

## FCC Part 22 Compliance Test Report

|   |   |                                   |   |
|---|---|-----------------------------------|---|
| <b>Test Report no.:</b>                                 | Bej_FCC_0913_11.doc   | <b>Date of Report:</b>            | 26-Mar-2009   |
| <b>Number of pages:</b>                                 | 10  | <b>Customer's Contact person:</b> | Sun Michael   |
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| <b>FCC listing no.:</b>                                 | 975940  |                                   |   |
| <b>IC recognition no.:</b>                              | 661AH-1   |                                   |   |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-513 HWID0404/ Battery BL-5C, AC-charger AC-3E, Headset HS-105</b>   |                                   |   |
| <b>FCC ID:</b>  | QTLRM-513   | <b>IC:</b>                        | 661AB-RM513   |
| <b>Supplement reports:</b>                              | -   |                                   |   |
| <b>Testing has been carried out in accordance with:</b> | CFR 47, FCC rules Part 22, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007) and RSS-132 (Issue 2, September 2005). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit". |                                   |   |
| <b>Documentation:</b>                                   | The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.                        |                                   |   |
| <b>Test Results:</b>                                    | <b>The EUT complies with the requirements in respect of all parameters subject to the test.</b><br>The test results relate only to devices specified in this document.  |                                   |   |
| <b>Date and signature for the contents:</b>             |   |                                   |   |

**Yin Hongpeng, Engineer**

## 1. Summary for FCC Part 22 Compliance Test Report

|                                      |   |
|--------------------------------------|---|
| <b>Date of receipt</b>               | 23-Mar-2009   |
| <b>Testing completed</b>             | 26-Mar-2009   |
| <b>The customer's contact person</b> | Sun Michael   |
| <b>Test Plan referred to</b>         | T:\Projects\RM-513\TestPlan_RS\RS_testplan_RM-513_CR_HW0404.xls |
| <b>Notes</b>                         | -   |
| <b>Document name</b>                 | T:\Projects\RM-513\EMC\Results\FCC\Bej_FCC_0913_11.doc          |

### 1.1. EUT and Accessory Information

The EUT is a 2-band (GSM850/1900) mobile phone with GPRS and Bluetooth. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

| Product    | Type   | SN                          | HW   | MV | SW                 | DUT   |
|------------|--------|-----------------------------|------|----|--------------------|-------|
| Phone      | RM-513 | 001004/00/352793/5          | 0404 | -  | pol07w41_09<br>w03 | 50944 |
| Battery    | BL-5C  | 0670400382066P24304CV30834  | -    | -  | -                  | 50950 |
| AC-charger | AC-3E  | 4419298322052130874;0675370 | -    | -  | -                  | 51101 |
| Headset    | HS-105 | 069428783601R49377          | -    | -  | -                  | 51115 |

### 1.2. Summary of Test Results

#### GSM 850:

| Section in CFR 47     | Section in RSS-GEN or RSS-132 | Name of the test                           | Result |
|-----------------------|-------------------------------|--|--------|
| §2.1046(a), 22.913(a) | 4.4                           | Conducted RF output power                  | NP     |
| §22.913(a)            | 4.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)            | 4.6.1                         | 99 % occupied bandwidth                    | NP     |
| §22.917(a)            | 4.5                           | Band edge compliance                       | PASSED |
| §22.917(a), §2.1051   | 4.5                           | Spurious emissions at antenna terminals    | NP     |
| §22.917(a), §2.1053   | 4.5                           | Spurious radiated emissions                | PASSED |
| §2.1055(a)            | 4.3                           | Frequency stability, temperature variation | NP     |
| §2.1055(d)            | 4.3                           | Frequency stability, voltage variation     | NP     |

PASSED

The EUT complies with the essential requirements in the standard.

FAILED

The EUT does not comply with the essential requirements in the standard.

NP

The test was not performed by the TCC Nokia Beijing Laboratory.

