

N725

eCall Test Process Specifications

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This document provides guide for users to use N725.

This document is intended for system engineers (SEs), development engineers, and test engineers.

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About This Document

Scope

This document is applicable to the N725 series.




Audience

This document is intended for [system engineers \(SEs\)](#), [development engineers](#), and [test engineers](#).

Change History

Issue	Date	Change	Changed By
1.0	2022-10	Initial draft	Polly Liang

Conventions

Symbol	Indication
	This warning symbol means danger. You are in a situation that could cause fatal device damage or even bodily damage.
	Means reader be careful. In this situation, you might perform an action that could result in module or product damages.
	Means note or tips for readers to use the module

1 Scope

This document details the testing methods and rules that eCall testing should follow.

1.1 Reference Documents

3GPP TS 26.267

1.2 Terminologies and Definitions

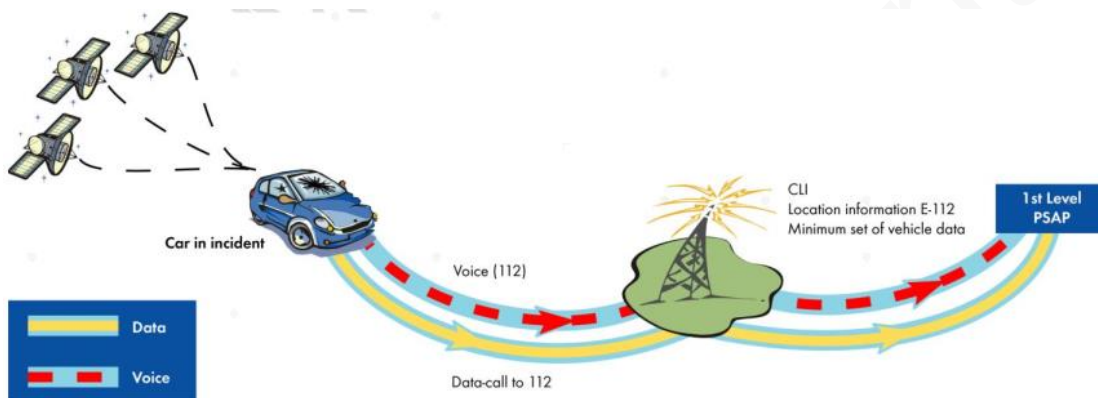
- IVS: In-Vehicle System
- PSAP: Public Safety Answering Point
- MSD: Minimum Set of Data
- An MSD message may contain the following information: longitude and latitude of the accident, information of the accident vehicle, time stamp, trigger reason, and other information required for emergency rescue.
- CS: Circuit Switched

2 Background and Workflow

2.1 Background

Emergency Call (eCall) is used to call the rescue dispatching center when a vehicle encounters an emergency.

Figure 2-1 eCall System Overview



The basic principle of eCall is as follows: In case of an accident, the In-Vehicle System (IVS) automatically dials or a user manually dials the emergency call number (112), and then the IVS sends an MSD message containing the related information of the accident to the call center through the voice channel. The eCall MSD message will be sent immediately after the voice call is established, or at any time later during the voice call.

2.2 Workflow

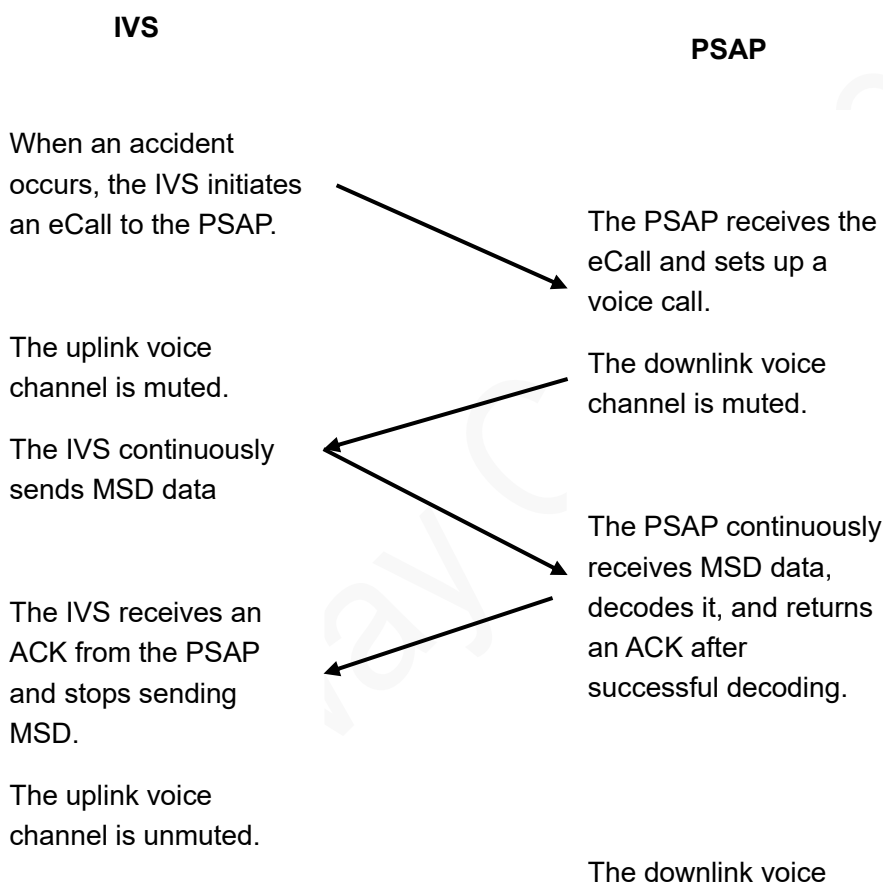
The biggest difference between eCall and an ordinary emergency call is as follows:

- As the eCall is automatically (or manually) initiated, the IVS must have a collision detection device. When the device detects a traffic accident, it immediately initiates an eCall.
- An MSD message will be sent. This message contains the following information: longitude and latitude of the accident, information of the accident vehicle, time stamp, trigger reason, and other information required for emergency rescue.

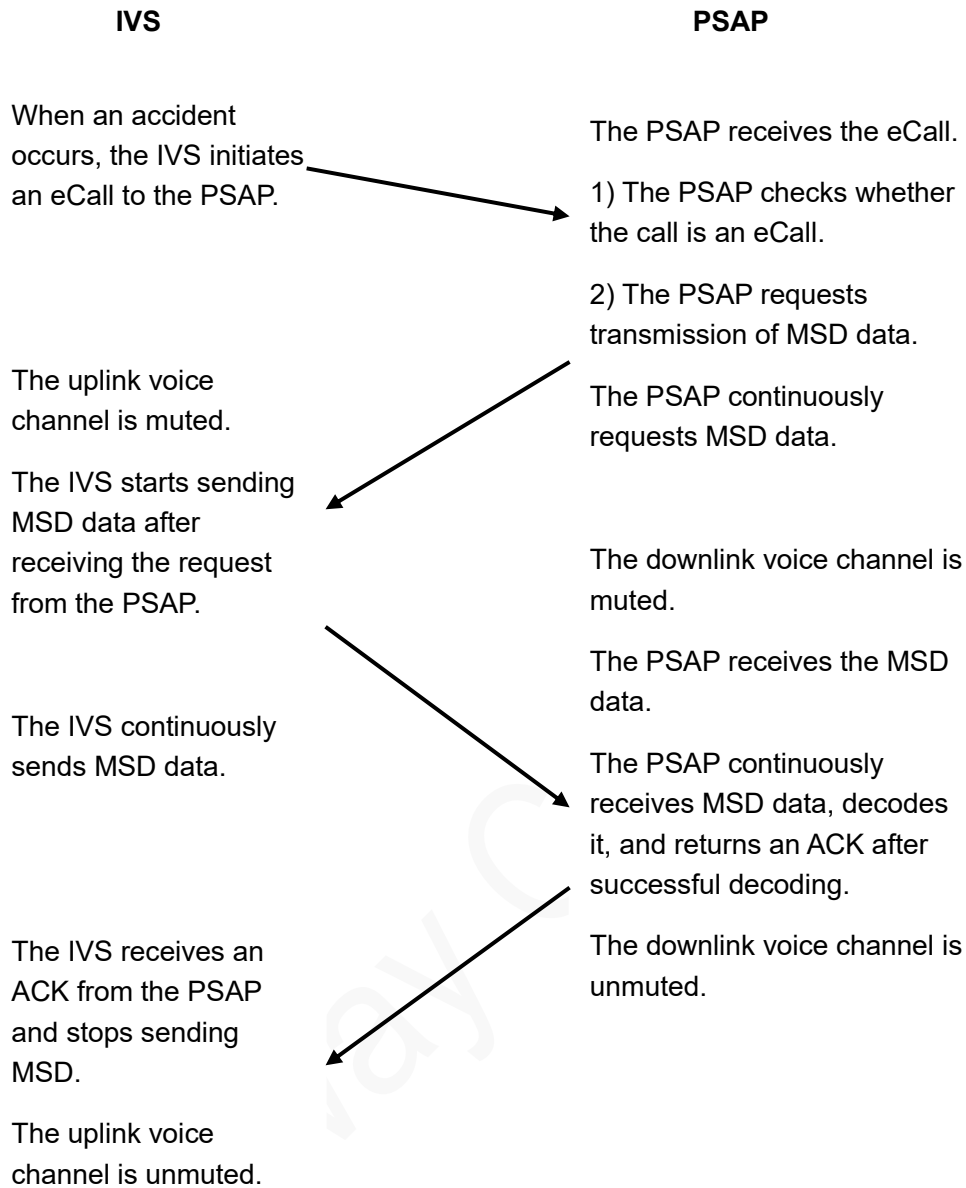
The sending of MSD data has the following characteristics:

- Transmission of the MSD data starts after eCall connection, which is earlier than voice call. That is, the call center establishes a voice call with the vehicle owner after receiving MSD data.
- The call center can request to receive MSD data again during the voice call.
- The voice call is muted during MSD transmission.
- The MSD is transmitted in either of the following modes: Push mode and Pull mode. MSD transmission initiated by the IVS is called Push mode, while that initiated by the PSAP is called Pull mode.

eCall process in Push mode



eCall process in Pull mode



3 Test Standard

3.1 Functional Tests

3.1.1 Manually Triggering an eCall

Test case ID	TC_F_eCall_001
Test case	The module supports manual initiation of an eCall.
Test objective	Check that module supports manual initiation of an eCall.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Switch to the eCall msdcfg option, and configure the MSD information. 4. Switch to the eCall msdgen option, and generate the MSD packet. 5. Switch to the eCall open option, and configure data to manually initiate an eCall. 6. Switch to the eCall open option, and release the eCall.
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. After "Manually initiated eCall" is configured, the system automatically dials 112 to call the PSAP. 6. The call is successfully released, and the call is disconnected at the auxiliary terminal.
Remarks	<ol style="list-style-type: none"> 1. In China, 112 is currently used for alarm calls. The voice prompt (prompt content: call 110 for bandit alarm, 119 for fire alarm, 120 for emergency center, and 122 for traffic fault) is played. After the voice prompt is played twice, the call will be automatically disconnected and will not be answered.

3.1.2 Automatically Triggering an eCall

Test case ID	TC_F_eCall_002
Test case	The module supports auto initiation of an eCall.
Test objective	Check that module supports auto initiation of an eCall.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg 4. Generate the MSD packet as prompted: eCall msdgen 5. Enable the eCall function by selecting eCall open, and configure data to automatically initiate an eCall. 6. Release the eCall call. (eCall open -> release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/#" input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. After "Automatically initiated eCall" is configured, the system automatically dials 112 to call the PSAP. 6. The call is successfully released, and the call is disconnected at the auxiliary terminal.
Remarks	<ol style="list-style-type: none"> 1. In China, 112 is currently used for alarm calls. The voice prompt (prompt content: call 110 for bandit alarm, 119 for fire alarm, 120 for emergency center, and 122 for traffic fault) is played. After the voice prompt is played twice, the call will be automatically disconnected and will not be answered.

3.1.3 Activating the eCall Only Mode

Test case ID	TC_F_eCall_003
Test case	The module can activate the eCall Only mode.
Test objective	Check that module can activate the eCall Only mode and initiate an eCall.
Test attribute	Mandatory

Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The nwy_network_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the network test program: ./nwy_network_test. Obtain the current registration information: Get network information. 3. Open the console again, and run the voice test program: ./nwy_voice_test 4. Configure the MSD information as prompted: eCall msdcfg 5. Generate the MSD packet as prompted: eCall msdgen 6. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and activate the eCall Only mode: Activate. 7. On the console opened in step 2, obtain the registration information again: Get network information. 8. Enable the eCall function by selecting eCall open, and test the eCall. 9. Select the Push mode, and send the MSD data to the PSAP: eCall push. 10. Release the eCall call. (eCall open -> release eCall) 11. On the console opened in step 3, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: Disable. 12. On the console opened in step 2, obtain the registration information again: Get network information.
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# input prompt appears. 2. The current registration information is obtained, and indicates that the module is registered with the network. 3. The system successfully enters the voice test program, and the voice-related test options appear. 4. The configuration is successful. 5. The packet is generated successfully. 6. The eCall Only mode is activated, and the PSAP number is configured. 7. The registration information indicates that the module is not registered with the network. 8. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 9. The MSD data is sent successfully, and the auxiliary terminal receives the MSD data. 10. The call is successfully released, and the call is disconnected at the auxiliary terminal. 11. The eCall Only mode is disabled. 12. The current registration information is obtained, and indicates that the module is registered with the network.

