



# TEST REPORT

**Report Number. :** 13708019-E1V2

**Applicant :** Samsung Electronics Co., Ltd.  
129 Samsung-Ro, Yeongtong-Gu  
Suwon-Si, Gyeonggi-Do, 16677, Korea

**Model :** SM-M127G/DS

**FCC ID :** A3LSMM127G

**EUT Description :** GSM/WCDMA/LTE Phablet with BT/BLE and DTS b/g/n

**Test Standard(s) :** FCC 47 CFR PART 22H, 24E AND 27

**Date Of Issue:**

March 15, 2021

**Prepared by:**

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Revision History




| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u>  | <u>Revised By</u> |
|-------------|-------------------|-------------------|-------------------|
| V1          | 3/8/2021          | Initial Issue     |                   |
| V2          | 3/15/2021         | Updated Section 6 | Kiya Kedida       |

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# 1. ATTESTATION OF TEST RESULTS

|  |   |   |
|--|---|---|
| Applicant Name and Address   | SAMSUNG ELECTRONICS CO., LTD.<br>129 SAMSUNG-RO, YEONGTONG-GU,<br>SUWON-SI, GYEONGGI-DO, 16677, KOREA |   |
| Model  | SM-M127G  |   |
| FCC ID   | A3LSMM127G <b>Error! Reference source not found.</b>  |   |
| EUT Description  | GSM/WCDMA/LTE PHABLET WITH BT/BLE AND DTS B/G/N   |   |
| Serial Number  | R38NB0188LV   |   |
| Date Tested  | FEBRUARY 17, 2021   |   |
| Applicable Standards   | FCC PART 22H, 24E, 27   |   |
| Test Results   | COMPLIES  |   |
| <p>UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p>The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.</p> <p>This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.</p> |   |   |
| Approved & Released By:  | Reviewed By:  | Prepared By:  |
|   |                    |  |
| Dan Corona<br>Operations Leader<br>UL Verification Services Inc.   | Kiya Kedida<br>Senior Project Engineer<br>UL Verification Services Inc.                               | Brian Shen<br>Laboratory Engineer<br>UL Verification Services Inc.                    |

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 22, Part 24, and Part 27
- [FCC KDB 971168 D01 v03r01](#): Power Meas License Digital Systems
- [FCC KDB 971168 D02 v02r01](#): Misc Rev Approv License Devices
- [FCC KDB 412172 D01 v01r01](#). Determining ERP and EIRP

## 3. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

|                                     | Address   | ISED CABID | ISED Company Number | FCC Registration |
|-------------------------------------|---|------------|---------------------|------------------|
| <input type="checkbox"/>            | Building 1:<br>47173 Benicia Street<br>Fremont, CA 94538, U.S.A | US0104     | 2324A               | 208313           |
| <input type="checkbox"/>            | Building 2:<br>47266 Benicia Street<br>Fremont, CA 94538, U.S.A | US0104     | 22541               | 208313           |
| <input checked="" type="checkbox"/> | Building 4:<br>47658 Kato Rd<br>Fremont, CA 94538, U.S.A        | US0104     | 2324B               | 208313           |

## 4. DECISION RULES AND MEASUREMENT UNCERTAINTY

### 4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

### 4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER   | U <sub>Lab</sub> |
|---|------------------|
| Worst Case Conducted Disturbance, 9KHz to 0.15 MHz  | 3.78 dB          |
| Worst Case Conducted Disturbance, 0.15 to 30 MHz    | 3.40 dB          |
| Worst Case Radiated Disturbance, 9KHz to 30 MHz     | 2.84 dB          |
| Worst Case Radiated Disturbance, 30 to 1000 MHz     | 4.84 dB          |
| Worst Case Radiated Disturbance, 1000 to 18000 MHz  | 4.73 dB          |
| Worst Case Radiated Disturbance, 18000 to 26000 MHz | 4.51 dB          |
| Worst Case Radiated Disturbance, 26000 to 40000 MHz | 5.29 dB          |

Uncertainty figures are valid to a confidence level of 95%.

