



Go/No Go Test Script Specification, Electrical

Applicable for: W830 and W850

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1 General

1.1 About This Document

This document contains the test requirements for a 3G GSM (900/1800/1900) and UMTS (2100) pocket transceiver using an antenna coupler (Radiated) or RF cable (Conducted) connection. These test sequences should be used as an arrival and verification test of radio functionality.

Tests are done in signaling mode, i.e. a call has been established to the test instrument. The test instrument controls the transceiver unit. RF performance is measured with an antenna coupler or the direct line connection, whichever method is selected.

1.2 Script Requirements

- The test should be designed so those users with little or no system expertise can perform accurate testing.
- The measurements should run automatically, though a certain amount of manual work is included (and mandatory), such as MS call setup (i.e. dialling number).
- It should be possible to print or store the measurement results.
- It should be possible to change the channels used in testing due to possible local radio interference. The ranges for these settings are specified under the *Channel Allocation Table*.
- All functions and settings should be protected in such a manner that the end-user cannot directly change them. (For example, a password or encrypted settings file.)
- The attenuation factors that should be used are stated in section 4. The test instrument must be capable of using different attenuation factors for RX and TX. It must also be possible to use various attenuation factors for different channels in each band.

NOTE! Any setups other than the one stated in this document must be discussed and exempted by Sony Ericsson to be approved.

1.3 Traffic Channel (TCH) Allocation Table

| Band | Ch definition | Any ARFCN of: |
|------------|---------------|---------------|
| GSM 900 | Low | 975-979 |
| GSM 900 | Mid | 36-40 |
| GSM 900 | High | 120-124 |
| | | |
| GSM 1800 | Low | 512-516 |
| GSM 1800 | Mid | 697-701 |
| GSM 1800 | High | 881-885 |
| | | |
| GSM 1900 | Low | 512-516 |
| GSM 1900 | Mid | 658-662 |
| GSM 1900 | High | 806-810 |
| | | |
| WCDMA 2100 | Low | 9612 |
| WCDMA 2100 | Mid | 9750 |
| WCDMA 2100 | High | 9888 |

1.4 Power Level Allocation Table

| Band | PL definition | Power level (PL) |
|---------------|---------------|------------------|
| GSM 900 | Lowest | 19 |
| GSM 900 | Mid | 12 |
| GSM 900 | Highest | 5 |
| | | |
| GSM 1800/1900 | Lowest | 15 |
| GSM 1800/1900 | Mid | 8 |
| GSM 1800/1900 | Highest | 0 |

1.5 Test Limits

The test limits for each measurement are specified in the Sequence Tables.

1. Since a coupler introduces higher measurement inaccuracy, some measurements in the radiated test sequences may have wider limits than stated in the 3GPP specifications.
2. The conducted limits conform to the phase 3GPP specification.

1.6 Attenuation Factors

The different scripts must be configured with the correct attenuation factors and named after the product that they are designed to test. The attenuation factors to be used are stated in section 4.

2 Test Sequence - Radiated

2.1 Initializing and Call Setup

| Parameter | Value | Unit |
|-----------------|----------|------|
| BCCH | Mid | Ch |
| TCH | Mid | Ch |
| TX power level | High | PL |
| RF output power | -40 | dBm |
| System | GSM 1800 | |



2.1.1 Sequence

1. Initialize instrument
2. Insert a test-USIM and attach a fully charged standard battery to the mobile. It's very important that a fully charged battery is used otherwise there is a high risk for incorrect test results.
3. Position the mobile in the coupler according to the picture.



Rohde & Schwarz Shield Box and Coupler

4. Turn on the mobile and wait for registration.
5. Set up a call to the instrument or let the instrument call the MS.
6. Close the lid on the shielding box.

2.2 Audio Loopback

1. Set power level to high.
2. Activate audio loopback in the instrument.
3. Operator must acknowledge passed or failed before the test is continued.

