

# TEST REPORT

EVALUATION Test for ATC41HSAN&ATC41HSKN

APPLICANT  
HYUNDAI MOBIS CO., LTD.

DATE OF ISSUE  
March 14, 2020

**HCT Co., Ltd.**

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA  
Tel. +82 31 634 6300 F ax. +82 31 645 6401



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**TEST  
REPORT**  
EVALUATION Test  
for ATC41HSAN &  
ATC41HSKN

**DATE OF ISSUE**  
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**Model**  
FCC: ATC41HSAN  
IC: ATC41HSKN

**Additional Model**  
FCC: VT260HSAN  
IC: VT260HSKN

|  |  |
|--|--|
| <b>Applicant</b>   | <b>HYUNDAI MOBIS CO., LTD.</b><br>203, Teheran-ro, Gangnam-gu, Seoul, 135-977, South Korea   |
| <b>FCC ID</b><br><b>IC</b>   | TQ8-ATC41HSAN<br>5074A-ATC41HSKN   |
| <b>Equipment Class(es)</b><br><b>Rule Part(s)</b><br><b>IC Part(s)</b> | DSS, DTS, NII<br>15<br>RSS-247 Issue 2 (February 2017)<br>RSS-Gen Issue 5_Amendment 1 (March 2019)   |
| <b>Application's Statement</b>   | The applicant takes full responsibility that the test data referenced below represents compliance for this FCC ID.   |
| <b>Differences Brief Description</b>                                   | Bluetooth & WLAN hardware and software of this device are identical to the implementation in TQ8-ATB41HSAN. The operational description includes detailed information about the changes between the devices. The data from that application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary table below. |
| <b>Test Reference</b>  | KDB 484596 D01 Reference Test Data v01   |
|  | The result shown in this test report refer only to the sample(s) tested unless otherwise stated.   |
|  | <b>Tested by</b><br>Jeong Ho Kim    |
|  | <b>Technical Manager</b><br>Jong Seok Lee   |

**HCT CO., LTD.**  
*Soo Chan Lee*  
SooChan Lee / CEO

The detail test data can be found in this documents, Appendix A.

| Category       | Spot Check         | Verdict |
|----------------|--------------------|---------|
| Unlicensed EMC | Band Edge          | Share   |
|                | Spurious Emissions | Share   |

Reference Detail Section

| Reference FCC ID | Equipment Class | Report Title     | Section      |
|------------------|-----------------|------------------|--------------|
| TQ8-ATB41HSAN    | DSS             | Bluetooth Report | All sections |
|                  | DTS             | WLAN DTS Report  | All sections |
|                  | NII             | UNII Test Report | All sections |

## Appendix A. The Spot check test data

### 1. Summary of the spot check for Unlicensed EMC

|           | Test Item         | Mod/Channel                   | Measured Frequency                      | ATB41HSAN(FCC)& ATB41HSKN(IC) Result [dBuV/m] |         | ATC41HSAN(FCC)& ATC41HSKN(IC) Result [dBuV/m] |         | Deviation (dB) |         |
|-----------|-------------------|-------------------------------|---|---|---------|---|---------|----------------|---------|
|           |                   |                               |   | Peak  | Average | Peak  | Average | Peak           | Average |
| Bluetooth | Band Edge         | DH5/ch.78                     | 2 483.5 MHz<br>~ 2 500 MHz              | 63.24   | 38.48   | 66.11   | 41.35   | 2.87           | 2.87    |
|           | RSE               | DH5/ch.0                      | 7 206 MHz                               | 49.80   | 25.04   | 49.84   | 25.08   | 0.04           | 0.04    |
| DTS       | Band Edge         | 802.11g<br>6 Mbps/ch.1        | 2 310 MHz<br>~ 2 390 MHz<br>(2 412 MHz) | 56.27   | 44.21   | 58.58   | 45.74   | 2.31           | 1.53    |
|           | RSE               | 802.11b<br>1 Mbps/ch.6        | 7 311 MHz                               | 56.35   | 45.91   | 53.63   | 42.43   | -2.72          | -3.48   |
| NII       | Band Edge Peak    | 802.11ac 40MHz<br>MCS0/ch.102 | 5 460 MHz<br>~ 5 470 MHz                | 58.72   | -       | 58.95   | -       | 0.23           | -       |
|           | Band Edge Average | 802.11ac 80MHz<br>MCS0/ch.58  | 5 350 MHz<br>~ 5 460 MHz                | -   | 44.62   | -   | 45.40   | -              | 0.78    |
|           | RSE               | 802.11a<br>6 Mbps/ch.165      | 17 475 MHz                              | 62.89   | -       | 62.47   | -       | -0.42          | -       |

