

**Project 25 Compliance Assessment Program**  
**SDOC - Motorola Solutions Inc. - APX 4000, 4000XE, 4000Li**  
**June 29, 2018**

**SUBSCRIBER PRODUCT INFORMATION**

<b>Subscriber Info</b>	<b>Detail</b>
Model Name:	APX 4000, 4000XE, 4000Li
Tested Software Versions: <sup>1</sup>	R15.10.00
Hardware Capabilities/Options & Software Options:	Full Display; Full DTMF Keypad; VHF (136-174MHz); UHF-R1 (380-435MHz); UHF-R2 (435-524MHz); 700MHz; 800MHz; P25 Conventional, P25 Trunking, P25 TDMA Trunking, AES-256 Encryption

**TEST REQUIREMENTS CAB IDENTIFICATION**

This product was tested according to the P25 CAP Test Requirements Compliance Assessment Bulletin (CAB) indicated by the checked box.

<b>check one</b>	<b>P25 CAP Test Requirement CAB</b>	<b>Details</b>
	<b>P25-CAB-CAI_TEST_REQ – August 2016<sup>2</sup></b>	Adds conventional interoperability testing to the March 2010 P25 CAP Test Requirements
✓	<b>P25-CAB-CAI_TEST_REQ – July 2017<sup>3</sup></b>	Includes August 2016 P25 CAP Test Requirements; Adds TDMA performance and interoperability testing and trunked supplementary data testing

**SUMMARY TEST REPORT IDENTIFIER<sup>4</sup>**

Summary Test Report (STR) Identifier:	STR - Motorola Solutions - SUBSCRIBER
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**CONTACT INFORMATION**

<b>Vendor Info</b>	<b>Details</b>
Vendor Name:	Motorola Solutions Inc.
Vendor Website URL:	<a href="http://www.motorolasolutions.com">www.motorolasolutions.com</a>
P25 CAP Contact Name:	Olga Derasmo
P25 CAP Contact Phone:	(954) 723-4054
P25 CAP Contact Email:	<a href="mailto:olgaderasmo@motorolasolutions.com">olgaderasmo@motorolasolutions.com</a>

<sup>1</sup> Current and previous software versions are listed in the 'Models & Software' worksheet tab of the Summary Test Report (STR).

<sup>2</sup> The following version of the 2016 CAB was used for testing: Baseline Common Air Interface Testing Requirements (August 2016).

<sup>3</sup> The following version of the 2017 CAB was used for testing: Baseline Common Air Interface Testing Requirements (July 2017).

<sup>4</sup> The Summary Test Report for this product is available upon request. Please send your STR request to [P25CAP@hq.dhs.gov](mailto:P25CAP@hq.dhs.gov) and please include the subscriber 'Vendor Name'.

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**ENCRYPTION STATEMENT**

This product complies with the P25 CAP Encryption Requirements CAB (P25-CAB-ENC\_REQ). The checked box indicates how the product was tested.

✓	Tested with the AES 256 encryption algorithm and shall be available with AES 256 encryption at a minimum or without any encryption of any type.
	Tested without the AES 256 encryption algorithm and shall only be available without any encryption of any type.

**CONVENTIONAL PERFORMANCE**

The Subscriber product has been tested for Conventional Performance. All requirements were passed except for those requirements identified below under Unsupported or Failed Requirements.

**P25 CAP Conventional Performance Testing Coverage**

**Receiver Tests:** Reference Sensitivity, Faded Reference Sensitivity, Signal Delay Spread Capability, Adjacent Channel Rejection, Offset Adjacent Channel Rejection, Co-Channel Rejection, Spurious Response Rejection, Intermodulation Rejection, Signal Displacement Bandwidth, Late Entry Unsilence Delay, and Receiver Throughput Delay.

**Transmitter Tests:** Unwanted Emissions (Adjacent Channel Power Ratio), Transmitter Power and Encoder Attack Time, Transmitter Throughput Delay, Frequency Deviation for C4FM, and Modulation Fidelity, Transient Frequency Behavior.

**Unsupported or Failed Requirements**

1. **None**

**TRUNKING PERFORMANCE - FDMA**

The Subscriber product has been tested for Trunking Performance - FDMA. All requirements were passed except for those requirements identified below under Unsupported or Failed Requirements.

**P25 CAP FDMA Trunking Performance Testing Coverage**

**Receiver Tests:** Reference Sensitivity, Faded Reference Sensitivity, Signal Delay Spread Capability, Adjacent Channel Rejection, Offset Adjacent Channel Rejection, Co-Channel Rejection, Spurious Response Rejection, Intermodulation Rejection, and Signal Displacement Bandwidth.

