

Introduction



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- Marketing Director, Huawei Asia Pacific Region
- In charge of ICT digital Infra industry promotion and strategy consultant
- Joined Huawei in 2000
- 12 years overseas wireless experience including in Europe, Latin America, India and Asia Pacific
- Spectrum and 5G industry policy consultant in Thailand, Indonesia, Vietnam, Cambodia, Myanmar, Malaysia, Bangladesh, Sri Lanka, Nepal, etc.
- Cooperation with international organization including ITU Asia Pacific and APT. Role as GSA member in AP.

L Band 1427-1518

Global Industry Update and Technical Feasibility

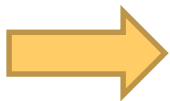
12 Oct 2021

L-bands 1427-1518MHz: Mid Band for IMT Coverage and Capacity

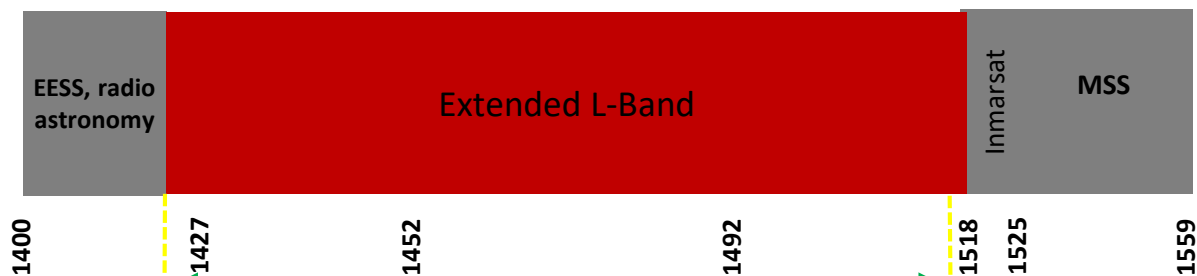
- Primary IMT allocation to MOBILE service (except aeronautical mobile) or MFCN Decision in Region 1, 2 and 3

IMT at WRC-15

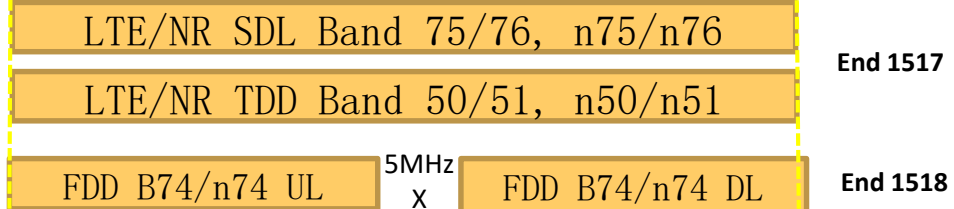
Regulation



Harmonised CEPT region



Standard



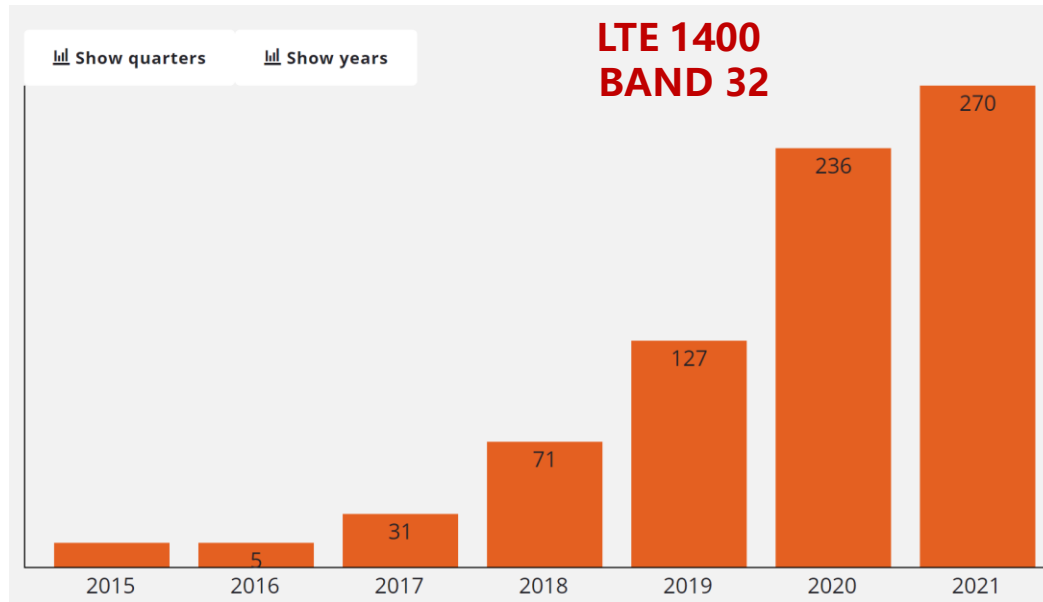
Europe
Middle East, China, Thailand
as 4G/5G candidate band
Japan only