Remarks	
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3.1.4 Saving the eCall Configuration

Test case ID	TC_F_eCall_004
Test case	The module saves the eCall configuration.
Test objective	Check that the module can save the eCall configuration.
Test attribute	Optional
Test equipment	N725 module
Test topology	Module – PSAP
Preset conditions	1. The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg. Set the current eCall storage mode to Save: eCall msdcfg-save the Whole msd configuration... 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 6. Select the test mode, and initiate an eCall: eCall open-test call. 7. Restart the device. 8. Start the voice program, select the test mode, and initiate an eCall: eCall open-test call.
Expected results	<ol style="list-style-type: none"> 1. The system switches to the data directory. 2. The system enters the voice test program, and the voice-related options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The configuration is successful. 6. The call is set up successfully, and the called number is the configured number. 7. The device is restarted successfully. 8. The call is set up successfully, the called number is the configured number, and the transmitted MSD data is the stored content.
Remarks	

3.1.5 Not Saving the eCall Configuration

Test case ID	TC_F_eCall_005
Test case	The module does not save the eCall configuration.
Test objective	Check the eCall when the module does not save the eCall configuration.
Test attribute	Optional
Test equipment	N725 module
Test topology	Module – PSAP
Preset conditions	The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg. Set the current eCall storage mode as follows: Do not save eCall msdcfg-save the Whole msd configuration... 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 6. Select the test mode, and initiate an eCall: eCall open-test call. 7. Restart the device. 8. Start the voice program, select the test mode, and initiate an eCall: eCall open-test call.
Expected results	<ol style="list-style-type: none"> 1. The system switches to the data directory. 2. The system enters the voice test program, and the voice-related options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The configuration is successful. 6. The call is set up successfully, and the called number is the configured number. 7. The device is restarted successfully. 8. The call is re-initiated, the called number is the configured number, and the transmitted MSD data is the original data.
Remarks	

3.1.6 Pushing MSD Data During a Call

Test case ID	TC_F_eCall_006
Test case	During an eCall, the module updates the MSD data after reconfiguration.
Test objective	Check the eCall when the eCall number is reconfigured on the module.

Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 6. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call. 7. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 8. Repeat steps 7 for 3 times.
Expected results	<ol style="list-style-type: none"> 1. The system switches to the data directory. 2. The system enters the voice test program, and the voice-related options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The configuration is successful. 6. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 7. The PSAP receives the MSD data. 8. Before the eCall is released, the sent MSD data can be normally received.
Remarks	

3.2 Compatibility Tests

3.2.1 Testing the eCall in the China Mobile 4G Network

Test case ID	TC_F_eCall_007
Test case	Insert a China Mobile card to the module, and use the module to initiate an eCall.
Test objective	Check that module can initiate an eCall in the China Mobile 4G network.
Test attribute	Mandatory
Test device	N725 module

Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. A China Mobile card is used for the test.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg. Select not to save the MSD configuration: Do not save MSD... 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 6. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call. 7. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 8. Open the console, go to the network test page, and obtain the current network information: Get network information 9. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The number is successfully configured, and the eCall Only mode is disabled. 6. The eCall test menu appears. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 7. The MSD data is sent successfully, and the PSAP receives the MSD data. 8. The module is currently registered with the China Mobile 2G network. 9. The eCall is released.

3.2.2 Testing the eCall in the China Unicom 4G Network

Test case ID	TC_F_eCall_008
Test case	Insert a China Unicom card to the module, and use the module to initiate an eCall.
Test objective	Check that module can initiate an eCall in the China Unicom 4G network.
Test attribute	Mandatory
Test device	N725 module

Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. A China Unicom card is used for the test.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 6. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call. 7. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 8. Open the console, go to the network test page, and obtain the current network information: Get network information 9. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# " input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The number is successfully configured, and the eCall Only mode is disabled. 6. The eCall test menu appears. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 7. The MSD data is sent successfully, and the PSAP receives the MSD data. 8. The module is registered with the China Unicom 3G network. 9. The eCall is released.
Remarks	

3.2.3 Testing the eCall in the China Telecom 4G Network

Test case ID	TC_F_eCall_009
Test case	Insert a China Telecom card to the module, and use the module to initiate an eCall.
Test objective	Check that module can initiate an eCall in the China Telecom 4G network.
Test attribute	Optional
Test equipment	N725 module

Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The China Telecom card is used for the test.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 6. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call.
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The number is successfully configured, and the eCall Only mode is disabled. 6. Call initiation fails. (The product does not support the CDMA network, and the China Telecom eCall cannot fall back to the CDMA network.)
Remarks	

3.2.4 Testing the eCall in the China Mobile 2G Network

Test case ID	TC_F_eCall_010
Test case	Use the module to initiate an eCall in the China Mobile 2G network.
Test objective	Check that module can initiate an eCall in the China Mobile 2G network.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. A China Mobile card is used for the test.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. Run the network test program: ./nwy_network_test. Lock the GSM network. 2. Open the console again and run the adb shell command to enter the data

