

# MPE TEST REPORT

Equipment Under Test : Private Land Mobile Radio for Vehicle (VHF)  
Model No. : SM5202  
Applicant : MAXON CIC Corp.  
Address of Applicant : Chongho Bldg, #7-61, Yangjae-Dong, Seocho-Gu, Seoul, Korea  
Date of Test(s) : 2009-07-30  
Date of Issue : 2009-07-31

Standards : FCC 47CFR 2.1091(b)

In the configuration tested, the EUT complied with the standards specified above.

## Remarks :

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

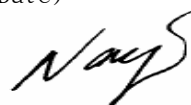
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July 31, 2009  
(Date)



Tested by **Hyunsup, Jin**

July 31, 2009  
(Date)



Reviewed by **TaeHyun, Nam**

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## 1. Description

The SM2102 is a DTMF, SECALL and SMS mobile radio with 208-channel capability. The radio is programmable for output power, channel spacing, and a range of features. The three buttons located on the bottom left-hand side of the radio under the LCD, are described as programmable. These three buttons (P1, P2, and P3) have a short and long press and can be used for various pre-programmed features, Monitor, Power H/L, Scan, DTMF, Key lock, Selcall, Scan, Public Address, Open Close, 1200/2400, SMS and Light.

## 2. Antenna Information

Whip Antenna for vehicle :148 MHz, 1/4 wave 0 dBi  
Whip Antenna for vehicle :161 MHz, 1/4 wave 0 dBi  
Whip Antenna for vehicle : 174 MHz, 1/4 wave 0 dBi

## 3. Test site

BWS TECH Inc.  
611-1, Maesan-ri, Mohyeon-myeon, Cheoin-gu, Yongin-si,  
Gyeonggi-do 449-853, Korea

## 4. Measurement System

- Automobile: Samsung SM3
- E-Field Survey Meter & Probe – NARDA Model EMC-20 (100KHz~3GHz)  
Calibration due date : 2009-07-30
- Antennas – (1/4 wave 0dBi)

## 5. Measurement Uncertainty

The information below presents an estimate of the possible errors that are associated with the measurement system.

| <u>Description</u>     | <u>Error</u> |
|------------------------|--------------|
| NARDA Survey Meter     | ± 3%         |
| Repeatability Accuracy | ± 7%         |

## 6. Method of measurement

### 6.1 EME measurements made on trunk mounted antennas

#### 6.1.1 External vehicle EME measurement

(Antenna mounted in trunk center)

With the survey meter and probe, take ten (10) measurements, at the test distance of 60cm to the antenna, from the back of the vehicle in a vertical line and then average the results. These measurements are taken and recorded at every twenty (20) centimeters over a range starting at twenty (20) centimeters above ground and ending at 2.0 meters.

#### 6.1.2 Internal vehicle EME measurement

(Antenna mounted in trunk center)

While rotating survey meter probe through 180 degrees to ensure that the highest level is found, scan the inside of the vehicle, both front and back seating areas, for the highest level in each location. After the highest level is found, scan vertically making two (2) additional measurement within an area approximately 40 cm wide (representing the width of a person) so as to have a total of three (3) measured points as indicated below that will be averaged

- a) Head area
- b) Chest area
- c) Lower Trunk area

### 6.2 EME measurements made on center roof mounted antennas

#### 6.2.1 External vehicle EME measurement

With the survey meter and probe, take ten (10) measurements, at the standard test distance of 110 cm from the vehicle-mounted antenna, in a vertical line and then average the results. These measurements are taken and recorded at every twenty (20) centimeters over a range starting at twenty (20) centimeters above ground and ending at 2.0 meters; this would be representative of a person standing next to a vehicle during a mobile radio transmission.

#### 6.2.2 Internal vehicle EME measurement

While rotating survey meter probe through 180 degrees to ensure that the highest level is found, scan the inside of the vehicle, both front and back seating areas, for the highest level in each location. After the highest level is found, scan vertically making two (2) additional measurements within an area approximately 40 cm wide (representing the width of a person) so as to have a total of three (3) measured points as indicated below that will be averaged.