4G/5G Band	UL	DL	Mode
n50/B50	1432 - 1517	1432-1517	TDD
N51/B51	1427 - 1432	1427 - 1432	TDD
N74/B74	1427 -1470	1475 - 1518	FDD
N75/B75	N/A	1432 - 1517	SDL
N76/B76	N/A	1427 -1432	SDL

4G Band	UL	DL	Mode	Subset of
B45	1447 – 1467	1447 – 1467	TDD	B50
B11	1427.9 – 1447.9	1475.9 – 1495.9	FDD	B74
B21	1447.9 – 1462.9	1495.9 – 1510.9	FDD	B74
B32	N/A	1452 – 1496	SDL	B75

L-Band Availability in Europe, 4G Ecosystem not Mature

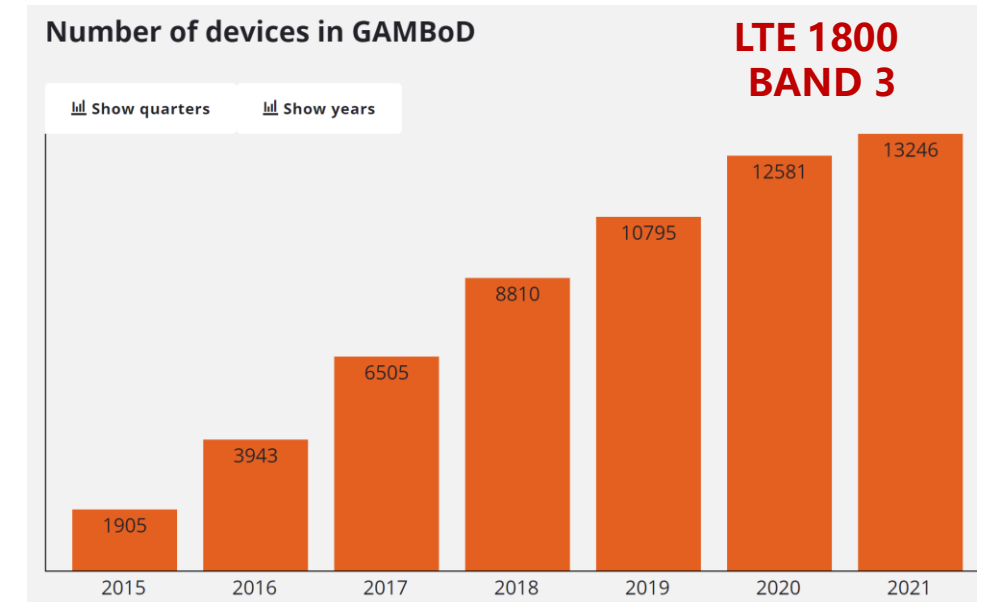
- According to the EU Commission Implementing Decision (EU) 2015/750, amended through [2018/661/EU](#)
 - ✓ all or some of the frequencies in the ranges 1427-1517 MHz shall be **designated and made available** for wireless broadband by 1 October 2018.
- **Five** countries assigned L-band:
 - ✓ The Core L-Band 1452-1496 MHz (LTE Band 32) is already awarded to MNOs in **Germany(DT & VDF), Italy(TIM), UK (VDF & 3UK) and Netherlands**. However **ecosystem maturity is very slow**.
 - ✓ The extended L-band 1427-1517MHz is allocated in **Switzerland, Austria**.
- Public consultation took place in several countries including: France, Italy, Austria, Belgium , Ireland, Portugal, Romania, Sweden, Slovenia, Latvia, etc. but only few auctioned the band.
- **Not enough interest expressed by MNOs in most countries as they are mainly focusing on 5G C-Band and 700MHz for now. SDL L-band requires CA with lower band in particular FDD 800MHz (B20).**



2%



Source: GSA Aug 2021



L-Band Planned in Middle East, Harmonized TDD Mode

- **Availability in Arab countries (ASMG). Regional harmonized TDD band plan**
- **ASMG agreed L-Band as 2nd priority 5G coverage band** (national wide DL/UL coverage including rural areas).
- **CITC KSA** stated its plans to consider the **band for 5G using TDD** technologies
- **In its March 2021 meeting, ASMG announced that they harmonized TDD band plan regionally.** This announcement by the wide region is expected to encourage development of **harmonized 5G TDD ecosystem** for the band and may be a crucial step in the next phase of the band's development.
- **5G TDD provide flexibility to both Administrations and MNOs to adapt to traffic TDD uplink and/or downlink and to assign the band even in the absence of lower bands (no need for CA)**
- **Different band plans if proposed in different countries in the same the region will created inevitably complex cross border coordination issues. This should not be encouraged.**
- **The 5G TDD ecosystem timeline is still not clear.** The ASMG has opted for the TDD configuration although no devices currently support N50/N51 .

