|  |  |
| --- | --- |
| 3GPP TS 38.101-3 V18.2.0 (2023-06) | |
| Technical Specification | |
| 3rd Generation Partnership Project;  Technical Specification Group Radio Access Network;  NR;  User Equipment (UE) radio transmission and reception;  Part 3: Range 1 and Range 2 Interworking operation with other radios  (Release 18) | |
|  | |
|  | 3GPP-logo_web |
|  | |
| The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP. The present document has not been subject to any approval process by the 3GPPOrganizational Partners and shall not be implemented. This Specification is provided for future development work within 3GPPonly. The Organizational Partners accept no liability for any use of this Specification. Specifications and Reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices. | |

|  |
| --- |
|  |
| ***3GPP***  Postal address  3GPP support office address  650 Route des Lucioles - Sophia Antipolis  Valbonne - FRANCE  Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16  Internet  http://www.3gpp.org |
| ***Copyright Notification***  No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.  © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).  All rights reserved.  UMTS™ is a Trade Mark of ETSI registered for the benefit of its members  3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners LTE™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners  GSM® and the GSM logo are registered and owned by the GSM Association |

Contents

Foreword 14

1 Scope 16

2 References 16

3 Definitions, symbols and abbreviations 16

3.1 Definitions 16

3.2 Symbols 17

3.3 Abbreviations 17

4 General 18

4.1 Relationship between minimum requirements and test requirements 18

4.2 Applicability of minimum requirements 18

4.3 Specification suffix information 19

5 Operating bands and channel arrangement 19

5.1 General 19

5.2 Operating bands 20

5.2A Operating bands for CA 20

5.2A.1 Inter-band CA between FR1 and FR2 20

5.2B Operating bands for DC 25

5.2B.1 General 25

5.2B.2 Void 25

5.2B.3 Void 25

5.2B.4 Void 25

5.2B.5 Void 25

5.2B.6 Void 25

5.2B.7 Void 25

5.2E Operating bands for V2X 25

5.2E.1 Intra-band V2X bands 25

5.2E.2 Inter-band V2X bands 26

5.3 UE Channel bandwidth 26

5.3A UE Channel bandwidth for CA 26

5.3A.1 Inter-band CA between FR1 and FR2 26

5.3B UE Channel bandwidth for DC 27

5.3B.0 General 27

5.3B.1 Intra-band EN-DC in FR1 27

5.3B.1.1 General 27

5.3B.1.2 BCS for Intra-band contiguous EN-DC 27

5.3B.1.3 BCS for Intra-band non-contiguous EN-DC 31

5.3B.1a Intra-band NE-DC in FR1 35

5.3B.1a.1 General 35

5.3B.1a.2 BCS for Intra-band contiguous NE-DC 36

5.3C Void 36

5.3D Void 36

5.3E UE Channel bandwidth for V2X 36

5.3E.0 General 36

5.3E.1 Intra-band contiguous V2X in FR1 36

5.3E.2 Intra-band non-contiguous V2X in FR1 36

5.3E.3 Inter-band V2X in FR1 37

5.4 Void 37

5.4A Channel arrangement for CA 37

5.4B Channel arrangement for DC 37

5.4B.0 General 37

5.4B.1 Channel spacing for intra-band EN-DC carriers 37

5.5 Configuration 38

5.5A Configuration for CA 38

5.5A.1 Inter-band CA configurations between FR1 and FR2 38

5.5B Configuration for DC 434

5.5B.1 General 434

5.5B.2 Intra-band contiguous EN-DC 435

5.5B.2a Intra-band contiguous NE-DC 435

5.5B.3 Intra-band non-contiguous EN-DC 436

5.5B.4 Inter-band EN-DC within FR1 437

5.5B.4.1 Inter-band EN-DC configurations within FR1 (two bands) 437

5.5B.4.2 Inter-band EN-DC configurations within FR1 (three bands) 448

5.5B.4.3 Inter-band EN-DC configurations within FR1 (four bands) 494

5.5B.4.4 Inter-band EN-DC configurations within FR1 (five bands) 556

5.5B.4.5 Inter-band EN-DC configurations within FR1 (six bands) 588

5.5B.4a Inter-band NE-DC within FR1 594

5.5B.4a.1 Inter-band NE-DC configurations within FR1 (two bands) 594

5.5B.4a.2 Inter-band NE-DC configurations within FR1 (three bands) 595

5.5B.4a.3 Inter-band NE-DC configurations within FR1 (four bands) 596

5.5B.4a.4 Inter-band NE-DC configurations within FR1 (five bands) 596

5.5B.5 Inter-band EN-DC including FR2 597

5.5B.5.1 Inter-band EN-DC configurations including FR2 (two bands) 597

5.5B.5.2 Inter-band EN-DC configurations including FR2 (three bands) 633

5.5B.5.3 Inter-band EN-DC configurations including FR2 (four bands) 680

5.5B.5.4 Inter-band EN-DC configurations including FR2 (five bands) 715

5.5B.5.5 Void 728

5.5B.5a Inter-band NE-DC including FR2 728

5.5B.5a.1 Inter-band NE-DC configurations including FR2 (two bands) 728

5.5B.5a.2 Inter-band NE-DC configurations including FR2 (three bands) 730

5.5B.5a.3 Inter-band NE-DC configurations including FR2 (four bands) 733

5.5B.5a.4 Inter-band NE-DC configurations including FR2 (five bands) 735

5.5B.6 Inter-band EN-DC including FR1 and FR2 736

5.5B.6.1 Void 736

5.5B.6.2 Inter-band EN-DC configurations including FR1 and FR2 (three bands) 736

5.5B.6.3 Inter-band EN-DC configurations including FR1 and FR2 (four bands) 752

5.5B.6.4 Inter-band EN-DC configurations including FR1 and FR2 (five bands) 779

5.5B.6.5 Inter-band EN-DC configurations including FR1 and FR2 (six bands) 801

5.5B.7 Inter-band NR-DC between FR1 and FR2 807

5.5B.7.0 General 807

5.5B.7.1 Inter-band NR-DC configurations between FR1 and FR2 (two bands) 808

5.5B.7.2 Inter-band NR-DC configurations between FR1 and FR2 (three bands) 829

5.5B.7.3 Inter-band NR-DC configurations between FR1 and FR2 (four bands) 856

5.5B.7.4 Inter-band NR-DC configurations between FR1 and FR2 (five bands) 866

5.5B.6a Inter-band NE-DC including FR1 and FR2 867

5.5B.6a.1 Void 867

5.5B.6a.2 Inter-band NE-DC configurations including FR1 and FR2 (three bands) 867