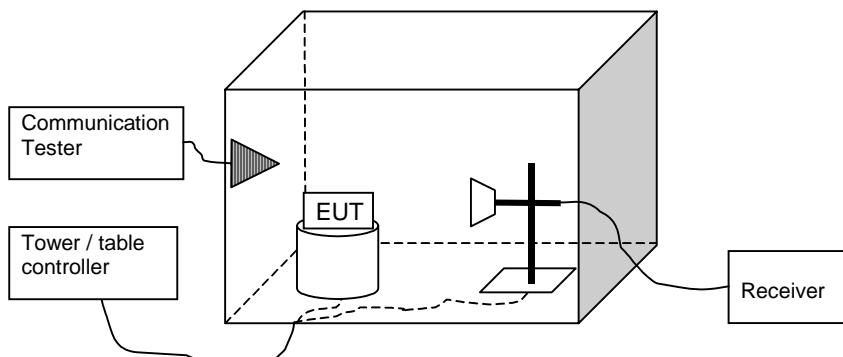
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## 2. Radiated RF output power (FCC §22.913(a), RSS-132 4.4)

|  |                  |
|--|------------------|
| <b>EUT with DUT number</b>                             | RM-513, DUT50944 |
| <b>Accessories with DUT numbers</b>                    | BL-5C, DUT50950  |
| <b>Operation Voltage [V] / [Hz]</b>                    | Nominal          |
| <b>Result</b>  | PASSED           |
| <b>Remarks</b>   | -                |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 19 / 50 / 101    |
| <b>Date of measurements</b>                            | 25-Mar-2009      |
| <b>Measured by</b>                                     | Yin Hongpeng     |

### 2.1. Test setup



### 2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

The substitution method is used. Substitution values at each frequencies are measured beforehand and saved to the test software.

The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$$

Where  $A_{SUBST}$  is the final substitution correction including receive antenna gain.  $P_{SUBST\_TX}$  is signal generator level,  $P_{SUBST\_RX}$  is receiver level,  $L_{SUBST\_CABLES}$  is cable losses including both TX and RX cables and  $G_{SUBST\_TX\_ANT}$  is substitution antenna gain.

The measurement results are obtained as described below:

$$P [dBm] = P_{MEAS} + A_{TOT}$$

Where  $P_{MEAS}$  is receiver reading in dBm and  $A_{TOT}$  is total correction factor including cable loss and substitution correction ( $A_{TOT} = L_{CABLES} + A_{SUBST}$ ).

Limits for radiated RF output power measurements

| Frequency range [MHz] | Limit [W] | Limit [dBm] |
|-----------------------|-----------|-------------|
| 824 - 849             | 7         | 38.5        |

### 2.3. GSM 850 Test results

GSM mode

| Channel / f <sub>c</sub> [MHz] | ERP [dBm] | ERP [W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|--------------------------------|-----------|---------|-------------------------|-----------------------|--------------|--------|
| 128 / 824.2                    | 29.30     | 0.851   | -5.30                   | 34.60                 | VERTICAL     | PASSED |
| 190 / 836.6                    | 29.90     | 0.977   | -3.50                   | 33.40                 | VERTICAL     | PASSED |
| 251 / 848.8                    | 30.00     | 1.000   | -3.60                   | 33.60                 | VERTICAL     | PASSED |

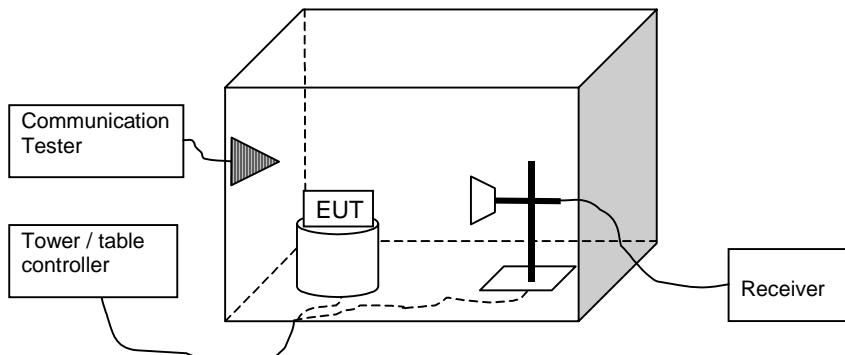
GPRS mode, 2 TX Slots

| Channel / f <sub>c</sub> [MHz] | ERP [dBm] | ERP [W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|--------------------------------|-----------|---------|-------------------------|-----------------------|--------------|--------|
| 128 / 824.2                    | 27.80     | 0.603   | -6.80                   | 34.60                 | VERTICAL     | PASSED |
| 190 / 836.6                    | 28.50     | 0.708   | -4.90                   | 33.40                 | VERTICAL     | PASSED |
| 251 / 848.8                    | 28.60     | 0.724   | -5.00                   | 33.60                 | VERTICAL     | PASSED |

### 3. Band edge compliance (FCC §22.917(a), RSS-132 4.5)

|  |                  |
|--|------------------|
| <b>EUT with DUT number</b>                             | RM-513, DUT50944 |
| <b>Accessories with DUT numbers</b>                    | BL-5C, DUT50950  |
| <b>Operation Voltage [V] / [Hz]</b>                    | Nominal          |
| <b>Result</b>  | PASSED           |
| <b>Remarks</b>   | -                |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 19 / 50 / 101    |
| <b>Date of measurements</b>                            | 25-Mar-2009      |
| <b>Measured by</b>                                     | Yin Hongpeng     |

#### 3.1. Test setup



#### 3.2. Test method and limit

The measurement is made according to FCC rules part 22 and IC standard RSS-132.