### 4.4. SAMPLE CALCULATION

#### RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

#### MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

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## 5. EQUIPMENT UNDER TEST

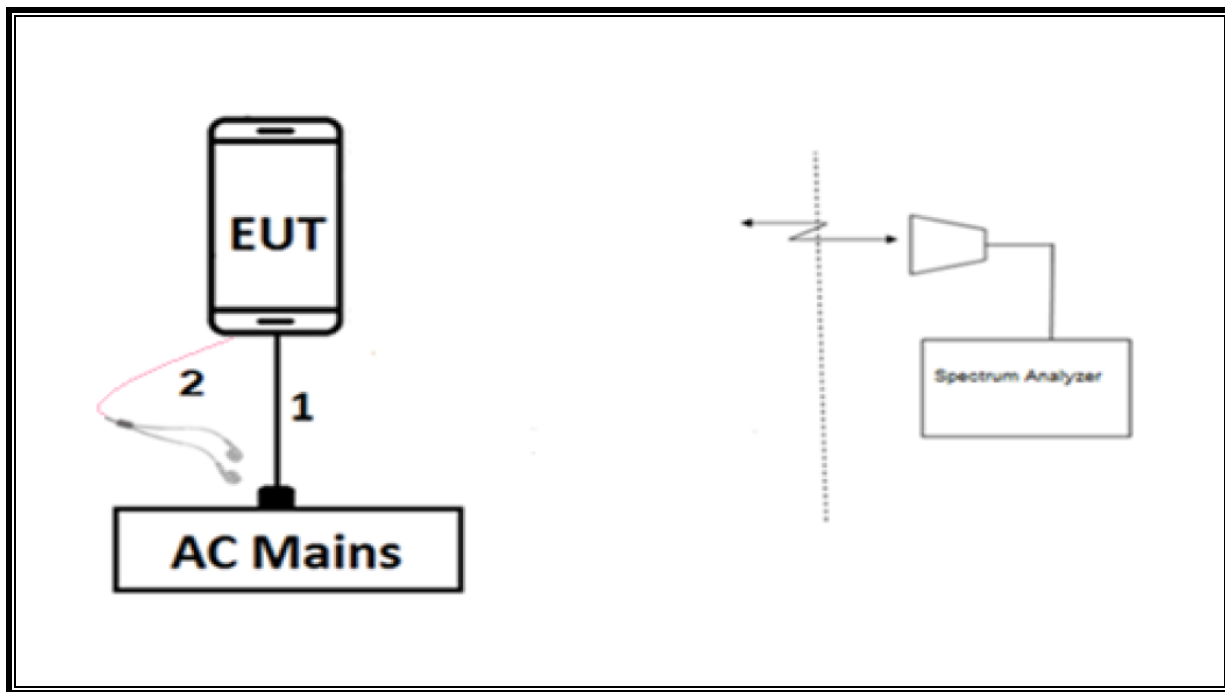
### 5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phablet with BT/BLE and DTS b/g/n.

## 5.2. DESCRIPTION OF TEST SETUP

| SUPPORT TEST EQUIPMENT        |              |                      |                |             |                  |         |
|-------------------------------|--------------|----------------------|----------------|-------------|------------------|---------|
| Description                   | Manufacturer | Model                | Serial Number  | FCC ID/ DoC |                  |         |
| AC Adapter                    | Samsung      | EP-TA200             | R37M3FL1XN1DK3 | N/A         |                  |         |
| Earphone                      | Samsung      | N/A                  | N/A            | N/A         |                  |         |
| I/O CABLES (RF RADIATED TEST) |              |                      |                |             |                  |         |
| Cable No.                     | Port         | # of Identical Ports | Connector Type | Cable Type  | Cable Length (m) | Remarks |
| 1                             | USB          | 1                    | AC Adapter     | Shielded    | 1                | N/A     |
| 2                             | Earphone     | 1                    | 3.5mm          | Un-Shielded | 1                | N/A     |

