

**Project 25 Compliance Assessment Program
 Summary Test Report
 EF Johnson Viking VP5230F2/F3 Portable Subscriber Unit
 STR-EFJ-16091902
 September 19, 2016**

Test Item Description

Manufacturer	EF Johnson Technologies
Manufacturer Contact	Randy O'Connor (972) 819-0911
Product Name	Viking VP5230F2/F3 Portable Subscriber Unit
Installed Options	Full and Limited Keypad, AES/DES KWD-AE30 Encryption Module Installed
Vocoder Identification	Enhanced Full Rate

Test Description
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.1 – Project 25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.3.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Interoperability

Laboratory Information

Laboratory	Details
P25 CAP Laboratory Code	P25CAP081010 (EF Johnson Technologies)
Date(s) of Test	August 2, 2016
Date of Issue	August 2, 2016

Laboratory	Details
P25 CAP Laboratory Code	P25CAP081010 (EF Johnson Technologies)
Date(s) of Test	August 17, 2016
Date of Issue	August 17, 2016

Laboratory	Details
P25 CAP Laboratory Code	P25CAP081017 (Harris)
Date(s) of Test	August 23, 2016
Date of Issue	August 23, 2016

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Informative References

Date	Title
Mar 2010	P25-CAB-CAI_TEST_REQ – March 2010

Other Devices Tested with Viking VP5230F3/F2 Portable Subscriber Unit

Manufacturer	Product Name, Definition, and Unique ID	Installed Options
EF Johnson	ATLAS Trunked Infrastructure	TSNI 1.3.2_14
Harris	P25 Trunked Infrastructure	Release SR10A.2
Motorola Solutions	Astro Trunked Infrastructure	Release 25.7.16

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Receiver Tests – Conventional

Test Identification	Detailed Test Report Identification
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.1 – Project 25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance	DTR-P25CAP081010-16080501

Receiver Tests			
Test Case	Description	Requirement	Results
2.1.4	Reference Sensitivity	≤ -116 dBm (Class A)	P1
2.1.5	Faded Reference Sensitivity	≤ -108 dBm (Class A)	P2
2.1.6	Signal Delay Spread Capability	≥ 50 μ s	P3
2.1.7	Adjacent Channel Rejection	≥ 60 dB (Class A)	P4
2.1.8	Co-Channel Rejection	≤ 9 dB	P
2.1.9	Spurious Response Rejection	≥ 80 dB (Class A)	P
2.1.10	Intermodulation Rejection	≥ 75 dB (Class A)	P
2.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P
2.1.17	Late Entry Unsilence Delay		
	No Talk Group or Encryption	≤ 125 ms	P
	Talk Group Only	≤ 370 ms	P
	Encryption Only	≤ 370 ms	P
	Both Talk Group and Encryption	≤ 460 ms	P
2.1.18	Receiver Throughput Delay	≤ 125 ms	P

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Transmitter Tests – Conventional

Test Identification	Detailed Test Report Identification
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.1 – Project 25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance	DTR-P25CAP081010-16080501

Transmitter Tests			
Test Case	Description	Requirement	Results
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	≥ 67 dB	P
2.2.12	Transmitter Power and Encoder Attack Time		
	Power Attack Time	≤ 50 ms	P
	Encoder Attack Time	≤ 100 ms	P
2.2.14	Transmitter Throughput Delay	≤ 125 ms	P
2.2.15	Frequency Deviation for C4FM		
	High Level Signal Deviation	$2544 \text{ Hz} < f_{\text{dev}} \leq 3111 \text{ Hz}$	P
	Low Level Signal Deviation	$848 \text{ Hz} < f_{\text{dev}} \leq 1037 \text{ Hz}$	P
2.2.16	Modulation Fidelity	$\leq 5\%$ (Class A)	P
2.2.18	Transient Frequency Behavior		
	Time Interval $t_1 = 5$ ms	$ \Delta f \leq 12.5$ kHz	P
	Time Interval $t_2 = 20$ ms	$ \Delta f \leq 6.25$ kHz	P
	Time Interval $t_3 = 5$ ms	$ \Delta f \leq 12.5$ kHz	P

