

**ADDENDUM 1 TO TEST REPORT OF A 2.4 GHz  
RADIOLAN DS.11 SERIES, BRAND BREEZECOM,  
TYPE AP-DS.11; WIRELESS ACCESS POINT,  
TYPE SA-DS.11: WIRELESS STATION ADAPTER,  
TYPE WBS-DS.11: WIRELESS BRIDGE SERVER,  
TYPE WBC-DS.11: WIRELESS BRIDGE CLIENT,  
IN CONFORMITY WITH FCC PART 15.**

**FCC ID: LKT-DS11**

FCC report layout endorsed by the FCC by Public  
Notice of March 11, 1992.

Accredited by	:	STERLAB accreditation number L029 D.A.R., TTI-P-G.127/96-00
Competent body	:	Article 10-2 EMC Directive
Notified body	:	Article 10-5 EMC Directive Low Voltage Directive Number 0122 TTE Directive
Designated laboratory	:	TTE Directive
Notified test service	:	Automotive Directive
FCC listed	:	31040/SIT
VCCI listed	:	R 592 and C 507
Certification body	:	Electrical Products Safety Regulation Hong Kong

**Nederlands Meetinstituut**

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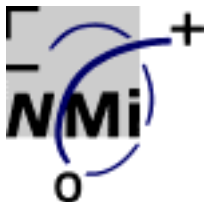
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Tinton Falls NJ (USA), Kawasaki (Japan), Hortolândia SP (Brazil)

Subsidiary companies:

NMi Certin B.V. (27233418)  
NMI Van Swinden Laboratorium B.V. (27228703)  
NMI International B.V. (27239176)



FCC ID: LKT-DS11  
 Description of EUT: 2.4 GHz RLAN SERIES  
 Manufacturer: No Wires Needed B.V.  
 Brand mark: BreezeCOM  
 Type: AP-DS.11,SA-DS.11,  
 WBS-DS.11,WBC-DS.11

## MEASUREMENT/TECHNICAL REPORT

**BreezeCOM, Ltd.**

**Model : AP-DS.11,SA-DS.11,WBS-DS.11,WBC-DS.11**

**FCC ID: LKT-DS11**

June 28, 1999

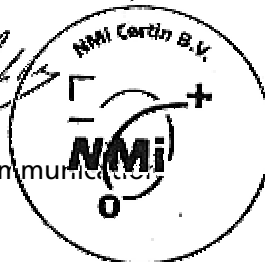
This report concerns (check one):	Original grant	Class II change
Equipment type: Direct Sequence Spread Spectrum Transceiver		
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	yes	no
If yes defer until: _____		
BreezeCOM, Ltd., Atidim Technology Park, Bldg 1, Tel Aviv 61131, Israel, agrees to notify the Commission by _____ of the intended date of announcement of the product so that the grant can be issued on that date.		
Transition Rules Request per 15.37	yes	no
If no, assumed Part 15, Subpart B for unintentional radiators – the new 47 CFR (10-1-90 Edition) provision.		
Report prepared by:	Name	: Jan S. Sikkema B.Sc. E.E.
	Company name	: NMI Certin B.V.
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	City/Place/Postal cd.	: 9822 ZG NIEKERK
	Country	: The Netherlands

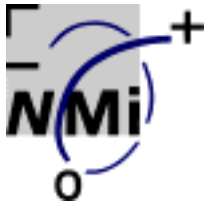
The data taken for this test and report herein was done in accordance with FCC Part 15 and measurement Procedures of ANSI C63.4-1992 and were relevant the procedures as specified in the sheets from the FCC attached to this test report. NMI Certin B.V. at Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission-profile of the Equipment Under Test (EUT) on the date of the test noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: June 28, 1999

Signature:

P.A.J.M. Robben  
 Department EMC and Telecommunicatie





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## 1 Processing gain

The processing gain is measured using the CW jamming margin method. A signal generator is stepped in 50 kHz increments across the passband of the system. At each point the generator level required to produce a Bit Error Rate equivalent to  $BER=1.0 \times 10E-5$  is recorded as the Jammer level (J). The output power of the transmitter is measured at the same point and recorded as Signal (S). The Jammer to Signal ratio (J/S) is then calculated with 20% of the worst datapoints discarded. The lowest remaining J/S ratio is used to calculate the processing gain using formula:

$$G_p = E_s/N_o + M_j + L_{sys}$$

with:

$E_s/N_o = 18.7$  dB for 11Mb/s (obtained from manufacturer's specification of spreading processor Harris semiconductor model HFA3860B)

$L_{sys} = 2$  dB

Measured lowest remaining  $J/S = M_j = -10.6$  dB

$$G_p = 18.7 \text{ dB} + (-10.6 \text{ dB}) + 2 \text{ dB} = 10.1 \text{ dB}$$

### 1.1 Blockdiagram Jamming testsetup:

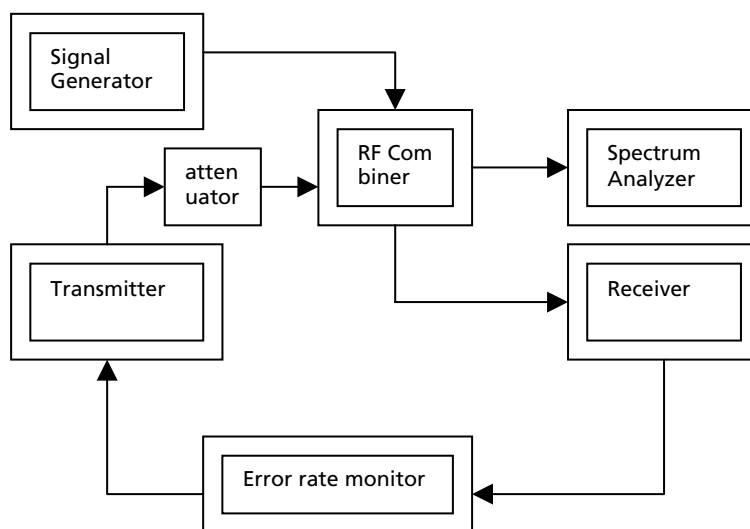
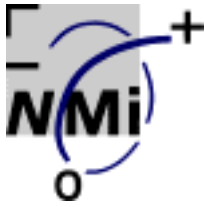


figure 1: blockdiagram of testsetup



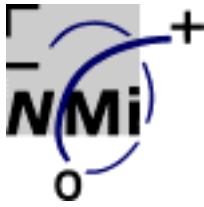
## 1.2 Processing Gain testresults tables

pass band =  $f_0 \pm 5\text{MHz}$  ( 5000 kHz = 100 x 50 kHz)

channel: 07 = 2441.7 MHz 1 of 4 (AP-DS.11 to SA-DS.11)

