

Calibration Laboratory of Microwave Measuring Equipment
of MWM lab



Calibration certificate

ISO 17025
ACCREDITED LABORATORY



Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 92-17 Date when calibrated 10/17/2017 Page 1 of 2

Item

calibrated

Mixer M05HWD # 110215-1

Description of measurement standard / measuring instrument / identification

Customer

Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, 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 Ukraine. 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 10/17/2017

Calibration Certificate

Certificate number **92-17**

Page **2** of **2**

Calibration is performed by using

1. Wattmeter M 523
2. Wattmeter M 514
3. Spectrum analyzer E4407B
4. Signal generator RG4-14
5. Voltmeter V7-34
6. Frequency meter RCH3-72
7. Diplexer DPL26
8. Frequency multiplier
9. Attenuator AP-19
10. Attenuator AP-18

Calibration conditions

Temperature 22.2 °C
Humidity 44.2 %
Pressure 99.7 kPa

Calibration results are given in the Measuring report # 92-17.

#	Parameter	Specifications required	Specifications tested and measured
1	System Operating Frequency	140 – 220 GHz	Corresponds
2	LO Input	+12 – +17 dBm	Corresponds
3	IF Frequency Range	321 – 2400 MHz	Corresponds
4	Mixer Bias	+5.75 mA	Corresponds
5	System Waveguide Interface	WR-05	Corresponds
6	Conversion Loss	59 dB	Corresponds (Table 1)
7	System LO/IF Interface	SMA (f)	Corresponds
8	Typical RF Power to Avoid Compression	-20 dBm (10 µW)	Corresponds

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

MEASURING REPORT # 92-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Mixer M05HWD # 110215-1
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 22.2 °C	Humidity: 44.2 %	Pressure: 99.7 kPa
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MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 523	162
2	Wattmeter M 514	165
3	Spectrum analyzer E4407B	MY45110807
4	Signal generator RG4-14	4
5	Voltmeter V7-34	0067787
6	Frequency meter RCH3-72	931200
7	Diplexer DPL26	01
8	Frequency multiplier	02
9	Attenuator AP-19	04
10	Attenuator AP-18	03

MEASURING RESULTS

IF Frequency 321.4 MHz $\pm$ 5 MHz;

Mixer Bias +5.75 mA;

LO Input Power 14.5 to 16 dBm (2.9 to 7.1 GHz).

LO Insertion Loss of Diplexer 0.7 dB.

Table 1

Frequency, GHz	140	180	220
Input RF Power, dBm	-20.0	-20.0	-20.0
Measured Value, dBm	-69.6	-69.2	-73.9
Conversion Loss, dB	49.6	49.2	53.9
Expanded uncertainty, dB	3.1	2.9	3.1

Engineer

 M. Kasperovich

Quality Manager

 A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1,
Lixing 1st Rd., East Dist., Hsinchu City 300, 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 93-17 Date when calibrated 10/17/2017 Page 1 of 2

Item

calibrated

Standard gain horn antenna M05RH

Description of measurement standard / measuring instrument / identification

Customer

Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, 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

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**Authorising
signature**



M. Svirid/ Technical manager
Name and position

Date of issue 10/17/2017

Calibration Certificate

Certificate number **93-17**

Page 2 of 2

Calibration is performed by using

1. Wattmeter M 523
2. Wattmeter M 514
3. Signal generator RG4-14
4. Voltmeter V7-34
5. Frequency meter RCH3-72
6. Frequency multiplier
7. Horn antenna P6-32

Calibration conditions

Temperature 22.2 °C

Humidity 44.2 %

Pressure 99.7 kPa

Calibration results are given in the Measuring report # 92-17.

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	140 – 220 GHz	Corresponds
2	Waveguide Interface	WR-05	Corresponds
3	Gain	24.3 dBi	Corresponds (Table 1)
4	Antenna Factor	51.0 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

October 17, 2017

MEASURING REPORT # 93-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Standard gain horn antenna M05RH
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 22.2 °C	Humidity: 44.2 %	Pressure: 99.7 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

MEASURING RESULTS

Distance between tested and generating antenna 0.5 m.

Table 1

Frequency, GHz	140	180	220
Input power, mW	4.0	2.0	2.0
Power density of electromagnetic field, W/m ²	3.6	2.9	4.2
Maximum level of measured power, μW	106	56	59
Gain, dB	23.5	23.9	24.2
Antenna factor, dB/m	49.6	51.5	52.9
Expanded uncertainty, dB	2.2	2.3	2.5

Engineer  M. Kasperovich

Quality Manager  A. Kostrikin

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Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 94-17 Date when calibrated 10/17/2017 Page 1 of 2

Item

calibrated **Mixer M05HWD # 110215-1 + Standard gain horn antenna M05RH**
Description of measurement standard / measuring instrument / identification

Customer

Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, 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

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Authorising
signature



M. Svirid/ Technical manager
Name and position

Date of issue 10/17/2017

Calibration Certificate

Certificate number **94-17**

Page **2** of **2**

Calibration is performed by using

1. Wattmeter M 523
2. Wattmeter M 514
3. Spectrum analyzer E4407B
4. Signal generator RG4-14
5. Voltmeter V7-34
6. Frequency meter RCH3-72
7. Diplexer DPL26
8. Frequency multiplier
9. Horn antenna P6-32

Calibration conditions

Temperature 22.2 °C

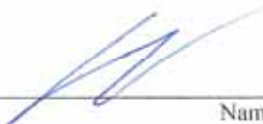
Humidity 44.2 %

Pressure 99.7 kPa

Calibration results are given in the Measuring report # 94-17.

