

## E-UTRA Bands, Channel Bandwidths, and Frequency Allocations.

E-UTRA Operating Bands indicates the carrier frequency. Not all LTE frequency bands support all bandwidth, This Chart includes FDD and TDD channels covering the evolutionary process from LTE Advanced PRO (Release 13/14) to 5G sub-6GHz New Radio [NR] (Release 15) and then the Official Launch of Release 16/17 (YR 2020), where mm-Wave bands enter our daily lives.

| E-UTRA Absolute RF Channel Number | Channel Bandwidth |      |      |       |       |       | Uplink (UL) eNode B Rcvr UE Xmtr (MHz) | Downlink (DL) eNode B Xmtr UE Rcvr (MHz) | UL-DL Band Separation (MHz) | Duplex Mode | Frequency | Name                    | Included in (subset of) band | Duplex Spacing (MHz) | REC DI Circulator      | REC SMT Circulator               | REC DI Isolator      | REC SMT Isolator                 |
|-----------------------------------|-------------------|------|------|-------|-------|-------|--|--|-----------------------------|-------------|-----------|-------------------------|------------------------------|----------------------|------------------------|----------------------------------|----------------------|----------------------------------|
|                                   | 1.4MHz            | 3MHz | 5MHz | 10MHz | 15MHz | 20MHz |  |  |                             |             |           |                         |                              |                      |                        |                                  |                      |                                  |
| 1                                 |                   |      | ✓    | ✓     | ✓     | ✓     | 1920 – 1980                            | 2110 – 2170                              | 130                         | FDD         | 2100      | IMT                     | 65                           | 190                  | 3G4NGD                 | 3SMC3NT-ROHS                     | 2H4NME               | 2SMC3NE-ROHS                     |
| 2                                 | ✓                 | ✓    | ✓    | ✓     | ✓     | ✓     | 1850 – 1910                            | 1930 – 1990                              | 20                          | FDD         | 1900      | PCS blocks A-F          | 25                           | 80                   | 3G4NGC                 | 3SMC3NT-ROHS                     | 2H4NMD               | 2SMC3NE-ROHS                     |
| 3                                 | ✓                 | ✓    | ✓    | ✓     | ✓     | ✓     | 1710 – 1785                            | 1805 – 1880                              | 20                          | FDD         | 1800      | DCS                     |                              | 95                   | 3G4NGA                 | 3SMC3NR-ROHS(U),3SMC3NT-ROHS(D)  | 2H4NMA               | 2SMC3ND-ROHS(U), 2SMC3NE-ROHS(D) |
| 4                                 | ✓                 | ✓    | ✓    | ✓     | ✓     | ✓     | 1710 – 1755                            | 2110 – 2155                              | 355                         | FDD         | 1700      | AWS blocks A-F (AWS-1)  | 66                           | 400                  | 3G4NGA(U), 3G4NEP-1(D) | 3SMC3NR-ROHS(U), 3SMC3NT-ROHS(D) | 2H4NMA(U), 2H4NMG(D) | 2SMC3ND-ROHS(U), 2SMC3NE-ROHS(D) |
| 5                                 | ✓                 | ✓    | ✓    | ✓     |       |       | 824 – 849                              | 869 – 894                                | 20                          | FDD         | 850       | CLR                     | 26                           | 45                   | 3G2NGG                 | 3SMC3NW-ROHS                     | 2H2NJP               | 2SMC3NG                          |
| 6                                 |                   |      | ✓    | ✓     |       |       | 830 – 840                              | 875 – 885                                | 35                          | FDD         | 850       |                         |                              |                      | 3G2NBS-1               | 3SMC3NW-ROHS                     | 2H2NJJ               | 2SMC3NG                          |
