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Motivation for New WID on Addition of TDD bands for ProSe Communication

Nokia, Nokia Shanghai Bell

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Justification

Ecosystem of ProSe based FDD is not well developed so far

- ProSe Communication has been specified in Rel-12 as a solution for public safety (PS)
  - The support of D2D in LTE is important to ensure feature parity with other PS solutions like P25
- The ecosystem of ProSe Communication is not well developed so far
- Although RAN1/2 design support both FDD and TDD, only FDD bands are defined for ProSe Communication

E-UTRA ProSe Band	E-UTRA Operating Band	ProSe UE transmit	ProSe UE receive	ProSe Duplex Mode	ProSe Direct	
		F_{UL_low} – F_{UL_high}	F_{DL_low} – F_{DL_high}		Disc.	Comm.
2	2	1850 MHz – 1910 MHz	1850 MHz – 1910 MHz	HD	Yes	
3	3	1710 MHz – 1785 MHz	1710 MHz – 1785 MHz	HD	Yes	Yes
4	4	1710 MHz – 1755 MHz	1710 MHz – 1755 MHz	HD	Yes	
7	7	2500 MHz – 2570 MHz	2500 MHz – 2570 MHz	HD	Yes	Yes
14	14	788 MHz – 798 MHz	788 MHz – 798 MHz	HD	Yes	Yes
20	20	832 MHz – 862 MHz	832 MHz – 862 MHz	HD	Yes	Yes
26	26	814 MHz – 849 MHz	814 MHz – 849 MHz	HD	Yes	Yes
28	28	703 MHz – 748 MHz	703 MHz – 748 MHz	HD	Yes	Yes
31	31	452.5 MHz – 457.5 MHz	452.5 MHz – 457.5 MHz	HD	Yes	Yes
41	41	2496 MHz – 2690 MHz	2496 MHz – 2690 MHz	HD	Yes	
68	68	698 MHz – 728 MHz	698 MHz – 728 MHz	HD	Yes	Yes

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Justification

Ecosystem of ProSe based on TDD can take advantage of existing TDD bands

- Prose based on TDD bands does not require hardware change
  - ProSe is designed to operate on the UL resources, thus requiring an additional Rx on FDD UL
- The ProSe ecosystem can take advantage of existing commercial TDD ecosystem

33	1900 MHz	–	1920 MHz	1900 MHz	–	1920 MHz	TDD
34	2010 MHz	–	2025 MHz	2010 MHz	–	2025 MHz	TDD
35	1850 MHz	–	1910 MHz	1850 MHz	–	1910 MHz	TDD
36	1930 MHz	–	1990 MHz	1930 MHz	–	1990 MHz	TDD
37	1910 MHz	–	1930 MHz	1910 MHz	–	1930 MHz	TDD
38	2570 MHz	–	2620 MHz	2570 MHz	–	2620 MHz	TDD
39	1880 MHz	–	1920 MHz	1880 MHz	–	1920 MHz	TDD
40	2300 MHz	–	2400 MHz	2300 MHz	–	2400 MHz	TDD
41	2496 MHz		2690 MHz	2496 MHz		2690 MHz	TDD
42	3400 MHz	–	3600 MHz	3400 MHz	–	3600 MHz	TDD
43	3600 MHz	–	3800 MHz	3600 MHz	–	3800 MHz	TDD
44	703 MHz	–	803 MHz	703 MHz	–	803 MHz	TDD
45	1447 MHz	–	1467 MHz	1447 MHz	–	1467 MHz	TDD
46	5150 MHz	–	5925 MHz	5150 MHz	–	5925 MHz	TDD[8,9]
47	5855 MHz	–	5925 MHz	5855 MHz	–	5925 MHz	TDD
48	3550 MHz	–	3700 MHz	3550 MHz	–	3700 MHz	TDD
…							

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Justification

Get the standard ready

- It is important for ecosystem development to extend the frequency bands support for ProSe Communication by including TDD bands
  - We need to get the standard ready, otherwise nobody would be interested to implement anything
- Possible user scenario
  - National regulator to determine a certain TDD band can be used for ProSe based on PS
  - No need to reserve any static resource from the commercial TDD network
  - ProSe UE will be told by network (when in coverage) or by pre-configuration (when out of coverage) which resource to use so to not to cause any interference to commercial TDD network
  - In case of disaster when commercial network is down, PS based on ProSe Communication can be used.

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Objectives

- Add TDD Band 33 and 39 as E-UTRA ProSe operating band with ProSe Communication supported.
  - Other bands are not precluded, if seen as needed.
- Specify RF requirements for ProSe Communication on TDD bands
  - Analyze if existing RF requirements for FDD bands are applicable, and if new/modified requirements need to be specified.
- Specify RRM core requirements for ProSe Communication on TDD bands
  - Analyze if existing RRM requirements for FDD bands are applicable, and if new/modified requirements need to be specified.

Most likely, the existing FDD requirements can be re-used, so only small TU allocation is planned for the WI

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