5.5B.6a.3 Inter-band NE-DC configurations including FR1 and FR2 (four bands) 868

5.5C Void 868

5.5D Void 868

5.5E Configuration for V2X operation 868

5.5E.1 General 868

5.5E.2 Intra-band contiguous V2X operation in FR1 868

5.5E.3 Intra-band non-contiguous V2X operation in FR1 868

5.5E.4 Inter-band V2X operation in FR1 869

5.5E.4.1 Inter-band V2X configurations within FR1 (two bands) 869

6 Transmitter characteristics 870

6.1 General 870

6.2 Void 870

6.2A Transmitter power for CA 870

6.2A.1 UE maximum output power for CA 870

6.2A.1.1 Inter-band CA between FR1 and FR2 870

6.2A.2 UE maximum output power reduction for CA 870

6.2A.2.1 Inter-band CA between FR1 and FR2 870

6.2A.3 UE additional maximum output power reduction for CA 870

6.2A.4 Configured output power for CA 870

6.2A.4.1 Configured output power level 870

6.2A.4.2 ΔTIB,c for CA 871

6.2A.4.2.1 ΔTIB,c for Inter-band CA between FR1 and FR2 871

6.2B Transmitter power for DC 871

6.2B.1 UE maximum output power for DC 871

6.2B.1.1 Intra-band contiguous EN-DC 871

6.2B.1.1a Intra-band contiguous NE-DC 873

6.2B.1.2 Intra-band non-contiguous EN-DC 874

6.2B.1.3 Inter-band EN-DC within FR1 875

6.2B.1.3a Inter-band NE-DC within FR1 883

6.2B.1.4 Inter-band EN-DC including FR2 883

6.2B.1.4a Inter-band NE-DC including FR2 883

6.2B.1.5 Inter-band EN-DC including both FR1 and FR2 883

6.2B.2 UE maximum output power reduction for DC 884

6.2B.2.0 General 884

6.2B.2.1 Intra-band contiguous EN-DC 884

6.2B.2.1.1 General 884

6.2B.2.1a Intra-band contiguous NE-DC 884

6.2B.2.1.2 MPR for power class 3 and power class 2 885

6.2B.2.2 Intra-band non-contiguous EN-DC 885

6.2B.2.2.1 General 885

6.2B.2.2.2 MPR for power class 3 and power class 2 886

6.2B.2.3 Inter-band EN-DC within FR1 887

6.2B.2.3a Inter-band NE-DC within FR1 887

6.2B.2.4 Inter-band EN-DC including FR2 887

6.2B.2.4a Inter-band NE-DC including FR2 887

6.2B.2.5 Inter-band EN-DC including both FR1 and FR2 887

6.2B.3 UE additional maximum output power reduction for EN-DC 887

6.2B.3.1 Intra-band contiguous EN-DC 887

6.2B.3.1.0 General 887

6.2B.3.1.1 A-MPR for DC\_(n)71AA 887

6.2B.3.1.2 A-MPR for NS\_04 889

6.2B.3.2 Intra-band non-contiguous EN-DC 891

6.2B.3.2.0 General 891

6.2B.3.2.1 A-MPR for NS\_04 892

6.2B.3.3 Inter-band EN-DC within FR1 893

6.2B.3.3A Inter-band NE-DC within FR1 896

6.2B.3.4 Inter-band EN-DC including FR2 897

6.2B.3.4A Inter-band NE-DC including FR2 897

6.2B.3.5 Inter-band EN-DC including both FR1 and FR2 897

6.2B.4 Configured output power for DC 897

6.2B.4.1 Configured output power level 897

6.2B.4.1.1 Intra-band contiguous EN-DC 897