2.3 GSM 1800 Low TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Low | Ch |
| TX power level | High | PL |
| RF output power | -68 | dBm |
| System | GSM 1800 | |

2.3.1 GSM 1800 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|-------|
| TX power | 30 +/-4 | dB |
| RMS Phase Error | 0 +/-5 | deg |
| Rx Level | 34-50 | dB |
| RX Quality | 0-3 | Units |

2.4 GSM 1800 Mid TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Mid | Ch |
| TX power level | Mid | PL |
| RF output power | -102 | dBm |
| System | GSM 1800 | |

2.4.1 GSM 1800 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|------------------|-------------|-------|
| TX power | 14 +/-5 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Peak Phase error | 0 +/-20 | deg |
| Freq. error | +/-0.1 ppm | Hz |
| Rx Level | 2-14 | dB |
| Rx Quality | 0-3 | Units |

2.5 GSM 1800 High TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | High | Ch |
| TX power level | Low | PL |
| RF output power | -68 | dBm |
| System | GSM 1800 | |

2.5.1 GSM 1800 High TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|------|
| TX power | 0 +/-7 | dB |
| RMS Phase error | 0 +/-5 | deg |

2.6 GSM 900 Low TCH Measurements

| Parameter | Value | Unit |
|-----------------|---------|------|
| TCH | Low | Ch |
| TX power level | High | PL |
| RF output power | -68 | dBm |
| System | GSM 900 | |

2.6.1 GSM 900 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|-------|
| TX power | 33 +/-4 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Rx Level | 34-50 | dB |
| Rx Quality | 0-3 | Units |

2.7 GSM 900 Mid TCH Measurements

| Parameter | Value | Unit |
|-----------------|---------|------|
| TCH | Mid | Ch |
| TX power level | Mid | PL |
| RF output power | -102 | dBm |
| System | GSM 900 | |

2.7.1 GSM 900 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|------------------|-------------|-------|
| TX power | 19 +/-5 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Peak Phase error | 0 +/-20 | deg |
| Freq error | +/-0.1 ppm | Hz |
| Rx Level | 2-14 | dB |
| Rx Quality | 0-3 | Units |

2.8 GSM 900 High TCH Measurements

| Parameter | Value | Unit |
|-----------------|---------|------|
| TCH | High | Ch |
| TX power level | Low | PL |
| RF output power | -68 | dBm |
| System | GSM 900 | |

2.8.1 GSM 900 High TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|------|
| TX power | 5 +/-7 | dB |
| RMS Phase error | 0 +/-5 | deg |

2.9 GSM 1900 Low TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Low | Ch |
| TX power level | Low | PL |
| RF output power | -68 | dBm |
| System | GSM 1900 | |

2.9.1 GSM 1900 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|-------|
| TX power | 0 +/-7 | dB |
| RMS Phase Error | 0 +/-5 | deg |
| Rx Level | 34-50 | dB |
| RX Quality | 0-3 | Units |

2.10 GSM 1900 Mid TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Mid | Ch |
| TX power level | Mid | PL |
| RF output power | -102 | dBm |
| System | GSM 1900 | |

2.10.1 GSM 1900 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|------------------|-------------|-------|
| TX power | 14 +/-5 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Peak Phase error | 0 +/-20 | deg |
| Freq. error | +/-0.1 ppm | Hz |
| Rx Level | 2-14 | dB |
| Rx Quality | 0-3 | Units |

2.11 GSM 1900 High TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | High | Ch |
| TX power level | High | PL |
| RF output power | -68 | dBm |
| System | GSM 1900 | |

2.11.1 GSM 1900 High TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|------|
| TX power | 30 +/-4 | dB |
| RMS Phase error | 0 +/-5 | deg |

2.12 UMTS 2100 Low TCH Measurements (W850 only)

| Parameter | Value | Unit |
|-------------|---------|---------|
| TCH | Low | Channel |
| Power Level | Maximum | dBm |
| RF out | -93 | dBm |

2.12.1 UMTS 2100 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|---|-------------|------|
| Tx Maximum Output Power | 19 to 27 | dBm |
| EVM | 17.5 max | % |
| Frequency Error | -0.1 to 0.1 | ppm |
| Tx Adjacent Channel Level Ratio +/- 5MHz | -36 | dBc |
| Tx Adjacent Channel Level Ratio +/- 10MHz | -46 | dBc |