**Transmitter Tests:** Unwanted Emissions (Adjacent Channel Power Ratio), Power Attack time, Encoder Attack Time, Transmitter Throughput Delay, Frequency Deviation for C4FM, and Modulation Fidelity, Transient Frequency Behavior.

**Trunked Tests:** Trunking Control Channel Slot Times, Trunking Request Time, and Transmitter Time to Key on a Traffic Channel.

**Unsupported or Failed Requirements**

1. **None**

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**TRUNKING PERFORMANCE - TDMA**

(only applicable for the 2017 CAB)

The Subscriber product has been tested for Trunking Performance - TDMA. All requirements were passed except for those requirements identified below under Unsupported or Failed Requirements.

**P25 CAP TDMA Trunking Performance Testing Coverage**

**Receiver Tests:** Reference Sensitivity, Faded Reference Sensitivity, Signal Delay Spread Capability, Adjacent Channel Rejection, Offset Adjacent Channel Rejection, Co-Channel Rejection, Spurious Response Rejection, Intermodulation Rejection, and Signal Displacement Bandwidth.

**Transmitter Tests:** Unwanted Emissions (Adjacent Channel Power Ratio), Frequency Deviation for H-CPM, Modulation Fidelity, Symbol Rate Accuracy, H-CPM Logical Channel Power measurements, and H-CPM Channel Time Alignment.

**Unsupported or Failed Requirements**

1. **None**

**CONVENTIONAL DIRECT MODE INTEROPERABILITY**

The Subscriber product has been tested for Conventional Direct Mode Interoperability. All test cases were passed except for those test cases identified below under Unsupported or Failed Test Cases. Test cases that passed but require specific, sometimes optional, product capabilities are also identified below.

**P25 CAP Direct Mode Interoperability Testing Coverage**

Network Access Code (NAC) Operation, Group Voice Call, Emergency Call, Unit-to-Unit Voice Call, Encryption, Call Alert, Radio Check, Message Update, Status Update, Status Query, and Radio Unit Monitor.

**Unsupported or Failed Test Cases**

1. Radio Check (Test Cases 2.3.2.4.1, 2.3.2.4.2), Message Update (2.3.3.4.1, 2.3.3.4.2), Status Update (2.3.4.4.1, 2.3.4.4.2), Status Query (2.3.5.3.1, 2.3.5.3.2), Radio Unit Monitor (2.3.6.4.1, 2.3.6.4.2, 2.3.6.4.3, 2.3.6.4.4) are unsupported.

**Optional Product Capabilities Required to Pass Test Cases**

1. In order to pass the Unit-to-Unit Voice Call and Call Alert test cases, a subscriber with DTMF keypad and ID display capability is required.
2. In order to pass the Encryption test case, a subscriber with AES-256 encryption is required.

**CONVENTIONAL REPEAT MODE INTEROPERABILITY**

The Subscriber product has been tested for Conventional Repeat Mode Interoperability. All test cases were passed except for those test cases identified below under Unsupported or Failed Test Cases. Test cases that passed but require specific, sometimes optional, product capabilities are also identified below.

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P25 CAP Repeat Mode Interoperability Testing Coverage

Network Access Code (NAC) Operation, Group Voice Call, Emergency Call, Unit-to-Unit Voice Call, Encryption, Call Alert, Radio Check, Message Update, Status Update, Status Query, and Radio Unit Monitor.

Unsupported or Failed Test Cases

1. Radio Check (Test Case 2.5.2.4.1), Message Update (2.5.3.4.1, 2.5.3.4.3), Status Update (2.5.4.4.1, 2.5.4.4.3), Status Query (2.5.5.4.1), Radio Unit Monitor (2.5.6.4.1, 2.5.6.4.3) are unsupported.

Optional Product Capabilities Required to Pass Test Cases

1. In order to pass the Unit-to-Unit Voice Call and Call Alert test cases, a subscriber with DTMF keypad and ID display capability is required.
2. In order to pass the Encryption test case, a subscriber with AES-256 encryption is required.

**CONVENTIONAL REPEAT MODE with DISPATCH MONITORING CONSOLE INTEROPERABILITY**

The Subscriber product has been tested for Conventional Repeat Mode with Dispatch Monitoring Console Interoperability. All test cases were passed except for those test cases identified below under Unsupported or Failed Test Cases. Test cases that passed but require specific, sometimes optional, product capabilities are also identified below.