	<p>directory in the adb environment.</p> <ol style="list-style-type: none"> 3. Run the voice test program: ./nwy_voice_test 4. Configure the MSD information as prompted: eCall msdcfg 5. Generate the MSD packet as prompted: eCall msdgen 6. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 7. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call. 8. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 9. Open the console, go to the network test page, and obtain the current network information: Get network information 10. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The GSM network is locked successfully. 2. The system successfully enters the adb environment, and the "/"# " input prompt appears. 3. The system successfully enters the voice test program, and the voice-related test options appear. 4. The configuration is successful. 5. The packet is generated successfully. 6. The number is successfully configured, and the eCall Only mode is disabled. 7. The eCall test menu appears. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 8. The MSD data is sent successfully, and the PSAP receives the MSD data. 9. The module is currently registered with the China Mobile 2G network. 10. The eCall is released.
Remarks	

3.2.5 Testing the eCall in the China Unicom 3G Network

Test case ID	TC_F_eCall_011
Test case	Use the module to initiate an eCall in the China Unicom 3G network.
Test objective	Check that module can initiate an eCall in the China Unicom 3G network.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. A China Unicom card is used for the test.

<p>Test steps</p>	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. Run the network test program: ./nwy_network_test. Lock the WCDMA network. 2. Open the console again and run the adb shell command to enter the data directory in the adb environment. 3. Run the voice test program: ./nwy_voice_test 4. Configure the MSD information as prompted: eCall msdcfg 5. Generate the MSD packet as prompted: eCall msdgen 6. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 7. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call. 8. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 9. Open the console, go to the network test page, and obtain the current network information: Get network information 10. Release the eCall call. (eCall open -> Release eCall)
<p>Expected results</p>	<ol style="list-style-type: none"> 1. The WCDMA network is locked successfully. 2. The system successfully enters the adb environment, and the "/"# input prompt appears. 3. The system successfully enters the voice test program, and the voice-related test options appear. 4. The configuration is successful. 5. The packet is generated successfully. 6. The number is successfully configured, and the eCall Only mode is disabled. 7. The eCall test menu appears. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 8. The MSD data is sent successfully, and the PSAP receives the MSD data. 9. The module is registered with the China Unicom 3G network. 10. The eCall is released.
<p>Remarks</p>	

3.2.6 Testing the eCall When the IoT Card Is Used

<p>Test case ID</p>	<p>TC_F_eCall_012</p>
<p>Test case</p>	<p>Insert an IoT to the module, and use the module to initiate an eCall.</p>
<p>Test objective</p>	<p>Check the eCall when the module inserted with an IoT card initiate an eCall.</p>
<p>Test attribute</p>	<p>Optional</p>
<p>Test equipment</p>	<p>N725 module</p>

Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. An IoT card is used for the test.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program ./nwy_voice_test. 3. Configure the MSD information as prompted: eCall msdcfg 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 6. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call.
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The number is successfully configured, and the eCall Only mode is disabled. 6. Call initiation fails. (The CS service is currently not activated for the IoT card.)
Remarks	

3.3 Interaction Tests

3.3.1 Testing the eCall During TCP Transmission

Test case ID	TC_F_eCall_013
Test case	The module initiates an eCall during TCP data transmission.
Test objective	Check the eCall initiated by the module during TCP data transmission.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. Initiate IPv4 dial-up. 2. Run the TCP test program: ./tcp_client. Configure the server port and address, and check the sending and receiving results of TCP data.

	<ol style="list-style-type: none"> 3. Open the console again, and run the voice program. 4. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 5. Select the eCall: eCall open -> Test call. 6. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 7. Release the eCall: eCall open -> Release eCall. 8. Run the dial-up program again: ./nwy_data_test, and initiate an IPv4 dial-up. 9. Run the TCP test program: ./tcp_client. Configure the server port and address, and check the sending and receiving results of TCP data.
Expected results	<ol style="list-style-type: none"> 1. The system switches to the data directory. After the successful dial-up, the IP address is obtained. 2. TCP data is sent and received successfully. 3. The system successfully enters the voice test program, and the eCall test menu appears. 4. The configuration is successful. 5. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. The TCP data Tx/Rx link is disconnected. (The module falls back to the 2G/3G network.) 6. The PSAP receives the MSD data. 7. The call is successfully released, and the call is disconnected. 8. Dial-up is successful, and the IP address is obtained. 9. TCP data is sent and received successfully.
Remarks	

3.3.2 Testing the eCall During GPS Positioning

Test case ID	TC_F_eCall_014
Test case	The module initiates an eCall during GPS positioning.
Test objective	Check the eCall initiated by the module during GPS positioning.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The nwy_loc_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the positioning test program: ./nwy_loc_test. Initiate GPS positioning:

	<p>for start navi.</p> <ol style="list-style-type: none"> 3. Open the console again, and run the voice program. 4. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 5. Select the eCall: eCall open -> Test call. 6. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 7. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system switches to the data directory. 2. GPS positioning is initiated successfully. 3. The system successfully enters the voice test program. 4. The configuration is successful. 5. The eCall is successfully initiated. The incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 6. The PSAP can receive the MSD data. During the MSD data transmission, the GPS positioning function is still effective. 7. The eCall is released, and the GPS positioning function is still effective.