2.13 UMTS 2100 Mid TCH Measurements (W850 only)

| Parameter | Value | Unit |
|-------------|--------------|---------|
| TCH | Mid | Channel |
| Power Level | Maximum | dBm |
| RF out | -93 (* -104) | dBm |

2.13.1 UMTS 2100 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|--|-------------|------|
| Tx Maximum Output Power | 19 to 27 | dBm |
| EVM | 17.5 max | % |
| Frequency Error | -0.1 to 0.1 | ppm |
| Tx Adjacent Channel Level Ratio +/- 5MHz | -36 | dBc |
| Tx Adjacent Channel Level Ratio +/- 10MHz | -46 | dBc |
| Rx Reference Sensitivity Level* (RF out: -104) | -0.1 to 0.1 | % |

2.14 UMTS 2100 High TCH Measurements (W850 only)

| Parameter | Value | Unit |
|-------------|---------|---------|
| TCH | High | Channel |
| Power Level | Maximum | dBm |
| RF out | -93 | dBm |

2.14.1 UMTS 2100 High TCH Test Limits

| Measurement | Test Limits | Unit |
|---|-------------|--------|
| Tx Maximum Output Power | 19 to 27 | dBm |
| EVM | 17.5 max | % |
| Frequency Error | -0.1 to 0.1 | degree |
| Tx Adjacent Channel Level Ratio +/- 5MHz | -36 | dBc |
| Tx Adjacent Channel Level Ratio +/- 10MHz | -46 | dBc |

2.14.2 Call Disconnect Sequence

1. Disconnect call.
2. End test.



3 Test Sequence - Conducted

3.1 Initializing and Call Setup

| Parameter | Value | Unit |
|-----------------|----------|------|
| BCCH | Mid | Ch |
| TCH | Mid | Ch |
| TX power level | High | PL |
| RF output power | -40 | dBm |
| System | GSM 1800 | |

3.1.1 Sequence

1. Initialize instrument
2. Insert a test-USIM and attach a fully charged standard battery to the mobile. It's very important that a fully charged battery is used otherwise there is a high risk for incorrect test results. A dummy battery can also be used.
3. Connect the mobile to the RF fixture according to the picture.



4. Turn on the mobile and wait for registration.
5. Set up a call to the instrument or let the instrument call the MS.

3.2 Audio Loopback

1. Set power level to high.
2. Activate audio loopback in the instrument.
3. Operator must acknowledge passed or failed before the test is continued.

3.3 GSM 1800 Low TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Low | Ch |
| TX power level | High | PL |
| RF output power | -68 | dBm |
| System | GSM 1800 | |

3.3.1 GSM 1800 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|-------|
| TX power | 30 +/-2 | dB |
| RMS Phase Error | 0 +/-5 | deg |
| Rx Level | 36-48 | dB |
| RX Quality | 0-3 | Units |

3.4 GSM 1800 Mid TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Mid | Ch |
| TX power level | Mid | PL |
| RF output power | -102 | dBm |
| System | GSM 1800 | |

3.4.1 GSM 1800 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|------------------|-------------|-------|
| TX power | 14 +/-3 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Peak Phase error | 0 +/-20 | deg |
| Freq. error | +/-0.1 ppm | Hz |
| Rx Level | 4-12 | dB |
| Rx Quality | 0-3 | Units |

3.5 GSM 1800 High TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | High | Ch |
| TX power level | Low | PL |
| RF output power | -68 | dBm |
| System | GSM 1800 | |

3.5.1 GSM 1800 High TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|------|
| TX power | 0 +/-5 | dB |
| RMS Phase error | 0 +/-5 | deg |

3.6 GSM 900 Low TCH Measurements

| Parameter | Value | Unit |
|-----------------|---------|------|
| TCH | Low | Ch |
| TX power level | High | PL |
| RF output power | -68 | dBm |
| System | GSM 900 | |

3.6.1 GSM 900 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|-------|
| TX power | 33 +/-2 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Rx Level | 36-48 | dB |
| Rx Quality | 0-3 | Units |

3.7 GSM 900 Mid TCH Measurements

| Parameter | Value | Unit |
|-----------------|---------|------|
| TCH | Mid | Ch |
| TX power level | Mid | PL |
| RF output power | -102 | dBm |
| System | GSM 900 | |