6.2B.4.1.1a Intra-band contiguous NE-DC 902

6.2B.4.1.2 Intra-band non-contiguous EN-DC 903

6.2B.4.1.3a Inter-band NE-DC within FR1 908

6.2B.4.1.4 Inter-band EN-DC including FR2 911

6.2B.4.1.4a Inter-band NE-DC including FR2 912

6.2B.4.1.5 Inter-band EN-DC including both FR1 and FR2 912

6.2B.4.2 ΔTIB,c for DC 912

6.2B.4.2.0 General 912

6.2B.4.2.1 Intra-band contiguous EN-DC 912

6.2B.4.2.1a Intra-band contiguous NE-DC 912

6.2B.4.2.2 Intra-band non-contiguous EN-DC 912

6.2B.4.2.3 Inter-band EN-DC within FR1 913

6.2B.4.2.3.1 ΔTIB,c for EN-DC two bands 913

6.2B.4.2.3.2 ΔTIB,c for EN-DC three bands 919

6.2B.4.2.3.3 ΔTIB,c for EN-DC four bands 936

6.2B.4.2.3.4 ΔTIB,c for EN-DC five bands 951

6.2B.4.2.3.5 ΔTIB,c for EN-DC six bands 956

6.2B.4.2.3a Inter-band NE-DC within FR1 957

6.2B.4.2.4 Inter-band EN-DC including FR2 957

6.2B.4.2.4.1 ΔTIB,c for EN-DC two bands 957

6.2B.4.2.4.2 ΔTIB,c for EN-DC three bands 958

6.2B.4.2.4.3 ΔTIB,c for EN-DC four bands 958

6.2B.4.2.4.4 ΔTIB,c for EN-DC five bands 958

6.2B.4.2.4.5 Void 958

6.2B.4.2.4a Inter-band NE-DC including FR2 958

6.2B.4.2.5 Inter-band EN-DC including both FR1 and FR2 958

6.2B.4.2.5.1 ΔTIB,c for EN-DC three bands 958

6.2B.4.2.5.2 ΔTIB,c for EN-DC four bands 958

6.2B.4.2.5.3 ΔTIB,c for EN-DC five bands 958

6.2B.4.2.5.4 ΔTIB,c for EN-DC six bands 958

6.2B.5 Configured output power for NR-DC 959

6.2B.5.1 Configured output power level 959

6.2B.5.1.1 Inter-band NR-DC between FR1 and FR2 959

6.2E Transmitter power for V2X in FR1 959

6.2E.1 UE maximum output power for V2X 959

6.2E.1.1 UE maximum output power for Intra-band contiguous V2X 959

6.2E.1.2 UE maximum output power for Intra-band non-contiguous V2X 959

6.2E.1.3 UE maximum output power for Inter-band V2X 959

6.2E.2 UE maximum output power reduction for V2X 960

6.2E.2.1 UE maximum output power reduction for Intra-band V2X 960

6.2E.2.2 UE maximum output power reduction for Inter-band V2X 960

6.2E.3 UE additional maximum output power reduction for V2X 960

6.2E.3.1 UE additional maximum output power reduction for Intra-band V2X 960

6.2E.3.2 UE additional maximum output power reduction for Inter-band V2X 960

6.2E.4 Configured output power for V2X 961

6.2E.4.1 UE configured output power for Intra-band V2X 961

6.2E.4.2 UE configured output power for Inter-band V2X 961

6.3 Output power dynamics 962

6.3A Output power dynamics for CA 962

6.3B Output power dynamics for DC 962

6.3B.0 General 962

6.3B.1 Output power dynamics for EN-DC with UL sharing from UE perspective 962

6.3B.1.1 E-UTRA and NR switching time mask for TDM based UL sharing from UE perspective 962