### RADIATED SETUP





## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| TEST EQUIPMENT LIST                      |                      |            |                         |            |            |
|--|----------------------|------------|-------------------------|------------|------------|
| Description                              | Manufacturer         | Model      | ID Num                  | Cal Due    | Last Cal   |
| EMI TEST RECEIVER                        | Rohde & Schwarz      | ESW44      | PRE0179522              | 2/19/2022  | 2/19/2021  |
| Antenna, Horn 1-18GHz                    | ETS-Lindgren         | 3117       | PRE0100034              | 9/15/2021  | 9/15/2020  |
| Amplifier, 1 to 18GHz, 35dB              | AMPLICAL             | AMP1G18-35 | T1571                   | 8/20/2021  | 8/20/2020  |
| Antenna, BroadBand Hybrid, 30MHz to 3GHz | Sunol Sciences Corp. | JB3        | PRE0184052              | 11/19/2021 | 11/19/2020 |
| Amplifier, 10KHz to 1GHz, 32dB           | SONOMA INSTRUMENT    | 310        | 170647                  | 12/29/2021 | 12/29/2020 |
| Antenna, Horn 1-18GHz                    | ETS-Lindgren         | 3117       | T863                    | 8/31/2021  | 8/31/2020  |
| Antenna, BroadBand Hybrid, 30MHz to 3GHz | Sunol Sciences Corp. | JB3        | T477                    | 9/24/2021  | 9/24/2020  |
| Antenna, Horn 1-18GHz                    | ETS-Lindgren         | 3117       | T345                    | 5/19/2021  | 5/19/2020  |
| ANTENNA, DIPOLE                          | ETS-Lindgren         | 3121C DB4  | T416                    | 11/11/2021 | 11/11/2020 |
| Filter, Highpass 1.5GHz                  | MICRO-TRONICS        | HPM50114   | T1852                   | 7/20/2021  | 7/20/2020  |
| Filter, 2.7 to 18GHz High Pass           | MICROWAVE CIRCUITS   | H2G518G6   | T772                    | 1/22/2022  | 1/22/2021  |
| Filter, Highpass 4.0GHz                  | MICRO-TRONICS        | HPM13351   | T1241                   | 6/25/2021  | 6/25/2020  |
| Test Software List                       |                      |            |                         |            |            |
| Description                              | Manufacturer         | Model      | Version                 |            |            |
| Radiated Software                        | UL                   | UL EMC     | Rev 9.5, April 30, 2020 |            |            |

## 7. REUSE OF TEST DATA

### 7.1. INTRODUCTION

According to the manufacturer, FCC ID: A3LSMM127F and FCC ID: A3LSMM127G licensed radios GSM850/1900, WCDMA B5, LTE Band 5 and 41 are electrically identical. They share the same chipset, same power and same antenna performance including antenna gain. The FCC ID: A3LSMM127F test data shall remain representative of FCC ID: A3LSMM127G so, FCC ID: A3LSMM127G leverages test data from A3LSMM127F.

### 7.2. DEVICE DIFFERENCES

1. H/W
  - WCDMA band W2/4 are deleted.
  - LTE band W2/412/17/20/26/28/66 are deleted.
2. S/W
  - SW was updated to reflect the HW changes.

### 7.3. SPOT CHECK VERIFICATION RESULTS SUMMARY

Full verification for GSM850/1900, WCDMA B5, LTE Band 5 and 41 has been done on device A3LSMM127G for RSE (Radiated Spurious Emissions). The data from the application has been verified through appropriate RSE testing to demonstrate compliance for this device as shown in Section 8.

### 7.4. REFERENCE DETAIL

| Equipment Class | Reference FCC ID | Report Title/Section                      |
|-----------------|------------------|---|
| PCB             | A3LSMM127F       | R13548896-E4 v2 WWAN 2G3G FCC REPORT      |
| PCB             | A3LSMM127F       | R13548896-E5 v5 WWAN LTE FCC REPORT Part1 |
| PCB             | A3LSMM127F       | R13548896-E5 v5 WWAN LTE FCC REPORT Part2 |
| PCB             | A3LSMM127F       | R13548896-E5 v5 WWAN LTE FCC REPORT Part3 |
| PCB             | A3LSMM127F       | R13548896-E5 v5 WWAN LTE FCC REPORT Part4 |
| PCB             | A3LSMM127F       | R13548896-E5 v5 WWAN LTE FCC REPORT Part5 |

## 8. SPOT CHECK DATA

### 8.1. FIELD STRENGTH OF SPURIOUS RADIATION

#### 8.1.1. GSM 850

##### GPRS MODE

|                |                         |
|----------------|-------------------------|
| Company:       | Samsung                 |
| Project #:     | 13708019                |
| Date:          | 2/17/2021               |
| Test Engineer: | 43575                   |
| Configuration: | EUT + Support Equipment |
| Mode:          | GPRS 850                |
| Chamber #:     | Chamber J               |

