

## EMC TEST REPORT For FCC



Test Report No. : CTK02-F169

Date of Issue : January 6, 2003

Model/Type No: : Digimax V4

Kind of Product : Digital Camera

Applicant : Samsung Techwin Co.,Ltd.

Applicant Address : #145-3, Sandaewon 1-Dong, Sungnam-Shi, Kyonggi-Do, Korea

Manufacturer : 1. Samsung Techwin Co.,Ltd.  
2. TIANJIN SAMSUNG OPTO-ELECTRONICS Co., Ltd.

Manufacturer Address : 1. #145-3, Sandaewon 1-Dong, Sungnam-Shi, Kyonggi-Do, Korea  
2. No.7, Pingchang Rd, Nankai Dist., Tianjin, P.R.

Contact Person : Mr. G. S. Kim (Manager)

Telephone : +82-31-740-8253

Received Date : December 16, 2002

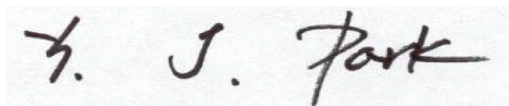
Test period : Start: December 16, 2002 End: December 20, 2002

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

CERTITEK Standards Laboratory Co., Ltd. is accredited by Korea Laboratory Accreditation Scheme (KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Tested by



Joon Pak  
EMC Test Engineer  
Date: January 6, 2003

Reviewed by



James Hong  
EMC Technical Manager  
Date: January 6, 2003



# CERTITEK Standards Laboratory Co., Ltd.

386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100

Tel: +82-31-339-9970 Fax: +82-31-339-9855

<http://www.certitek.com/>



## REPORT REVISION HISTORY

Date	Revision	Page No
January 6, 2003	Issued (CTK02-F169)	All

*This report shall not be reproduced except in full, without the written approval of CERTITEK Standards Laboratory Co., Ltd. This document may be altered or revised by CERTITEK Standards Laboratory Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by CERTITEK Standards Laboratory Co., Ltd. will constitute fraud and shall nullify the document.*

## TABLE OF CONTENTS

1.0 General Product Description .....	4
1.1 Model Differences .....	4
1.2 Device Modifications.....	4
1.3 EUT Configuration(s) .....	5
1.4 Test Software.....	5
1.5 EUT Operating Mode(s).....	5
1.6 Calibration Details of Equipment Used for Measurement .....	6
1.7 Test Facility .....	6
1.8 Measurement Procedure .....	6
1.9 Laboratory Accreditations and Listings.....	7
2.0 Emissions Test Regulations .....	8
2.1 Conducted Voltage Emissions.....	9
2.2 Radiated Electric Field Emissions .....	10
Configurations .....	11
APPENDIX A - TEST DATA.....	12
Conducted Voltage Emissions (Quasi-Peak reading) .....	12
Radiated Electric Field Emissions (Quasi-Peak reading).....	14

## 1.0 General Product Description

### 1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model Digimax V4.
- ☐ Tests performed on Model \_\_\_\_\_ were considered to be representative of Model(s) \_\_\_\_\_.

### 1.0.2 Equipment Size, Mobility and Identification

Dimensions: 105.5 by 54.6 by 38.0 ☒ mm ☐ in  
Mobility: ☒ Hand-Held ☐ Table-top ☐ Floor-standing  
☐ -  
Serial No.: Not applicable

### 1.0.3 Electrical Ratings

Input: Adaptor - AC 100-250V, 50/60Hz  
EUT - DC 5.0V  
Output: Adaptor - DC 5.0V, 2.0A  
EUT - Not applicable

### 1.0.4 Test Voltage & Frequency (Using the adaptor)

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: AC 120V  
Frequency: 60Hz

### 1.0.5 Clock & Other Frequencies Utilized

DSP : 13.5MHz  
HOST CPU : 5.00MHz  
TG&CDS&AGC : 36.00MHz

## 1.1 Model Differences

Not applicable

## 1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

### 1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
Adaptor	Ault Korea	ATC4250-US	12501032	-
Desk Top PC	Samsung	M4340	736692ER700204	DoC
Monitor	Samsung	PG17HS	P013H1DN301661	DoC
Keyboard	World Com Mart	KB120	-	D840902
Mouse (PS/2 type)	PANWEST	Cyber Beetle	PM1F184045737	DoC
Mouse (Serial type)	Microsoft	BASM1	4475951-20000	DoC