6.3B.1a Output power dynamics for NE-DC with UL sharing from UE perspective 964

6.3B.2 Output power dynamics for intra-band EN-DC without dual PA capability 964

6.3B.2a Output power dynamics for intra-band NE-DC without dual PA capability 964

6.3B.3 Output power dynamics for intra-band EN-DC with dual PA capability 965

6.3B.3a Output power dynamics for intra-band NE-DC with dual PA capability 965

6.3B.4 Output power dynamics for switching between two uplink carriers 965

6.3B.4.1 E-UTRA and NR switching time mask between two uplink carriers 965

6.3B.5 Output power dynamics for inter-band EN-DC 966

6.3E Output power dynamics for V2X 967

6.3E.1 General 967

6.3E.2 Output power dynamics for intra-band V2X operation 967

6.3E.3 Output power dynamics for inter-band V2X con-current operation 968

6.4 Void 968

6.4A Transmit signal quality for CA 968

6.4A.1 Frequency error for CA 968

6.4A.2 Transmit modulation quality for CA 968

6.4B Transmit signal quality for DC 968

6.4B.1 Frequency error for DC 968

6.4B.1.1 Frequency error for Intra-band contiguous EN-DC 968

6.4B.1.1a Frequency error for Intra-band contiguous NE-DC 968

6.4B.1.2 Frequency error for Intra-band non-contiguous EN-DC 968

6.4B.1.3 Frequency error for inter-band EN-DC within FR1 968

6.4B.1.3a Frequency error for inter-band NE-DC within FR1 969

6.4B.1.4 Frequency error for inter-band EN-DC including FR2 969

6.4B.1.4a Frequency error for inter-band NE-DC including FR2 969

6.4B.1.5 Frequency error for inter-band EN-DC including both FR1 and FR2 969

6.4B.2 Transmit modulation quality for DC 969

6.4B.2.1 Transmit modulation quality for Intra-band contiguous EN-DC 969

6.4B.2.1.1 Error Vector Magnitude 969

6.4B.2.1.2 Carrier leakage 969

6.4B.2.1.3 In-band emissions 969

6.4B.2.1a Transmit modulation quality for Intra-band contiguous NE-DC 970

6.4B.2.1a.1 Error Vector Magnitude 970

6.4B.2.1a.2 Carrier leakage 970

6.4B.2.1a.3 In-band emissions 970

6.4B.2.2 Transmit modulation quality for Intra-band non-contiguous EN-DC 970

6.4B.2.2.1 Error Vector Magnitude 970

6.4B.2.2.2 Carrier leakage 970

6.4B.2.2.3 In-band emissions 970

6.4B.2.3a Transmit modulation quality for Inter-band NE-DC within FR1 971

6.4B.2.4 Transmit modulation quality for Inter-band EN-DC including FR2 971

6.4B.2.4a Transmit modulation quality for Inter-band NE-DC including FR2 971

6.4B.2.5 Transmit modulation quality for inter-band EN-DC including both FR1 and FR2 971