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	140 – 220 GHz	Corresponds
2	Waveguide Interface	WR-05	Corresponds
3	LO Input	+12 – +17 dBm	Corresponds
4	IF Frequency Range	321 – 2400 MHz	Corresponds
5	Mixer Bias	+5.75 mA	Corresponds
6	Conversion Loss	< 59 dB	Corresponds (Table 1)
7	System LO/IF Interface	SMA (f)	Corresponds

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

October 17, 2017

MEASURING REPORT # 94-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Mixer M05HWD # 110215-1 + standard gain horn antenna M05RH
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 22.2 °C	Humidity: 44.2 %	Pressure: 99.7 kPa
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MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 523	162
2	Wattmeter M 514	165
3	Spectrum analyzer E4407B	MY45110807
4	Signal generator RG4-14	4
5	Voltmeter V7-34	0067787
6	Frequency meter RCH3-72	931200
7	Diplexer DPL26	01
8	Frequency multiplier	02
9	Horn antenna P6-32	115671

MEASURING RESULTS

IF Frequency 321.4 MHz $\pm$ 5 MHz;

Mixer Bias +5.75 mA;

LO Input Power 14.5 to 16 dBm (2.9 to 7.1 GHz).

LO Insertion Loss of Diplexer 0.7 dB.

Distance between tested and generating antenna 0.5 m.

Table 1

Frequency, GHz	140	180	220
Input RF power, mW	0.36	0.34	0.33
Power density of electromagnetic field, W/m ²	0.117	0.179	0.249
Measured Level, dBm	-69.96	-69.15	-74.46
Power received by antenna, dBm	-20.2	-20.2	-20.2
Conversion Loss, dB	49.8	49.0	54.3
Expanded uncertainty, dB	2.8	3.1	3.3

Engineer  M. Kasperovich

Quality Manager  A. Kostrikin

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1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1,
Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.

2. Calibration Laboratory of Microwave Measuring Equipment

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Calibration certificate

ISO 17025
ACCREDITED LABORATORY



Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 104-17 Date when calibrated 10/17/2017 Page 1 of 2

Item

calibrated

Diplexer DPL26 # 01

Description of measurement standard / measuring instrument / identification

Customer

Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, 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

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**Authorising
signature**



M. Svirid/ Technical manager
Name and position

Date of issue 10/17/2017

Calibration Certificate

Certificate number **104-17**

Page 2 of 2

Calibration is performed by using

1. Frequency meter CH3-66
2. Scalar Network Analyzer R2-102
3. Scalar Network Analyzer R2-107
4. Spectrum analyzer E4407B

Calibration conditions

Temperature 21.0 °C
Humidity 45 %
Pressure 99.9 kPa

Calibration results are given in the Measuring report # 104-17.

#	Parameter	Specifications required	Specifications tested and measured
1	LO Frequency Range	2 GHz – 6 GHz	Corresponds
2	LO Insertion Loss	1.0 dB	Corresponds (Table 4)
3	LO to IF Isolation	> 40 dB	Corresponds (Table 3)
4	LO to VSWR	2.0:1	Corresponds (Table 1)
5	IF Frequency Range	DC – 1 GHz	Corresponds
6	IF Insertion Loss	1.0 dB	Corresponds (Table 5)
7	IF VSWR	2.0:1	Corresponds (Table 2)

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
October 17, 2017

MEASURING REPORT # 104-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Diplexer DPL26 # 01
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 21.0 °C	Humidity: 45 %	Pressure: 99.9 kPa
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MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Scalar network analyzer R2-102	195190/124691
2	Scalar network analyzer R2-107	061090/034991
3	Spectrum analyzer E4407B	MY45110807
4	Frequency meter CH3-66	98051

MEASURING RESULTS

Table 1

Frequency, GHz	2	4	6
LO VSWR	1.23	1.28	1.26
Expanded uncertainty	0.35	0.35	0.36

Table 2

Frequency, GHz	0.1	0.5	1
IF VSWR	1.05	1.17	1.38
Expanded uncertainty	0.35	0.35	0.36

Table 3

Frequency, GHz	2	4	6
LO to IF Isolation, dB	-57.8	-62.6	-60.7
Expanded uncertainty, dB	2.7	2.7	2.8

Table 4

Frequency, GHz	2	4	6
LO Insertion Loss, dB	-0.84	-0.86	-0.62
Expanded uncertainty, dB	0.41	0.41	0.38

Table 5

Frequency, GHz	0.1	0.5	1
IF Insertion Loss, dB	-0.30	-0.69	-1.98
Expanded uncertainty, dB	0.38	0.39	0.44

Engineer

M. Kasperovich

Quality Manager

A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, 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 114-17 Date when calibrated 10/17/2017 Page 1 of 2

Item

calibrated **Antenna WR15CH # WR15CH-01**

Description of measurement standard / measuring instrument / identification

Customer

Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, 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

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Authorising
signature



M. Syrid/ Technical manager
Name and position

Date of issue 10/17/2017

Calibration is performed by using

- 1 Wattmeter M 568
- 2 Wattmeter M 546
- 3 Signal generator G4-186
- 4 Signal generator G4-161
- 5 Voltmeter V7-34
- 6 Frequency meter RCH3-72
- 7 Horn antenna P6-134

Calibration conditions

Temperature: 21.9 °C.