## 2. List of test equipment for EMC

| Manufacturer           | Model / Equipment                                       | Calibration Date | Calibration Interval | Serial No.  |
|------------------------|---|------------------|----------------------|-------------|
| Innco system           | CO3000 / Controller(Antenna mast)                       | N/A              | N/A                  | CO3000-4p   |
| Innco system           | MA4640/800-XP-EP / Antenna Position Tower               | N/A              | N/A                  | N/A         |
| Audix                  | EM1000 / Controller                                     | N/A              | N/A                  | 060520      |
| Audix                  | Turn Table  | N/A              | N/A                  | N/A         |
| TNM system             | FBSM-01B / Amp & Filter Bank Switch Controller          | N/A              | N/A                  | N/A         |
| Rohde & Schwarz        | Loop Antenna  | 04/26/2019       | Biennial             | 1513-175    |
| Schwarzbeck            | VULB 9168 / Hybrid Antenna                              | 08/02/2019       | Biennial             | 01039       |
| Schwarzbeck            | BBHA 9120D / Horn Antenna                               | 06/28/2019       | Biennial             | 1300        |
| Schwarzbeck            | BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)                | 04/29/2019       | Biennial             | BBHA9170342 |
| Rohde & Schwarz        | FSP(9 kHz ~ 40 GHz) / Spectrum Analyzer                 | 07/16/2019       | Annual               | 100843      |
| Wainwright Instruments | WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter | 01/21/2020       | Annual               | 2           |
| Wainwright Instruments | WRCJV5100/5850-40/50-8EEK / Band Reject Filter          | 02/10/2020       | Annual               | 1           |
| CERNEX                 | CBL18265035 / Power Amplifier                           | 12/26/2019       | Annual               | 22966       |
| CERNEX                 | CBL26405040 / Power Amplifier                           | 06/18/2019       | Annual               | 25956       |
| TESCOM                 | TC-3000C / Bluetooth Tester                             | 03/26/2019       | Annual               | 3000C000276 |
| TNM system             | FBSM-05B / HPF(3~18GHz) + LNA1(1~18GHz)                 | 01/21/2020       | Annual               | F6          |
| TNM system             | FBSM-05B / ATT(10dB) + LNA1(1~18GHz)                    | 01/21/2020       | Annual               | None        |
| TNM system             | FBSM-05B / ATT(3dB) + LNA1(1~18GHz)                     | 01/21/2020       | Annual               | None        |
| TNM system             | FBSM-05B / LNA1(1~18GHz)                                | 01/21/2020       | Annual               | 25540       |
| TNM system             | FBSM-05B / HPF(7~18GHz) + LNA2(6~18GHz)                 | 01/21/2020       | Annual               | 28550       |
| TNM system             | FBSM-05B / Thru(30MHz ~ 18GHz)                          | 01/21/2020       | Annual               | None        |