3.7.1 GSM 900 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|------------------|-------------|-------|
| TX power | 19 +/-3 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Peak Phase error | 0 +/-20 | deg |
| Freq error | +/-0.1 ppm | Hz |
| Rx Level | 4-12 | dB |
| Rx Quality | 0-3 | Units |

3.8 GSM 900 High TCH Measurements

| Parameter | Value | Unit |
|-----------------|---------|------|
| TCH | High | Ch |
| TX power level | Low | PL |
| RF output power | -68 | dBm |
| System | GSM 900 | |

3.8.1 GSM 900 High TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|------|
| TX power | 5 +/-5 | dB |
| RMS Phase error | 0 +/-5 | deg |

3.9 GSM 1900 Low TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Low | Ch |
| TX power level | Low | PL |
| RF output power | -68 | dBm |
| System | GSM 1900 | |

3.9.1 GSM 1900 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|-------|
| TX power | 0 +/-5 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Rx Level | 36-48 | dB |
| RX Quality | 0-3 | Units |

3.10 GSM 1900 Mid TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | Mid | Ch |
| TX power level | Mid | PL |
| RF output power | -102 | dBm |
| System | GSM 1900 | |

3.10.1 GSM 1900 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|------------------|-------------|-------|
| TX power | 14 +/-3 | dB |
| RMS Phase error | 0 +/-5 | deg |
| Peak Phase error | 0 +/-20 | deg |
| Freq. error | +/-0.1 ppm | Hz |
| Rx Level | 4-12 | dB |
| Rx Quality | 0-3 | Units |

3.11 GSM 1900 High TCH Measurements

| Parameter | Value | Unit |
|-----------------|----------|------|
| TCH | High | Ch |
| TX power level | High | PL |
| RF output power | -68 | dBm |
| System | GSM 1900 | |

3.11.1 GSM 1900 High TCH Test Limits

| Measurement | Test Limits | Unit |
|-----------------|-------------|------|
| TX power | 30 +/-2 | dB |
| RMS Phase error | 0 +/-5 | deg |

3.12 UMTS 2100 Low TCH Measurements (W850 only)

| Parameter | Value | Unit |
|-------------|---------|---------|
| TCH | Low | Channel |
| Power Level | Maximum | dBm |
| RF out | -93 | dBm |

3.12.1 UMTS 2100 Low TCH Test Limits

| Measurement | Test Limits | Unit |
|---|-------------|------|
| Tx Maximum Output Power | 21 to 25 | dBm |
| EVM | 17.5 max | % |
| Frequency Error | -0.1 to 0.1 | ppm |
| Tx Adjacent Channel Level Ratio +/- 5MHz | -36 | dBc |
| Tx Adjacent Channel Level Ratio +/- 10MHz | -46 | dBc |

3.13 UMTS 2100 Mid TCH Measurements (W850 only)

| Parameter | Value | Unit |
|-------------|--------------|---------|
| TCH | Mid | Channel |
| Power Level | Maximum | dBm |
| RF out | -93 (* -104) | dBm |

3.13.1 UMTS 2100 Mid TCH Test Limits

| Measurement | Test Limits | Unit |
|--|-------------|------|
| Tx Maximum Output Power | 21 to 25 | dBm |
| EVM | 17.5 max | % |
| Frequency Error | -0.1 to 0.1 | ppm |
| Tx Adjacent Channel Level Ratio +/- 5MHz | -36 | dBc |
| Tx Adjacent Channel Level Ratio +/- 10MHz | -46 | dBc |
| Rx Reference Sensitivity Level* (RF out: -104) | -0.1 to 0.1 | % |

3.14 UMTS 2100 High TCH Measurements (W850 only)

| Parameter | Value | Unit |
|-------------|---------|---------|
| TCH | High | Channel |
| Power Level | Maximum | dBm |
| RF out | -93 | dBm |

3.14.1 UMTS 2100 High TCH Test Limits

| Measurement | Test Limits | Unit |
|---|-------------|--------|
| Tx Maximum Output Power | 21 to 25 | dBm |
| EVM | 17.5 max | % |
| Frequency Error | -0.1 to 0.1 | degree |
| Tx Adjacent Channel Level Ratio +/- 5MHz | -36 | dBc |
| Tx Adjacent Channel Level Ratio +/- 10MHz | -46 | dBc |