6.4E Transmit signal quality for V2X operation in FR1 971

6.4E.1 Frequency error for V2X 971

6.4E.2 Transmit modulation quality for V2X 971

6.4E.2.1 Transmit modulation quality for Intra-band V2X 971

6.4E.2.2.1 Error Vector Magnitude 971

6.4E.2.2.2 Carrier leakage 972

6.4E.2.2.3 In-band emissions 972

6.4E.2.2 Transmit modulation quality for Inter-band V2X 972

6.5 Void 972

6.5A Output RF spectrum emissions for CA 972

6.5A.1 Occupied bandwidth for CA 972

6.5A.2 Out-of-band emissions for CA 972

6.5A.3 Spurious emissions for CA 972

6.5A.3.1 Inter-band CA between FR1 and FR2 972

6.5A.4 Transmit intermodulation for CA 972

6.5B Output RF spectrum emissions for DC 973

6.5B.1 Occupied bandwidth for EN-DC 973

6.5B.1.1 Intra-band contiguous EN-DC 973

6.5B.1.2 Intra-band non-contiguous EN-DC 973

6.5B.1.3 Inter-band EN-DC within FR1 973

6.5B.1.3a Inter-band NE-DC within FR1 973

6.5B.1.4 Inter-band EN-DC including FR2 973

6.5B.1.4a Inter-band NE-DC including FR2 973

6.5B.1.5 Inter-band EN-DC including both FR1 and FR2 973

6.5B.2 Out-of-band emissions for DC 973

6.5B.2.1 Intra-band contiguous EN-DC 973

6.5B.2.1.1 Spectrum emissions mask 974

6.5B.2.1.2 Additional spectrum emissions mask 974

6.5B.2.1.2.1 Requirements for network signalled value "NS\_35" 974

6.5B.2.1.2.2 Requirements for network signalled value "NS\_04" 974

6.5B.2.1.3 Adjacent channel leakage ratio 975

6.5B.2.2 Intra-band non-contiguous EN-DC 975

6.5B.2.2.1 Spectrum emissions mask 975

6.5B.2.2.2 Additional spectrum emissions mask 975

6.5B.2.2.3 Adjacent channel leakage ratio 975

6.5B.2.3 Inter-band EN-DC within FR1 976

6.5B.2.3a Inter-band NE-DC within FR1 976

6.5B.2.4 Inter-band EN-DC including FR2 976

6.5B.2.4a Inter-band NE-DC including FR2 976

6.5B.2.5 Inter-band EN-DC including both FR1 and FR2 976

6.5B.3 Spurious emissions for DC 976

6.5B.3.1 Intra-band contiguous EN-DC 976

6.5B.3.1.1 General spurious emissions 976

6.5B.3.1.2 Spurious emission band UE co-existence 976

6.5B.3.2 Intra-band non-contiguous EN-DC 977

6.5B.3.2.1 General spurious emissions 977

6.5B.3.2.2 Spurious emission band UE co-existence 977

6.5B.3.3 Inter-band EN-DC within FR1 978

6.5B.3.3.2 Spurious emission band UE co-existence 979

6.5B.3.3a Inter-band NE-DC within FR1 988

6.5B.3.3a.1 General spurious emissions 988

6.5B.3.3a.2 Spurious emission band UE co-existence 988

6.5B.3.4 Inter-band EN-DC including FR2 990

6.5B.3.4.0 General spurious emission 990

6.5B.3.4.1 Spurious emission band UE co-existence 990

6.5B.3.4a Inter-band NE-DC including FR2 990

6.5B.3.4a.1 Spurious emission band UE co-existence 990

6.5B.3.5 Inter-band EN-DC including both FR1 and FR2 990

6.5B.3.5.0 General spurious emission 990

6.5B.3.5.1 Spurious emission band UE co-existence 990

6.5B.4 Additional spurious emissions 991

6.5B.4.1 General 991

6.5B.4.1.1 Void 991

6.5B.4.2 Intra-band contiguous EN-DC 991

6.5B.4.2.1 Minimum requirement (network signalled value "NS\_04") 991

6.5B.4.3 Intra-band non-contiguous EN-DC 991

6.5B.4.3.1 Minimum requirement (network signalled value "NS\_04") 991

6.5B.4.4 Inter-band EN-DC within FR1 992

6.5B.4.4a Inter-band NE-DC within FR1 992

6.5B.4.5 Inter-band EN-DC including FR2 992

6.5B.4.6 Inter-band EN-DC including both FR1 and FR2 992

6.5B.5 Transmit intermodulation for DC 992

6.5B.5.1 Intra-band contiguous EN-DC 992

6.5B.5.1a Intra-band contiguous NE-DC 992

6.5B.5.2 Intra-band non-contiguous EN-DC 992

6.5B.5.3 Inter-band EN-DC within FR1 992