- a) Head area
- b) Chest area
- c) Lower Trunk area

## 7. Test Result

| Measurement Information                  |                                 |          |          |
|--|---------------------------------|----------|----------|
| Measurement Freq.(MHz)                   | 148.025                         | 161.025  | 173.975  |
| Raw Data Power(W)                        | 54.95                           | 55.08    | 51.40    |
| Controlled Limit                         | 1.0                             | 1.0      | 1.0      |
| Uncontrolled Limit                       | 0.2                             | 0.2      | 0.2      |
| Cal. Factor                              | 1                               | 1        | 1        |
| Antenna / gain(dBi)                      | Whip / 0                        | Whip / 0 | Whip / 0 |
| External Vehicle Power Density(50% duty) | Average over body/2             |          |          |
| Internal Vehicle Power Density(50% duty) | Average over (head/Chest/leg)/2 |          |          |

| External Vehicle MPE Assessment at 148.0250 MHz |               |                       |               |                    |                       |                                    |
|---|---------------|-----------------------|---------------|--------------------|-----------------------|------------------------------------|
| Antenna Location                                | Antenna/ gain | Meas. Distance (cm)   | E/H Field     | Calibration Factor | Average Over Body     | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk   | Whip / 0      | 60                    | E             | 1                  | 0.333                 | 0.1665                             |
| Measurement grid                                |               |                       |               |                    |                       |                                    |
| Test Position                                   | Height (cm)   | % of controlled limit | Test Position | Height (cm)        | % of controlled limit |                                    |
| 1   | 20            | 2                     | 6             | 120                | 19                    |                                    |
| 2   | 40            | 3                     | 7             | 140                | 14                    |                                    |
| 3   | 60            | 3                     | 8             | 160                | 12                    |                                    |
| 4   | 80            | 6                     | 9             | 180                | 13                    |                                    |
| 5   | 100           | 13                    | 10            | 200                | 16                    |                                    |

| External Vehicle MPE Assessment at 161.0250 MHz |               |                       |               |                    |                       |                                    |
|---|---------------|-----------------------|---------------|--------------------|-----------------------|------------------------------------|
| Antenna Location                                | Antenna/ gain | Meas. Distance (cm)   | E/H Field     | Calibration Factor | Average Over Body     | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk   | Whip / 0      | 60                    | E             | 1                  | 0.0914                | 0.0457                             |
| Measurement grid                                |               |                       |               |                    |                       |                                    |
| Test Position                                   | Height (cm)   | % of controlled limit | Test Position | Height (cm)        | % of controlled limit |                                    |
| 1   | 20            | 3                     | 6             | 120                | 35                    |                                    |
| 2   | 40            | 5                     | 7             | 140                | 28                    |                                    |
| 3   | 60            | 9                     | 8             | 160                | 21                    |                                    |
| 4   | 80            | 19                    | 9             | 180                | 23                    |                                    |
| 5   | 100           | 30                    | 10            | 200                | 20                    |                                    |

| External Vehicle MPE Assessment at 173.9750 MHz |              |                       |               |                    |                       |                                    |
|---|--------------|-----------------------|---------------|--------------------|-----------------------|------------------------------------|
| Antenna Location                                | Antenna/gain | Meas. Distance (cm)   | E/H Field     | Calibration Factor | Average Over Body     | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk   | Whip / 0     | 60                    | E             | 1                  | 0.0714                | 0.0357                             |
| Measurement grid                                |              |                       |               |                    |                       |                                    |
| Test Position                                   | Height (cm)  | % of controlled limit | Test Position | Height (cm)        | % of controlled limit |                                    |
| 1   | 20           | 11                    | 6             | 120                | 28                    |                                    |
| 2   | 40           | 3                     | 7             | 140                | 30                    |                                    |
| 3   | 60           | 7                     | 8             | 160                | 7                     |                                    |
| 4   | 80           | 17                    | 9             | 180                | 9                     |                                    |
| 5   | 100          | 28                    | 10            | 200                | 21                    |                                    |

