



Go/No Go Test Script Specification, Electrical

Applicable for: P990

Contents

1... General	3
1.1 About This Document.....	3
1.2 Script Requirements.....	3
1.3 Traffic Channel (TCH) Allocation Table	4
1.4 Power Level Allocation Table.....	4
1.5 Test Limits.....	4
1.6 Attenuation Factors	4
2... Test Sequence - Radiated.....	5
2.1 Initializing and Call Setup	5
2.2 Audio Loopback	7
2.3 GSM 1800 Low TCH Measurements.....	7
2.4 GSM 1800 Mid TCH Measurements.....	7
2.5 GSM 1800 High TCH Measurements.....	8
2.6 GSM 900 Low TCH Measurements	8
2.7 GSM 900 Mid TCH Measurements.....	9
2.8 GSM 900 High TCH Measurements	9
2.9 GSM 1900 Low TCH Measurements.....	10
2.10 GSM 1900 Mid TCH Measurements.....	10
2.11 GSM 1900 High TCH Measurements.....	11
2.12 UMTS 2100 Low TCH Measurements	11
2.13 UMTS 2100 Mid TCH Measurements	12
2.14 UMTS 2100 High TCH Measurements.....	12
3... Test Sequence - Conducted.....	13
3.1 Initializing and Call Setup	13
3.2 Audio Loopback	14
3.3 GSM 1800 Low TCH Measurements.....	14
3.4 GSM 1800 Mid TCH Measurements.....	14
3.5 GSM 1800 High TCH Measurements.....	15
3.6 GSM 900 Low TCH Measurements	15
3.7 GSM 900 Mid TCH Measurements.....	16
3.8 GSM 900 High TCH Measurements	16
3.9 GSM 1900 Low TCH Measurements.....	17
3.10 GSM 1900 Mid TCH Measurements.....	17
3.11 GSM 1900 High TCH Measurements.....	18
3.12 UMTS 2100 Low TCH Measurements	18
3.13 UMTS 2100 Mid TCH Measurements	19
3.14 UMTS 2100 High TCH Measurements.....	19
4... Attenuation Factors.....	20

4.1	Radiated Loss Values	20
4.2	Conducted Loss Values	21
5...	Revision history	21

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.



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

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

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

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

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

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

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

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	8.09	8.55
	Mid	8.73	5.97
	High	9.22	7.17
GSM 1800	Low	13.87	17.56
	Mid	13.44	13.79
	High	13.80	15.38
GSM 1900	Low	13.94	14.26
	Mid	14.01	13.22
	High	16.01	12.81
WCDMA 2100	Low	22.86	14.10
	Mid	22.93	14.82
	High	23.00	15.59

4.2 Conducted Loss Values

The following values shall be used when testing 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 112 561**).

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

5 Revision history

Rev.	Date	Changes / Comments
A	2006-07-19	Initial Release
B	2007-11-05	Updated the WCDMA test routine.