

Project 25 Compliance Assessment Program
Summary Test Report
Viking VM5830, VM6830, VM7830 UHF (450MHz to 512 MHz) Mobile Subscriber
Unit
STR-EFJ-17041704
April 17, 2017

Test Item Description

Manufacturer	EF Johnson Technologies
Manufacturer Contact	Randy O'Connor (972) 819-0911
Product Name	Viking VM5830, VM6830, VM7830 UHF (450 MHz to 512 MHz) 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

Laboratory	Details
P25 CAP Laboratory Code	P25CAP081010 (EF Johnson Technologies)
Date(s) of Test	May 9, 2017
Date of Issue	June 14 , 2017

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Informative References

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

Other Devices Tested with Viking VM5830, VM6830, VM7830 UHF (450 to 512) MHz 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
Motorola	Astro 25 Trunked Infrastructure	System Release 7.17

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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-P25CAP081010-17042101

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-P25CAP081010-17042101

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 $t_1 = 10$ ms	$ \Delta f \leq 12.5$ kHz	P
	Time Interval $t_2 = 25$ 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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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-P25CAP081010-17042101 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

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Transmitter Tests – Trunked

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P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance	DTR-P25CAP081010-17042101 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 $t_1 = 10$ ms	$ \Delta f \leq 12.5$ kHz	P
	Time Interval $t_2 = 25$ 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-P25CAP081010-17042101 DTR-P25CAP081010-17033101

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 VM5830, VM6830, VM7830 450 to 512 MHz 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
Motorola	DTR-P25CAP081010-17061401

Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure	Motorola Trunked Infrastructure
2.2.1	Full Registration				
2.2.1.4.1	Test Case 1 - Valid Registration				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.1.4.2	Test Case 2 – Denied or Refused Registration				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.1.4.3	Test Case 3 - Unverified Registration				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.2	Group Voice Call				
2.2.2.4.1	Test Case 1 – Group Call Granted				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.2.4.2	Test Case 2 – Group Call Denied				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4

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Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure	Motorola Trunked Infrastructure
2.2.2.4.3	Test Case 3 – Group Call Request Queued				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4

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Tait Limited	229BZUT17_2.1.3.3 TN9400 TRUNKING SU IOT DTR 170103
Motorola	DTR-P25CAP081010-17061401

Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure	Motorola 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	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.3.4.2	Test Case 2 – Unit-To-Unit Call Target Availability Check Denied By Target				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
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	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
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	N/A 1
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
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	N/A 1

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	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
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	N/A 1
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.3.4.7	Test Case 7 – Unit-To-Unit Call Denied				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4

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Tait Limited	229BZUT17_2.1.3.3 TN9400 TRUNKING SU IOT DTR 170103
Motorola	DTR-P25CAP081010-17061401

Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure	Motorola Trunked Infrastructure
2.2.4	Broadcast Voice Call				
2.2.4.4.1	Test Case 1 – Broadcast Voice Call				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
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	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.5.4.2	Test Case 2 - Radio Denied Affiliation To New Group				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
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	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.7	Emergency Alarm				
2.2.7.4.1	Test Case 1 - Emergency Alarm				
	Home Operation	P	P	P	P

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Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure	Motorola Trunked Infrastructure
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4

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Tait Limited	229BZUT17_2.1.3.3 TN9400 TRUNKING SU IOT DTR 170103
Motorola	DTR-P25CAP081010-17061401

Test Case	Description	EF Johnson Atlas Trunked Infrastructure	Airbus/Tait Trunked Infrastructure	Tait Limited Trunked Infrastructure	Motorola Trunked Infrastructure
2.2.8	Emergency Group Call				
2.2.8.4.1	Test Case 1 - Emergency Call				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.10	Encryption				
2.2.10.4.1	Test Case 1 - Call Privacy For Encrypted Call				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4
2.2.11	Intra-Location Registration Area Roaming				
2.2.11.4.1	Test Case 1 – Idle Radio				
	Home Operation	P	P	P	P
	Inter-System Operation	N1	N2	N3	N4
	Inter-WACN Operation	N1	N2	N3	N4

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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 VM5830, VM6830, VM7830 Mobile	Viking VM5830, VM6830, VM7830 (450 to 512 MHz) 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.
N4:	Motorola infrastructure does not support Inter-System or Inter-WACN roaming.
P1:	VM5830, VM6830, VM7830 (450 to 512 MHz) Mobile passes Reference Sensitivity (≤ -116 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P2:	VM5830, VM6830, VM7830 (450 to 512 MHz) Mobile passes Faded Reference Sensitivity (≤ -108 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
P3:	VM5830, VM6830, VM7830 (450 to 512 MHz) Mobile passes Signal Delay Spread Capability specification for C4FM (Non-Simulcast) (≥ 50 μ s) and Simulcast modulations (≥ 80 μ s).
P4:	VM5830, VM6830, VM7830 (450 to 512 MHz) Mobile passes Adjacent Channel Rejection (≥ 60 dB) specification for C4FM (Non-Simulcast) and Simulcast modulations.

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EXPIRATION DATE: 06/30/2019

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