6.5B.5.3a Inter-band NE-DC within FR1 992

6.5B.5.4 Inter-band EN-DC including FR2 992

6.5B.5.4a Inter-band NE-DC including FR2 993

6.5B.5.5 Inter-band EN-DC including both FR1 and FR2 993

6.5E Output RF spectrum emissions for V2X operation in FR1 993

6.5E.1 Occupied bandwidth 993

6.5E.1.1 Intra-band V2X 993

6.5E.1.2 inter-band V2X con-current operation 993

6.5E.2 Out-of-band emissions 993

6.5E.2.1 Intra-band V2X 993

6.5E.2.2 Inter-band V2X con-current operation 993

6.5E.3 Spurious emissions 993

6.5E.3.1 Intra-band V2X 993

6.5E.3.1.1 General spurious emissions 993

6.5E.3.1.2 Spurious emission band UE co-existence 993

6.5E.3.2 Inter-band V2X con-current operation 994

6.5E.3.2.1 General spurious emissions 994

6.5E.3.2.2 Spurious emission band UE co-existence 994

6.5E.4 Transmit intermodulation 996

6.5E.4.1 Intra-band V2X 996

6.5E.4.2 Inter-band V2X con-current operation 997

6.6B Beam correspondence for DC 997

6.6B.1 Void 997

6.6B.2 Void 997

6.6B.3 Void 997

6.6B.4 Inter-band EN-DC including FR2 997

6.6B.4a Inter-band NE-DC including FR2 997

6.6B.5 Inter-band EN-DC including both FR1 and FR2 997

7 Receiver characteristics 997

7.1 General 997

7.2 Void 998

7.3 Void 998

7.3A Reference sensitivity for CA 998

7.3A.1 General 998

7.3A.2 Reference sensitivity power level for CA 999

7.3A.3 ΔRIB,c for CA 999

7.3A.3.1 ΔRIB,c for Inter-band CA between FR1 and FR2 999

7.3A.4 Void 999

7.3B Reference sensitivity level for DC 999

7.3B.1 General 999

7.3B.2 Reference sensitivity for DC 1000

7.3B.2.1 Intra-band contiguous EN-DC 1000

7.3B.2.1a Intra-band contiguous NE-DC 1002

7.3B.2.2 Intra-band non-contiguous EN-DC 1002

7.3B.2.3 Inter-band EN-DC within FR1 1002

7.3B.2.3.0 General 1002

7.3B.2.3.1 Reference sensitivity exceptions due to UL harmonic interference for EN-DC in NR FR1 1003

7.3B.2.3.2 Reference sensitivity exceptions due to receiver harmonic mixing for EN-DC in NR FR1 1010

7.3B.2.3.3 Void 1014

7.3B.2.3.4 Reference sensitivity exceptions due to cross band isolation for EN-DC in NR FR1 1014

7.3B.2.3.5 MSD for intermodulation interference due to dual uplink operation for EN-DC in NR FR1 1022

7.3B.2.3.5.1 MSD test points for intermodulation interference due to dual uplink operation for PC3 EN-DC in NR FR1 involving two bands 1023

7.3B.2.3.5.2 MSD test points for intermodulation interference due to dual uplink operation for EN-DC in NR FR1 involving three bands 1033

7.3B.2.3.5.3 Void 1094

7.3B.2.3.5.4 MSD test points for intermodulation interference due to dual uplink operation for EN-DC in NR FR1 involving four bands 1094

7.3B.2.3.6 Reference sensitivity exceptions due to Tx non-linearity interference in 1st or 2nd adjacent channel of UL band for EN-DC in NR FR1 1094

7.3B.2.3a Inter-band NE-DC within FR1 1095

7.3B.2.3a.0 General 1095

7.3B.2.3a.1 Reference sensitivity exceptions due to UL harmonic interference for NE-DC in NR FR1 1095

7.3B.2.3a.2 Reference sensitivity exceptions due to receiver harmonic mixing for NE-DC in NR FR1 1095

7.3B.2.3a.3 Reference sensitivity exceptions due to cross band isolation for NE-DC in NR FR1 1095

7.3B.2.3a.4 MSD for intermodulation interference due to dual uplink operation for NE-DC in NR FR1 1096

7.3B.2.4 Inter-band EN-DC including FR2 1096

7.3B.2.4.1 Void 1096

7.3B.2.5 Inter-band EN-DC including both FR1 and FR2 1096

7.3B.2.5.1 Reference sensitivity exceptions due to UL harmonic interference for EN-DC including both FR1 and FR2 1096