3.3.3 Testing the eCall When Playing an Audio File

Test case ID	TC_F_eCall_015
Test case	The module initiates an eCall when playing an audio file.
Test objective	Check the eCall initiated by the module when playing an audio file.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The nwy_audio_test file and audio file are imported. (The size of the audio file should be long to prevent the case that playback of the audio file is finished before the eCall is set up.)
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the audio test program: ./nwy_audio_test, and play the imported audio file: for play wav. 3. Open the console again, and run the voice program. 4. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 5. Select the eCall: eCall open -> Test call. 6. Select the Push mode, and send the default MSD data to the PSAP: eCall

	<p>push.</p> <p>7. Release the eCall call. (eCall open -> Release eCall)</p>
Expected results	<ol style="list-style-type: none"> 1. The system switches to the data directory. 2. The audio file is played normally. 3. The system successfully enters the voice test program. 4. The configuration is successful. 5. The eCall is successfully initiated, and playback of the audio file is paused. The incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 6. The PSAP receives the MSD data. 7. The call is released, and playback of the audio file continues.

3.4 Fault Tolerance Tests

3.4.1 Testing the eCall When a SIM Card in Arrears Is Used

Test case ID	TC_F_eCall_016
Test case	The module initiates an eCall when its SIM card is in arrears.
Test objective	Check the eCall initiated by the module when the SIM card is in arrears.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	1. The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg. Select not to save the MSD configuration: Do not save MSD... 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Manual initiated eCall. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# " input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully.

Remarks	<p>5. The eCall is initiated successfully. The system automatically dials 112 to call the PSAP.</p> <p>6. The call is successfully released, and the call is terminated.</p>
	<p>1. The SIM card is in arrears, but the network signal is available.</p> <p>2. In China, 112 is currently used for alarm calls. The voice prompt (prompt content: call 110 for bandit alarm, 119 for fire alarm, 120 for emergency center, and 122 for traffic fault) is played. After the voice prompt is played twice, the call will be automatically disconnected and will not be answered.</p>

3.4.2 Using a Voice Option to Terminate the eCall

Test case ID	TC_F_eCall_017
Test case	After the module initiates an eCall, use a voice option to terminate the eCall.
Test objective	Check whether a voice option can be used to terminate the eCall after the module initiates the eCall.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	1. The nwy_voice_test file is imported.
Test steps	<p>1. Open the console and run the adb shell command to enter the data directory in the adb environment.</p> <p>2. Run the voice test program: ./nwy_voice_test</p> <p>3. Configure the MSD information as prompted: eCall msdcfg. Select not to save the MSD configuration: Do not save MSD...</p> <p>4. Generate the MSD packet as prompted: eCall msdgen</p> <p>5. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable.</p> <p>6. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Test call.</p> <p>7. Select the Push mode, and send the default MSD data to the PSAP: eCall push.</p> <p>8. Select the end/rejected call option from the voice menu to terminate the call.</p> <p>9. Release the eCall again. (eCall open -> Release eCall)</p>
Expected results	<p>1. The system successfully enters the adb environment, and the "/"# input prompt appears.</p> <p>2. The system successfully enters the voice test program, and the voice-related test options appear.</p> <p>3. The configuration is successful.</p>

	<ol style="list-style-type: none"> 4. The packet is generated successfully. 5. The number is successfully configured, and the eCall Only mode is disabled. 6. The eCall test menu appears. After the call is initiated, the incoming call prompt is displayed on the PSAP, and the PSAP can answer the call. 7. The MSD data is sent successfully, and the PSAP receives the MSD data. 8. The call cannot be terminated. 9. The call is successfully released, and the call is terminated.
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3.4.3 Testing the eCall When There Is No SIM Card