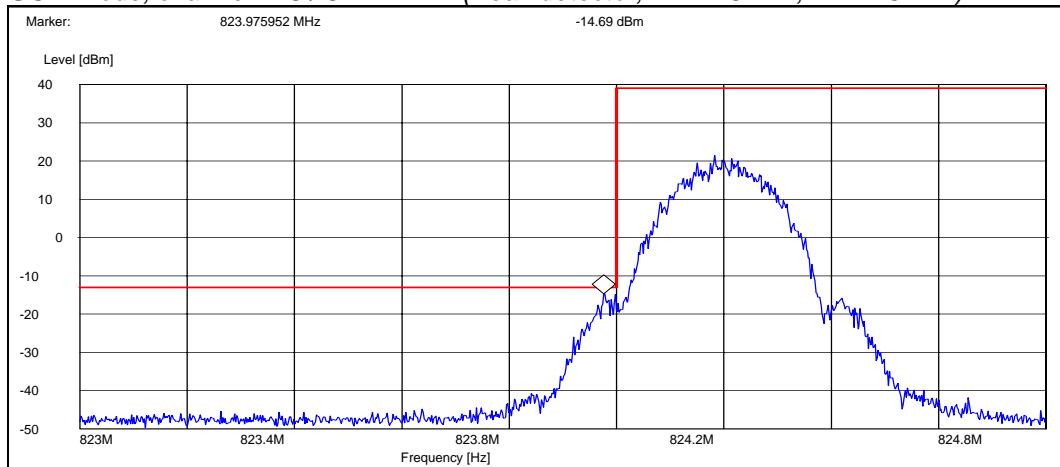
Limits for band edge compliance measurements

| <b>Operation band</b> | <b>Frequency range [MHz]</b> | <b>Limit [dBm]</b> |
|-----------------------|------------------------------|--------------------|
| GSM 850               | Below 824 and above 849      | -13                |

### 3.3. GSM 850 Test results

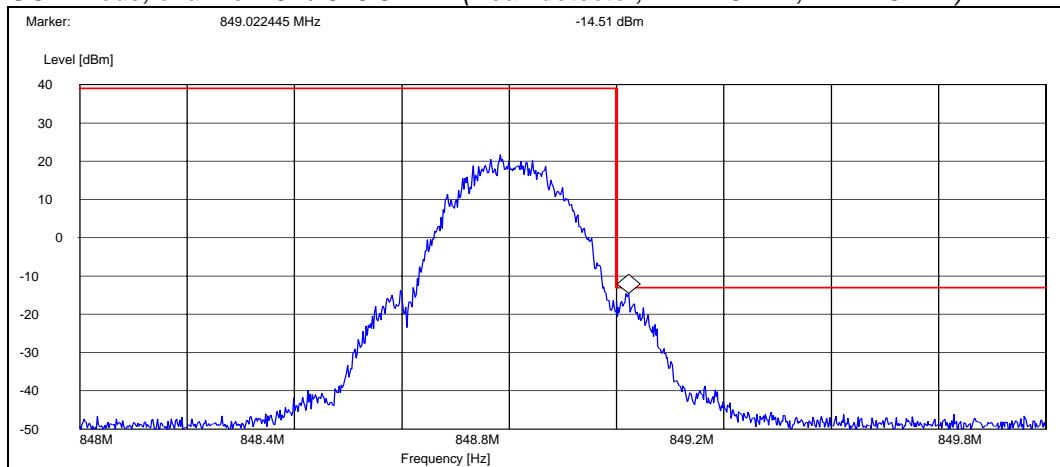
| Operation mode (TX on) | Channel / $f_c$ [MHz] | Level [dBm] |
|------------------------|-----------------------|-------------|
| GSM                    | 128 / 824.2           | -14.70      |
| GSM                    | 251 / 848.8           | -14.50      |