Frequency (MHz)	frequency offset (kHz)	J (dBm)	S (dBm)	J/S (dB)
2446.95	+100 x 50	-59.3	-51.0	-8.3
2446.90	+99 x 50	-59.2	-51.0	-8.2
2446.85	+98 x 50	-59.3	-51.0	-8.3
2446.80	+97 x 50	-59.2	-51.0	-8.2
2446.75	+96 x 50	-58.8	-51.0	-7.8
2446.70	+95 x 50	-58.8	-51.0	-7.8
2446.65	+94 x 50	-57.8	-51.0	-6.8
2446.60	+93 x 50	-57.9	-51.0	-6.9
2446.55	+92 x 50	-57.5	-51.0	-6.5
2446.50	+91 x 50	-57.2	-51.0	-6.2
2446.45	+90 x 50	-57.2	-51.0	-6.2
2446.40	+89 x 50	-57.1	-51.0	-6.1
2446.35	+88 x 50	-58.7	-51.0	-7.7
2446.30	+87 x 50	-58.6	-51.0	-7.6
2446.25	+86 x 50	-59.6	-51.0	-8.6
2446.15	+85 x 50	-59.7	-51.0	-8.7
2446.10	+84 x 50	-60.1	-51.0	-9.1
2446.05	+83 x 50	-60.7	-51.0	-9.7
2446.00	+82 x 50	-61.1	-51.0	-10.1
2445.95	+81 x 50	-61.1	-51.0	-10.1
2445.90	+80 x 50x	-61.2	-51.0	-10.2
2445.85	+79 x 50	-61.5	-51.0	-10.5
2445.80	+78 x 50	-61.4	-51.0	-10.4
2445.75	+77 x 50	-62.3	-51.0	-11.3
2445.70	+76 x 50	-62.5	-51.0	-11.5
2445.65	+75 x 50	-61.2	-51.0	-10.2
2445.60	+74 x 50	-61.0	-51.0	-10
2445.55	+73 x 50	-58.9	-51.0	-7.9
2445.50	+72 x 50	-58.8	-51.0	-7.8
2445.45	+71 x 50	-60.5	-51.0	-9.5
2445.40	+70 x 50	-60.4	-51.0	-9.4
2445.35	+69 x 50	-59.2	-51.0	-8.2
2445.30	+68 x 50	-59.1	-51.0	-8.1
2445.25	+67 x 50	-60.6	-51.0	-9.6
2445.15	+66 x 50	-60.2	-51.0	-9.2
2445.10	+65 x 50	-61.0	-51.0	-10
2445.05	+64 x 50	-61.2	-51.0	-10.2
2445.00	+63 x 50	-60.8	-51.0	-9.8
2444.95	+62 x 50	-60.3	-51.0	-9.3
2444.90	+61 x 50	-60.0	-51.0	-9
2444.85	+60 x 50	-59.4	-51.0	-8.4
2444.80	+59 x 50	-59.5	-51.0	-8.5
2444.75	+58 x 50	-59.5	-51.0	-8.5
2444.70	+57 x 50	-59.3	-51.0	-8.3
2444.65	+56 x 50	-59.0	-51.0	-8
2444.60	+55 x 50	-58.6	-51.0	-7.6
2444.55	+54 x 50	-58.2	-51.0	-7.2
2444.50	+53 x 50	-58.1	-51.0	-7.1
2444.45	+52 x 50	-58.1	-51.0	-7.1
2444.40	+51 x 50	-57.7	-51.0	-6.7
2444.35	+50 x 50	-57.9	-51.0	-6.9

Table 1 : J/S values for  $f_0(+50 \times 50\text{kHz})$  to  $f_0(+100 \times 50\text{kHz})$

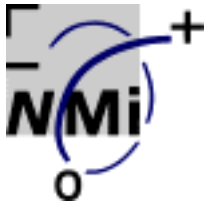


FCC ID: LKT-DS11  
 Description of EUT: 2.4 GHz RLAN SERIES  
 Manufacturer: No Wires Needed B.V.  
 Brand mark: BreezeCOM  
 Type: AP-DS.11,SA-DS.11,  
 WBS-DS.11,WBC-DS.11

pass band =  $f_o \pm 5\text{MHz}$  ( 5000 kHz = 100 x 50 kHz)  
 channel: 07 = 2441.7 MHz 2 of 4 (AP-DS.11 to SA-DS.11)