Test case ID	TC_F_eCall_018
Test case	Use the module to initiate an eCall when no SIM card is inserted to the module.
Test objective	Test the eCall when no SIM card is inserted to the module.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	1. The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg. Select not to save the MSD configuration: Do not save MSD... 4. Generate the MSD packet as prompted: eCall msdgen 5. According to the prompt, enable the eCall function, and initiate an eCall: eCall open -> Manual initiated eCall. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. The eCall is initiated successfully. The system automatically dials 112 to call the PSAP. 6. The call is successfully released, and the call is terminated.
Remarks	<ol style="list-style-type: none"> 1. Conduct this test when no SIM card is inserted, but the network signal is normal. 2. In China, 112 is currently used for alarm calls. The voice prompt (prompt

	content: call 110 for bandit alarm, 119 for fire alarm, 120 for emergency center, and 122 for traffic fault) is played. After the voice prompt is played twice, the call will be automatically disconnected and will not be answered.
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3.5 Outfield Tests

3.5.1 Testing the eCall When the Module Moves at a Low Speed

Test case ID	TC_F_eCall_019
Test case	Use the module to initiate an eCall when the module moves at a low speed.
Test objective	Test the eCall when the module moves at a low speed.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The speed is 40 km/h.
Test steps	<ol style="list-style-type: none"> 1. Open the console, and run the voice program. 2. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 3. Select the eCall: eCall open -> Test call. 4. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 5. When the module moves at a low speed, test the quality of the eCall for 3 minutes. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the voice program. 2. The configuration is successful. 3. The configuration is successful. The eCall is initiated successfully. After the PSAP receives the eCall, it can answer the call. 4. The MSD data is sent successfully, and the PSAP receives the MSD data. 5. When the module moves at a low speed, the eCall is normal and the voice is clear. 6. The call is successfully released, and the call is terminated.
Remarks	

3.5.2 Testing the eCall When the Module Moves at a Medium Speed

Test case ID	TC_F_eCall_020
Test case	Use the module to initiate an eCall when the module moves at a medium speed.
Test objective	Test the eCall when the module moves at a medium speed.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The speed is 60 km/h.
Test steps	<ol style="list-style-type: none"> 1. Open the console, and run the voice program. 2. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 3. Select the eCall: eCall open -> Test call. 4. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 5. When the module moves at a medium speed, test the quality of the eCall for 3 minutes. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the voice program. 2. The configuration is successful. 3. The configuration is successful. The eCall is initiated successfully. After the PSAP receives the eCall, it can answer the call. 4. The MSD data is sent successfully, and the PSAP receives the MSD data. 5. When the module moves at a medium speed, the eCall is normal and the voice is clear. 6. The call is successfully released, and the call is terminated.
Remarks	

3.5.3 Testing the eCall When the Module Moves at a High Speed

Test case ID	TC_F_eCall_021
Test case	Use the module to initiate an eCall when the module moves at a high speed.
Test objective	Test the eCall when the module moves at a high speed.
Test attribute	Mandatory
Test device	N725 module

Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The speed is 100 km/h.
Test steps	<ol style="list-style-type: none"> 1. Open the console, and run the voice program. 2. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 3. Select the eCall: eCall open -> Test call. 4. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 5. When the module moves at a high speed, test the quality of the eCall for 3 minutes. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the voice program. 2. The configuration is successful. 3. The configuration is successful. The eCall is initiated successfully. After the PSAP receives the eCall, it can answer the call. 4. The MSD data is sent successfully, and the PSAP receives the MSD data. 5. When the module moves at a high speed, the eCall is normal and the voice is clear. 6. The call is successfully released, and the call is terminated.
Remarks	

3.5.4 Testing the eCall in a Complex Environment

Test case ID	TC_F_eCall_022
Test case	Use the module to initiate an eCall when the module is in a complex environment.
Test objective	Test the eCall when the module is in a complex environment.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. Four windows of the vehicle are rolled down on a busy urban road.
Test steps	<ol style="list-style-type: none"> 1. Open the console, and run the voice program. 2. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 3. Select the eCall: eCall open -> Test call.

	<ol style="list-style-type: none"> 4. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 5. Test the quality of the eCall for 5 minutes. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the voice program. 2. The configuration is successful. 3. The configuration is successful. The eCall is initiated successfully. After the PSAP receives the eCall, it can answer the call. 4. The MSD data is sent successfully, and the PSAP receives the MSD data. 5. The eCall is normal and the voice is clear. 6. The call is successfully released, and the call is terminated.
Remarks	

3.5.5 Testing the eCall in a Tunnel

Test case ID	TC_F_eCall_023
Test case	Use the module to initiate an eCall when the module is in a tunnel.
Test objective	Test the eCall when the module is in a tunnel.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The vehicle is located in a tunnel.
Test steps	<ol style="list-style-type: none"> 1. Open the console, and run the voice program. 2. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 3. Select the eCall: eCall open -> Test call. 4. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 5. Check the voice quality of the eCall. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the voice program. 2. The configuration is successful. 3. The configuration is successful. The eCall is initiated successfully. After the PSAP receives the eCall, it can answer the call. 4. The MSD data is sent successfully, and the PSAP receives the MSD data. 5. The eCall is normal and the voice is clear. 6. The call is successfully released, and the call is terminated.