Humidity: 42.0 %.

Pressure: 100.1 kPa.

Calibration results are given in the Measuring report # 114-17

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	50 – 75 GHz	Corresponds
2	Antenna Gain	21 dBi	Corresponds (Table 1)
3	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
October 17, 2017

MEASURING REPORT # 114-17
October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Antenna WR15CH # WR15CH-01
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 21.9 °C	Humidity: 42.0 %	Pressure: 100.1 kPa
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MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 568	164
2	Wattmeter M 546	163
3	Signal generator G4-161	3
4	Signal generator G4-186	5
5	Voltmeter V7-34	0067787
6	Frequency meter RCH3-72	931200
7	Horn antenna P6-134	14002

MEASURING RESULTS

Distance between antennas 0.60 m.

Table 1

Frequency, GHz	50	55	65	75
Input power, mW	8.5	8.5	8.5	8.5
Power density of electromagnetic field, W/m ²	0.365	0.416	0.516	0.680
Maximum level of measured power, μ W	102	110	120	118
Gain, dB	19.9	20.5	21.4	21.4
Antenna factor, dB/m	44.3	44.6	45.1	46.4
Expanded uncertainty, dB	2.0	2.0	2.0	2.0

Engineer  M. Kasperovich

Quality Manager  A. Kostrikin

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Calibration Laboratory of Microwave Measuring Equipment
of MWM lab



Calibration certificate

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ACCREDITED LABORATORY



Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 113-17 Date when calibrated 10/17/2017 Page 1 of 2

Item

calibrated

Antenna WR10CH # WR10CH-01

Description of measurement standard / measuring instrument / identification

Customer

Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, 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

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Authorising
signature



M. Svirid/ Technical manager
Name and position

Date of issue 10/17/2017

Calibration is performed by using

- 1 Wattmeter M 534
- 2 Wattmeter M 546
- 3 Signal generator G4-186
- 4 Signal generator RG4-14
- 5 Voltmeter V7-34
- 6 Frequency meter RCH3-72
- 7 Horn antenna P6-31A

Calibration conditions

Temperature: 21.9 °C.
Humidity: 42.0 %.
Pressure: 100.1 kPa.

Calibration results are given in the Measuring report # 113-17

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency range	75 – 110 GHz	Corresponds
2	Antenna Gain	21 dBi	Corresponds (Table 1)
3	Antenna Factor	49 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
October 17, 2017

MEASURING REPORT # 113-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Antenna WR10CH # WR10CH-01
Method of calibration:	GOST 20271.1, MK KL 8.2-16
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 21.9 °C	Humidity: 42.0 %	Pressure: 100.1 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 P6-31A	35864

MEASURING RESULTS

Distance between antennas 0.50 m.

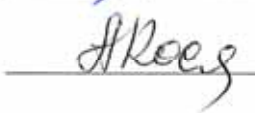
Table 1

Frequency, GHz	75	92.5	110
Input power, mW	5.0	5.0	5.0
Power density of electromagnetic field, W/m ²	0.499	0.735	0.940
Maximum level of measured power, μW	64.1	74.1	73.6
Gain, dB	20.0	20.8	21.2
Antenna factor, dB/m	47.7	48.8	49.9
Expanded uncertainty, dB	2.0	2.2	2.2

Engineer

 M. Kasperovich

Quality Manager

 A. Kostrikin

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1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.

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Calibration certificate

ISO 17025
ACCREDITED LABORATORY



Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 115-17 Date when calibrated 10/17/2017 Page 1 of 2

Item calibrated Signal Generator Extension Module SGX 050
E8257DV15 # US54250106

Description of measurement standard / measuring instrument / identification

Customer Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan,
R.O.C.

Name of the customer, address

Method of calibration GOST 20271.1, MK KL 05.3-2014

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 Ukraine. 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 10/17/2017

Calibration is performed by using

- 1 Wattmeter M 568
- 2 Wattmeter M 546
- 3 Voltmeter V7-34
- 4 Frequency meter RCH3-72
- 5 Signal generator MG3694C
- 6 Attenuator D3-37
- 7 Attenuator D3-38

Calibration conditions

Temperature: 21.9 °C.
Humidity: 42.0 %.
Pressure: 100.1 kPa.

Calibration results are given in the Measuring report # 115-17

#	Parameter	Specifications required	Specifications tested and measured
1	RF Frequency Band	50 – 75 GHz	Corresponds
2	Multiplication Factor (Low / High)	4 / 2	Corresponds
3	Low Frequency RF Input	12.5 – 18.75 GHz	Corresponds
4	Low Freq. RF Input Power (Typical / Damage)	10 dBm ± 3dB / 16 dBm	Corresponds
5	High Frequency RF Input	25 – 37.5 GHz	Corresponds
6	High Freq. RF Input Power (Typical / Damage)	0 dBm ± 3dB / 6 dBm	Corresponds
7	Output Power (Typical / Minimum)	20 dBm / 17 dBm	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

October 17, 2017

MEASURING REPORT # 115-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Signal Generator Extension Module SGX 050 E8257DV15 # US54250106
Method of calibration:	GOST 20271.1, MK KL 05.3-2014
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 21.9 °C	Humidity: 42.0 %	Pressure: 100.1 kPa
----------------------	------------------	---------------------

MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 568	164
2	Wattmeter M 546	163
3	Voltmeter V7-34	0067787
4	Frequency meter RCH3-72	931200
5	Signal generator MG3694C	133805
6	Attenuator D3-37	2
7	Attenuator D3-38	8

MEASURING RESULTS

Table 1

RF output frequency, GHz	50	55	65	75
RF input frequency, GHz	12.50	13.75	16.25	18.75
RF input power, dBm	10.0	10.0	10.0	10.0
RF output power, dBm	20.33	19.41	22.10	20.28
Expanded uncertainty, dB	0.68	0.68	0.68	0.68

Engineer  M. KasperovichQuality Manager  A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1,
Lixing 1st Rd., East Dist., Hsinchu City 300, 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 116-17 Date when calibrated 10/17/2017 Page 1 of 2

Item calibrated Signal Generator Extension Module SGX 051
E8257DV10 # US53250009

Description of measurement standard / measuring instrument / identification

Customer Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan,
R.O.C.