| Marker    | Frequency (GHz) | Meter Reading (dBuV) | Det | AF PRE0100034 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Tx WWAN Limit | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------|-----------------|----------------------|-----|----------------------|--------------|---------|-------------------------|---------------|-------------|----------------|-------------|----------|
| 836.6 MHz |                 |                      |     |                      |              |         |                         |               |             |                |             |          |
| 1         | 1.67309         | 65.14                | Pk  | 28.7                 | -35.6        | -95.2   | -36.96                  | -13           | -23.96      | 0-360          | 150         | H        |
| 3         | 2.50955         | 52.78                | Pk  | 32.6                 | -35.2        | -95.2   | -45.02                  | -13           | -32.02      | 0-360          | 150         | H        |
| 5         | 3.36831         | 41.16                | Pk  | 33.1                 | -34.1        | -95.2   | -55.04                  | -13           | -42.04      | 0-360          | 150         | H        |
| 2         | 1.67309         | 59.36                | Pk  | 28.7                 | -35.6        | -95.2   | -42.74                  | -13           | -29.74      | 0-360          | 150         | V        |
| 4         | 2.50955         | 51.69                | Pk  | 32.6                 | -35.2        | -95.2   | -46.11                  | -13           | -33.11      | 0-360          | 150         | V        |
| 6         | 3.363           | 41.26                | Pk  | 33                   | -34.1        | -95.2   | -55.04                  | -13           | -42.04      | 0-360          | 150         | V        |

**8.1.1. GSM 1900**

**GPRS MODE**

|                |                         |
|----------------|-------------------------|
| Company:       | Samsung                 |
| Project #:     | 13708019                |
| Date:          | 2/17/2021               |
| Test Engineer: | 43575                   |
| Configuration: | EUT + Support Equipment |
| Mode:          | GPRS 1900               |
| Chamber #:     | Chamber J               |

| Marker   | Frequency (GHz) | Meter Reading (dBuV) | Det | AF PRE0100034 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Tx WWAN Limit | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|----------|-----------------|----------------------|-----|----------------------|--------------|---------|-------------------------|---------------|-------------|----------------|-------------|----------|
| 1880 MHz |                 |                      |     |                      |              |         |                         |               |             |                |             |          |
| 1        | 3.75984         | 41.58                | Pk  | 33.7                 | -32.9        | -95.2   | -52.82                  | -13           | -39.82      | 0-360          | 149         | H        |
| 2        | 5.63622         | 38.13                | Pk  | 34.9                 | -30.2        | -95.2   | -52.37                  | -13           | -39.37      | 0-360          | 149         | H        |
| 3        | 7.41591         | 35.75                | Pk  | 35.9                 | -27.3        | -95.2   | -50.85                  | -13           | -37.85      | 0-360          | 149         | H        |
| 4        | 3.75984         | 42.33                | Pk  | 33.7                 | -32.9        | -95.2   | -52.07                  | -13           | -39.07      | 0-360          | 149         | V        |
| 5        | 5.7005          | 37.33                | Pk  | 35.2                 | -30          | -95.2   | -52.67                  | -13           | -39.67      | 0-360          | 149         | V        |
| 6        | 7.52428         | 35.51                | Pk  | 35.9                 | -27.3        | -95.2   | -51.09                  | -13           | -38.09      | 0-360          | 149         | V        |

**8.1.1. WCDMA BAND 5**

**REL 99 MODE**

|                |                         |
|----------------|-------------------------|
| Company:       | Samsung                 |
| Project #:     | 13708019                |
| Date:          | 2/17/2021               |
| Test Engineer: | 43575                   |
| Configuration: | EUT + Support Equipment |
| Mode:          | REL 99 Band 5           |
| Chamber #:     | Chamber J               |

| Marker    | Frequency (GHz) | Meter Reading (dBuV) | Det | AF PRE0100034 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Tx WWAN Limit | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------|-----------------|----------------------|-----|----------------------|--------------|---------|-------------------------|---------------|-------------|----------------|-------------|----------|
| 836.6 MHz |                 |                      |     |                      |              |         |                         |               |             |                |             |          |
| 1         | 1.67522         | 45.48                | Pk  | 28.8                 | -35.6        | -95.2   | -56.52                  | -13           | -43.52      | 0-360          | 150         | H        |
| 3         | 2.53425         | 41.7                 | Pk  | 32.7                 | -35.1        | -95.2   | -55.9                   | -13           | -42.9       | 0-360          | 150         | H        |
| 5         | 3.33538         | 41.27                | Pk  | 33                   | -34.2        | -95.2   | -55.13                  | -13           | -42.13      | 0-360          | 150         | H        |
| 2         | 1.69275         | 41.68                | Pk  | 29                   | -35.6        | -95.2   | -60.12                  | -13           | -47.12      | 0-360          | 150         | V        |
| 4         | 2.52841         | 40.96                | Pk  | 32.8                 | -35.1        | -95.2   | -56.54                  | -13           | -43.54      | 0-360          | 150         | V        |
| 6         | 3.34016         | 41                   | Pk  | 33                   | -34.2        | -95.2   | -55.4                   | -13           | -42.4       | 0-360          | 150         | V        |