☒ Cable Description

#	Description	Ferrited	Length (m)	Other Details
1	AC power cable, Unshielded	No	1.8	Connect to AC power
2	AC power cable, Unshielded	No	1.5	Connect to AC power
3	AC power cable, Unshielded	No	1.5	Connect to AC power
4	DC output cable, Shielded	Yes	1.5	Between the adaptor and EUT
5	USB cable, Shielded	Yes	1.2	Between the EUT and PC
6	Monitor cable, Shielded	Yes	1.8	Between the PC and Monitor
7	Mouse cable, Shielded	No	2.1	Serial type
8	Mouse cable, Shielded	No	2.1	PS/2 type
9	Keyboard cable, Shielded	No	1.5	-

n/a = not available

### 1.4 Test Software

☐ Pinging

☒ Name : Digimax Viewer 2.0

### 1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

☐ Test program (H-Pattern)

☐ Test program (color bar)

☐ Standby

☐ Test program (customer specific)

☒ Practice operation - Saved video file of the EUT playing mode via USB.

## 1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

## 1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)






Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

\* Measurement procedures was In accordance with ANSI C63.4-1992 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

## 1.9 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 and 10 meter Open Area Test Sites to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	MIC	EMI (CE, RE) EMS (ESD, Burst, RS, Surge, CS, Power-Frequency Susceptibility, Voltage Dips and Short Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	 NO.119
Europe	GLAS	EMC EN 55011, EN 55022, EN 55024, EN 61326, EN 50130-4, EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2, EN 61000-6-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61000-3-2, EN 61000-3-3	 No.13000796-02

## 2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> EN 50081-1:1992                                       |   |   |
| <input type="checkbox"/> EN 55011:1998 +A1:1999                                | <input type="checkbox"/> Group 1                          | <input type="checkbox"/> Group 2            |
|  | <input type="checkbox"/> Class A                          | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 55013:1990 +A12:1994 +A13:1996 +A14:1999           |   |   |
| <input type="checkbox"/> EN 55013:2001   |   |   |
| <input type="checkbox"/> EN 55014-1:1993 +A1:1997 +A2:1999                     | <input type="checkbox"/> Household appliances and similar |   |
|  | <input type="checkbox"/> Portable tools                   |   |
|  | <input type="checkbox"/> Semiconductor devices            |   |
| <input type="checkbox"/> EN 55014-1:2000                                       |   |   |
| <input type="checkbox"/> EN 55014-2:1997                                       |   |   |
| <input type="checkbox"/> EN 55015:1996 +A1:1997 +A2:1999                       |   |   |
| <input type="checkbox"/> EN 55015:2000   |   |   |
| <input type="checkbox"/> EN 55020:1994 +A11:1996 +A13:1999 +A14:1999           |   |   |
| <input type="checkbox"/> EN 55020:1994 +A11:1996 +A12:1999 +A13:1999 +A14:1999 |   |   |
| <input type="checkbox"/> EN 55022:1994 +A1:1995 +A2:1997                       | <input type="checkbox"/> Class A                          | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 55022:1998 +A1:2000                                | <input type="checkbox"/> Class A                          | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 61000-3-2:1995 +A1:1998 +A2:1998                   |   |   |
| <input type="checkbox"/> EN 61000-3-2:1995 +A1:1998 +A2:1998 +A14:2000         |   |   |
| <input type="checkbox"/> EN 61000-3-2:2000                                     |   |   |
| <input type="checkbox"/> EN 61000-3-3:1995                                     |   |   |
| <input type="checkbox"/> VCCI V-3/99.05 : 1999                                 | <input type="checkbox"/> Class A                          | <input type="checkbox"/> Class B            |
| <input checked="" type="checkbox"/> FCC Part 15 SUBPART B                      | <input type="checkbox"/> Class A                          | <input checked="" type="checkbox"/> Class B |
| <input type="checkbox"/> AS 3548 (1992)  | <input type="checkbox"/> Class A                          | <input type="checkbox"/> Class B            |
| <input checked="" type="checkbox"/> CISPR 22 (1997)                            | <input type="checkbox"/> Class A                          | <input checked="" type="checkbox"/> Class B |





