

**Project 25 Compliance Assessment Program
 Summary Test Report
 Viking VM5730, VM6730, VM7730 VHF Mobile Subscriber Unit
 STR-EFJ-17041702
 April 17, 2017**

Test Item Description

Manufacturer	EF Johnson Technologies
Manufacturer Contact	Randy O'Connor (972) 819-0911
Product Name	Viking VM5730, VM6730, VM7730 VHF Mobile 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	January 13, 2017 - March 30, 2017
Date of Issue	March 30, 2017

Laboratory	Details
P25 CAP Laboratory Code	P25CAP081016 (TIMCO Engineering)
Date(s) of Test	March 22, 2017
Date of Issue	March 23, 2017

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Informative References

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

Other Devices Tested with Viking VM5730, VM6730, VM7730 Mobile Subscriber Unit

Manufacturer	Product Name, Definition, and Unique ID	Installed Options
EF Johnson	ATLAS Trunked Infrastructure	TSNI 2.0.2.5
Airbus / Tait	P25 Trunked Infrastructure TB5500i	EADS P25V11_06 E22
Tait Limited	P25 Trunked Infrastructure TN9400	V1.12

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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-P25CAP081010-17033101

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
2.1.17	Late Entry Unsquelch 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-P25CAP081010-17033101

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-P25CAP081010-17033101 DTR-P25CAP081010-17033102

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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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-P25CAP081010-17033101 DTR-P25CAP081010-17033102

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 $t_1 = 20$ ms	$ \Delta f \leq 12.5$ kHz	P
	Time Interval $t_2 = 50$ ms	$ \Delta f \leq 6.25$ kHz	P
	Time Interval $t_3 = 10$ 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-P25CAP081010-17033101 DTR-P25CAP081010-17033102

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	Viking VM5730, VM6730, VM7730 Mobile Subscriber

Product	Detailed Test Report Identification
EF Johnson Technologies	DTR-P25CAP081010-17032801
Airbus / Tait	229BZUT17_2.1.3.3 AirBus TRUNKING SU IOT DTR 170208
Tait Limited	229BZUT17_2.1.3.3 TN9400 TRUNKING SU IOT DTR 170103

Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited 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	N2	N3
	Inter-WACN Operation	N1	N2	N3
2.2.1.4.2	Test Case 2 – Denied or Refused Registration			
	Home Operation	P	P	P
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3
2.2.1.4.3	Test Case 3 - Unverified Registration			
	Home Operation	P	P	P
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3
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	N2	N3
	Inter-WACN Operation	N1	N2	N3
2.2.2.4.2	Test Case 2 – Group Call Denied			
	Home Operation	P	P	P
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3
2.2.2.4.3	Test Case 3 – Group Call Request Queued			
	Home Operation	P	P	P

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Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3

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Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited 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	N2	N3
	Inter-WACN Operation	N1	N2	N3
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	N2	N3
	Inter-WACN Operation	N1	N2	N3
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	N/A 2	N/A 2
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3
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 2
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3
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 2
	Inter-System Operation	N1	N2	N3

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Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure
	Inter-WACN Operation	N1	N2	N3
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 2
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3
2.2.3.4.7	Test Case 7 – Unit-To-Unit Call Denied			
	Home Operation	P	P	P
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3

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Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited 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	N2	N3
	Inter-WACN Operation	N1	N2	N3
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	N2	N3
	Inter-WACN Operation	N1	N2	N3
2.2.5.4.2	Test Case 2 - Radio Denied Affiliation To New Group			
	Home Operation	P	P	P
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3
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	N2	N3
	Inter-WACN Operation	N1	N2	N3
2.2.7	Emergency Alarm			
2.2.7.4.1	Test Case 1 - Emergency Alarm			
	Home Operation	P	P	P
	Inter-System Operation	N1	N2	N3
	Inter-WACN Operation	N1	N2	N3

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Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited 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	N2	N3
	Inter-WACN Operation	N1	N2	N3
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	N2	N3
	Inter-WACN Operation	N1	N2	N3
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	N2	N3
	Inter-WACN Operation	N1	N2	N3

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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 VM5730, VM6730, VM7730 Mobile	Viking VM5730, VM6730, VM7730 Mobile Subscriber	Firmware: 8.18.7

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 2.2.3.4.3, 2.2.3.4.4, 2.2.3.4.5, 2.2.3.4.6 is not applicable for these infrastructures
N1:	EF Johnson infrastructure does not support Inter-System or Inter-WACN roaming.
N2:	Airbus/Tait infrastructure does not support Inter-System or Inter-WACN roaming.
N3:	Tait Limited infrastructure does not support Inter-System or Inter-WACN roaming.
P1:	VM5730, VM6730, VM7730 VHF Mobile passes Reference Sensitivity (≤ -116 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P2:	VM5730, VM6730, VM7730 VHF Mobile passes Faded Reference Sensitivity (≤ -108 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P3:	VM5730, VM6730, VM7730 VHF Mobile passes Signal Delay Spread Capability specification for C4FM (Non-Simulcast) (≥ 50 μ s) and Simulcast modulations (≥ 80 μ s).
P4:	VM5730, VM6730, VM7730 VHF Mobile passes Adjacent Channel Rejection (≥ 60 dB) specification for C4FM (Non-Simulcast) and Simulcast modulations.

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