**8.1.2. LTE BAND 5**

**QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)**

|                |                         |
|----------------|-------------------------|
| Company:       | Samsung                 |
| Project #:     | 13708019                |
| Date:          | 2/17/2021               |
| Test Engineer: | 43575                   |
| Configuration: | EUT + Support Equipment |
| Mode           | LTE 5 QPSK 10MHz        |
| Chamber #:     | Chamber J               |

| Marker    | Frequency (GHz) | Meter Reading (dBuV) | Det | AF PRE0100034 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Tx WWAN Limit | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------|-----------------|----------------------|-----|----------------------|--------------|---------|-------------------------|---------------|-------------|----------------|-------------|----------|
| 836.5 MHz |                 |                      |     |                      |              |         |                         |               |             |                |             |          |
| 1         | 1.66353         | 52.65                | Pk  | 28.7                 | -35.6        | -95.2   | -49.45                  | -13           | -36.45      | 0-360          | 150         | H        |
| 3         | 2.496           | 43.69                | Pk  | 32.5                 | -35.2        | -95.2   | -54.21                  | -13           | -41.21      | 0-360          | 150         | H        |
| 5         | 3.34653         | 40.39                | Pk  | 33                   | -34.1        | -95.2   | -55.91                  | -13           | -42.91      | 0-360          | 150         | H        |
| 2         | 1.66353         | 48.43                | Pk  | 28.7                 | -35.6        | -95.2   | -53.67                  | -13           | -40.67      | 0-360          | 150         | V        |
| 4         | 2.496           | 41.52                | Pk  | 32.5                 | -35.2        | -95.2   | -56.38                  | -13           | -43.38      | 0-360          | 150         | V        |
| 6         | 3.34706         | 40.93                | Pk  | 33                   | -34.1        | -95.2   | -55.37                  | -13           | -42.37      | 0-360          | 150         | V        |

**8.1.1. LTE BAND 41**

**QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)**

|                |                         |
|----------------|-------------------------|
| Company:       | Samsung                 |
| Project #:     | 13708019                |
| Date:          | 2/17/2021               |
| Test Engineer: | 43575                   |
| Configuration: | EUT + Support Equipment |
| Mode           | LTE 41 QPSK 20MHz       |
| Chamber #:     | Chamber J               |

| Marker   | Frequency (GHz) | Meter Reading (dBuV) | Det | AF PRE0100034 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Tx WWAN Limit | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|----------|-----------------|----------------------|-----|----------------------|--------------|---------|-------------------------|---------------|-------------|----------------|-------------|----------|
| 2593 MHz |                 |                      |     |                      |              |         |                         |               |             |                |             |          |
| 1        | 5.16819         | 49.16                | Pk  | 34.4                 | -30.6        | -95.2   | -42.24                  | -25           | -17.24      | 0-360          | 150         | H        |
| 2        | 7.80372         | 35.15                | Pk  | 36                   | -27          | -95.2   | -51.05                  | -25           | -26.05      | 0-360          | 150         | H        |
| 3        | 10.43978        | 34.21                | Pk  | 37.8                 | -24.7        | -95.2   | -47.89                  | -25           | -22.89      | 0-360          | 150         | H        |
| 4        | 5.16766         | 46.09                | Pk  | 34.4                 | -30.6        | -95.2   | -45.31                  | -25           | -20.31      | 0-360          | 150         | V        |
| 5        | 7.75192         | 35.39                | Pk  | 36.1                 | -27.1        | -95.2   | -50.81                  | -25           | -25.81      | 0-360          | 150         | V        |
| 6        | 10.33672        | 34.96                | Pk  | 37.7                 | -24.8        | -95.2   | -47.34                  | -25           | -22.34      | 0-360          | 150         | V        |