GSM mode, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)



| Operation mode (TX on) | Channel / $f_c$ [MHz] | P [dBm] |
|------------------------|-----------------------|---------|
| GSM                    | 128 / 824.2           | -14.70  |

GSM mode, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz, VBW: 3 kHz)

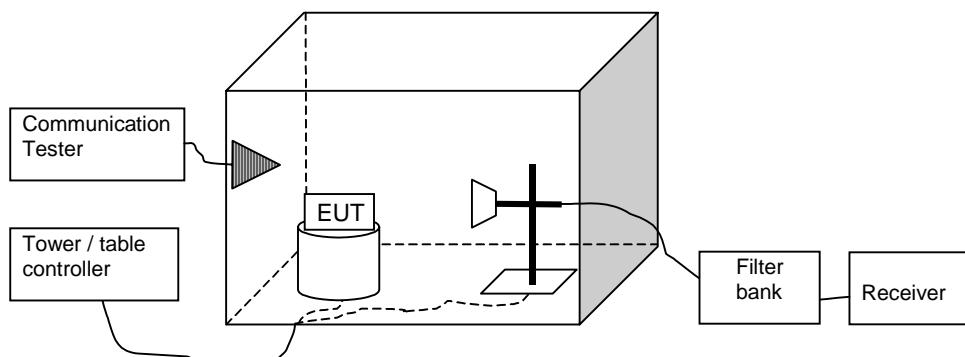


| Operation mode (TX on) | Channel / $f_c$ [MHz] | P [dBm] |
|------------------------|-----------------------|---------|
| GSM                    | 251 / 848.8           | -14.50  |

## 4. Spurious radiated emissions (FCC §22.917(a), §2.1053, RSS-132 4.5)

|  |   |
|--|---|
| <b>EUT with DUT number</b>                             | RM-513, DUT 50944                                     |
| <b>Accessories with DUT numbers</b>                    | BL-5C, DUT 50950; AC-3E, DUT 51101; HS-105, DUT 51115 |
| <b>Operation Voltage [V] / [Hz]</b>                    | Nominal   |
| <b>Result</b>  | PASSED  |
| <b>Remarks</b>   | -   |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 20 / 47 /102  |
| <b>Date of measurements</b>                            | 26-Mar-2009   |
| <b>Measured by</b>                                     | Jia Dongsheng   |

### 4.1. Test setup



### 4.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The substitution method is used. Substitution values at each frequencies are measured beforehand and saved to the test software.

The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$$

Where  $A_{SUBST}$  is the final substitution correction including receive antenna gain.  $P_{SUBST\_TX}$  is signal generator level,  $P_{SUBST\_RX}$  is receiver level,  $L_{SUBST\_CABLES}$  is cable losses including both TX and RX cables and  $G_{SUBST\_TX\_ANT}$  is substitution antenna gain.

The measurement results are obtained as described below:

$$P [dBm] = P_{MEAS} + A_{TOT}$$

Where  $P_{MEAS}$  is receiver reading in dBm and  $A_{TOT}$  is total correction factor including cable loss, preamplifier gain and substitution correction ( $A_{TOT} = L_{CABLES} - G_{PREAMP} + A_{SUBST}$ ).

Limits for spurious radiated emissions measurements

| Operation band | Frequency range [MHz] | Limit [dBm] |
|----------------|-----------------------|-------------|
| GSM 850        | 30 - 8500             | -13         |

#### 4.3. GSM 850 Test results

GSM mode, channel 190 / 836.6 MHz

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|--------|
| 1673.348697     | -47.70  | 0.01698      | -52.00                  | 4.30                  | VERTICAL     | PASSED |
| 1683.170341     | -59.30  | 0.00117      | -64.10                  | 4.80                  | HORIZONTAL   | PASSED |
| 2500.998998     | -52.90  | 0.00513      | -64.00                  | 11.10                 | VERTICAL     | PASSED |
| 2509.820641     | -49.40  | 0.01148      | -60.80                  | 11.40                 | HORIZONTAL   | PASSED |
| 3346.697395     | -43.90  | 0.04074      | -51.20                  | 7.30                  | VERTICAL     | PASSED |