7.3B.3 ΔRIB,c, ΔRIBNC for DC 1096

7.3B.3.0 General 1096

7.3B.3.1 Intra-band contiguous EN-DC 1098

7.3B.3.2 Intra-band non-contiguous EN-DC 1098

7.3B.3.3 Inter-band EN-DC within FR1 1105

7.3B.3.3.1 ΔRIB,c for EN-DC in two bands 1105

7.3B.3.3.2 ΔRIB,c for EN-DC three bands 1109

7.3B.3.3.3 ΔRIB,c for EN-DC four bands 1122

7.3B.3.3.4 ΔRIB,c for EN-DC five bands 1136

7.3B.3.3.5 ΔRIB,c for EN-DC six bands 1142

7.3B.3.3a Inter-band NE-DC within FR1 1142

7.3B.3.4 Inter-band EN-DC including FR2 1142

7.3B.3.4.1 ΔRIB,c for EN-DC in two bands 1142

7.3B.3.4.2 ΔRIB,c for EN-DC three bands 1142

7.3B.3.4.3 ΔRIB,c for EN-DC four bands 1143

7.3B.3.4.4 ΔRIB,c for EN-DC five bands 1143

7.3B.3.4.5 Void 1143

7.3B.3.4a Inter-band NE-DC including FR2 1143

7.3B.3.5 Inter-band EN-DC including both FR1 and FR2 1143

7.3B.3.5.2 ΔRIB,c for EN-DC three bands 1143

7.3B.3.5.3 ΔRIB,c for EN-DC four bands 1143

7.3B.3.5.4 ΔRIB,c for EN-DC five bands 1143

7.3B.3.5.5 ΔRIB,c for EN-DC six bands 1143

7.3E Reference sensitivity for V2X operation in FR1 1144

7.3E.1 General 1144

7.3E.2 Reference sensitivity for V2X 1144

7.3E.2.1 Intra-band contiguous V2X 1144

7.3E.2.2 Intra-band non-contiguous V2X 1144

7.3E.2.3 Inter-band V2X con-current operation 1144

7.3E.2.3.0 General 1144

7.3E.2.3.1 Reference sensitivity exception due to UL harmonic problem 1145

7.4 Void 1146

7.4A Maximum input level for CA 1146

7.4B Maximum input level for DC in FR1 1146

7.4B.1 Intra-band contiguous EN-DC in FR1 1146

7.4B.1a Intra-band contiguous NE-DC in FR1 1146

7.4B.2 Intra-band non-contiguous EN-DC in FR1 1146

7.4B.3 Inter-band EN-DC within FR1 1146

7.4B.3a Inter-band NE-DC within FR1 1146

7.4B.4 Inter-band EN-DC including FR2 1147

7.4B.4a Inter-band NE-DC including FR2 1147

7.4B.5 Inter-band EN-DC including both FR1 and FR2 1147

7.4E Maximum input level for V2X operation in FR1 1147

7.5 Void 1147

7.5A Adjacent channel selectivity for CA 1147

7.5B Adjacent channel selectivity for DC in FR1 1147

7.5B.1 Intra-band contiguous EN-DC in FR1 1147

7.5B.1a Intra-band contiguous NE-DC in FR1 1148

7.5B.2 Intra-band non-contiguous EN-DC in FR1 1149

7.5B.3 Inter-band EN-DC within FR1 1149

7.5B.3a Inter-band NE-DC within FR1 1149

7.5B.4 Inter-band EN-DC including FR2 1149

7.5B.4a Inter-band NE-DC including FR2 1149

7.5E Adjacent channel selectivity for V2X operation in FR1 1150

7.6 Void 1150

7.6A Blocking characteristics for CA 1150

7.6B Blocking characteristics for DC in FR1 1150

7.6B.1 General 1150

7.6B.2 In-band blocking for DC in FR1 1150

7.6B.2.1 Intra-band contiguous EN-DC in FR1 1150

7.6B.2.1a Intra-band contiguous NE-DC in FR1 1150

7.6B.2.2 Intra-band non-contiguous EN-DC in FR1 1151

7.6B.2.3 Inter-band EN-DC within FR1 1151

7.6B.2.3a Inter-band NE-DC within FR1 1151

7.6B.2.4 Inter-band EN-DC including FR2 1151

7.6B.2.4a Inter-band NE-DC including FR2 1151

7.6B.2.5 Inter-band EN-DC including both FR1 and FR2 1151

7.6B.2.6 Void 1151

7.6B.3 Out-of-band blocking for DC in FR1 1152

7.6B.3.1 Intra-band contiguous EN-DC in FR1 1152

7.6B.3.1a Intra-band contiguous NE-DC in FR1 1152

7.6B.3.2 Intra-band non-contiguous EN-DC in FR1 1152

