., Minsk  
220027, Belarus

Phone/Fax: +375 17 2938496

Technical Manager



M. Svirid

August 17, 2018

**MEASURING REPORT # 30-18**

August 17, 2018

Customer:	Sporton International Inc. No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District, TaoYuan City 333, Taiwan, R.O.C.
Item calibrated:	<b>Antenna QWH-FPRR00 # 923800008</b>
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	07/20/2018
Date of calibration:	From 07/23/2018 to 08/17/2018

## MEASURING CONDITIONS

Temperature: 22.5 °C	Humidity: 44 %	Pressure: 99.9 kPa
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## MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 523	162
2	Wattmeter M 534	161
3	Voltmeter V7-34	0067787
4	Frequency meter RCH3-72	931200
5	Signal generator RG4-14	22
6	Signal generator G4-161	282
7	Antenna P6-31A	35864
8	Antenna P6-32	115671

## MEASURING RESULTS

Distance between the testing and generating antennas was 1.5 m at 90-115 GHz and 1.2 m at 140 GHz.

Table 1

Frequency, GHz	90	115	140
Input Power, mW	8.0	8.0	5.0
Power density of electromagnetic field, W/m <sup>2</sup>	0.125	0.174	0.212
Maximum level of measured power, μW	18.03	20.22	21.08
Gain, dB	22.1	23.3	24.4
Antenna Factor, dB/m	47.2	48.1	48.8
Expanded uncertainty, dB	2.1	2.2	2.2

Engineer



M. Kasperovich

Quality Manager



A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Sporton International INC.

Address: No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District, TaoYuan City 333, Taiwan, R.O.C.

2. Calibration Laboratory of Microwave Measuring Equipment

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



## Calibration certificate

**ISO 17025**  
ACCREDITED LABORATORY



Accreditation certificate No. **№ BY/112 02.5.0.0065** of **09.01.2015**

Certificate number **35-18** Date when calibrated **08/17/2018** Page **1** of **2**

### Item

calibrated

**Antenna QWH-GPRR00 # 923900001**

Description of measurement standard / measuring instrument / identification

Customer

Sporton International Inc.

No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District,  
TaoYuan City 333, Taiwan, R.O.C.

Name of the customer, address

Method of  
calibration

**GOST 20271.1, MK KL 8.2-16**

Name of the method / identification

*All measurements are traceable to the SI units which are realized by national measurement standards of NMI and state standards of RF. This certificate shall not be reproduced, except in full. Any publication extracts from the calibration certificate requires written permission of the issuing calibration laboratory of microwave measuring equipment.*

Authorising  
signature



**M. Svirid/ Technical manager**

Name and position

**Date of issue 08/17/2018**



# Calibration Certificate

Certificate number **35-18**

Page 2 of 2

## Calibration is performed by using

#	Measuring equipment	Serial number
1	Wattmeter M 523	162
2	Wattmeter M 514	165
3	Signal generator RG4-14	4
4	Voltmeter V7-34	0067787
5	Frequency meter RCH3-72	931200
6	Frequency multiplier	02
7	Horn antenna P6-32	115671
8	Horn antenna 2P1	138421

## Calibration conditions

Temperature: 22.5 °C.


Humidity: 44.0 %.

Pressure: 99.9 kPa.

## Calibration results are given in the Measuring report # 35-18.

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	140 – 220 GHz	Corresponds (Table 1)
2	Waveguide Interface	WR-5	Corresponds
3	Antenna Gain	24 dB	Corresponds (Table 1)
4	Antenna Factor	52 dB/m	Corresponds (Table 1)

**Signature of the person who has performed calibration**

  
M. Kasperovich/ Engineer  
Name and function

**Calibration Laboratory of  
Microwave Measuring Equipment**

Accreditation certificate

No. BY/112 02.5.0.0065

Address: 6, P. Brovki str., Minsk  
220027, Belarus

Phone/Fax: +375 17 2938496



Technical Manager

\_\_\_\_\_ M. Svirid

August 17, 2018

**MEASURING REPORT # 35-18**

August 17, 2018

Customer:	Sporton International Inc. No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District, TaoYuan City 333, Taiwan, R.O.C.
Item calibrated:	<b>Antenna QWH-GPRR00 # 923900001</b>
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	07/20/2018
Date of calibration:	From 07/23/2018 to 08/17/2018

## MEASURING CONDITIONS

Temperature: 22.5 °C	Humidity: 44 %	Pressure: 99.9 kPa
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## MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 523	162
2	Wattmeter M 514	165
3	Signal generator RG4-14	4
4	Voltmeter V7-34	0067787
5	Frequency meter RCH3-72	931200
6	Frequency multiplier	02
7	Horn antenna P6-32	115671
8	Horn antenna 2P1	138421

## MEASURING 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
Input power, mW	5.0	2.0	2.0
Power density of electromagnetic field, W/m <sup>2</sup>	0.311	0.369	0.327
Maximum level of measured power, $\mu$ W	18.15	16.71	11.42
Gain, dB	22.0	23.1	23.7
Antenna factor, dB/m	51.1	52.2	53.4
Expanded uncertainty, dB	2.2	2.3	2.5

Engineer  M. Kasperovich

Quality Manager  A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Sporton International INC.

Address: No. 52, HwaYa 1st Road, HwaYa Technology Park, Kwei-Shan District, TaoYuan City 333, Taiwan, R.O.C.

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