CERTITEK

## CERTITEK Standards Laboratory Co., Ltd.

386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100

Tel: +82-31-339-9970 Fax: +82-31-339-9855

<http://www.certitek.com/>



## 2.1 Conducted Voltage Emissions

### Test Date

December 26, 2002

### Test Location

EMI-CE: Shielded Room

### Test Instruments

<input checked="" type="checkbox"/> Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002
--	-----------------	--------	------------

### Test Accessories

<input type="checkbox"/> LISN	EMCO	3825/2	9206-1971
<input checked="" type="checkbox"/> LISN	EMCO	3825/2	9409-2246
<input checked="" type="checkbox"/> LISN	EMCO	3825/2	9607-2574
<input checked="" type="checkbox"/> Control PC	HP	Vectra 500	SG72000192

### Frequency Range of Measurement

☒ 150 kHz to 30 MHz  
☐ 450 kHz to 30 MHz  
☐ \_\_\_\_\_

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

<input checked="" type="checkbox"/> MET	minimum margin is 7.9 dBuV at 0.34 MHz
<input type="checkbox"/> NOT MET	limit exceeded by maximum of ____ dBuV at ____ MHz
<input type="checkbox"/> NOT APPLICABLE	

### Remarks

See Appendix A for test data.

## 2.2 Radiated Electric Field Emissions

### Test Date

December 24, 2002

### Test Location

- ☒ EMI-OATS: Testing was performed at a test distance of 10 m  
☐ EMI-OATS: Testing was performed at a test distance of 3 m

### Test Instruments

☒ Field Strength Meter Rohde & Schwarz ESVS30 826638/008

### Test Accessories

<input checked="" type="checkbox"/> ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014
<input type="checkbox"/> Biconical Antenna	Schwarzbeck	BBA9106	41-00201
<input type="checkbox"/> Biconical Antenna	EMCO	3110B	9607-2564
<input type="checkbox"/> Log-periodic Antenna	EMCO	3146	9607-4567

