Test Item Description		
Manufacturer	EF Johnson Technologies	
Manufacturer Contact	John Oblak (507) 382-6327	
Product Name	Viking VM600 and VM400 700/800 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

Test Information			
P25 CAP Laboratory Code P25CAP081010 (EF Johnson Technologies)			
Date(s) of Test June 4, 2014 to June 17, 2014			
Date of Issue	June 24, 2014		

Test Information			
P25 CAP Laboratory Code P25CAP081010 (EF Johnson Technologies)			
Date(s) of Test	June 16, 2014 to June 18, 2014		
Date of Issue	June 24, 2014		

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

Test Information			
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		

Test Information			
P25 CAP Laboratory Code P25CAP081010 (EF Johnson Technologies)			
Date(s) of Test	March 27, 2015		
Date of Issue	March 27, 2015		

Informative References		
Date	e Title	
Mar 2010	P25-CAB-CAI_TEST_REQ – March 2010	

Other Devices Tested with Viking VM600 and VM400 Mobile Subscriber Unit			
Manufacturer Product Name, Definition, and Unique ID Installed Options			
Harris	P25 Trunked Infrastructure	RFSS: MASTR V Firmware R7G13 FNE: VIDA Premiere SR10A	
EF Johnson	ATLAS Trunked Infrastructure	TSNI 1.2.1-8	
Motorola Solutions	ASTRO Trunked Infrastructure	ASTRO 25 7.15	

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.1 – Project 25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance		DTR-P25CAP081010-14062401				
	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	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			

P25-CAB-CAI_TEST_REQ – March 2010, Section P.1.1.1 – Project 25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance		DTR-P25CAP081010-14062401	
	Transmitter Test	s (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	$848~Hz < f_{dev} \leq 1037~Hz$	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	Δf ≤ 12.5 kHz	Р

1.1.1 – Proje	TEST_REQ – March 2010, Section ct 25 Phase 1 Common Air Interface Subscriber Unit Performance	DTR-P25CAP08101	0-14062401		
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	$2544 \; Hz < f_{dev} \le 3111 \; Hz$	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	Δf ≤ 12.5 kHz	Р		

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance		DTR-P25CAP081010-14062401 DTR-P25CAP081010-14062402	
	Receiver ⁻	Tests	
Test Case	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

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Frunked Subscriber Unit Performance		DTR-P25CAP081010-14062401 DTR-P25CAP081010-14062402		
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	$848 \; Hz < f_{dev} \le 1037 \; Hz$	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	Δf ≤ 6.25 kHz	Р	
	Time Interval t ₃ = 10 ms	∆f ≤ 12.5 kHz	Р	

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance		DTR-P25CAP081010-14062401 DTR-P25CAP081010-14062402		
	Transmitter Test	s (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	$2544 \; Hz < f_{dev} \le 3111 \; Hz$	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	Δf ≤ 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	

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance		DTR-P25CAP081010-14062401 DTR-P25CAP081010-14062402		
	Trunked Subs	criber Unit Tests		
Test Case	Description	Requirement	Results	
2.3.1	Trunking Control Channel Slot Times (45 ms slot) N7 Encode Attack Time	2.00 ms ≤ t ≤ 11.65 ms	P	
	RF Power Attack Time RF Power Turn Off Time	0 ms ≤ t ≤ 11.65 ms ≤ 1.57 ms	P P	
2.3.2	Trunking Request Time	≤ 167.5 ms	Р	
2.3.3	Trunking Voice Access Time	500 ms (Manufacturer Specified)	Р	
2.3.5	Transmitter Time to Key on a Traffic Channel Short Channel Form	≤ 150.0 ms	Р	

P25-CAB-C Section 2.1 Common A Unit Interop	DTR- P25CAP081017- 1150218E	DTR- P25CAP081010- 15032702	DTP- P25CAP081010- 15032701	
EF Johnson	Harris Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Motorola Solutions ASTRO Trunked Infrastructure	
Test Case	Description			
2.2.1	Full Registration			
2.2.1.4.1	Test Case 1 - Valid Registration			
	Home Operation	P P		Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5 N4		N6
2.2.1.4.2	Test Case 2 – Denied or Refused			, T
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
2.2.1.4.3	Test Case 3 - Unverified Registration			
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
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	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
2.2.2.4.2	Test Case 2 – Group Call Denied		1	,
	Home Operation	Р	Р	Р
	Inter-System Operation		N4	N6
	Inter-WACN Operation	N5	N4	N6
2.2.2.4.3	Test Case 3 – Group Call Request		ı	,
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6