**Note:**

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

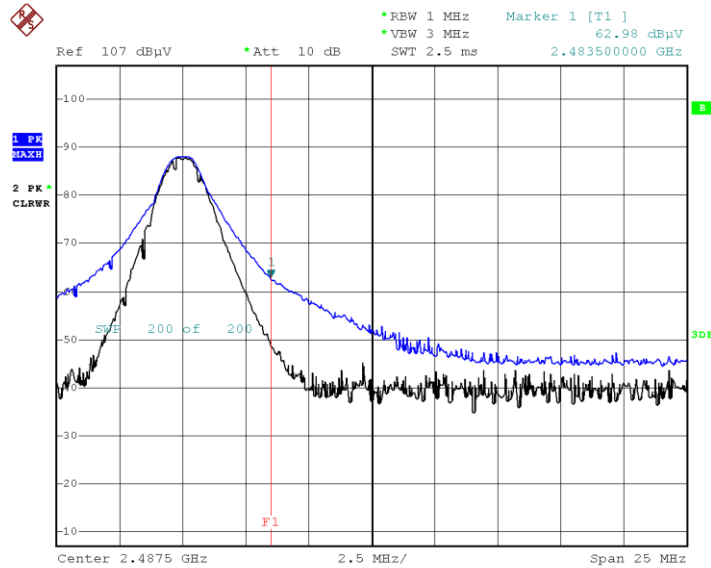
### 3. Test Plot

#### Bluetooth Band Edge X-H (DH5/ch.78)

#### Bandedge

| Frequency [MHz] | Reading dBuV | ※ A.F+C.L -AMP+ATT+D.F [dB] | ANT. POL [H/V] | Duty Cycle Correction [dB] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect [dB] |
|-----------------|--------------|-----------------------------|----------------|----------------------------|----------------|----------------|-------------|-------------|
| 2483.5          | 62.98        | 3.13                        | H              | 0                          | 66.11          | 73.98          | 7.87        | PK          |
| 2483.5          | 62.98        | 3.13                        | H              | -24.76                     | 41.35          | 53.98          | 12.63       | AV          |

Radiated Restricted Band Edges plot – Peak & Average Reading



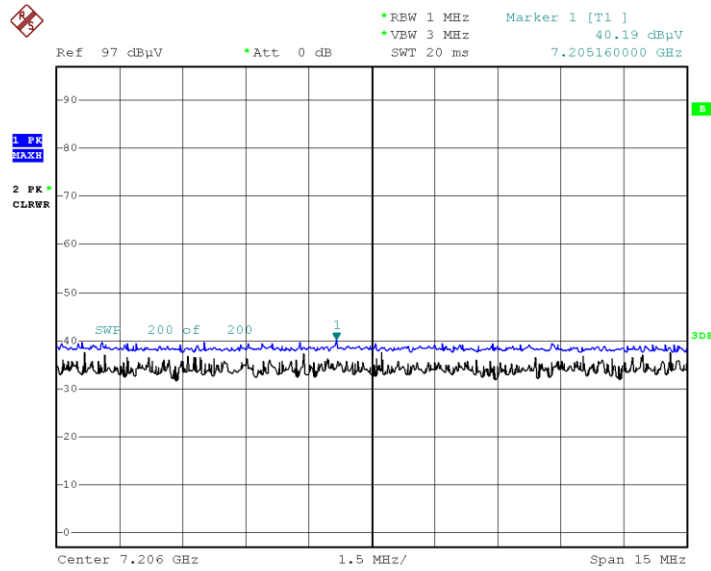
Date: 20.MAR.2020 14:24:56

### Bluetooth R.S.E 3rd X-H (DH5/ch.0)

#### RSE

| Frequency [MHz] | Reading dBuV | A.F+C.L-A.G+D.F [dB] | ANT. POL [H/V] | Duty Cycle Correction [dB] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|-----------------|--------------|----------------------|----------------|----------------------------|----------------|----------------|-------------|--------|
| 7206            | 40.19        | 9.65                 | H              | 0.00                       | 49.84          | 73.98          | 24.14       | PK     |
| 7206            | 40.19        | 9.65                 | H              | -24.76                     | 25.08          | 53.98          | 28.90       | AV     |