| 7                                 |                   |      | ✓    | ✓     | ✓     | ✓     | 2500 – 2570                            | 2620 – 2690                              | 50                          | FDD         | 2600      | IMT-E                   |                              | 120                  | 3G4NGE                 | 3SMC3NX                          | 2H4NMK               | 2SMC3NF                          |
| 8                                 | ✓                 | ✓    | ✓    | ✓     |       |       | 880 – 915                              | 925 – 960                                | 45                          | FDD         | 900       | E-GSM                   |                              | 45                   | 3G2NGH                 | 3SMC3NW-ROHS                     | 2H2NJJ               | 2SMC3NG                          |
| 9                                 |                   |      | ✓    | ✓     | ✓     | ✓     | 1749.9-1784.9                          | 1844.9-1879.9                            | 60                          | FDD         | 1750      |                         |                              | 60                   | 3G4NGA                 | 3SMC3NR-ROHS(U), 3SMC3NT-ROHS(D) | 2H4NMA               | 2SMC3ND-ROHS(U), 2SMC3NE-ROHS(D) |
| 10                                |                   |      | ✓    | ✓     | ✓     | ✓     | 1710 – 1770                            | 2110 – 2170                              | 340                         | FDD         | 1700      | Extended AWS blocks A-I | 66                           | 400                  | 3G4NGA(U), 3G4NEP-1(D) | 3SMC3NR-ROHS(U), 3SMC3NT-ROHS(D) | 2H4NMA(U), 2H4NMG(D) | 2SMC3ND-ROHS(U), 2SMC3NE-ROHS(D) |
| 11                                |                   |      | ✓    | ✓     | ✓     | ✓     | 1427.9 – 1447.9                        | 1475.9 – 1495.9                          | 23                          | FDD         | 1500      | Lower PDC               |                              | 48                   | 3G3NCZ                 | 3SMC3NR-ROHS                     | 2H3NDG               | 2SMC3ND-ROHS                     |
| 12                                | ✓                 | ✓    | ✓    | ✓     |       |       | 699 – 716                              | 729 – 746                                | 12                          | FDD         | 700       | Lower SMH blocks A/B/C  |                              | 30                   | 3G2NGE                 | 3SMC2NT                          | 2H2NJK               | 2SMC2NG                          |
| 13                                |                   |      | ✓    | ✓     |       |       | 777 – 787                              | 746 – 756                                | 21                          | FDD         | 700       | Upper SMH block C       |                              | -31                  | 3G2NGE                 | 3SMC2NT                          | 2H2NJK               | 2SMC2NG                          |
| 14                                |                   |      | ✓    | ✓     |       |       | 788 – 798                              | 758 – 768                                | 20                          | FDD         | 700       | Upper SMH block D       |                              | -30                  | 3G2NGE                 | 3SMC2NT                          | 2H2NJK               | 2SMC2NG                          |
| 15/16                             |                   |      |      |       |       |       | Reserved                               | Reserved                                 |                             |             |           |                         |                              |                      |                        |                                  |                      |                                  |
| 17                                |                   |      | ✓    | ✓     |       |       | 704 – 716                              | 734 – 746                                | 18                          | FDD         | 700       | Lower SMH blocks B/C    | 12                           | 30                   | 3G2NGE                 | 3SMC2NT                          | 2H2NJK               | 2SMC2NG                          |
