Test Item Description

Manufacturer	EF Johnson Technologies	
Manufacturer Contact	Randy O'Connor (972) 819-0911	
Product Name	Viking VP5430F2/F3 700/800 Portable Subscriber Unit	
Installed Options	SEM 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 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

Laboratory	Details
P25 CAP Laboratory Code	P25CAP081017 (Harris)
Date(s) of Test	February 18, 2015
Date of Issue	February 18, 2015

Laboratory	Details	
P25 CAP Laboratory Code	P25CAP081010 (EF Johnson Technologies)	
Date(s) of Test	March 11, 2015 to March 12, 2015	
Date of Issue	March 27, 2015	

Informative References

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

Other Devices Tested with Viking VP5430F3/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

Receiver Tests (700/800 MHz) - 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-P25CAP081010-16081101	

Receiver Tests (700/800 MHz)			
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	Р
2.1.9	Spurious Response Rejection	≥ 80 dB (Class A)	Р
2.1.10	Intermodulation Rejection	≥ 75 dB (Class A)	Р
2.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	Р
2.1.17	Late Entry Unsquelch Delay		
	No Talk Group or Encryption	≤ 125 ms	Р
	Talk Group Only	≤ 370 ms	Р
	Encryption Only	≤ 370 ms	Р
	Both Talk Group and Encryption	≤ 460 ms	Р
2.1.18	Receiver Throughput Delay	≤ 125 ms	Р

Transmitter Tests (800 MHz) - 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-P25CAP081010-16081101	

Transmitter Tests (800 MHz)			
Test Case	Description	Requirement	Results
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	≥ 67 dB	Р
2.2.12	Transmitter Power and Encoder Attack Time		
	Power Attack Time	≤ 50 ms	Р
	Encoder Attack Time	≤ 100 ms	Р
2.2.14	Transmitter Throughput Delay	≤ 125 ms	Р
2.2.15	Frequency Deviation for C4FM		
	High Level Signal Deviation	$2544 \; Hz < f_{dev} \le 3111 \; Hz$	Р
	Low Level Signal Deviation	$848~Hz < f_{\text{dev}} \leq 1037~Hz$	Р
2.2.16	Modulation Fidelity	≤ 5% (Class A)	Р
2.2.18	Transient Frequency Behavior		
	Time Interval t ₁ = 20 ms	∆f ≤ 12.5 kHz	Р
	Time Interval t ₂ = 50 ms	∆f ≤ 6.25 kHz	Р
	Time Interval t ₃ = 10 ms	∆f ≤ 12.5 kHz	Р

Transmitter Tests (700 MHz) – 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-P25CAP081010-16081101

	Transmitter Tests (700 MHz)				
Test Case	Description	Requirement	Results		
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio				
	Offset From Center Frequency (kHz)				
	9.375	≥ 40 dB	Р		
	15.625, 21.875, 37.5	≥ 60 dB	Р		
	62.5, 87.5, 150, 250, 350	≥ 65 dB	Р		
	>400 kHz to 12 MHz	≥ 75 dB	Р		
	12 MHz to paired RX Band	≥ 75 dB	Р		
	In the paired RX Band	≥ 100 dB	Р		
2.2.12	Transmitter Power and Encoder Attack Time				
	Power Attack Time	≤ 50 ms	Р		
	Encoder Attack Time	≤ 100 ms	Р		
2.2.14	Transmitter Throughput Delay	≤ 125 ms	Р		
2.2.15	Frequency Deviation for C4FM				
	High Level Signal Deviation	2544 Hz < f _{dev} ≤ 3111 Hz	Р		
	Low Level Signal Deviation	$848~Hz < f_{dev} \leq 1037~Hz$	Р		
2.2.16	Modulation Fidelity	≤ 5% (Class A)	Р		
2.2.18	Transient Frequency Behavior				
	Time Interval t ₁ = 20 ms	∆f ≤ 12.5 kHz	Р		
	Time Interval t ₂ = 50 ms	∆f ≤ 6.25 kHz	Р		
	Time Interval t₃ = 10 ms	∆f ≤ 12.5 kHz	Р		

Receiver Tests (700/800 MHz) - 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-P25CAP081010-16081101 DTR-P25CAP081010-16081601	