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Receiver Tests– Trunked

Test Identification	Detailed Test Report Identification
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance	DTR-P25CAP081010-16080501 DTR-P25CAP081010-16081701

Receiver Tests			
Test Case	Description	Requirement	Results
2.1.4	Reference Sensitivity	≤ -116 dBm (Class A)	P1
2.1.5	Faded Reference Sensitivity	≤ -108 dBm (Class A)	P2
2.1.6	Signal Delay Spread Capability	≥ 50 μs	P3
2.1.7	Adjacent Channel Rejection	≥ 60 dB (Class A)	P4
2.1.8	Co-Channel Rejection	≤ 9 dB	P
2.1.9	Spurious Response Rejection	≥ 80 dB (Class A)	P
2.1.10	Intermodulation Rejection	≥ 75 dB (Class A)	P
2.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P

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Transmitter Tests			
Test Case	Description	Requirement	Results
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	≥ 67 dB	P
2.2.12	Transmitter Power and Encoder Attack Time		
	Power Attack Time	≤ 50 ms	P
	Encoder Attack Time	≤ 100 ms	P
2.2.14	Transmitter Throughput Delay	≤ 125 ms	P
2.2.15	Frequency Deviation for C4FM		
	High Level Signal Deviation	$2544 \text{ Hz} < f_{\text{dev}} \leq 3111 \text{ Hz}$	P
	Low Level Signal Deviation	$848 \text{ Hz} < f_{\text{dev}} \leq 1037 \text{ Hz}$	P
2.2.16	Modulation Fidelity	$\leq 5\%$ (Class A)	P
2.2.18	Transient Frequency Behavior		
	Time Interval $t_1 = 5$ ms	$ \Delta f \leq 12.5$ kHz	P
	Time Interval $t_2 = 20$ ms	$ \Delta f \leq 6.25$ kHz	P
	Time Interval $t_3 = 5$ ms	$ \Delta f \leq 12.5$ kHz	P

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Trunked Subscriber Unit Tests – Trunked

Test Identification	Detailed Test Report Identification
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance	DTR-P25CAP081010-16080501 DTR-P25CAP081010-16081701

Trunked Subscriber Unit Tests			
Test Case	Description	Requirement	Results
2.3.1	Trunking Control Channel Slot Times (45 ms slot) N7		
	Encode Attack Time	$2.00 \text{ ms} \leq t \leq 11.65 \text{ ms}$	P
	RF Power Attack Time	$0 \text{ ms} \leq t \leq 11.65 \text{ ms}$	P
	RF Power Turn Off Time	$\leq 1.57 \text{ ms}$	P
2.3.2	Trunking Request Time	$\leq 167.5 \text{ ms}$	P
2.3.3	Trunking Voice Access Time	500 ms (Manufacturer Specified)	P
2.3.5	Transmitter Time to Key on a Traffic Channel		
	Short Channel Form	$\leq 150.0 \text{ ms}$	P

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Test Identification	Product
P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.3.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Interoperability	EF Johnson Viking VP5230F2/F3 Portable Subscriber

Product	Detailed Test Report Identification
Motorola Solutions ASTRO Trunked Infrastructure	DTR-P25CAP081010-16080202
EF Johnson Atlas Trunked Infrastructure	DTR-P25CAP081010-16080301
Harris Infrastructure	DTP-P25CAP081010-1121211E01

Test Case	Description	Motorola Solutions ASTRO Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Harris Trunked Infrastructure
2.2.1	Full Registration			
2.2.1.4.1	Test Case 1 - Valid Registration			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.1.4.2	Test Case 2 – Denied or Refused Registration			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.1.4.3	Test Case 3 - Unverified Registration			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.2	Group Voice Call			
2.2.2.4.1	Test Case 1 – Group Call Granted			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.2.4.2	Test Case 2 – Group Call Denied			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.2.4.3	Test Case 3 – Group Call Request Queued			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5