Remarks	
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3.5.6 Testing the eCall in a Parking Lot with Weak Network Signals

Test case ID	TC_F_eCall_024
Test case	Use the module to initiate an eCall when the module is in a parking lot with weak network signals.
Test objective	Test the eCall when the module is in a parking lot with weak network signals.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	<ol style="list-style-type: none"> 1. The nwy_voice_test file is imported. 2. The network signal in the parking lot is weak (weak signal range: LTE CSQ:10--14, 2G/3G CSQ:6-10).
Test steps	<ol style="list-style-type: none"> 1. Open the console, and run the voice program. 2. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 3. Select the eCall: eCall open -> Test call. 4. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 5. Check the voice quality of the eCall. 6. Release the eCall call. (eCall open -> Release eCall)
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the voice program. 2. The configuration is successful. 3. The configuration is successful. The eCall is initiated successfully. After the PSAP receives the eCall, it can answer the call. 4. The MSD data is sent successfully, and the PSAP receives the MSD data. 5. The eCall is normal and the voice is clear. 6. The call is successfully released, and the call is terminated.
Remarks	<ol style="list-style-type: none"> 1. In the environment with weak network signals, if the eCall of the device fails or the voice is intermittent, use other platforms to compare the device or mobile phone.

3.6 Stress Tests

3.6.1 Testing the eCall Manual Initiation Success Rate

Test case ID	TC_F_eCall_025
Test case	Use the module to manually trigger eCalls, and check the eCall success rate.
Test objective	Test the eCall manual initiation success rate.
Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	1. The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console, and run the voice program. 2. According to the prompt, under the eCall Only option, configure the PSAP number (simulated by using an auxiliary terminal), and disable the eCall Only mode: disable. 3. Select the eCall: eCall open -> Manual initiated eCall. 4. Select the Push mode, and send the default MSD data to the PSAP: eCall push. 5. Release the eCall call. (eCall open -> Release eCall) 6. Repeat steps 3-5 for 50 times.
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the voice program. 2. The configuration is successful. 3. The configuration is successful. The eCall is initiated successfully. After the PSAP receives the eCall, it can answer the call. 4. The MSD data is sent successfully, and the PSAP receives the MSD data. 5. The call is successfully released, and the call is terminated. 6. The eCall manual initiation success rate is 100%, and the success rate for the PSAP to receive MSD data is also 100%.
Remarks	1. In China, 112 is currently used for alarm calls. The voice prompt (prompt content: call 110 for bandit alarm, 119 for fire alarm, 120 for emergency center, and 122 for traffic fault) is played. After the voice prompt is played twice, the call will be automatically disconnected and will not be answered.

3.6.2 Testing the eCall Auto Initiation Success Rate

Test case ID	TC_F_eCall_026
Test case	Use the module to automatically trigger eCalls, and check the eCall success rate.
Test objective	Test the eCall auto initiation success rate.

Test attribute	Mandatory
Test device	N725 module
Test topology	Module – PSAP
Preset conditions	1. The nwy_voice_test file is imported.
Test steps	<ol style="list-style-type: none"> 1. Open the console and run the adb shell command to enter the data directory in the adb environment. 2. Run the voice test program: ./nwy_voice_test 3. Configure the MSD information as prompted: eCall msdcfg 4. Generate the MSD packet as prompted: eCall msdgen 5. Enable the eCall function by selecting eCall open, and configure data to automatically initiate an eCall. 6. Select the Push mode, and send the MSD data to the PSAP: eCall push. 7. Release the eCall call. (eCall open -> release eCall) 8. Repeat steps 5-7 for 50 times.
Expected results	<ol style="list-style-type: none"> 1. The system successfully enters the adb environment, and the "/"# " input prompt appears. 2. The system successfully enters the voice test program, and the voice-related test options appear. 3. The configuration is successful. 4. The packet is generated successfully. 5. After the auto eCall is configured, the PSAP receives the call request and answers the call. 6. The MSD data is sent successfully, and the PSAP receives the MSD data. 7. The call is successfully released, and the call is terminated. 8. The eCall auto initiation success rate is 100%, and the success rate for the PSAP to receive MSD data is also 100%.
Remarks	In China, 112 is currently used for alarm calls. The voice prompt (prompt content: call 110 for bandit alarm, 119 for fire alarm, 120 for emergency center, and 122 for traffic fault) is played. After the voice prompt is played twice, the call will be automatically disconnected and will not be answered.

4 Precautions

- Currently, the N725 module only supports the eCall over CS (2G/3G).
- As the eCall in Pull mode requires the cooperation of PSAP, this document does not cover the test design verification of this mode.