Name of the customer, address

Method of calibration GOST 20271.1, MK KL 05.3-2014

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 Ukraine. 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 10/17/2017

Calibration is performed by using

- 1 Wattmeter M 534
- 2 Wattmeter M 546
- 3 Voltmeter V7-34
- 4 Frequency meter RCH3-72
- 5 Signal generator MG3694C
- 6 Attenuator D3-38
- 7 Attenuator AP-20

Calibration conditions

Temperature: 21.9 °C.
Humidity: 42.0 %.
Pressure: 100.1 kPa.

Calibration results are given in the Measuring report # 116-17

#	Parameter	Specifications required	Specifications tested and measured
1	RF Frequency Band	75 – 110 GHz	Corresponds
2	Multiplication Factor (Low / High)	6 / 3	Corresponds
3	Low Frequency RF Input	12.5 – 18.33 GHz	Corresponds
4	Low Freq. RF Input Power (Typical / Damage)	10 dBm ± 3dB / 16 dBm	Corresponds
5	High Frequency RF Input	25 – 36.67 GHz	Corresponds
6	High Freq. RF Input Power (Typical / Damage)	0 dBm ± 3dB / 6 dBm	Corresponds
7	Output Power (Typical / Minimum)	14 dBm / 10 dBm	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

October 17, 2017

MEASURING REPORT # 116-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Signal Generator Extension Module SGX 051 E8257DV10 # US53250009
Method of calibration:	GOST 20271.1, MK KL 05.3-2014
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 21.9 °C	Humidity: 42.0 %	Pressure: 100.1 kPa
----------------------	------------------	---------------------

#	Measuring equipment	Serial number
1	Wattmeter M 534	161
2	Wattmeter M 546	163
3	Voltmeter V7-34	0067787
4	Frequency meter RCH3-72	931200
5	Signal generator MG3694C	133805
6	Attenuator D3-38	8
7	Attenuator AP-20	4

MEASURING RESULTS

Table 1

RF output frequency, GHz	75	92.5	110
RF input frequency, GHz	12.50	15.42	18.33
RF input power, dBm	10.0	10.0	10.0
RF output power, dBm	13.34	15.03	11.89
Expanded uncertainty, dB	0.68	0.82	0.82

Engineer  M. Kasperovich

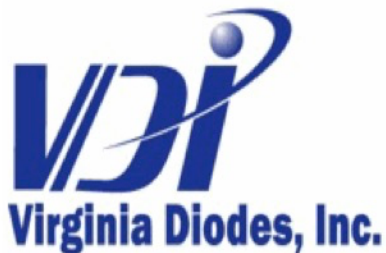
Quality Manager  A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1,
Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.

2. Calibration Laboratory of Microwave Measuring Equipment

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



Virginia Diodes, Inc

Certificate of Conformance

To: Agilent
1400 Fountaingrove Parkway
Dock 2LS
Santa Rosa, CA 95403

From: Virginia Diodes, Inc

Packing List No: 131072

Today's Date: 06/21/13

Shipping Date: 06/21/13

PO Number: 9000612686

Attn: Mike Skaggs

Phone: 1-707-577-4607

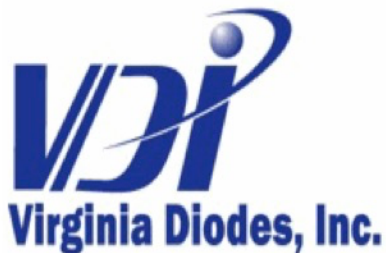
Quantity				<u>Order-Job</u>
<u>Shipped</u>	<u>Unit</u>	<u>Description</u>		<u>Number</u>
1	EA	VDIWR8.0SAX WR8.0PXAX - Frequency Extender for Agilent PXA: 90-140GHz, SN: PXAX002.		13056A-01
1	EA	VDIWR8.0SGX WR8.0PSGX - Frequency Extender for Agilent PSG: 90-140GHz, SN: PSGX002.		13056A-02

Handwritten initials 'MS' in blue ink.

Inspector's Initials
Virginia Diodes, Inc

Handwritten signature in blue ink, appearing to read 'C. Skaggs'.

Authorized Signature
Virginia Diodes, Inc



Virginia Diodes, Inc

Certificate of Conformance

To: Agilent
1400 Fountaingrove Parkway
Dock 4LS
Santa Rosa, CA 95403

From: Virginia Diodes, Inc

Packing List No: 131150
Shipping Date: 07/02/13

Today's Date: 07/02/13
PO Number: 9000612686

Attn: Mike Skaggs

Phone: 1-707-577-4607

Quantity				<u>Order-Job</u>
<u>Shipped</u>	<u>Unit</u>	<u>Description</u>		<u>Number</u>
1	EA	VDIWR5.1SAX WR5.1PXAX - Frequency Extender PXA 140-220GHz; SN: VDI PXAX 007.		13056B-01
1	EA	VDIWR5.1SGX WR5.1PSGX - Frequency Extender PSG 140-220GHz; SN: VDI PSGX 007.		13056B-02

Handwritten initials 'MS' in black ink.