| External Vehicle MPE Assessment at 148.0250 MHz |              |                       |               |                    |                       |                                    |
|---|--------------|-----------------------|---------------|--------------------|-----------------------|------------------------------------|
| Antenna Location                                | Antenna/gain | Meas. Distance (cm)   | E/H Field     | Calibration Factor | Average Over Body     | Pwr. Density (mW/cm <sup>2</sup> ) |
| Roof  | Whip / 0     | 110                   | E             | 1                  | 0.023                 | 0.0115                             |
| Measurement grid                                |              |                       |               |                    |                       |                                    |
| Test Position                                   | Height (cm)  | % of controlled limit | Test Position | Height (cm)        | % of controlled limit |                                    |
| 1   | 20           | 1                     | 6             | 120                | 2                     |                                    |
| 2   | 40           | 1                     | 7             | 140                | 4                     |                                    |
| 3   | 60           | 2                     | 8             | 160                | 3                     |                                    |
| 4   | 80           | 2                     | 9             | 180                | 3                     |                                    |
| 5   | 100          | 2                     | 10            | 200                | 3                     |                                    |

| Internal Vehicle MPE Assessment at 148.0250 MHz |                            |                     |                             |                    |                           |                                    |
|---|----------------------------|---------------------|-----------------------------|--------------------|---------------------------|------------------------------------|
| Antenna Location                                | Antenna/gain               | Meas. Distance (cm) | E/H Field                   | Calibration Factor | Average Over Body         | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk   | Whip / 0                   | Highest reading     | E                           | 1                  | 0.10/0.08                 | 0.05                               |
| Measurement grid                                |                            |                     |                             |                    |                           |                                    |
| Test Position                                   | % of controlled limit Head |                     | % of controlled limit Chest |                    | % of controlled limit Leg |                                    |
| Back  | 9                          |                     | 22                          |                    | 13                        |                                    |
| Front   | 9                          |                     | 10                          |                    | 5                         |                                    |

| Internal Vehicle MPE Assessment at 161.0250 MHz |                            |                     |                             |                    |                           |                                    |
|---|----------------------------|---------------------|-----------------------------|--------------------|---------------------------|------------------------------------|
| Antenna Location                                | Antenna/gain               | Meas. Distance (cm) | E/H Field                   | Calibration Factor | Average Over Body         | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk   | Whip / 0                   | Highest reading     | E                           | 1                  | 0.11/0.09                 | 0.06                               |
| Measurement grid                                |                            |                     |                             |                    |                           |                                    |
| Test Position                                   | % of controlled limit Head |                     | % of controlled limit Chest |                    | % of controlled limit Leg |                                    |
| Back  | 15                         |                     | 12                          |                    | 22                        |                                    |
| Front   | 10                         |                     | 1                           |                    | 2                         |                                    |

| Internal Vehicle MPE Assessment at 173.9750 MHz |                            |                     |                             |                    |                           |                                    |
|---|----------------------------|---------------------|-----------------------------|--------------------|---------------------------|------------------------------------|
| Antenna Location                                | Antenna/gain               | Meas. Distance (cm) | E/H Field                   | Calibration Factor | Average Over Body         | Pwr. Density (mW/cm <sup>2</sup> ) |
| Trunk   | Whip / 0                   | Highest reading     | E                           | 1                  | 0.10/0.38                 | 0.05                               |
| Measurement grid                                |                            |                     |                             |                    |                           |                                    |
| Test Position                                   | % of controlled limit Head |                     | % of controlled limit Chest |                    | % of controlled limit Leg |                                    |
| Back  | 3                          |                     | 8                           |                    | 5                         |                                    |
| Front   | 18                         |                     | 12                          |                    | 5                         |                                    |

| Internal Vehicle MPE Assessment at 148.0250 MHz |                            |                     |                             |                    |                           |                                    |
|---|----------------------------|---------------------|-----------------------------|--------------------|---------------------------|------------------------------------|
| Antenna Location                                | Antenna/gain               | Meas. Distance (cm) | E/H Field                   | Calibration Factor | Average Over Body         | Pwr. Density (mW/cm <sup>2</sup> ) |
| Roof  | Whip / 0                   | Highest reading     | E                           | 1                  | 0.06/0.04                 | 0.03                               |
| Measurement grid                                |                            |                     |                             |                    |                           |                                    |
| Test Position                                   | % of controlled limit Head |                     | % of controlled limit Chest |                    | % of controlled limit Leg |                                    |
| Back  | 5                          |                     | 5                           |                    | 2                         |                                    |
| Front   | 6                          |                     | 5                           |                    | 2                         |                                    |

## 8. Conclusion

**The measurement results complies with the FCC Limit Per 47 CFR 2.1091(b)  
for the Uncontrolled RF Exposure.**