Project 25 Compliance Assessment Program

Summary Test Report

NX-5200 Portable Radio, VHF

STR-JKWRD-NX5200-0815

Device Under Test Description	
Manufacturer	JVCKENWOOD Corporation JVCKENWOOD USA Corporation
Manufacturer Contact	Donald E. Wingo, 678-474-4719
Product Name	NX-5200, Portable Subscriber Unit – VHF
Frequency Band	VHF (136 – 174 MHz)
Installed Options	P25 Conventional P25 Trunking P25 DES (multi-keys) encryption P25 AES (multi-keys) encryption
Installed Vocoder	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	
P25 CAP Laboratory Number	P25CAP081010 (EFJohnson Technologies)
Date(s) of Test	10 March 2015 – 01 April 2015 25 March 2015 – 13 July 2015
Date of Issue	14 July 2015
P25 CAP Laboratory Number	P25CAP081010 (EFJohnson Technologies)
Date(s) of Test	7 August 2014
Date of Issue	20 August 2014
P25 CAP Laboratory Number	P25CAP081017 (Harris Corporation)
Date(s) of Test	06 November 2014
Date of Issue	10 November 2014
P25 CAP Laboratory Number	P25CAP081011 (Compliance Testing, LLC)
Date(s) of Test	27 May 2015
Date of Issue	02 June 2015

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Informative References	
Date	**Title**
March 2010	P25-CAB-CAI_TEST_REQ

Other Devices Tested with: JVCKENWOOD NX-5xxx (Model Class*)

Manufacturer	Product Name, Definition, and Unique ID	Installed Options
EFJohnson	ATLAS, P25 Trunking System	Rel 1..1.0-10, TSNI 1.2.0-14
Harris Corp.	VIDA Premier SR10A MASTR V	Firmware R7G13
Codan Radio	Codan MT-4E – Daniels Trunked Radio	V1.1.0.9

**JVCKENWOOD Model Class is defined as all subscriber units, mobile and portable, that use common software / firmware and hardware design as related to interoperability testing.*

Performance Test Cases and Results

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.1 – Project 25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance		**DTR-P25CAP081010-15050402**	
Performance – Conventional Receiver Tests NX-5200 (VHF)			
Test Case	**Description**	**Requirement**	**Results**
2.1.4	Reference Sensitivity	≤ -116 dBm	P1
2.1.5	Faded Reference Sensitivity	≤ -108 dBm	P2
2.1.6	Signal Delay Spread Capability	≥ 50 us	P3
2.1.7	Adjacent Channel Rejection	≥ 60 dB	P4
2.1.8	Co-Channel Rejection	≤ 9 dB	P
2.1.9	Spurious Response Rejection	≥ 70 dB	P
2.1.10	Intermodulation Rejection	≥ 70 dB	P
2.1.11	Signal Displacement Bandwidth	≥ 1000 Hz	P
2.1.17	Late Entry Unsquelch Delay No Talk Group or Encryption Talk Group Only Encryption Only Both (On Clear or Encrypted Channel)	 ≤ 125 ms ≤ 370 ms ≤ 370 ms ≤ 460 ms	 P P P P
2.1.18	Receiver Throughput Delay	≤ 125 ms	P

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P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.1 – Project 25 Phase 1 Common Air Interface Conventional Subscriber Unit Performance		**DTR-P25CAP081010-15050402**	
Performance – Conventional Transmitter Tests NX-5200 (VHF)			
Test Case	**Description**	**Requirement**	**Results**
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	$\geq$ 67 dB	P
2.2.12	Transmitter Power Attack Time Encoder Attack Time	$\leq$ 50 ms $\leq$ 100 ms	P P
2.2.14	Transmitter Throughput Delay	$\leq$ 125 ms	P
2.2.15	Frequency Deviation for C4FM High Level Signal Deviation Low Level Signal Deviation	 $2544 \leq f_{dev} \leq 3111$ Hz $848 \leq f_{dev} \leq 1037$ Hz	 P P
2.2.16	Modulation Fidelity	$\leq$ 5%	P
2.2.18	Transient Frequency Behavior Time Interval t^1 = 5 ms Time Interval t^2 = 20 ms Time Interval t^3 = 5 ms	 $\{\triangle f\} \leq 12.5$ kHz $\{\triangle f\} \leq 6.25$ kHz $\{\triangle f\} \leq 12.5$ kHz	 P P P

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance		**DTR-P25CAP081010-15071401**	
Performance – Trunked Receiver Tests NX-5200 (VHF)			
Test Case	**Description**	**Requirement**	**Results**
2.1.4	Reference Sensitivity	$\leq$ -116 dBm	P1
2.1.5	Faded Reference Sensitivity	$\leq$ -108 dBm	P2
2.1.6	Signal Delay Spread Capability	$\geq$ 50 us	P3
2.1.7	Adjacent Channel Rejection	$\geq$ 60 dB	P4
2.1.8	Co-Channel Rejection	$\leq$ 9 dB	P
2.1.9	Spurious Response Rejection	$\geq$ 70 dB	P
2.1.10	Intermodulation Rejection	$\geq$ 70 dB	P
2.1.11	Signal Displacement Bandwidth	$\geq$ 1000 Hz	P