| 18                                |                   |      | ✓    | ✓     | ✓     |       | 815 – 830                              | 860 – 875                                | 45                          | FDD         | 850       | Japan lower 800         | 26                           | 45                   | 3G2NBS-1               | 3SMC3NW                          | 2H2NJJ               | 2SMC3NG                          |
| 19                                |                   |      | ✓    | ✓     | ✓     |       | 830 – 845                              | 875 – 890                                | 45                          | FDD         | 850       | Japan upper 800         | 26                           | 45                   | 3G2NBS-1               | 3SMC3NW                          | 2H2NJJ               | 2SMC3NG                          |

|    |   |   |   |   |   |                 |                 |       |     |      |  |        |        |          |   |                         |  |
|----|---|---|---|---|---|-----------------|-----------------|-------|-----|------|--|--------|--------|----------|---|-------------------------|--|
| 20 |   | ✓ | ✓ | ✓ | ✓ | 832 – 862       | 791 – 821       | 41    | FDD | 800  | EU Digital Dividend                      |        | -41    | 3G2NGF   | 3SMC3NW(U),<br>3SMC2NT(D)                   | 2H2NJM                  | 2SMC3NG(U),<br>2SMC2NG(D)                                  |
| 21 |   | ✓ | ✓ | ✓ | ✓ | 1447.9 – 1462.9 | 1495.9 – 1510.9 | 48    | FDD | 1500 | Upper PDC                                |        | 48     | 3G3NCZ   | 3SMC3NR-ROHS                                | 2H3NDG                  | 2SMC3ND-ROHS   |
| 22 |   | ✓ | ✓ | ✓ | ✓ | 3410 – 3490     | 3510 – 3590     | 100   | FDD | 3500 |  |        | 100    | R3G5NAY  | 3SMH5NB                                     | R2H5NDF                 | 2SMH5NB  |
| 24 |   | ✓ | ✓ |   |   | 1626.5 – 1660.5 | 1525 – 1559     | 101.5 | FDD | 1600 | L-Band 1600 (US)                         |        | -101.5 | 3G3NAM-1 | 3SMC3NR-ROHS                                | 2H3NDJ                  | 2SMC3ND-ROHS   |
| 25 | ✓ | ✓ | ✓ | ✓ | ✓ | 1850 – 1915     | 1930 – 1995     | 80    | FDD | 1900 | Extended PCS blocks<br>A–G               |        | 80     | 3G4NGC   | 3SMC3NT-ROHS                                | 2H4NMD                  | 2SMC3NE-ROHS   |
| 26 | ✓ | ✓ | ✓ | ✓ | ✓ | 814 – 849       | 859 – 894       | 45    | FDD | 850  | Extended CLR                             |        | 45     | 3G2NBS-1 | 3SMC3NW                                     | 2H2NJJ                  | 2SMC3NG  |
| 27 | ✓ | ✓ | ✓ | ✓ |   | 807 – 824       | 852 – 869       | 45    | FDD | 800  | SMR ( <i>adjacent to band<br/>5</i> )    |        | 45     | 3G2NBS-1 | 3SMC3NW                                     | 2H2NJJ                  | 2SMC3NG  |
| 28 |   | ✓ | ✓ | ✓ | ✓ | 703 – 748       | 758 – 803       | 55    | FDD | 700  | APT                                      |        | 55     | 3G2NGF   | 3SMC2NT                                     | 2H2NJM                  | 2SMC2NG  |
| 29 |   | ✓ | ✓ | ✓ |   | 717 – 728       |                 | N/A   | FDD | 700  | Lower SMH blocks D/E                     |        | N/A    | 3G2NGE   | 3SMC2NT                                     | 2H2NJK                  | 2SMC2NG  |
| 30 |   | ✓ | ✓ |   |   | 2305 – 2315     | 2350 – 2360     | 45    | FDD | 2300 | WCS blocks A/B                           |        | 45     | 3G4NBT-1 | 3SMC3NT-ROHS                                | 2H4NMH                  | 2SMC3NE-ROHS   |
| 31 | ✓ | ✓ | ✓ |   |   | 452.5 – 457.5   | 462.5 – 467.5   | 10    | FDD | 450  |  |        | 10     | 3G2NGD   | 3SMC2NR                                     | 2H2NJJ                  | 2SMC2NF  |
| 32 |   | ✓ | ✓ | ✓ | ✓ | 1452 – 1496     |                 | N/A   | TDD | 1500 | L-Band (EU)                              | 50, 75 | N/A    | 3G3NAC-1 | 3SMC3NR-ROHS                                | 2H3NDF                  | 2SMC3ND-ROHS   |
| 33 |   | ✓ | ✓ | ✓ | ✓ | 1900 – 1920     |                 | N/A   | TDD | 2100 | IMT                                      | 39     | N/A    | 3G4NGC   | 3SMC3NT-ROHS                                | 2H4NMD                  | 2SMC3NE-ROHS   |
| 34 |   | ✓ | ✓ | ✓ |   | 2010 – 2025     |                 | N/A   | TDD | 2100 | IMT                                      |        | N/A    | 3G4NEP-1 | 3SMC3NT-ROHS                                | 2H4NMG                  | 2SMC3NE-ROHS   |