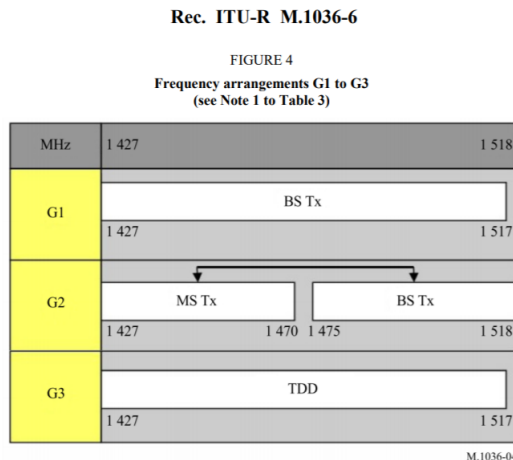
Source: CITC public consult Jan 2021, and GSMA ASMG Countries Progress Lower Frequencies and Aim for Rural 5G_22 Apr 2022, [link](#)

L-bands Co-exist with MSS Feasibility: ITU and ECC Reports

With respect to IMT in the frequency band 1 492-1 518 MHz and the MSS in the frequency band 1 518-1 525 MHz, **ITU-R studies are being conducted** in accordance with **Resolution 223 (Rev.WRC-15)** to

provide possible technical measures to facilitate adjacent band compatibility. The implementation of the frequency arrangements and the text of this Note may need to be reviewed and revised taking into account the results of these studies, which are intended to be included in ITU-R Reports and ITU-R Recommendations, as appropriate.

Moreover, when implementing these frequency arrangements, administrations are also encouraged to take into account the results of the compatibility studies, e.g. in order to address IMT-MSS coexistence in certain areas (around seaports and airports, etc.).



•ECC: 1MHz Guard band sufficient to coexist with MSS above 1518 MHz

• ECC Report 263 (Mar 2017) addresses the compatibility studies between IMT base stations operating below 1518 MHz and MSS land terminals operating above 1518 MHz. It concluded that:

- **1MHz guard band is sufficient** on the IMT side 1517-1518MHz to ensure coexistence with MSS above 1518MHz
- The min in-band blocking for MSS receivers from a 5 MHz broadband signal interferer operating below 1518 MHz shall be -30dBm above 1520 MHz
- Europe agreed measures will be implemented through the relevant harmonised standards to improve the receiver blocking characteristics of MES above 1518 MHz according to ECC Report 263

• EESS coexistence Below 1427MHz: ITU Resolution 750 limits IMT BS to $-72\text{ dBW}/27\text{ MHz}$ in the 1400-1427 MHz band.

Table 14: CW and LTE Interferer levels causing 1 dB degradation in C/No, with MES @ 1518.1 MHz

Test against MES carrier @ 1518.1 MHz, MES#2			
Interferer	Interferer levels (@ antenna connector) that cause 1 dB degradation in C/N ₀		
	1 MHz offset	3 MHz offset	5 MHz offset
CW	-58.6 dBm	-49.0 dBm	-43.0 dBm
5 MHz LTE	-67.8 dBm/5MHz	-57.0 dBm/5MHz	-49.8 dBm/5MHz

Summary to L Band 1427-1518MHz

- **L-Band is supplement of 2nd wave IMT 5G band (after TDD3.5/2.6/2.3 and FDD700)**
- It is recommended that **ASEAN members harmonizes ONE Band plan** for the whole region
- APAC to review **harmonization of either 5G TDD or SDL (depending on availability of lower bands to aggregate with SDL)**, and explore possibilities for alignment with global ecosystem readiness **at country/regional/international level.**
- **Co-exist with MSS feasibility based on ITU guide and detailed ECC reports and study**
- **Both TDD and SDL have advantages compared to FDD:**
 - ✓ Benefit to spectrum efficiency, build common potential market and product for 5G NR TDD and SDL.
 - ✓ Flexibility of TDD band plan for 5G full scenario with variable DL/UL traffic and latency requirements.
 - ✓ TDD 5G BS can also be configured as Downlink only mode as per scenario requirement.
 - ✓ FDD not recommend due to only in single market and waste of spectrum due to duplex band gap.

Thank you.