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EF Johnson Atlas Trunked Infrastructure	DTR-P25CAP081010-16080301
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Test Case	Description	Motorola Solutions ASTRO Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Harris Trunked Infrastructure
2.2.3	Unit-To-Unit Voice Call			
2.2.3.4.1	Test Case 1 – Unit-To-Unit Call With Target Availability Check			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.3.4.2	Test Case 2 – Unit-To-Unit Call Target Availability Check Denied By Target			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.3.4.3	Test Case 3 – Unit-To-Unit Call Queued With Target Availability Check – traffic channel assignment after target availability check			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.3.4.4	Test Case 4 – Unit-To-Unit Call Queued With Target Availability Check – traffic channel assignment before target availability check			
	Home Operation	N/A 1	N/A 1	N/A 1
	Inter-System Operation	N1	N3	N4
	Inter-WACN Operation	N1	N3	N4
2.2.3.4.5	Test Case 5 – Unit-To-Unit Call Without Target Availability Check			
	Home Operation	N2	N2	N2
	Inter-System Operation	N1	N3	N4
	Inter-WACN Operation	N1	N3	N4

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Test Case	Description	Motorola Solutions ASTRO Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Harris Trunked Infrastructure
2.2.3.4.6	Test Case 6 – Unit-To-Unit Call Queued Without Target Availability Check			
	Home Operation	N2	N2	N2
	Inter-System Operation	N1	N3	N4
	Inter-WACN Operation	N1	N3	N4
2.2.3.4.7	Test Case 7 – Unit-To-Unit Call Denied			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5

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Test Case	Description	Motorola Solutions ASTRO Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Harris Trunked Infrastructure
2.2.4	Broadcast Voice Call			
2.2.4.4.1	Test Case 1 – Broadcast Voice Call			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.5	Affiliation			
2.2.5.4.1	<i>Test Case 1 - Radio Permitted To Affiliate With New Group</i>			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.5.4.2	Test Case 2 - Radio Denied Affiliation To New Group			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.6	Announcement Group Call			
2.2.6.4.1	Test Case 1 - Collection Of Talk Groups Receive Call			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.7	Emergency Alarm			
2.2.7.4.1	Test Case 1 - Emergency Alarm			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5

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Test Case	Description	Motorola Solutions ASTRO Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Harris Trunked Infrastructure
2.2.8	Emergency Group Call			
2.2.8.4.1	Test Case 1 - Emergency Call			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.10	Encryption			
2.2.10.4.1	Test Case 1 - Call Privacy For Encrypted Call			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5
2.2.11	Intra-Location Registration Area Roaming			
2.2.11.4.1	Test Case 1 – Idle Radio			
	Home Operation	P	P	P
	Inter-System Operation	N1	N3	P
	Inter-WACN Operation	N1	N3	N5

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Model Class Definition

Applied to P25-CAB-CAI_Test_Req Mar 2010, 2.1.3.2

Model Class Name	Product Name, Definition, and Unique ID	Installed Options
Viking VP5230 Portable	EF Johnson Viking VP5230F2/F3 Portable Subscriber	Firmware: 8.16.3 Firmware: 8.16.6

Test Case Result Definitions

No Test Performed	---
Test Does Not Apply to the Test Object	N/A
Test Object Meets Requirements	P (Pass)
Test Object Does Not Meet Requirements	F (Fail)
Test Object is Not Conclusive	I (Inconclusive)

Comments

N/A 1:	N/A 1: Test case 2.2.3.4.4 is not applicable for these infrastructures; see results of test 2.2.3.4.3.
N1:	Motorola infrastructure does not support Inter-System or Inter-WACN roaming.
N2:	Test Cases 2.2.3.4.5 and 2.2.3.4.6 are not supported by EF Johnson
N3:	EF Johnson infrastructure does not support Inter-System or Inter-WACN roaming.
N4:	Not supported by EF Johnson Subscriber Unit
N5:	Harris infrastructure does not support Inter-WACN roaming.
P1:	EF Johnson VP 5230 subscriber passes Reference Sensitivity (≤ -116 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P2:	EF Johnson VP 5230 subscriber passes Faded Reference Sensitivity (≤ -108 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P3:	EF Johnson VP 5230 subscriber passes Signal Delay Spread Capability specification for C4FM (Non-Simulcast) (≥ 50 μ s) and Simulcast modulations (≥ 80 μ s).
P4:	EF Johnson VP 5230 subscriber passes Adjacent Channel Rejection (≥ 60 dB) specification for C4FM (Non-Simulcast) and Simulcast modulations.

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