3.14.2 Call Disconnect Sequence

1. Disconnect call.
2. End test.

4 Attenuation Factors

4.1 Radiated Loss Values

4.1.1 Using the Rohde & Schwarz RF Shield Box and Coupler for the W850

The following values shall be used when testing the in the Rohde & Schwarz RF shield box (**R&S part # 1150.1008.02**) using the Rohde & Schwarz coupler (**R&S part # 1150.0801.02**) and SEMC RF-cable (**SEMC part # RPM 119 855**). A precision type N Male to SMA Female adapter is required to connect the cable to the RF shield box.

| Band | Channel* | Attenuation | |
|------------|----------|-------------|-------|
| | | RX | TX |
| GSM 900 | Low | 11.30 | 12.46 |
| | Mid | 14.86 | 10.48 |
| | High | 15.58 | 12.10 |
| GSM 1800 | Low | 8.97 | 11.61 |
| | Mid | 8.74 | 10.83 |
| | High | 9.19 | 9.98 |
| GSM 1900 | Low | 11.19 | 8.20 |
| | Mid | 12.74 | 7.74 |
| | High | 14.74 | 9.15 |
| WCDMA 2100 | Low | 12.78 | 11.02 |
| | Mid | 11.72 | 13.21 |
| | High | 12.72 | 14.74 |

4.1.2 Using the Rohde & Schwarz RF Shield Box and Coupler for the W830

The following values shall be used when testing the in the Rohde & Schwarz RF shield box (**R&S part # 1150.1008.02**) using the Rohde & Schwarz coupler (**R&S part # 1150.0801.02**) and SEMC RF-cable (**SEMC part # RPM 119 855**). A precision type N Male to SMA Female adapter is required to connect the cable to the RF shield box.

| Band | Channel* | Attenuation | |
|----------|----------|-------------|-------|
| | | RX | TX |
| GSM 900 | Low | 8.70 | 7.78 |
| | Mid | 9.85 | 6.73 |
| | High | 9.80 | 7.82 |
| GSM 1800 | Low | 13.80 | 15.98 |
| | Mid | 13.55 | 14.35 |
| | High | 11.85 | 14.38 |
| GSM 1900 | Low | 13.80 | 14.05 |
| | Mid | 15.00 | 14.56 |
| | High | 15.65 | 13.73 |

4.2 Conducted Loss Values

4.2.1 Using a Direct Line Connection for the W850

The following values shall be used when testing the Sony Ericsson W850 with a Direct Line connection. The Direct Line connection shall consist of a SEMC RF-cable (**SEMC part # RPM 119 855**), RF Probe (**SEMC part # RNT 403 303/001**) and RF Fixture (**SEMC part # NTZ 112 565**).

| Band | Channel* | Attenuation | |
|------------|----------|-------------|-----|
| | | RX | TX |
| GSM 900 | ALL | 0.8 | 0.8 |
| GSM 1800 | ALL | 1.3 | 1.3 |
| GSM 1900 | ALL | 1.3 | 1.3 |
| WCDMA 2100 | ALL | 1.5 | 1.5 |

4.2.2 Using a Direct Line Connection for the W830c

The following values shall be used when testing the Sony Ericsson W830c with a Direct Line connection. The Direct Line connection shall consist of a SEMC RF-cable (**SEMC part # RPM 119 855**), RF Probe (**SEMC part # RNT 403 303/001**) and RF Fixture (**SEMC part # NTZ 112 565**).

| Band | Channel* | Attenuation | |
|----------|----------|-------------|-----|
| | | RX | TX |
| GSM 900 | ALL | 0.8 | 0.8 |
| GSM 1800 | ALL | 1.3 | 1.3 |
| GSM 1900 | ALL | 1.3 | 1.3 |

5 Revision history

| Rev. | Date | Changes / Comments |
|------|------------|---------------------------------|
| A | 2006-10-27 | Initial Release |
| B | 2007-01-04 | Added W830 |
| C | 2007-11-05 | Updated the WCDMA test routine. |