Receiver Tests (700/800 MHz)				
Test Case	est Case Description Requirement			
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	Р	
2.1.9	Spurious Response Rejection	≥ 80 dB (Class A)	Р	
2.1.10	Intermodulation Rejection	≥ 75 dB (Class A)	Р	
2.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	Р	

Transmitter Tests (800 MHz) - 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-P25CAP081010-16081101 DTR-P25CAP081010-16081601

	Transmitter Tests (800 MHz)				
Test Case	Description	Requirement	Results		
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	≥ 67 dB	Р		
2.2.12	Transmitter Power and Encoder Attack Time				
	Power Attack Time	≤ 50 ms	Р		
	Encoder Attack Time	≤ 100 ms	Р		
2.2.14	Transmitter Throughput Delay	≤ 125 ms	Р		
2.2.15	Frequency Deviation for C4FM				
	High Level Signal Deviation	$2544~\text{Hz} < f_{\text{dev}} \leq 3111~\text{Hz}$	Р		
	Low Level Signal Deviation	$848~Hz < f_{dev} \leq 1037~Hz$	Р		
2.2.16	Modulation Fidelity	≤ 5% (Class A)	Р		
2.2.18	Transient Frequency Behavior				
	Time Interval t ₁ = 20 ms	∆f ≤ 12.5 kHz	Р		
	Time Interval t ₂ = 50 ms	∆f ≤ 6.25 kHz	Р		
	Time Interval t ₃ = 10 ms	∆f ≤ 12.5 kHz	Р		

Transmitter Tests (700 MHz) - 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-P25CAP081010-16081101 DTR-P25CAP081010-16081601

	Transmitter Tests (700 MHz)				
Test Case	Description	Requirement	Results		
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio				
	Offset From Center Frequency (kHz)				
	9.375	≥ 40 dB	Р		
	15.625, 21.875, 37.5	≥ 60 dB	Р		
	62.5, 87.5, 150, 250, 350	≥ 65 dB	Р		
	>400 kHz to 12 MHz	≥ 75 dB	Р		
	12 MHz to Paired RX Band	≥ 75 dB	Р		
	In the Paired RX Band	≥ 100 dB	Р		
2.2.12	Transmitter Power and Encoder Attack Time				
	Power Attack Time	≤ 50 ms	Р		
	Encoder Attack Time	≤ 100 ms	Р		
2.2.14	Transmitter Throughput Delay	≤ 125 ms	Р		
2.2.15	Frequency Deviation for C4FM				
	High Level Signal Deviation	2544 Hz < f _{dev} ≤ 3111 Hz	Р		
	Low Level Signal Deviation	$848 \; Hz < f_{dev} \le 1037 \; Hz$	Р		
2.2.16	Modulation Fidelity	≤ 5% (Class A)	Р		
2.2.18	Transient Frequency Behavior				
	Time Interval t ₁ = 20 ms	∆f ≤ 12.5 kHz	Р		
	Time Interval t ₂ = 50 ms	∆f ≤ 6.25 kHz	Р		
	Time Interval t ₃ = 10 ms	∆f ≤ 12.5 kHz	Р		

Trunked Subscriber Unit Tests (700/800 MHz) - 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-P25CAP081010-16081101 DTR-P25CAP081010-16081601	

Trunked Subscriber Unit Tests (700/800 MHz)			
Test Case	Description	Requirement	Results
2.3.1	Trunking Control Channel Slot Times (45 ms slot) N7		
	Encode Attack Time	$2.00 \text{ ms} \le t \le 11.65 \text{ ms}$	Р
	RF Power Attack Time	$0 \text{ ms} \le t \le 11.65 \text{ ms}$	Р
	RF Power Turn Off Time	≤ 1.57 ms	Р
2.3.2	Trunking Request Time	≤ 167.5 ms	Р
2.3.3	Trunking Voice Access Time	500 ms	Р
		(Manufacturer Specified)	
2.3.5	Transmitter Time to Key on a Traffic Channel		
	Short Channel Form	≤ 150.0 ms	Р

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 VP5430F2/F3 Portable Subscriber

Product	Detailed Test Report Identification	
Motorola Solutions ASTRO Trunked Infrastructure	DTR-P25CAP081010-16080202	
EF Johnson Atlas Trunked Infrastructure	DTR-P25CAP081010-16081101	
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	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.1.4.2	Test Case 2 – Denied or Refused Registration			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.1.4.3	Test Case 3 - Unverified Registration			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.2	Group Voice Call			
2.2.2.4.1	Test Case 1 – Group Call Granted			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.2.4.2	Test Case 2 – Group Call Denied			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.2.4.3	Test Case 3 – Group Call Request Queued			
=	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р