## 5. Test Equipment

### 5.1. Conducted measurements

| Eq. No     | Equipment                  | Type       | Manufacturer            | Used in            |
|------------|----------------------------|------------|-------------------------|--------------------|
| BJPCPT0073 | SIGNAL GENERATOR           | SMR 20     | Rohde&Schwarz           | 22/24/27, 15C, 15B |
| BJPCTC0055 | RADIO COMMUNICATION TESTER | CMU200     | Rohde&Schwarz           | 22/24/27, 15C, 15B |
| BJPCPT0039 | LISN                       | ESH3-Z5    | Rohde&Schwarz           | 15C, 15B           |
| BJPCPT0040 | TEST RECEIVER              | ESCS30     | Rohde&Schwarz           | 15C, 15B           |
| BJPCPT0069 | LISN                       | ESH3-Z5    | Rohde&Schwarz           | 15C, 15B           |
| BJPCPT0079 | LISN                       | ESH3-Z5    | Rohde&Schwarz           | 15C, 15B           |
| BJPCPT0191 | PULSE LIMITER              | ESH3-Z2    | Rohde&Schwarz           | 15C, 15B           |
| BJPCPT0131 | RADIO COMMUNICATION TESTER | CMU200     | ROHDE&SCHWARZ           | 15C, 15B           |
| BJPCTC0089 | Temperature Test chamber   | VT4002     | Vötsch Industrietechnik | 22/24/27, 15C      |
| BJPCTC0090 | FSP spectrum analyzer      | FSP30      | R&S                     | 22/24/27, 15C      |
| BJPCTC0067 | BLUETOOTH TESTER           | CBT        | R&S                     | 22/24/27, 15C      |
| BJPCHW0020 | Dc Power supply            | Hp6632B    | HP                      | 22/24/27, 15C      |
| BJPCTC0094 | GPIO-RS232 convertor       | GPIO-RS232 | National Instruments    | 22/24/27, 15C      |

### 5.2. Radiated measurements

| Eq. No     | Equipment                                  | Type                              | Manufacturer           | Used in            |
|------------|--|-----------------------------------|------------------------|--------------------|
| BJPCPT0129 | Relay Unit                                 | TS-RSP                            | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCPT0130 | Relay Unit                                 | TS-RSP                            | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCPT0080 | Device Controller                          | EMCO2090                          | ETS-EMCO               | 22/24/27, 15C, 15B |
| BJPCTC0048 | RF Preamplifier 10MHz-3GHz (Metal chassis) | AFS4-00100300-10-10P-4            | MITEQ                  | 22/24/27, 15C, 15B |
| BJPCTC0007 | Ultra Broadband Antenna 30MHz-3000MHz      | HL562                             | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCPT0162 | Horn Antenna 1GHz-18GHz                    | HF906                             | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCTC0029 | Horn Antenna 1GHz-18GHz                    | HF906                             | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCTC0049 | RF preamplifier 3GHz-18GHz                 | BLMA-0118-1A-BT                   | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCTC0072 | 3m anechoic chamber                        | -                                 | ETS-Lindgren           | 22/24/27, 15C, 15B |
| BJPCTC0075 | Turntable                                  | Model 2088                        | ETS-EMCO               | 22/24/27, 15C, 15B |
| BJPCPT0072 | EMI Test Receiver 20Hz-26.5GHz             | ESIB26                            | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCTC0150 | High Pass filter                           | WHKS 1200-10SS                    | Wainwright Instruments | 22/24/27, 15C, 15B |
| BJPCTC0034 | Notch Filter                               | WRCT800/880-0.2/40-5SSK           | Wainwright Instruments | 22, 15B            |
| BJPCPT0151 | Notch Filter                               | WRCD1800/2000-0.2/40-5SSK         | Wainwright Instruments | 24, 15B            |
| BJPCTC0017 | Radio Communication Tester                 | CMU200                            | Rohde&Schwarz          | 22/24/27, 15C, 15B |
| BJPCTC0154 | Filter                                     | WRCT2402/2480-2400/2483.5-30-20SS | Wainwright Instruments | 15C, 15B           |
| BJPCTC0058 | Bluetooth tester                           | CBT                               | Rohde&Schwarz          | 15C, 15B           |
| BJPCTC0064 | WCDMA II FILTER                            | WRCG1877/1883-1870/1890-40/6SS    | Wainwright Instruments | 24, 15B            |
| BJPCTC0065 | WCDMA V FILTER                             | WRCG832/838-825/845-40/5SS        | Wainwright Instruments | 22, 15B            |
| BJPCTC0066 | ANTENNA                                    | SBA9113                           | SWARZBECK              | 22/24/27           |
| BJPCTC0096 | RF Preamplifier 100MHz-3GHz                | AFS4-00100300-20-23P-6            | MITEQ                  | 22/24/27, 15C, 15B |