

# Test Report

## Client Information:

Applicant: Sigma Elektro GmbH  
Applicant add.: Dr.-Julius-Leber-Strabe 15, 67433 Neustadt an der Weinstrabe,  
Germany

## EUT Information:

EUT Name: heart rate and speed transmitter  
Model No.: R3  
Brand Name: Sigma  
FCC ID M5LR3STS

## Prepared By:

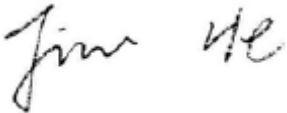
Asia Institute Technology (Dongguan) Limited  
Add. : No.6 Binhe Road, Tianxin Village, Huangjiang,  
Dongguan, Guangdong, China.

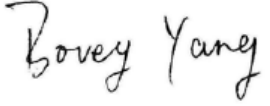
Date of Receipt: Jul. 12, 2010      Date of Test: Jul. 13-19, 2010  
Date of Issue: Jul. 19, 2010      Test Result: Pass

## Test procedure used: ANSI C63.4-2003

This device described above has been tested by Asia Institute Technology (Dongguan) Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

\*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Reviewed by:   
\_\_\_\_\_  
Test director

Approved by:   
\_\_\_\_\_  
Technical director

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## 1.1 Compliance with FCC Part 15 subpart C

Test	FCC rule part	Result
Timing of the transmitter (Duty cycle correction factor )	Section 15.31(c)	<b>PASS</b>
Radiated Emissions	Section 15.209	<b>PASS</b>
Conducted Emissions Limits	Section 15.107/15.207	<b>N/A</b>

## 1.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, The following measurements uncertainty Level have estimated based on ANSI C63.4:2003, the maximum value of the uncertainty as below

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	Radiated Emission Test	$\pm 3.57\text{dB}$

## 2 Test Facility

**The test facility is recognized, certified or accredited by the following organizations:**

**.FCC- Registration No: 248337**

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dong guan) Limited have been registered by Federal Communications Commission (FCC) on Dec.07, 2006.

**.Industry Canada(IC)-Registration No: IC6819A-1 & IC6819A-2**

The 3m Semi-Anechoic Chamber and 3m/10m Open Area Test Site of Asia Institute Technology (Dongguan) Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Nov.07, 2006.

**.VCCI- Registration No: R-2482 & C-2730**

The 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dongguan) Limited have been registered by Voluntary Control Council for Interference on Jan.24, 2007.

**.TUV Rhineland**

Asia Institute Technology (Dongguan) Limited has been assessed on Jan.16, 2007 that it can carry out EMC tests by order and under supervision of TUV Rhineland.

**.ITS- Registration No: TMPSHA031**

Asia Institute Technology (Dongguan) Limited has been assessed and included in Intertek Shanghai TMP Program regarding Laboratory facilities and test equipment on Nov.10, 2006.

### 2.1 Deviation from standard

None

### 2.2 Abnormalities from standard conditions

None

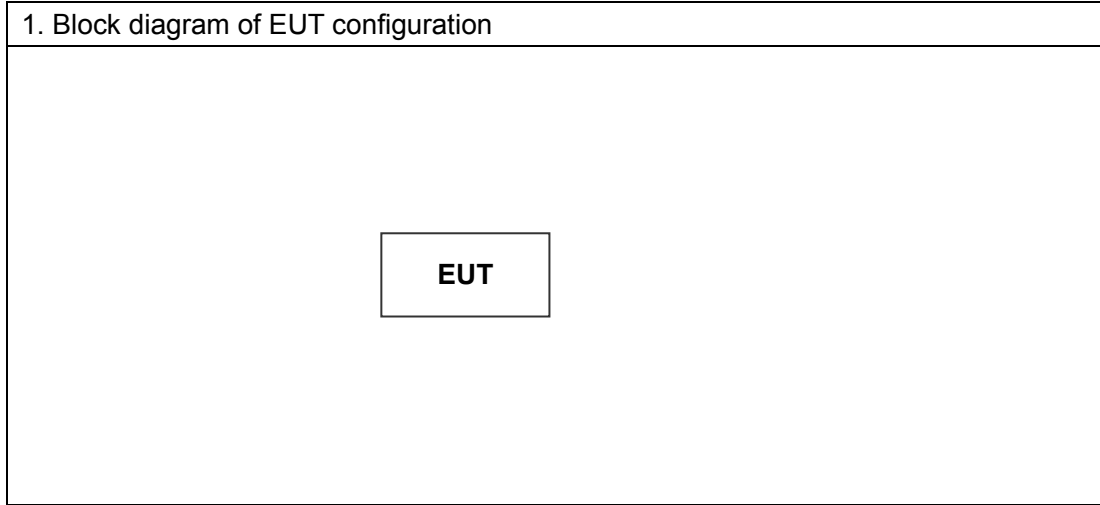
### 3 General Information

#### 3.1 General Description of EUT

Manufacturer:	IDT Technology Limited
Manufacturer Address:	Block C,9/F.,Kaiser Estate, Phase 1, 41 Man Yue Street, Hunghom, Kowloon
EUT Name:	heart rate and speed transmitter
Model No:	R3
Operation frequency:	112kHz
Channel Number:	1
AntennaType:	Integrated antenna
Brand Name:	Sigma
Serial No:	N/A
Power Supply Range:	DC 3V From battery
Power Supply:	DC 3V From battery
Power Cord:	N/A
Signal Cable:	N/A
Description of Channel:	
Channel No.	Frequency(kHz)
1	112

### 3.2 Description of Test conditions

(1) EUT was tested in normal configuration (Please See following Block diagram)



(2) E.U.T. test conditions:

15.31(e) :For intentional radiators, measurements of the variation of the input power or the adiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% ofthe nominal rated supply voltage. For battery operated equipment, theequipment tests shall be performed using a new battery.