Radiated Spurious Emissions plot – Peak & Average Reading



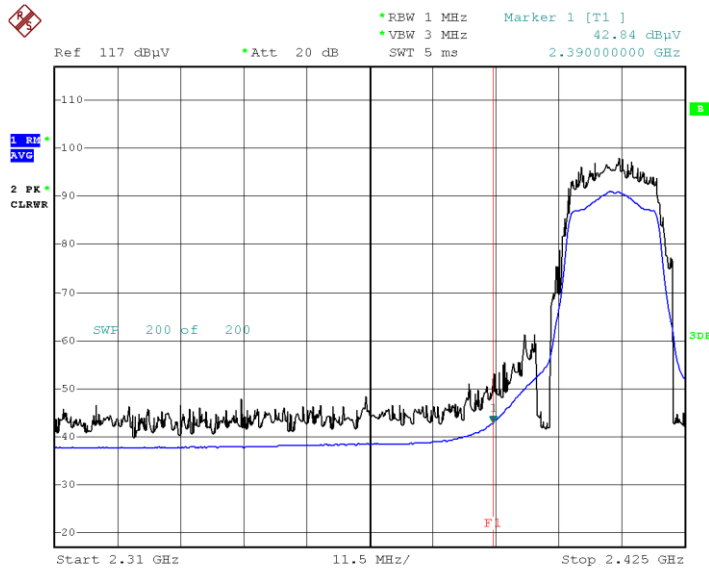
Date: 20.MAR.2020 15:01:12

### DTS Band Edge X-V (802.11g\_6 Mbps/ch.1)

#### Bandedge

| Frequency [MHz] | Reading dBuV | Duty Cycle Factor | ※ A.F+C.L-<br>A.G+ATT+D.F [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|-----------------|--------------|-------------------|--------------------------------|----------------|----------------|----------------|-------------|--------|
| 2390.0          | 55.97        | 0.00              | 2.61                           | V              | 58.58          | 73.98          | 15.40       | PK     |
| 2390.0          | 42.84        | 0.29              | 2.61                           | V              | 45.74          | 53.98          | 8.24        | AV     |

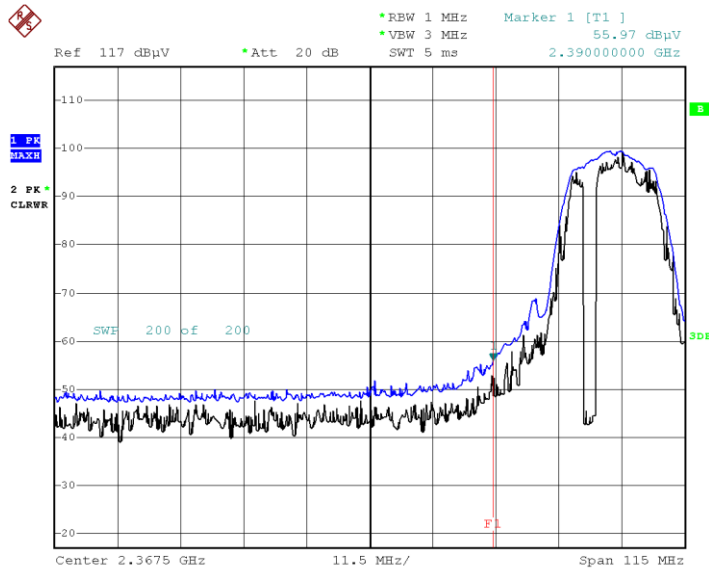
Radiated Restricted Band Edges plot –Average Reading