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 VP5430F2/F3 Portable Subscriber

Product	Detailed Test Report Identification
Motorola Solutions ASTRO Trunked Infrastructure	DTR-P25CAP081010-16080202
EF Johnson Atlas Trunked Infrastructure	DTR-P25CAP081010-16081101
Harris Infrastructure	DTP-P25CAP081010-1121211E01

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	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.3.4.2	Test Case 2 – Unit-To-Unit Call Target Availability Check Denied By Target			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
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	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
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 2	N/A 3
	Inter-System Operation	N/A 1	N/A 2	N/A 3
	Inter-WACN Operation	N/A 1	N/A 2	N/A 3
2.2.3.4.5	Test Case 5 – Unit-To-Unit Call Without Target Availability Check			
	Home Operation	N/A 1	N/A 2	N/A 3
	Inter-System Operation	N/A 1	N/A 2	N/A 3
	Inter-WACN Operation	N/A 1	N/A 2	N/A 3

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	N/A 1	N/A 2	N/A 3
	Inter-System Operation	N/A 1	N/A 2	N/A 3
	Inter-WACN Operation	N/A 1	N/A 2	N/A 3
2.2.3.4.7	Test Case 7 – Unit-To-Unit Call Denied			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р

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 VP5430F2/F3 Portable Subscriber

Product	Detailed Test Report Identification
Motorola Solutions ASTRO Trunked Infrastructure	DTR-P25CAP081010-16080202
EF Johnson Atlas Trunked Infrastructure	DTR-P25CAP081010-16081101
Harris Infrastructure	DTP-P25CAP081010-1121211E01

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	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.5	Affiliation			
2.2.5.4.1	Test Case 1 - Radio Permitted To Affiliate With New Group			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.5.4.2	Test Case 2 - Radio Denied Affiliation To New Group			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.6	Announcement Group Call			
2.2.6.4.1	Test Case 1 - Collection Of Talk Groups Receive Call			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.7	Emergency Alarm			
2.2.7.4.1	Test Case 1 - Emergency Alarm			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р

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 VP5430F2/F3 Portable Subscriber

Product	Detailed Test Report Identification
Motorola Solutions ASTRO Trunked Infrastructure	DTR-P25CAP081010-16080202
EF Johnson Atlas Trunked Infrastructure	DTR-P25CAP081010-16081101
Harris Infrastructure	DTP-P25CAP081010-1121211E01

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	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.10	Encryption			
2.2.10.4.1	Test Case 1 - Call Privacy For Encrypted Call			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р
2.2.11	Intra-Location Registration Area Roaming			
2.2.11.4.1	Test Case 1 – Idle Radio			
	Home Operation	Р	Р	Р
	Inter-System Operation	N1	N2	Р
	Inter-WACN Operation	N1	N2	Р

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 VP5430 Portable	EF Johnson Viking VP5430F2/F3	Firmware: 8.16.3
	Portable Subscriber	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:	Test case 2.2.3.4.4, 2.2.3.4.5, 2.2.3.4.6 is not applicable for these infrastructures; see results of test 2.2.3.4.3.
N/A 2:	Test case 2.2.3.4.4, 2.2.3.4.5, 2.2.3.4.6 is not applicable for these infrastructures; see results of test 2.2.3.4.3.
N/A 3:	Test case 2.2.3.4.4, 2.2.3.4.5, 2.2.3.4.6 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:	EF Johnson infrastructure does not support Inter-System or Inter-WACN roaming.
P1:	EF Johnson TK 5430 700/800 subscriber passes Reference Sensitivity (≤ -116 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P2:	EF Johnson TK 5430 700/800 subscriber passes Faded Reference Sensitivity (≤ -108 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P3:	EF Johnson TK 5430 700/800 subscriber passes Signal Delay Spread Capability specification for C4FM (Non-Simulcast) (\geq 50 µs) and Simulcast modulations (\geq 80 µs).
P4:	EF Johnson TK 5430 700/800 subscriber passes Adjacent Channel Rejection (≥ 60 dB) specification for C4FM (Non-Simulcast) and Simulcast modulations.

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