7.6B.3.3 Inter-band EN-DC within FR1 1152

7.6B.3.3a Inter-band NE-DC within FR1 1153

7.6B.3.4 Inter-band EN-DC including FR2 1154

7.6B.3.4a Inter-band NE-DC including FR2 1154

7.6B.3.5 Inter-band EN-DC including both FR1 and FR2 1154

7.6B.4 Narrow band blocking for DC in FR1 1154

7.6B.4.1 Intra-band contiguous EN-DC in FR1 1154

7.6B.4.1a Intra-band contiguous NE-DC in FR1 1154

7.6B.4.2 Intra-band non-contiguous EN-DC in FR1 1155

7.6B.4.3 Inter-band EN-DC within FR1 1155

7.6B.4.3a Inter-band NE-DC within FR1 1155

7.6B.4.4 Inter-band EN-DC including FR2 1155

7.6B.4.4a Inter-band NE-DC including FR2 1155

7.6B.4.5 Inter-band EN-DC including both FR1 and FR2 1155

7.6E Blocking characteristics for V2X in FR1 1155

7.7 Void 1155

7.7A Spurious response for CA 1155

7.7B Spurious response for DC in FR1 1156

7.7B.1 Intra-band contiguous EN-DC in FR1 1156

7.7B.1a Intra-band contiguous NE-DC in FR1 1156

7.7B.2 Intra-band non-contiguous EN-DC in FR1 1156

7.7B.3 Inter-band EN-DC within FR1 1156

7.7B.4a Inter-band NE-DC including FR2 1157

7.7B.5 Inter-band EN-DC including both FR1 and FR2 1157

7.7E Spurious response for V2X in FR1 1157

7.8 Void 1157

7.8A Intermodulation characteristics for CA 1157

7.8B Intermodulation characteristics for DC in FR1 1157

7.8B.1 General 1157

7.8B.2 Wide band Intermodulation 1157

7.8B.2.1 Intra-band contiguous EN-DC in FR1 1157

7.8B.2.1a Intra-band contiguous NE-DC in FR1 1158

7.8B.2.2 Intra-band non-contiguous EN-DC in FR1 1158

7.8B.2.3 Inter-band EN-DC within FR1 1158

7.8B.2.3a Inter-band NE-DC within FR1 1158

7.8B.2.4 Inter-band EN-DC including FR2 1158

7.8B.2.4a Inter-band NE-DC including FR2 1159

7.8B.2.5 Inter-band EN-DC including both FR1 and FR2 1159

7.8E Intermodulation characteristics for V2X operation in FR1 1159

7.9 Void 1159

7.9A Spurious emissions for CA 1159

7.9B Spurious emissions for DC in FR1 1159

7.9B.1 Intra-band contiguous EN-DC in FR1 1159

7.9B.1a Intra-band contiguous NE-DC in FR1 1159

7.9B.2 Intra-band non-contiguous EN-DC in FR1 1159

7.9B.3 Inter-band EN-DC within FR1 1159

7.9B.3a Inter-band NE-DC within FR1 1159

7.9B.4 Inter-band EN-DC including FR2 1160

7.9B.4a Inter-band NE-DC including FR2 1160

7.10 Void 1160

7.10A Void 1160

7.10B power imbalance for DC in FR1 1160

7.10B.3 Inter-band EN-DC within FR1 1160

Annex A (normative): Measurement channels 1161

A.1 General 1161

A.2 UL reference measurement channels for E-UTRA TDD Config 2 1161

A.2.1 General 1161

A.2.2 Reference measurement channels for E-UTRA 1162

A.2.2.1 Full RB allocation 1162

A.2.2.1.1 QPSK 1162

A.2.2.1.2 16-QAM 1163

A.2.2.1.3 64-QAM 1164

A.2.2.1.4 256 QAM 1165

A.2.2.2 Partial RB allocation 1166

A.2.2.2.1 QPSK 1166

A.2.2.2.3 64-QAM 1172

A.2.2.2.4 256 QAM 1175

A.3 DL reference measurement channels for E-UTRA 1178

A.3.1 General 1178

A.3.1.1 QPSK 1179

A.3.1.2 64-QAM 1180

A.3.1.3 256-QAM 1181

Annex B: Void 1181

Annex C: Void 1181

Annex D: Void 1181

Annex E: Void 1182

Annex F: Void 1182

Annex G: Void 1182

Annex H (normative): Modified MPR behavior 1182

Annex I (normative): Dual uplink interferer 1183

Annex J: Void 1183

Annex K: Void 1183

Annex L (informative): Change history 1184