Inspector's Initials
Virginia Diodes, Inc

Handwritten signature in black ink.

Authorized Signature
Virginia Diodes, Inc

☒ 校正實驗室
33383 桃園市龜山區
文明路29巷8號
TEL:+886-3-3280026

財團法人台灣電子檢驗中心

校正報告

CALIBRATION REPORT



☐ 新竹校正實驗室
30075 新竹市科學園區
園區二路47號205室
TEL:+886-3-5798806

工服 NO. 18-06-BCC-337-01L

ELECTRONICS TESTING CENTER, TAIWAN

Page 1 of 5

申請者(Applicant): 香港商立德國際商品試驗有限公司新竹分公司

地址(Address): 新竹市科學園區力行一路1號E-2

供校儀器 ITEM CALIBRATED

儀器名稱: PSG Analog Signal Generator

Nomenclature

型別: E8257D

Model No.

校正依據: 詳如說明4所示

Cal. Procedure Used

校正資料: ☒ 僅量測

☐ 調整

Cal. Info. Cal.Only

Adjusted

實際環境: 溫度: 23 °C

相對濕度: 46 %

Real Condition Temperature

Relative Humidity

製造商:

KEYSIGHT

Mfg.

識別號碼:

MY53401987

ID. No.

收件日期:

Jun.22,2018

Receipt Date

校正日期:

Jun.26,2018

Cal. Date

建議再校日期: Jun.25,2019

Recommended Recal. Date

使用標準器及附配件 STANDARD AND ACCESSORIES

儀器名稱

廠牌/型號

識別號碼

校正日期

有效日期

Nomenclature

Mfg. / Model No.

ID. No.

Date Cal.

Due Date

EPM Series Power Meter

HP E4419B

13050609-001

2018/03/21

2019/09/20

Power Sensor

AGILENT 8487D

13053508-004

2017/09/15

2021/03/14

Measuring Receiver

R&S FSMR

13054413-001

2017/11/16

2021/05/15

Universal Counter

HP 53132A

13060804-001

2018/01/12

2018/07/11

Frequency Counter

AGILENT 53152A

13060808-001

2015/11/30

2019/05/29

追溯源 CALIBRATION SOURCE

儀器名稱

校正單位(認可編號)

報告號碼

校正日期

有效日期

Nomenclature

Cal. Source(ACRED Code)

Cal. Report No.

Date Cal.

Due Date

Power Sensor

AGILENT(ANAB AC-1498)

1-9230656670-1

2017/09/15

2021/03/14

Measuring Receiver

R&S(DAKK S D-K-15195-01-00)

438369/D-K-15195-01-01

2017/11/16

2021/05/15

Rubidium Atomic Frequency Standard

CHT(TAF N0815)

FTC-2018-04-16

2018/04/30

2019/10/29

Power Meter

NML(TAF N0688)

U180022A

2018/03/30

2019/09/29

ETC hereby certifies that the equipment noted herein has been compared with the above listed standards. The Standards used to perform this calibration are traceable to NML/ROC,NIST/USA or other countries. The calibration services from ETC are capable of performing services in compliance with the requirements of ISO/IEC 17025.

財團法人台灣電子檢驗中心特此證明報告內記載之受校儀器已與上列標準做過比較校正,用以校正之標準器可追溯至中華民國國家度量衡標準實驗室,美國標準及技術研究院,或其它國家之度量衡國家標準。本中心的校正服務均符合ISO/IEC 17025之規定。

校正地點: 財團法人台灣電子檢驗中心校正實驗室

財團法人台灣電子檢驗中心
ELECTRONICS TESTING CENTER,
TAIWAN



實驗室主管
Laboratory Head



報告簽署人

Signature



校正報告

財團法人台灣電子檢驗中心

工 服NO.18-06-BCC-337-01L

CALIBRATION REPORT

ELECTRONICS TESTING
CENTER, TAIWAN

Page 2 of 5

1. Frequency Accuracy Check:

Reading	Standard	Expanded Uncertainty
250.0000 kHz	249.99999054 kHz	1.2×10^{-7}
1.000000 MHz	0.9999999620 MHz	1.2×10^{-7}
10.000000 MHz	9.9999996197 MHz	1.2×10^{-7}
100.000000 MHz	99.999996197 MHz	1.2×10^{-7}
200.000000 MHz	199.99999240 MHz	1.2×10^{-7}
500.000000 MHz	499.99998101 MHz	1.2×10^{-7}
1.000000000 GHz	0.999999962 GHz	1.2×10^{-7}
2.000000000 GHz	1.999999924 GHz	1.2×10^{-7}
5.000000000 GHz	4.999999811 GHz	1.2×10^{-7}
10.000000000 GHz	9.999999622 GHz	1.2×10^{-7}
20.000000000 GHz	19.999999242 GHz	1.2×10^{-7}
30.000000000 GHz	29.999998861 GHz	1.2×10^{-7}
40.000000000 GHz	39.999998732 GHz	1.2×10^{-7}
46.000000000 GHz	45.999998545 GHz	1.2×10^{-7}

