35 Low battery voltage detection

35.1 Definition and applicability

Low battery or shutdown voltage detection is used to trigger inhibition of all RF transmission before the MS supply voltage reaches a level where effective use of the radio frequency spectrum is no longer guaranteed.

The requirements and this test apply to all types of GSM 900 and DCS 1 800 MS.

35.2 Conformance requirement

1. The MS shall not make ineffective use of the radio frequency spectrum. In no case shall the MS exceed the transmitted levels as defined in GSM 05.05 for extreme operation.
   GSM 05.05, annex D.2.2.

2. The MS shall inhibit all RF transmission when the power supply voltage is below the manufacturer declared approximate shutdown voltage.
   GSM 05.05, annex D.2.2.

35.3 Test purpose

1. To verify that the MS does not make ineffective use of the RF spectrum.

2. To verify that the MS inhibits all RF transmission when the battery voltage falls below the manufacturer declared shutdown level.

35.4 Method of test

35.4.1 Initial conditions

The SS transmits a BCCH with a location updating time set to 0,1 hours.

The SS sends a paging request message to the MS.

The MS responds with a channel request message.

The SS sends an immediate assignment message establishing an SDCCH.

35.4.2 Procedure

a) The SS gradually reduces the power supply voltage until the MS ceases the production of RF output.

   The RF output spectrum shall be monitored for any anomalies while the supply voltage is being reduced.

   NOTE 1: The declared approximate shutdown voltage gives an indication of the voltage where the MS will cease RF output.

   NOTE 2: If any anomalies occur, then additional testing using the transmitter tests at the voltage where the anomaly occurred is performed to determine in an objective manner, whether or not the conformance requirement is met.

c) After 7 minutes, the SS sends a paging message to the MS.

d) The SS observes whether or not the MS produces any RF output.

   This measurement is performed over the relevant transmit band.

The spectrum analyser is set to:
Bandwidth: 3 MHz
Peak Hold

e) The SS modifies the location area of the BCCH.

f) For 7 minutes, the SS observes whether or not the MS produces any RF output.

NOTE 3: It is anticipated that the MS might attempt location updating.

g) The MS is switched off and on.

h) The SS pages the MS.

i) The SS observes whether or not the MS produces any RF output.

35.5 Test requirement

1. In step a) no anomalies shall occur.

2. In step a), the MS shall cease the production of RF output.

3. In steps d), f) and i), the MS shall not produce any RF output above -30 dBm.