Date: 20.MAR.2020 15:23:01



### Radiated Restricted Band Edges plot - Peak Reading



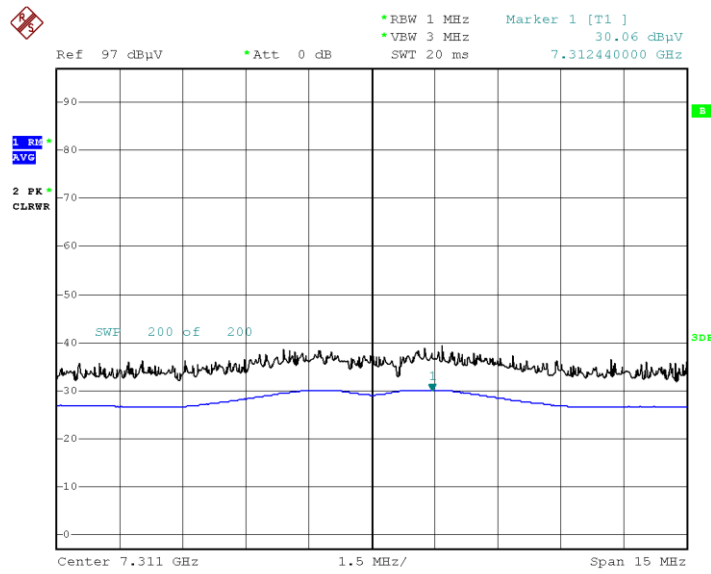
Date: 20.MAR.2020 15:21:43

DTS R.S.E 3rd X-V (802.11b 1 Mbps/ch.6)

RSE

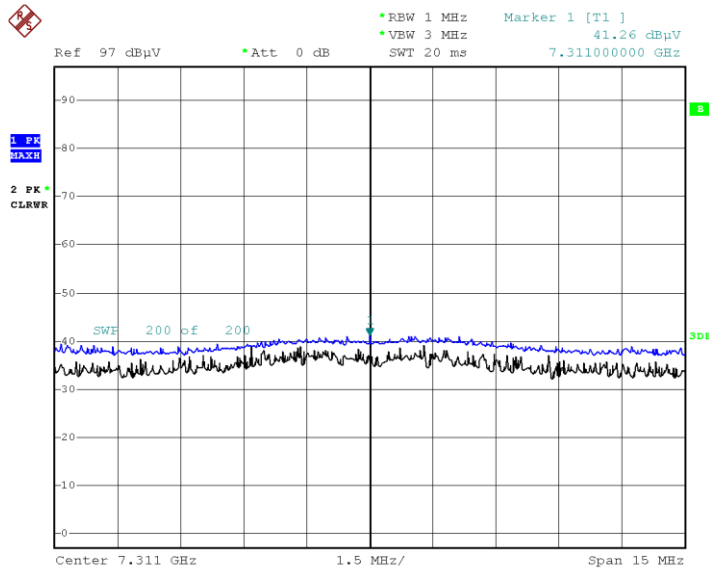
| Frequency [MHz] | Reading dBuV | A.F+C.L-AMP+D.F [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|-----------------|--------------|----------------------|----------------|----------------|----------------|-------------|--------|
| 7311            | 41.26        | 12.37                | V              | 53.63          | 73.98          | 20.35       | PK     |
| 7311            | 30.06        | 12.37                | V              | 42.43          | 53.98          | 11.55       | AV     |

Radiated Spurious Emissions plot – Average Reading



Date: 20.MAR.2020 15:39:47

### Radiated Spurious Emissions plot – Peak Reading



Date: 20.MAR.2020 15:38:11

U-NII Band Band X-V

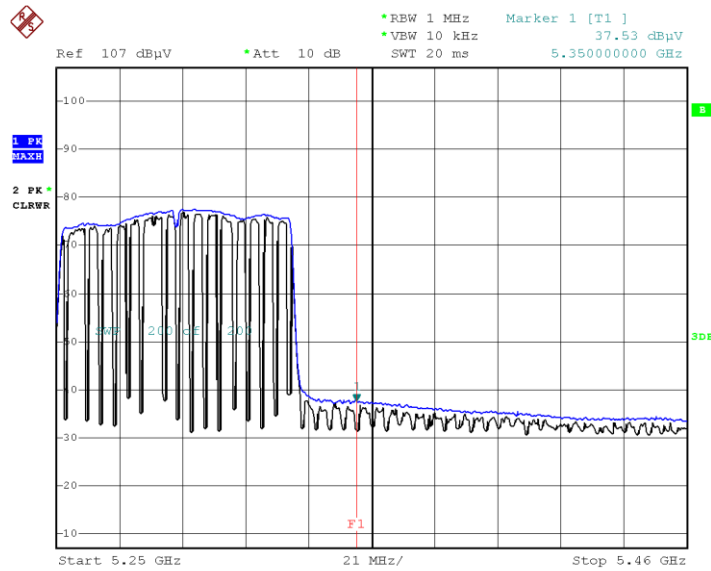
Edge Peak (802.11ac 40MHz MCS0/ch.102)