2. Output Level And Frequency Response Accuracy Check:

Test Freq.	Setting(dBm)	Measured(dBm)	Expanded Uncertainty(dB)
250.0000 kHz	0.00	0.06	0.22
1.000000 MHz	0.00	-0.03	0.22
10.000000 MHz	0.00	-0.05	0.22
100.000000 MHz	0.00	-0.04	0.22
200.000000 MHz	0.00	-0.04	0.22
500.000000 MHz	0.00	-0.02	0.22
1.000000000 GHz	0.00	-0.06	0.22
2.000000000 GHz	0.00	0.00	0.27
3.000000000 GHz	0.00	-0.06	0.27
4.000000000 GHz	0.00	-0.04	0.27
5.000000000 GHz	0.00	-0.05	0.27
6.000000000 GHz	0.00	-0.07	0.27
7.000000000 GHz	0.00	-0.07	0.27
8.000000000 GHz	0.00	-0.11	0.27
9.000000000 GHz	0.00	-0.12	0.27
10.000000000 GHz	0.00	-0.10	0.27
11.000000000 GHz	0.00	-0.13	0.27
12.000000000 GHz	0.00	-0.33	0.27
13.000000000 GHz	0.00	-0.48	0.32
14.000000000 GHz	0.00	-0.17	0.32
15.000000000 GHz	0.00	-0.14	0.32
16.000000000 GHz	0.00	-0.12	0.32
17.000000000 GHz	0.00	-0.05	0.32
18.000000000 GHz	0.00	-0.12	0.38

校正報告

財團法人台灣電子檢驗中心

工 服NO. 18-06-BCC-337-01L

CALIBRATION REPORT

ELECTRONICS TESTING
CENTER, TAIWAN

Page 3 of 5

2. Output Level And Frequency Response Accuracy Check: (Continued)

Test Freq.	Setting(dBm)	Measured(dBm)	Expanded Uncertainty(dB)
19.000000000 GHz	0.00	-0.09	0.38
20.000000000 GHz	0.00	-0.14	0.38
21.000000000 GHz	0.00	-0.08	0.38
22.000000000 GHz	0.00	-0.08	0.38
23.000000000 GHz	0.00	-0.09	0.38
24.000000000 GHz	0.00	-0.10	0.38
25.000000000 GHz	0.00	-0.20	0.38
26.000000000 GHz	0.00	-0.12	0.38
27.000000000 GHz	0.00	-0.20	0.61
28.000000000 GHz	0.00	-0.16	0.61
29.000000000 GHz	0.00	-0.27	0.61
30.000000000 GHz	0.00	-0.10	0.61
31.000000000 GHz	0.00	-0.09	0.61
32.000000000 GHz	0.00	-0.06	0.61
33.000000000 GHz	0.00	-0.22	0.61
34.000000000 GHz	0.00	-0.02	0.61
35.000000000 GHz	0.00	-0.13	0.61
36.000000000 GHz	0.00	-0.21	0.61
37.000000000 GHz	0.00	-0.06	0.61
38.000000000 GHz	0.00	-0.11	0.61
39.000000000 GHz	0.00	-0.15	0.61
40.000000000 GHz	0.00	0.02	0.91
41.000000000 GHz	0.00	-0.05	0.91
42.000000000 GHz	0.00	-0.04	0.91
43.000000000 GHz	0.00	-0.42	0.91
44.000000000 GHz	0.00	-0.46	0.91
45.000000000 GHz	0.00	-0.02	0.91
46.000000000 GHz	0.00	-0.56	0.91
47.000000000 GHz	0.00	-0.63	0.91
48.000000000 GHz	0.00	-0.45	0.91
49.000000000 GHz	0.00	-0.31	0.91
50.000000000 GHz	0.00	-0.54	0.91
100.000000 MHz	10.00	9.98	0.68
100.000000 MHz	-10.00	-10.07	0.68
100.000000 MHz	-20.00	-20.07	0.68
100.000000 MHz	-30.00	-30.08	0.68
100.000000 MHz	-40.00	-40.08	0.68
100.000000 MHz	-50.00	-50.11	0.68
100.000000 MHz	-60.00	-60.10	0.68
100.000000 MHz	-70.00	-70.12	0.68
100.000000 MHz	-80.00	-80.12	0.68
100.000000 MHz	-90.00	-90.15	0.68