Frequency (MHz)	frequency offset (kHz)	J (dBm)	S (dBm)	J/S (dB)
2444.35	+50 x 50	-57.9	-51.0	-6.9
2444.30	+49 x 50	-57.9	-51.0	-6.9
2444.25	+48 x 50	-57.7	-51.0	-6.7
2444.15	+47 x 50	-57.9	-51.0	-6.9
2444.10	+46 x 50	-58.0	-51.0	-7
2444.05	+45 x 50	-57.8	-51.0	-6.8
2444.00	+44 x 50	-57.5	-51.0	-6.5
2443.95	+43 x 50	-58.0	-51.0	-7
2443.90	+42 x 50	-58.3	-51.0	-7.3
2443.85	+41 x 50	-59.1	-51.0	-8.1
2443.80	+40 x 50	-59.0	-51.0	-8
2443.75	+39 x 50	-59.8	-51.0	-8.8
2443.70	+38 x 50	-61.1	-51.0	-10.1
2443.65	+37 x 50	-62.3	-51.0	-11.3
2443.60	+36 x 50	-62.4	-51.0	-11.4
2443.55	+35 x 50	-61.9	-51.0	-10.9
2443.50	+34 x 50	-61.5	-51.0	-10.5
2443.45	+33 x 50	-61.3	-51.0	-10.3
2443.40	+32 x 50	-61.2	-51.0	-10.2
2443.35	+31 x 50	-61.9	-51.0	-10.9
2443.30	+30 x 50	-62.7	-51.0	-11.7
2443.25	+29 x 50	-61.9	-51.0	-10.9
2443.15	+28 x 50	-61.6	-51.0	-10.6
2443.10	+27 x 50	-61.6	-51.0	-10.6
2443.05	+26 x 50	-61.5	-51.0	-10.5
2443.00	+25 x 50	-62.1	-51.0	-11.1
2442.95	+24 x 50	-62.6	-51.0	-11.6
2442.90	+23 x 50	-63.1	-51.0	-12.1
2442.85	+22 x 50	-63.5	-51.0	-12.5
2442.80	+21 x 50	-63.7	-51.0	-12.7
2442.75	+20 x 50	-63.8	-51.0	-12.8
2442.70	+19 x 50	-64.0	-51.0	-13
2442.65	+18 x 50	-64.3	-51.0	-13.3
2442.60	+17 x 50	-63.0	-51.0	-12
2442.55	+16 x 50	-63.1	-51.0	-12.1
2442.50	+15 x 50	-61.8	-51.0	-10.8
2442.45	+14 x 50	-60.3	-51.0	-9.3
2442.40	+13 x 50	-60.9	-51.0	-9.9
2442.35	+12 x 50	-61.0	-51.0	-10
2442.30	+11 x 50	-60.9	-51.0	-9.9
2442.25	+10 x 50	-60.9	-51.0	-9.9
2442.15	+09 x 50	-59.6	-51.0	-8.6
2442.10	+08 x 50	-59.4	-51.0	-8.4
2442.05	+07 x 50	-58.6	-51.0	-7.6
2442.00	+06 x 50	-58.1	-51.0	-7.1
2441.95	+05 x 50	-59.0	-51.0	-8
2441.90	+04 x 50	-59.8	-51.0	-8.8
2441.85	+03 x 50	-60.3	-51.0	-9.3
2441.80	+02 x 50	-60.9	-51.0	-9.9
2441.75	+01 x 50	-61.3	-51.0	-10.3
2441.70	+00 x 50	-61.5	-51.0	-10.5

Table 2 : J/S values for  $f_o(+0x50\text{kHz})$  to  $f_o(+50x50\text{kHz})$

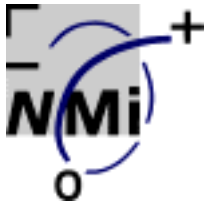


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pass band =  $f_0 \pm 5\text{MHz}$  ( 5000 kHz = 100 x 50 kHz)  
 channel: 07 = 2441.7 MHz      3 of 4 (AP-DS.11 to SA-DS.11)

Frequency (MHz)	frequency offset (kHz)	J (dBm)	S (dBm)	J/S (dB)
2436.70	-100 x 50	-55.8	-51.0	-4.8
2436.75	-99 x 50	-55.9	-51.0	-4.9
2436.80	-98 x 50	-55.8	-51.0	-4.8
2436.85	-97 x 50	-55.9	-51.0	-4.9
2436.90	-96 x 50	-55.8	-51.0	-4.8
2436.95	-95 x 50	-55.8	-51.0	-4.8
2437.00	-94 x 50	-55.9	-51.0	-4.9
2437.05	-93 x 50	-55.9	-51.0	-4.9
2437.10	-92 x 50	-56.0	-51.0	-5
2437.15	-91 x 50	-56.0	-51.0	-5
2437.20	-90 x 50	-56.8	-51.0	-5.8
2437.25	-89 x 50	-57.2	-51.0	-6.2
2437.30	-88 x 50	-57.5	-51.0	-6.5
2437.35	-87 x 50	-57.8	-51.0	-6.8
2437.40	-86 x 50	-58.0	-51.0	-7
2437.45	-85 x 50	-58.2	-51.0	-7.2
2437.50	-84 x 50	-58.5	-51.0	-7.5
2437.55	-83 x 50	-58.8	-51.0	-7.8
2437.60	-82 x 50	-58.3	-51.0	-7.3
2437.65	-81 x 50	-58.2	-51.0	-7.2
2437.70	-80 x 50	-59.1	-51.0	-8.1
2437.75	-79 x 50	-59.7	-51.0	-8.7
2437.80	-78 x 50	-60.3	-51.0	-9.3
2437.85	-77 x 50	-61.5	-51.0	-10.5
2437.90	-76 x 50	-61.0	-51.0	-10
2437.95	-75 x 50	-60.4	-51.0	-9.4
2438.00	-74 x 50	-60.6	-51.0	-9.6
2438.05	-73 x 50	-60.5	-51.0	-9.5
2438.10	-72 x 50	-61.0	-51.0	-10
2438.15	-71 x 50	-61.1	-51.0	-10.1
2438.20	-70 x 50	-61.1	-51.0	-10.1
2438.25	-69 x 50	-61.2	-51.0	-10.2
2438.30	-68 x 50	-61.1	-51.0	-10.1
2438.35	-67 x 50	-61.0	-51.0	-10
2438.40	-66 x 50	-61.2	-51.0	-10.2
2438.45	-65 x 50	-61.8	-51.0	-10.8
2438.50	-64 x 50	-62.1	-51.0	-11.1
2438.55	-63 x 50	-62.5	-51.0	-11.5
2438.60	-62 x 50	-62.0	-51.0	-11
2438.65	-61 x 50	-61.2	-51.0	-10.2
2438.70	-60 x 50	-61.0	-51.0	-10
2438.75	-59 x 50	-60.7	-51.0	-9.7
2438.80	-58 x 50	-61.0	-51.0	-10
2438.85	-57 x 50	-61.2	-51.0	-10.2
2438.90	-56 x 50	-61.0	-51.0	-10
2438.95	-55 x 50	-61.5	-51.0	-10.5
2439.00	-54 x 50	-61.1	-51.0	-10.1
2439.05	-53 x 50	-61.4	-51.0	-10.4
2439.10	-52 x 50	-61.0	-51.0	-10
2439.15	-51 x 50	-60.5	-51.0	-9.5
2439.20	-50 x 50	-60.3	-51.0	-9.3