Section 2 Common	-CAI_TEST_REQ – March 2010, .1.3.2 – Project 25 Phase 1 Air Interface Trunked Subscriber operability	DTR- P25CAP081017- 1150218E	DTR- P25CAP081010- 15032702	DTP- P25CAP081010- 15032701
EF Johnson Viking VM600 and VM400 Mobile		Harris Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Motorola Solutions ASTRO Trunked Infrastructure
Test Case	Description			
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		Р
	Inter-System Operation	N5 N4 N		N6
	Inter-WACN Operation	N5 N4 N		N6
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	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
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	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
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	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
2.2.3.4.5	Test Case 5 – Unit-To-Unit Call Without Target Availability Check			
	Home Operation	N3	N2	N2
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6

P25-CAB- Section 2 Common Unit Inter	DTR- P25CAP081017- 1150218E	DTP- P25CAP081010- 15032701		
EF Johns Mobile	on Viking VM600 and VM400	Harris Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Motorola Solutions ASTRO Trunked Infrastructure
Test Case	Description			
2.2.3	Unit-To-Unit Voice Call			
2.2.3.4.6	Test Case 6 – Unit-To-Unit Call Queued Without Target Availability Check			
	Home Operation	N3	N2	N2
	Inter-System Operation	N5	N4	N6
Inter-WACN Operation		N5	N4	N6
2.2.3.4.7	Test Case 7 – Unit-To-Unit Call Denied			
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6

P25-CAB-CA Section 2.1. Air Interface Interoperabi	DTR- P25CAP081017- 1150218E	DTR- P25CAP081010- 15032702	DTP- P25CAP081010- 15032701	
EF Johnson Viking VM600 and VM400 Mobile			EF Johnson Atlas Trunked Infrastructure	Motorola Solutions ASTRO Trunked Infrastructure
Test Case	Description			
2.2.4	Broadcast Voice Call			
2.2.4.4.1	Test Case 1 – Broadcast Voice Call		Г	
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
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	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
2.2.5.4.2	Test Case 2 - Radio Denied Affiliation To New Group			
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
2.2.6	Announcement Group Call			
2.2.6.4.1	Test Case 1 - Collection Of Talk Groups Receive Call			
	Home Operation	P P		Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation		N4	N6
2.2.7	Emergency Alarm			
2.2.7.4.1	Test Case 1 - Emergency Alarm			
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6

P25-CAB-C Section 2.1 Air Interfac Interoperab	DTR- P25CAP081017- 1150218E	DTR- P25CAP081010- 15032702	DTP- P25CAP081010- 15032701	
EF Johnson	n Viking VM600 and VM400 Mobile	Harris Trunked Infrastructure	EF Johnson Atlas Trunked Infrastructure	Motorola Solutions ASTRO Trunked Infrastructure
Test Case	Description			
2.2.8	Emergency Group Call			
2.2.8.4.1	Test Case 1 - Emergency Call			
	Home Operation	Р	Р	Р
	Inter-System Operation	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
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	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6
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	N5	N4	N6
	Inter-WACN Operation	N5	N4	N6

Model Class Definition		Applied to P25-CAB-CAI_Test_Req Mar 2010, 2.1.3.2		
Model Class Name Product Definition		Name, n, and Unique ID	Installed Options	
Viking VM600 and VM400 Series Mobile	Viking VI Mobile	M600 and VM400	Firmware:	V 8.10.29
			Firmware:	V 8.12.7

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)

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- 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.
- N2: Infrastructure and EF Johnson Viking VM600 and VM400 do not support this mode of operation.
- N3: EF Johnson VM600 and VM400 subscriber does not support this mode of operation.
- N4: EF Johnson trunking system release Atlas TSNI 1.3.1-8, and EF Johnson Viking VM600 and VM400 subscriber do not support these features.
- N5: Harris infrastructure release SR10A and EF Johnson Viking VM600 and VM400 subscriber do not support these features.
- N6: Motorola infrastructure release 25 7.15 and EF Johnson Viking VM600 and VM400 subscriber do not support these features.
- N7: VM600 and VM400 meets timing requirements in the 45 ms slot timing mode.
- P1: EF Johnson Viking VM600 and VM400 700/800 MHz subscriber passes Reference Sensitivity (≤ 116 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
- P2: EF Johnson Viking VM600 and VM400 700/800 MHz subscriber passes Faded Reference Sensitivity (≤ -108 dBm) specification for C4FM (Non-Simulcast) and Simulcast modulations.
- P3: EF Johnson Viking VM600 700/800 MHz subscriber passes Signal Delay Spread Capability specification for C4FM (Non-Simulcast) (≥ 50 µs) and Simulcast modulations (≥ 80 µs).
- P4: EF Johnson Viking VM600 and VM400 700/800 MHz subscriber passes Adjacent Channel Rejection (≥ 60 dB) specification for C4FM (Non-Simulcast) and Simulcast modulations.

October 1, 2015

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