校正報告

財團法人台灣電子檢驗中心

工 服NO. 18-06-BCC-337-01L

CALIBRATION REPORT

ELECTRONICS TESTING
CENTER, TAIWAN

Page 4 of 5

2. Output Level And Frequency Response Accuracy Check: (Continued)

Test Freq.	Setting(dBm)	Measured(dBm)	Expanded Uncertainty(dB)
100.000000 MHz	-100.00	-100.14	0.68
1.000000000 GHz	10.00	10.00	0.68
1.000000000 GHz	-10.00	-10.08	0.68
1.000000000 GHz	-20.00	-20.10	0.68
1.000000000 GHz	-30.00	-30.12	0.68
1.000000000 GHz	-40.00	-40.14	0.68
1.000000000 GHz	-50.00	-50.12	0.68
1.000000000 GHz	-60.00	-60.12	0.68
1.000000000 GHz	-70.00	-70.13	0.68
1.000000000 GHz	-80.00	-80.12	0.68
1.000000000 GHz	-90.00	-90.13	0.68
1.000000000 GHz	-100.00	-100.11	0.68
10.000000000 GHz	10.00	9.93	1.1
10.000000000 GHz	-10.00	-10.07	1.1
10.000000000 GHz	-20.00	-20.06	1.1
10.000000000 GHz	-30.00	-30.10	1.1
10.000000000 GHz	-40.00	-40.11	1.1
10.000000000 GHz	-50.00	-50.09	1.1
10.000000000 GHz	-60.00	-60.12	1.1
10.000000000 GHz	-70.00	-70.12	1.1
10.000000000 GHz	-80.00	-80.13	1.1
10.000000000 GHz	-90.00	-90.14	1.1
10.000000000 GHz	-100.00	-100.14	1.1
20.000000000 GHz	10.00	9.86	1.4
20.000000000 GHz	-10.00	-10.13	1.4
20.000000000 GHz	-20.00	-20.14	1.4
20.000000000 GHz	-30.00	-30.14	1.4
20.000000000 GHz	-40.00	-40.15	1.4
20.000000000 GHz	-50.00	-50.19	1.4
20.000000000 GHz	-60.00	-60.16	1.4
20.000000000 GHz	-70.00	-70.15	1.4
20.000000000 GHz	-80.00	-80.14	1.4
20.000000000 GHz	-90.00	-90.17	1.4
20.000000000 GHz	-100.00	-100.17	1.4

校正報告

財團法人台灣電子檢驗中心

工 服NO. 18-06-BCC-337-01L

CALIBRATION REPORT

ELECTRONICS TESTING
CENTER, TAIWAN

Page 5 of 5

3. Harmonic Distortion Measurement Check:

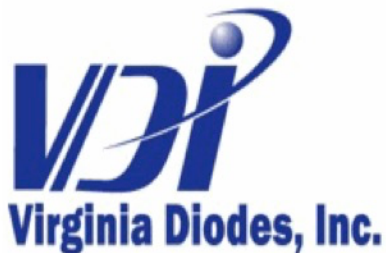
Test Freq.	Harmonic(dBc)	Expanded Uncertainty(dB)
250.0000 kHz	-32.1	0.74
1.00000 MHz	-34.5	0.74
10.0000 MHz	-40.0	0.74
100.0000 MHz	-61.5	0.74
500.0000 MHz	-37.5	0.74
1.000000000 GHz	-40.1	0.74
5.000000000 GHz	-62.4	1.4
10.000000000 GHz	-76.7	1.9
20.000000000 GHz	-69.7	2.0

4. 10 MHz Ref. Out. Frequency Accuracy Check:

Reading(MHz)	Standard(MHz)	Expanded Uncertainty
10	9.9999996223	1.2×10^{-7}

說明:

- 1.本校正報告內的擴充不確定度評估與表示是依據「ISO Guide 98-3量測不確定度表示方式指引」，擴充不確定度 $U = ku_c$ ，其中 u_c 為組合標準不確定度， $k = 2.0$ ，為信賴水準約95%之涵蓋因子。
- 2.環境管制條件: 溫度: $(23 \pm 2) ^\circ\text{C}$; 相對濕度: $(50 \pm 10) \%$ 。
- 3.報告內之建議再校日期為應申請者要求列入。
- 4.「信號產生器之校正程序書」，B00-CD-369，3rd Edition。



Virginia Diodes, Inc

Certificate of Conformance

To: Agilent
1400 Fountaingrove Parkway
Dock 2LS
Santa Rosa, CA 95403

From: Virginia Diodes, Inc

Packing List No: 131072

Today's Date: 06/21/13

Shipping Date: 06/21/13

PO Number: 9000612686

Attn: Mike Skaggs

Phone: 1-707-577-4607

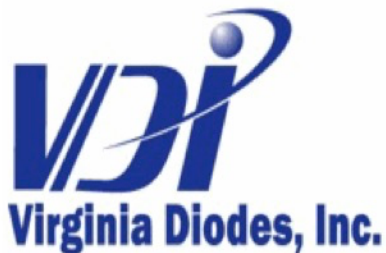
Quantity				<u>Order-Job</u>
<u>Shipped</u>	<u>Unit</u>	<u>Description</u>		<u>Number</u>
1	EA	VDIWR8.0SAX WR8.0PXAX - Frequency Extender for Agilent PXA: 90-140GHz, SN: PXAX002.		13056A-01
1	EA	VDIWR8.0SGX WR8.0PSGX - Frequency Extender for Agilent PSG: 90-140GHz, SN: PSGX002.		13056A-02

Handwritten initials 'MS' in blue ink.

Inspector's Initials
Virginia Diodes, Inc

Handwritten signature in blue ink, appearing to read 'C. Skaggs'.

Authorized Signature
Virginia Diodes, Inc



Virginia Diodes, Inc

Certificate of Conformance

To: Agilent
1400 Fountaingrove Parkway
Dock 4LS
Santa Rosa, CA 95403

From: Virginia Diodes, Inc

Packing List No: 131150
Shipping Date: 07/02/13

Today's Date: 07/02/13
PO Number: 9000612686

Attn: Mike Skaggs

Phone: 1-707-577-4607

Quantity			<u>Order-Job</u>
<u>Shipped</u>	<u>Unit</u>	<u>Description</u>	<u>Number</u>
1	EA	VDIWR5.1SAX WR5.1PXAX - Frequency Extender PXA 140-220GHz; SN: VDI PXAX 007.	13056B-01
1	EA	VDIWR5.1SGX WR5.1PSGX - Frequency Extender PSG 140-220GHz; SN: VDI PSGX 007.	13056B-02

Handwritten initials 'MS' in black ink.