P25 CAP Repeat Mode Interoperability Testing Coverage

Group Voice Call, Emergency Call, All Call, Unit-to-Unit Voice Call, Encryption, Emergency Alarm, Call Alert, Radio Check, Radio Unit Inhibit/Uninhibit, Message Update, Status Update, Status Query, and Radio Unit Monitor.

Unsupported or Failed Test Cases

1. Message Update (Test Cases 2.7.6.4.1, 2.7.6.4.2, 2.7.6.4.3), Status Update (2.7.7.4.1), Radio Unit Monitor (2.7.9.4.2) are unsupported.

Optional Product Capabilities Required to Pass Test Cases

1. In order to pass the Unit-to-Unit Voice Call, Call Alert and Status Update test case (2.7.7.4.2), a subscriber with DTMF keypad and ID display capability is required.
2. In order to pass the Encryption test case, a subscriber with AES-256 encryption is required.

**TRUNKED SUBSCRIBER UNIT INTEROPERABILITY – FDMA**

(Baseline features are tested as part of the 2016 CAB. Additional features are tested as part of the 2017 CAB.)

The Subscriber product has been tested for Trunked Interoperability - FDMA. All test cases were passed except for those test cases identified below under Unsupported or Failed Test Cases. Test cases that passed but require specific, sometimes optional, product capabilities are also identified below.

2016 P25 CAP FDMA Trunked Interoperability Testing Coverage

Full Registration, Group Voice Call, Unit to Unit Voice Call, Broadcast Voice Call, Affiliation, Announcement Group Call, Emergency Alarm, Emergency Group Call, Encryption, Intra-Location Registration Area Roaming

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2017 P25 CAP FDMA Trunked Interoperability Testing Coverage

Deregistration, System Call, Call Alert, Short Message, Status Query, Status Update, Radio Unit Monitoring, Radio Unit Disable/Re-Enable, and Radio Check.

Unsupported or Failed Test Cases

1. Short Message (Test Case 2.2.16.4.1), Radio Unit Monitor Individual Silent/Non-Silent (2.2.19.4.1, 2.2.19.4.2) are unsupported.

Optional Product Capabilities Required to Pass Test Cases

1. In order to pass the Unit-to-Unit Voice Call, Call Alert and Status Update test cases, a subscriber with DTMF keypad and ID display capability is required.
2. In order to pass the Encryption test case, a subscriber with AES-256 encryption is required.

**TRUNKED SUBSCRIBER UNIT INTEROPERABILITY – TDMA**

(only applicable for the 2017 CAB)

The Subscriber product has been tested for Trunked Interoperability - TDMA. All test cases were passed except for those test cases identified below under Unsupported or Failed Test Cases. Test cases that passed but require specific, sometimes optional, product capabilities are also identified below.

P25 CAP TDMA Trunked Interoperability Testing Coverage

Registration, Group Voice Call, Unit-to-Unit Voice Call, Broadcast Call, Announcement Group Call, Emergency Group Call, Encryption Group Call, System Call, Radio Unit Monitoring, and Transmitting Subscriber Forced Preemption.

Unsupported or Failed Test Cases

1. Short Message, Radio Unit Monitor Individual (Test Cases 2.2.19.4.1, 2.2.19.4.2), SU Forced Audio Preemption (Test Case 2.2.26.4.1) are unsupported.

Optional Product Capabilities Required to Pass Test Cases

1. In order to pass the Unit-to-Unit Voice Call, Call Alert and Status Update test cases, a subscriber with DTMF keypad and ID display capability is required.
2. In order to pass the Encryption test case, a subscriber with AES-256 encryption is required.

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**SIGNATURE AND DATE**

6/29/2018  
Date Signed

Olga Derasmo  
Vendor's Authorized Representative Signature

Olga Derasmo  
Vendor's Authorized Representative Printed Name

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**BURDEN STATEMENT**

OMB NO: 6040-0015 (additional questions are pending OMB approval)

EXPIRATION DATE: 6/30/2019 (additional questions are pending OMB approval)

An agency may not conduct or sponsor information collection and a person is not required to respond to this information collection unless it displays a current valid Office of Management and Budget control number and expiration date. The control number for this collection is 6040-0015 and this form will expire on 06/30/2019 (additional questions are pending OMB approval). The estimated average time to complete this form is 60 minutes per respondent. If you have any comments regarding the burden estimate, you can write to the U.S. Department of Homeland Security, Science and Technology Directorate, Washington, D.C. 20528.

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