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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-P25CAP081010-15071401**	
Performance – Trunked Transmitter Tests NX-5200 (VHF)			
Test Case	**Description**	**Requirement**	**Results**
2.2.8	Unwanted Emissions: Adjacent Channel Power Ratio	$\geq$ 67 dB	P
2.2.12	Transmitter Power Attack Time Encoder Attach Time	$\leq$ 50 ms $\leq$ 100 ms	P P
2.2.14	Transmitter Throughput Delay	$\leq$ 125 ms	P
2.2.15	Frequency Deviation for C4FM High Level Signal Deviation Low Level Signal Deviation	 $2544 \leq f_{dev} \leq 3111$ Hz $848 \leq f_{dev} \leq 1037$ Hz	 P P
2.2.16	Modulation Fidelity	$\leq$ 5%	P
2.2.18	Transient Frequency Behavior Time Interval t^1 = 5 ms Time Interval t^2 = 20 ms Time Interval t^3 = 5 ms	 $\{\triangle f\} \leq 12.5$ kHz $\{\triangle f\} \leq 6.25$ kHz $\{\triangle f\} \leq 12.5$ kHz	 P P P

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.1.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Performance		**DTR-P25CAP081010-15071401**	
Performance – Trunked Transmitter Tests NX-5200 (VHF)			
Test Case	**Description**	**Requirement**	**Results**
2.3.1	Trunking Control Channel Slot Time 45 ms Slot Encode Attack Time RF Power Attack Time RF Turn Off Time	 2.0 ms $\leq$ t $\leq$ 11.65 ms 0.0 ms $\leq$ t $\leq$ 11.65 ms $\leq$ 1.57 ms	 P P P
2.3.2	Trunking Request Time	$\leq$ 167.5 ms	P
2.3.3	Trunking Voice Access Time	< 500 ms	P5
2.3.5	Transmit Time to Key on Traffic Channel	$\leq$ 150 ms	P

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Interoperability Test Cases and Results

P25-CAB-CAI_TEST_REQ – March 2010, Section 2.1.3.2 – Project 25 Phase 1 Common Air Interface Trunked Subscriber Unit Interoperability		DTR-P25CAP081010-14082001	DTR-P25CAP081017-1141104K	DTR-P25CAP081011
Kenwood Model Class – NX-5000		**EFJ ATLAS**	**HARRIS VIDA**	**CODAN**
Test Case	**Description**	**Result**		
2.2.1	**Full Registration**			
2.2.1.4.1	Test Case 1 – Valid Registration			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.1.4.2	Test Case 2 – Denied or Refused Registration			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.1.4.3	Test Case 3 – Unverified Registration			
	Home Configuration	P	P	N5
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.2	**Group Voice Call**			
2.2.2.4.1	Test Case 1 – Group Call Granted			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.2.4.2	Test Case 2 – Group Call Denied			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.2.4.3	Test Case 3 – Group Call Request Queued			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4

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 Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.3.4.2	Test Case 2 – Unit-to-Unit Call with Target Availability Check Denied by Target			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	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 Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	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 Configuration	NA1	NA1	NA1
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.3.4.5	Test Case 5 – Unit-to-Unit Call without Target Availability Check			
	Home Configuration	N2	P	N2
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.3.4.6	Test Case 6 – Unit-to-Unit Call Queued without Target Availability Check			
	Home Configuration	N2	P	N2
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.3.4.7	Test Case 7 – Unit-to-Unit Call Denied			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4

2.2.4	**Broadcast Voice Call**			
2.2.4.4.1	Test Case 1 – Broadcast Voice Call			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.5	**Affiliation**			
2.2.5.4.1	Test Case 1 – Radio Permitted to Affiliate with New Group			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.5.4.2	Test Case 2 – Radio Denied Affiliation to New Group			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.6	**Announcement Group Call**			
2.2.6.4.1	Test Case 1 – Collection of Talk Groups Receive Call			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.7	**Emergency Alarm**			
2.2.7.4.1	Test Case 1 – Emergency Alarm			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.8	**Emergency Group Call**			
2.2.8.4.1	Test Case 1 – Emergency Call			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.10	**Encryption**			
2.2.10.4.1	Test Case 1 – Call Privacy for Encrypted Call			
	Home Configuration	P	P	P
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4
2.2.11	**Intra-Location Registration Area Roaming**			
2.2.11.4.1	Test Case 1 – Idle Radio			
	Home Configuration	P	P	N6
	Inter-System Roaming Configuration	N1	N3	N4
	Inter-WACN Roaming Configuration	N1	N3	N4

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Model Class: NX-5xxx Subscriber	
Product Name, Definitions and Unique ID	**Model Number and Installed Options**
NX-5200 VHF Portable	FW K 1.11.01; Trunking, Encryption

Test Case Results Definitions	
No Test Performed	NT
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	
P1: Kenwood subscriber passes Reference Sensitivity specification for C4FM and Simulcast modulations.	
P2: Kenwood subscriber passes Faded Reference Sensitivity specification for C4FM and Simulcast modulations.	
P3: Kenwood subscriber passes Signal Delay Spread Capability specification for C4FM ($\geq$ 50 us) and Simulcast ($\geq$ 80 us) modulations.	
P4: Kenwood subscriber passes Adjacent Channel Rejection specification for C4FM and Simulcast modulations.	
P5: Trunking Voice Access Time will vary dependent on actual system design and implementation.	
N1: EFJohnson 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 EFJohnson and Codan FNE.	
N3: Harris infrastructure does not support Inter-System or Inter-WACN roaming	
N4: Codan infrastructure does not support Inter-System or Inter-WACN roaming	
N5: Codan infrastructure does not support Test Case 3, Section 2.2.1.4.3 Unverified Registration	
N6: Codan infrastructure does not support Intra-Location Registration Area Roaming, Test Case 1, Section 2.2.11.4.1.	
NA1: Test Case 2, Section 2.2.3.4.4 is not applicable to JVCKENWOOD subscribers on EFJ, Harris and Codan infrastructures; see results of test case 2.2.3.4.3	

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OMB NO: 1640-0015
EXPIRATION DATE: 07/31/2015

Burden Statement