Table 3 : J/S values for  $f_0(-50 \times 50\text{kHz})$  to  $f_0(-100 \times 50\text{kHz})$



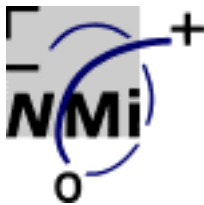
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 channel: 07 = 2441.7 MHz 4 of 4 (AP-DS.11 to SA-DS.11)

Frequency (MHz)	frequency offset (kHz)	J (dBm)	S (dBm)	J/S (dB)
2439.20	-50 x 50	-60.4	-51.0	-9.4
2439.25	-49 x 50	-59.6	-51.0	-8.6
2439.30	-48 x 50	-58.9	-51.0	-7.9
2439.35	-47 x 50	-57.8	-51.0	-6.8
2439.40	-46 x 50	-57.9	-51.0	-6.9
2439.45	-45 x 50	-57.8	-51.0	-6.8
2439.50	-44 x 50	-57.9	-51.0	-6.9
2439.55	-43 x 50	-58.6	-51.0	-7.6
2439.60	-42 x 50	-59.1	-51.0	-8.1
2439.65	-41 x 50	-58.3	-51.0	-7.3
2439.70	-40 x 50	-58.0	-51.0	-7
2439.75	-39 x 50	-59.0	-51.0	-8
2439.80	-38 x 50	-59.8	-51.0	-8.8
2439.85	-37 x 50	-60.5	-51.0	-9.5
2439.90	-36 x 50	-60.7	-51.0	-9.7
2439.95	-35 x 50	-60.4	-51.0	-9.4
2440.00	-34 x 50	-60.3	-51.0	-9.3
2440.05	-33 x 50	-60.8	-51.0	-9.8
2440.10	-32 x 50	-61.2	-51.0	-10.2
2440.15	-31 x 50	-60.9	-51.0	-9.9
2440.20	-30 x 50	-60.7	-51.0	-9.7
2440.25	-29 x 50	-60.5	-51.0	-9.5
2440.30	-28 x 50	-60.3	-51.0	-9.3
2440.35	-27 x 50	-60.1	-51.0	-9.1
2440.40	-26 x 50	-60.8	-51.0	-9.8
2440.45	-25 x 50	-60.9	-51.0	-9.9
2440.50	-24 x 50	-61.6	-51.0	-10.6
2440.55	-23 x 50	-62.4	-51.0	-11.4
2440.60	-22 x 50	-62.2	-51.0	-11.2
2440.65	-21 x 50	-62.1	-51.0	-11.1
2440.70	-20 x 50	-62.2	-51.0	-11.2
2440.75	-19 x 50	-62.1	-51.0	-11.1
2440.80	-18 x 50	-62.2	-51.0	-11.2
2440.85	-17 x 50	-62.4	-51.0	-11.4
2440.90	-16 x 50	-62.0	-51.0	-11
2440.95	-15 x 50	-61.6	-51.0	-10.6
2441.00	-14 x 50	-62.0	-51.0	-11
2441.05	-13 x 50	-62.4	-51.0	-11.4
2441.10	-12 x 50	-62.1	-51.0	-11.1
2441.15	-11 x 50	-62.0	-51.0	-11
2441.20	-10 x 50	-61.5	-51.0	-10.5
2441.25	-09 x 50	-61.6	-51.0	-10.6
2441.30	-08 x 50	-61.6	-51.0	-10.6
2441.35	-07 x 50	-61.5	-51.0	-10.5
2441.40	-06 x 50	-61.9	-51.0	-10.9
2441.45	-05 x 50	-61.6	-51.0	-10.6
2441.50	-04 x 50	-61.9	-51.0	-10.9
2441.55	-03 x 50	-62.0	-51.0	-11
2441.60	-02 x 50	-61.6	-51.0	-10.6
2441.65	-01 x 50	-61.5	-51.0	-10.5
2441.70	-00 x 50	-61.5	-51.0	-10.5