Edge Average (802.11ac 80MHz MCS0/ch.58)

**Bandedge**

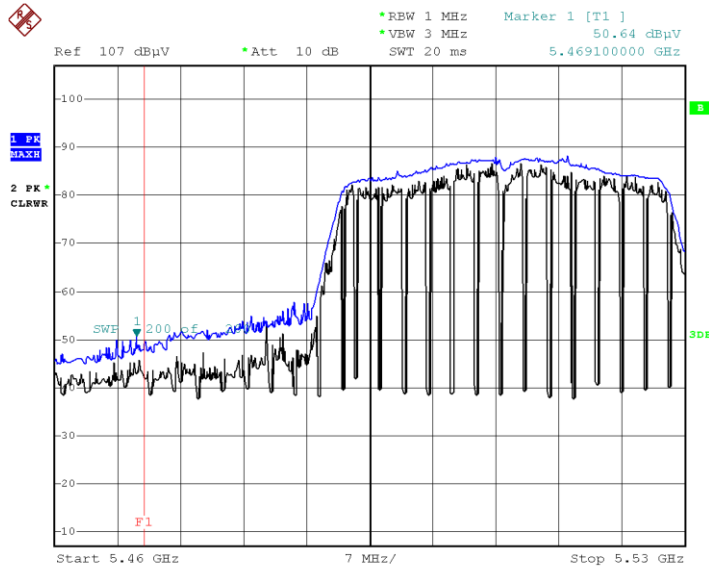
| Frequency [MHz] | Reading dBuV | AF+CL+AG+ATT+DF [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|-----------------|--------------|----------------------|----------------|----------------|----------------|-------------|--------|
| 5470            | 50.64        | 8.31                 | V              | 58.95          | 68.20          | 9.25        | PK     |
| 5350            | 37.53        | 7.87                 | V              | 45.40          | 53.98          | 8.58        | AV     |

Radiated Restricted Band Edges plot – Average Reading



Date: 23.MAR.2020 09:40:22

### Radiated Restricted Band Edges plot – Peak Reading



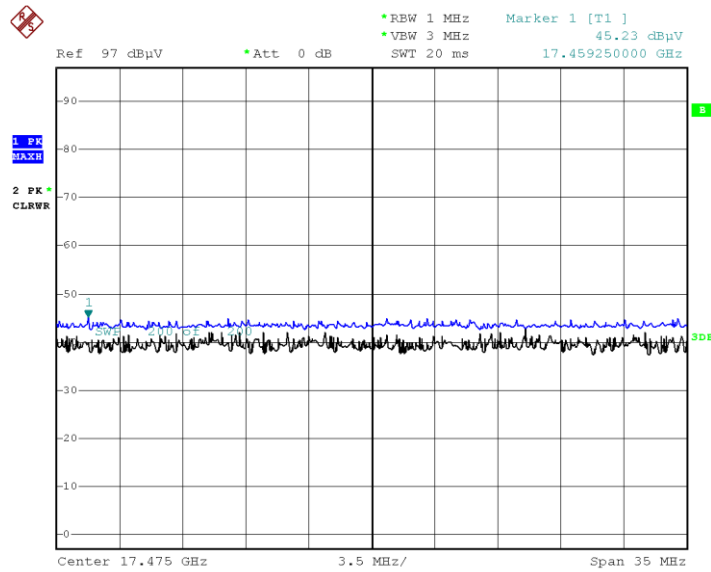
Date: 23.MAR.2020 09:22:51

U-NII R.S.E 3rd X-V (802.11a\_20 MHz 6 Mbps/ch.165)

RSE

| Frequency [MHz] | Reading dBuV | CL+AF+DF-AG [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|-----------------|--------------|------------------|----------------|----------------|----------------|-------------|--------|
| 17475           | 45.23        | 17.24            | V              | 62.47          | 68.20          | 5.73        | PK     |

Radiated Spurious Emissions plot – Peak Reading



Date: 23.MAR.2020 10:02:39