Inspector's Initials
Virginia Diodes, Inc

Handwritten signature 'C. Skaggs' in black ink.

Authorized Signature
Virginia Diodes, Inc

Calibration Laboratory of Microwave Measuring Equipment
of MWM lab



Calibration certificate

ISO 17025
ACCREDITED LABORATORY



Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 112-17 Date when calibrated 10/17/2017 Page 1 of 2

Item
calibrated

Keysight E4417A Power Meter # MY55276004 +
W8486A Power Sensor # MY55230006

Description of measurement standard / measuring instrument / identification

Customer

Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan,
R.O.C.

Name of the customer, address

Method of
calibration

GOST 20271.1, MK KL 04.3-2014

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 Ukraine. 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 10/17/2017

Calibration is performed by using

- 1 Wattmeter M 534
- 2 Wattmeter M 546
- 3 Voltmeter V7-34
- 4 Frequency meter RCH3-72
- 5 Signal generator G4-186
- 6 Signal generator RG4-14

Calibration conditions

Temperature: 21.9 °C.
Humidity: 42.0 %.
Pressure: 100.1 kPa.

Calibration results are given in the Measuring report # 112-17

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency Range	75 – 110 GHz	Corresponds
2	Range of Measured Power	1 μ W to 100 mW (–30 dBm to +20 dBm)	Corresponds
3	Calibration Factor (CF)	Data printed on the power sensor	Corresponds
4	Accuracy	15 %	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
October 17, 2017

MEASURING REPORT # 112-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Keysight E4417A Power Meter # MY55276004 + W8486A Power Sensor # MY55230006
Method of calibration:	GOST 20271.1, MK KL 04.3-2014
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 21.9 °C	Humidity: 42.0 %	Pressure: 100.1 kPa
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MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 534	161
2	Wattmeter M 546	163
3	Voltmeter V7-34	0067787
4	Frequency meter RCH3-72	931200
5	Signal generator G4-186	5
6	Signal generator RG4-14	22

MEASURING RESULTS

Table 1

Frequency, GHz	75.0	92.5	110.0
Reference power, dBm	0.00	0.00	0.00
Measured power, dBm	-0.08	-0.16	-0.26
Power measurement error, %	1.8	3.6	5.8
Expanded uncertainty, %	5.7	6.0	7.2

Engineer

 M. Kasperovich

Quality Manager

 A. Kostrikin

This Measuring report issued in duplicate and sent to:

1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1,
Lixing 1st Rd., East Dist., Hsinchu City 300, 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 Laboratory of Microwave Measuring Equipment
of MWM lab



Calibration certificate

ISO 17025
ACCREDITED LABORATORY



Accreditation certificate No. № BY/112 02.5.0.0065 of 09.01.2015

Certificate number 111-17 Date when calibrated 10/17/2017 Page 1 of 2

Item calibrated Keysight E4417A Power Meter # MY55276004 +
V8486A Power Sensor # MY55170003

Description of measurement standard / measuring instrument / identification

Customer Bureau Veritas Group Consumer Products Services Division, Taiwan
Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan,
R.O.C.

Name of the customer, address

Method of calibration GOST 20271.1, MK KL 04.3-2014

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 Ukraine. 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 10/17/2017

Calibration is performed by using

- 1 Wattmeter M 568
- 2 Wattmeter M 546
- 3 Voltmeter V7-34
- 4 Frequency meter RCH3-72
- 5 Signal generator G4-186
- 6 Signal generator G4-161

Calibration conditions

Temperature: 21.9 °C.
Humidity: 42.0 %.
Pressure: 100.1 kPa.

Calibration results are given in the Measuring report # 111-17

#	Parameter	Specifications required	Specifications tested and measured
1	Frequency Range	50 – 75 GHz	Corresponds
2	Range of Measured Power	1 μ W to 100 mW (–30 dBm to +20 dBm)	Corresponds
3	Accuracy	7.5 %	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

October 17, 2017

MEASURING REPORT # 111-17

October 17, 2017

Customer:	Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.
Item calibrated:	Keysight E4417A Power Meter # MY55276004 + V8486A Power Sensor # MY55170003
Method of calibration:	GOST 20271.1, MK KL 04.3-2014
Number of samples:	One
Delivery date of the sample:	09/18/2017
Date of calibration:	From 09/18/2017 to 10/17/2017

MEASURING CONDITIONS

Temperature: 21.9 °C	Humidity: 42.0 %	Pressure: 100.1 kPa
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MEASURING EQUIPMENT

#	Measuring equipment	Serial number
1	Wattmeter M 568	164
2	Wattmeter M 546	163
3	Voltmeter V7-34	0067787
4	Frequency meter RCH3-72	931200
5	Signal generator G4-186	5
6	Signal generator G4-161	3

MEASURING RESULTS

Table 1

Frequency, GHz	50	55	65	75
Reference power, dBm	0.00	0.00	0.00	0.00
Measured power, dBm	-0.15	0.13	0.02	-0.12
Power measurement error, %	2.7	0.5	3.0	3.4
Expanded uncertainty, %	5.5	5.5	5.6	5.7

Engineer

M. Kasperovich

Quality Manager

A. Kostrikin

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1. Bureau Veritas Group Consumer Products Services Division, Taiwan Branch E-2, No.1,
Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan, R.O.C.

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