Table 4 : J/S values for  $f_0(-0x50\text{kHz})$  to  $f_0(-50x50\text{kHz})$





Summary of J/S values

J/S table 1	J/S table 2	J/S table 3	J/S table 4
-11.5	-13.3	-11.5	-11.4
-11.3	-13	-11.1	-11.4
-10.5	-12.8	-11	-11.4
-10.4	-12.7	-10.8	-11.2
-10.2	-12.5	-10.5	-11.2
-10.2	-12.1	-10.5	-11.2
-10.2	-12.1	-10.4	-11.1
-10.1	-12	-10.2	-11.1
-10.1	-11.7	-10.2	-11.1
-10	-11.6	-10.2	-11
-10	-11.4	-10.2	-11
-9.8	-11.3	-10.1	-11
-9.7	-11.1	-10.1	-11
-9.6	-10.9	-10.1	-10.9
-9.5	-10.9	-10.1	-10.9
-9.4	-10.9	-10	<b><i>J/S=-10.6</i></b>
-9.3	-10.8	-10	-10.6
-9.2	-10.6	-10	-10.6
-9.1	-10.6	-10	-10.6
-9	-10.5	-10	-10.6
-8.7	-10.5	-10	-10.6
-8.6	-10.5	-10	-10.5
-8.5	-10.3	-9.7	-10.5
-8.5	-10.3	-9.6	-10.5
-8.4	-10.2	-9.5	-10.5
-8.3	-10.1	-9.5	-10.2
-8.3	-10	-9.4	-9.9
-8.3	-9.9	-9.3	-9.9
-8.2	-9.9	-9.3	-9.8
-8.2	-9.9	-8.7	-9.8
-8.2	-9.9	-8.1	-9.7
-8.1	-9.3	-7.8	-9.7
-8	-9.3	-7.5	-9.5
-7.9	-8.8	-7.3	-9.5
-7.8	-8.8	-7.2	-9.4
-7.8	-8.6	-7.2	-9.4
-7.8	-8.4	-7	-9.3
-7.7	-8.1	-6.8	-9.3
-7.6	-8	-6.5	-9.1
-7.6	-8	-6.2	-8.8
-7.2	-7.6	-5.8	-8.6
-7.1	-7.3	-5	-8.1
-7.1	-7.1	-5	-8
-6.9	-7	-4.9	-7.9
-6.9	-7	-4.9	-7.6
-6.8	-6.9	-4.9	-7.3
-6.7	-6.9	-4.9	-7
-6.5	-6.9	-4.8	-6.9
-6.2	-6.8	-4.8	-6.9
-6.2	-6.7	-4.8	-6.8
-6.1	-6.5	-4.8	-6.8

Table 5: J/S values sorted in descending order

Note: Values in bold font are 20% worst case discarded. J/S = ***-10.6*** (italics)

### 1.3 Photograph of testsetup



**Photograph 1: testsetup**