### Frequency Range of Measurement

30 MHz to 1 GHz

### Instrument Settings

IF Band Width: 120 kHz

### Test Results

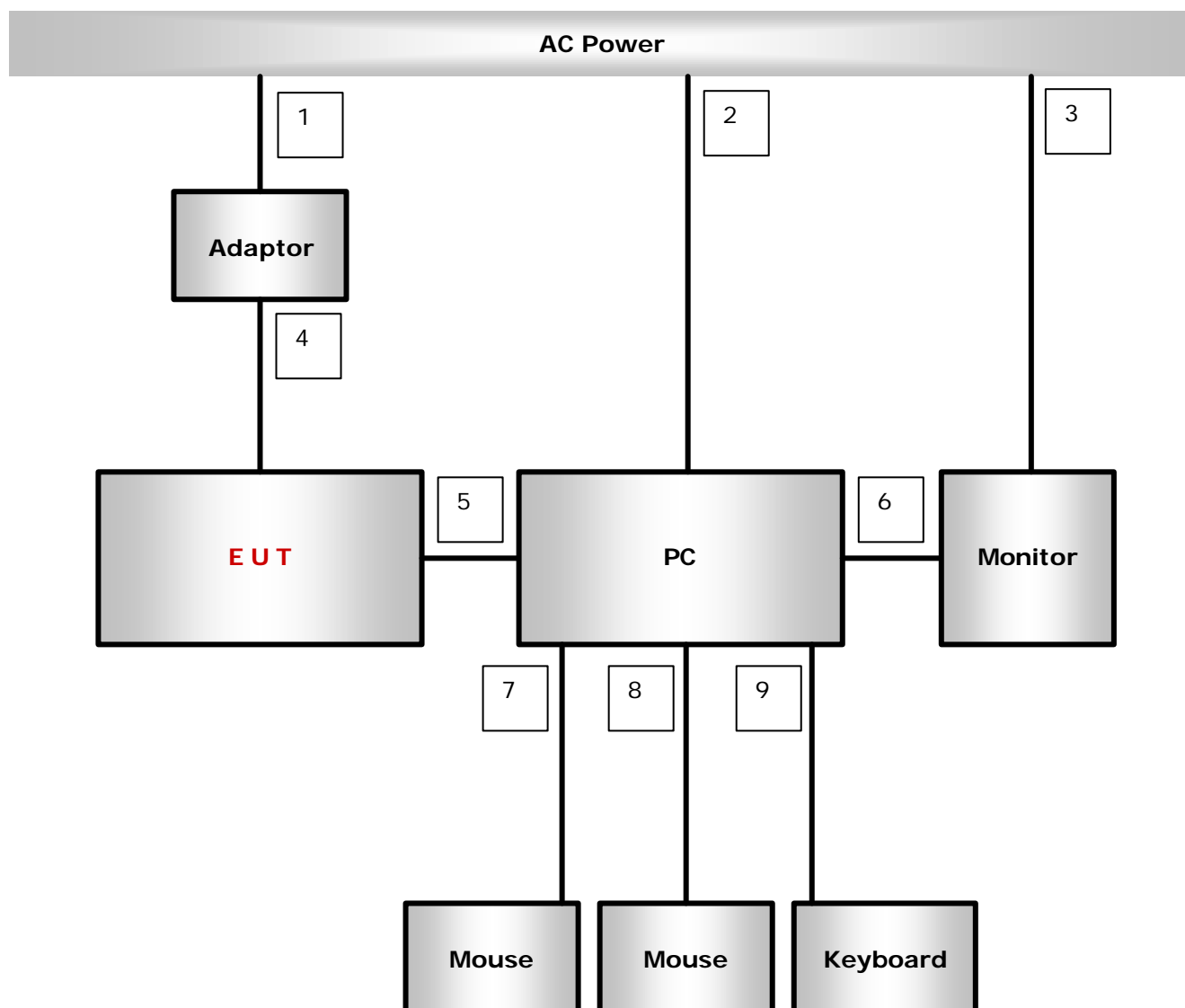
The requirements are:

- ☒ MET minimum margin is 3.0 dB (uV/m) at 756.00 MHz  
☐ NOT MET limit exceeded by maximum of \_\_\_\_ dB(uV/m) at \_\_\_\_ MHz  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data