(3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of fequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

### 3.3 Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A

### 4 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2010.04.17	2011.04.16
2	EMI Measuring Receiver	Schaffner	SCR3501	235	2010.04.07	2011.04.06
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2010.03.07	2010.09.06
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2010.04.08	2011.04.07
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2010.07.16	2011.07.15
7	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2010.03.07	2010.09.06
8	EMI Test Receiver	R&S	ESCI	100124	2009.12.28	2010.12.27
9	Loop Antenna 650	ARA	PLA-1030/B	1030	2010.03.20	2011.03.19

## 5 Test Result

### 5.1 Conduction Emissions Measurement

#### 5.1.1 limit

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note:Decreases with the logarithm of the frequency.

#### 5.1.2 Test procedure

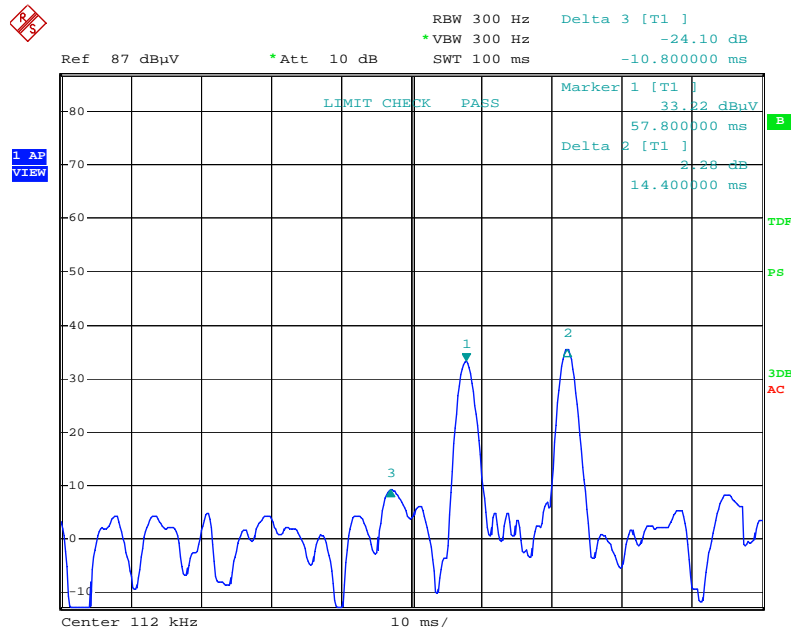
EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

#### 5.1.3 Test result

Cause the EUT only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices



## 5.2 Timing of the transmitter



Date: 19.JUL.2010 11:55:14

### Limits: § 15.35 (c)

(c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

## 5.3 Radiated Emissions Measurement

### 5.3.1 Limit

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in 93 Section 15.209, whichever limit permits a higher field strength.

Frequency of Emission (MHz)	Field Strength		Measurement Distance (meters)
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	
0.009 – 0.490	2400 / F (kHz)		300
0.490 – 1.705	24000 / F (kHz)		30
1.705 – 30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

### 5.3.2 Test procedure

EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

And according 15.35(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Interference (CISPR) of the International Electrotechnical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

### 5.3.3 Test Result

Test Data: 2010-7-15

Frequency Range: 9kHz to 30MHz

RBW/VBW: 200Hz/200Hz

Measurement Distance: 3 m

Operating Environment: 25°C, 58% RH, 102 Kpa

Frequency (kHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
56.00	4.895	23.56	48.445	-48.445	113.00	QUASIPeAK
112.00	5.001	42.25	67.251	-39.749	107.00	QUASIPeAK
140.00	5.101	31.45	56.551	-48.449	105.00	QUASIPeAK
224.00	5.224	25.65	50.874	-50.126	101.00	QUASIPeAK
560.00	5.368	20.10	45.468	-7.532	53.00	QUASIPeAK
28000	8.224	15.24	23.464	-6.036	29.50	QUASIPeAK

Note: '\*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Test Data: 2010-7-15

Frequency Range: 30MHz to 1GHz

RBW/VBW: 100KHz/300KHz for spectrum, RBW=120KHz for receiver

Measurement Distance: 3 m

Operating Environment: 25°C, 58% RH, 102 Kpa

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
53.280	13.980	2.454	16.434	-23.566	40.000	QUASPEAK
137.670	15.730	3.117	18.847	-24.653	43.500	QUASPEAK
395.690	19.750	1.540	21.290	-24.710	46.000	QUASPEAK
589.690	24.530	1.259	25.789	-20.211	46.000	QUASPEAK
892.330	29.550	1.829	31.379	-14.621	46.000	QUASPEAK
935.980	30.130	3.994	34.124	-11.876	46.000	QUASPEAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
44.550	14.110	4.656	18.766	-21.234	40.000	QUASPEAK
135.730	15.570	4.842	20.412	-23.088	43.500	QUASPEAK
143.490	16.140	4.272	20.412	-23.088	43.500	QUASPEAK
169.680	16.220	3.637	19.857	-23.643	43.500	QUASPEAK
192.960	13.960	6.452	20.412	-23.088	43.500	QUASPEAK
305.480	17.270	5.722	22.992	-23.008	46.000	QUASPEAK

Note: ‘\*’ means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

## 5.4 Test Setup photograph