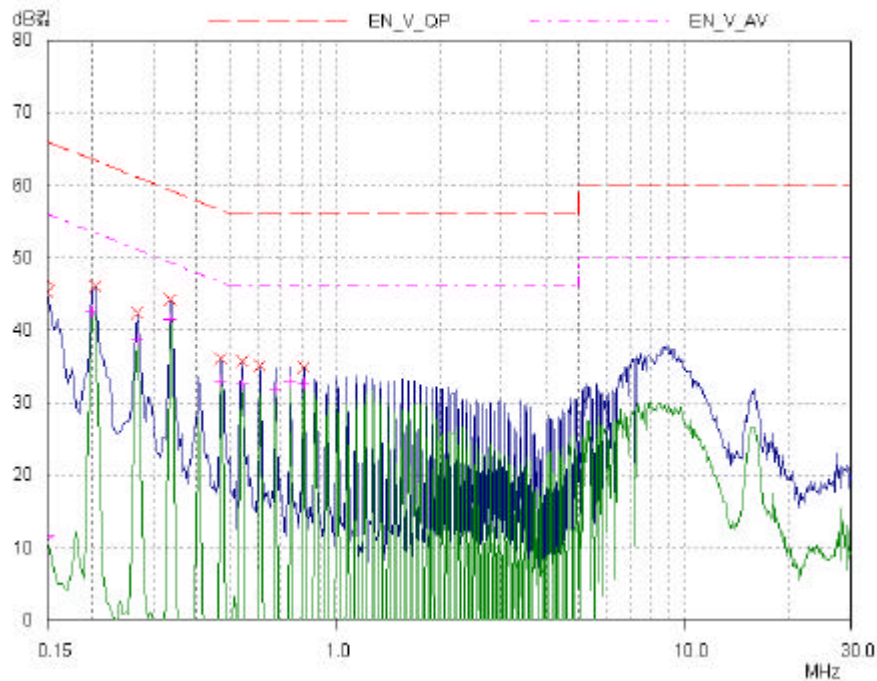
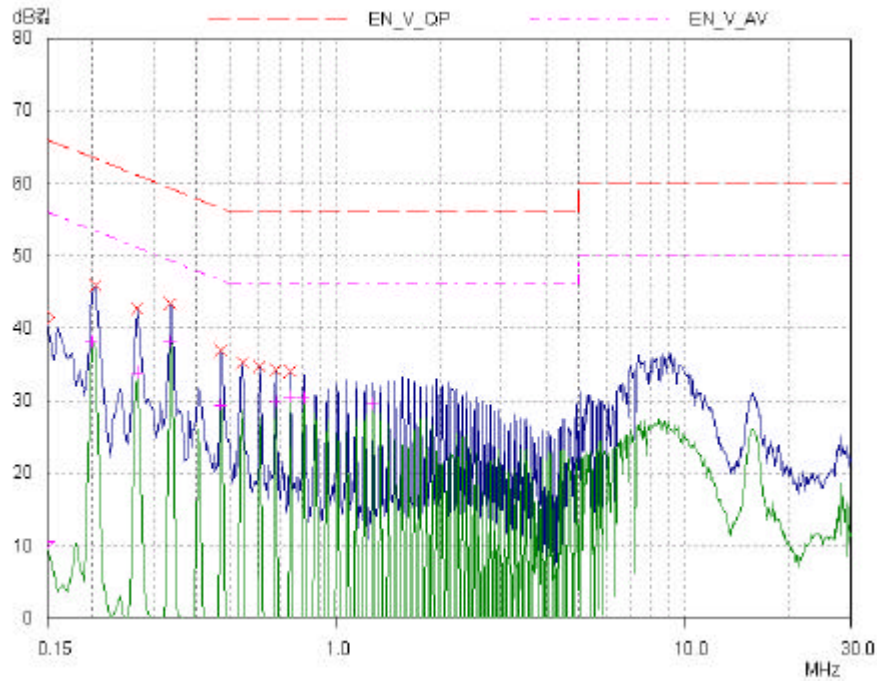
## Configuration



## APPENDIX A – TEST DATA

### Conducted Voltage Emissions (Quasi-Peak reading)

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]
0.20	1.7	0.1	N					53.6	40.6	42.4	11.2
0.27	0.8	0.1	N	61.1	41.4	42.3	18.8	51.1	37.6	38.5	12.6
0.34	0.7	0.1	N	59.3	43.3	44.1	15.2	49.3	40.6	41.4	7.9
0.47	0.5	0.1	N	56.5	35.4	36.0	20.5	46.5	32.2	32.8	13.7
0.54	0.5	0.1	N	56.0	35.1	35.7	20.3	46.0	31.8	32.4	13.6
0.68	0.4	0.1	N					46.0	31.3	31.8	14.2
0.74	0.4	0.1	N					46.0	32.3	32.8	13.3
0.81	0.4	0.1	N	56.0	34.4	34.9	21.1	46.0	32.0	32.5	13.5





## Radiated Electric Field Emissions (Quasi-Peak reading)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
81.30	16.1	V	1.0	8.60	1.80	30.0	26.50	3.50
135.30	16.3	V	1.2	8.40	2.30	30.0	26.99	3.01
243.30	13.5	H	4.0	9.10	2.90	37.0	25.52	11.48
270.30	14.5	H	4.0	10.10	3.30	37.0	27.93	9.07
297.30	18.1	H	3.8	10.90	3.60	37.0	32.61	4.39
487.10	14.2	H	3.0	15.30	4.40	37.0	33.88	3.12
756.00	8.9	H	3.2	19.00	6.10	37.0	34.00	3.00
810.40	6.9	V	2.0	19.60	6.60	37.0	33.12	3.88
919.40	6.5	H	3.5	20.80	6.70	37.0	33.97	3.03