| 35 | ✓ | ✓ | ✓ | ✓ | ✓ | 1850 – 1910     |                 | N/A   | TDD | 1900 | PCS (Uplink)                             |        | N/A    | 3G4NBE-1 | 3SMC3NT-ROHS                                | 2H4NMC                  | 2SMC3NE-ROHS   |
| 36 | ✓ | ✓ | ✓ | ✓ | ✓ | 1930 – 1990     |                 | N/A   | TDD | 1900 | PCS (Downlink)                           |        | N/A    | 3G4NBF-2 | 3SMC3NT-ROHS                                | 2H4NME                  | 2SMC3NE-ROHS   |
| 37 |   | ✓ | ✓ | ✓ | ✓ | 1910 – 1930     |                 | N/A   | TDD | 1900 | PCS (Duplex spacing)                     |        | N/A    | 3G4NGC   | 3SMC3NT-ROHS                                | 2H4NMD                  | 2SMC3NE-ROHS   |
| 38 |   | ✓ | ✓ | ✓ | ✓ | 2570 – 2620     |                 | N/A   | TDD | 2600 | IMT-E (Duplex<br>Spacing)                | 41     | N/A    | 3G4NGE   | 3SMC3NX                                     | 2H4NMK                  | 2SMC3NF  |
| 39 |   | ✓ | ✓ | ✓ | ✓ | 1880 – 1920     |                 | N/A   | TDD | 1900 | DCS-IMT gap                              |        | N/A    | 3G4NGC   | 3SMC3NT-ROHS                                | 2H4NMD                  | 2SMC3NE-ROHS   |
| 40 |   | ✓ | ✓ | ✓ | ✓ | 2300 – 2400     |                 | N/A   | TDD | 2300 |  |        | N/A    | 3G4NDD-1 | 3SMC3NT-ROHS                                | 2H4NMJ                  | 2SMC3NE-ROHS   |
| 41 |   | ✓ | ✓ | ✓ | ✓ | 2496 – 2690     |                 | N/A   | TDD | 2500 | BRS / EBS                                |        | N/A    | 3G4NGE   | 3SMC3NX                                     | 2H4NMK                  | 2SMC3NF  |
| 42 |   | ✓ | ✓ | ✓ | ✓ | 3400 – 3600     |                 | N/A   | TDD | 3500 | CBRS (EU/Japan)                          |        | N/A    | R3G5NAY  | 3SMH5NB                                     | R2H5NDF                 | 2SMH5NB  |
| 43 |   | ✓ | ✓ | ✓ | ✓ | 3600 – 3800     |                 | N/A   | TDD | 3700 |  |        | N/A    | R3G5NAY  | 3SMH5NB                                     | R2H5NDF                 | 2SMH5NB  |
| 44 |   | ✓ | ✓ | ✓ | ✓ | 703 – 803       |                 | N/A   | TDD | 700  | APT                                      |        | N/A    | 3G2NGE   | 3SMC2NT                                     | 2H2NJK                  | 2SMC2NG  |
| 45 |   | ✓ | ✓ | ✓ | ✓ | 1447 – 1467     |                 | N/A   | TDD | 1500 | L-Band (China)                           | 50     | N/A    | 3G3NDA   | 3SMC3NR-ROHS                                | 2H3NDH                  | 2SMC3ND-ROHS   |
| 46 |   |   |   |   |   | 5150 – 5925     |                 | N/A   | TDD | 5200 | U-NII                                    |        | N/A    | 3G6NAH   | 3SMH6NN                                     | 2H6NCG                  | 2SMH6NP  |
| 47 |   |   |   |   |   | 5855 – 5925     |                 | N/A   | TDD | 5900 | U-NII-4 (V2X)                            |        | N/A    | 3G6NAH   | 3SMH6NN                                     | 2H6NCG                  | 2SMH6NP  |
| 48 |   |   |   |   |   | 3550 – 3700     |                 | N/A   | TDD | 3600 | CBRS (US)                                |        | N/A    | R3G5NAY  | 3SMH5NB                                     | R2H5NDF                 | 2SMH5NB  |
| 50 |   |   |   |   |   | 1432 – 1517     |                 | N/A   | TDD | 1500 | L-Band (EU)                              |        | N/A    | 3G3NAC-1 | 3SMC3NR-ROHS                                | 2H3NDF                  | 2SMC3ND-ROHS   |
| 51 |   |   |   |   |   | 1427 – 1432     |                 | N/A   | TDD | 1500 | Extended L-Band (EU)                     |        | N/A    | 3G3NAC-1 | 3SMC3NR-ROHS                                | 2H3NDF                  | 2SMC3ND-ROHS   |
| 65 |   | ✓ | ✓ | ✓ | ✓ | 1920 – 2010     | 2110 – 2200     | 190   | FDD | 2100 | Extended IMT                             |        | 190    | 3G4NGD   | 3SMC3NT-ROHS                                | 2H4NME                  | 2SMC3NE-ROHS   |
| 66 | ✓ | ✓ | ✓ | ✓ | ✓ | 1710 – 1780     | 2110 – 2200     | 400   | FDD | 1700 | Extended AWS blocks<br>A–J (AWS-1/AWS-3) |        | 400    | 3G4NEP-1 | 3SMC3NR-<br>ROHS(U),<br>3SMC3NT-<br>ROHS(D) | 2H4NMA(U),<br>2H4NMG(D) | 2SMC4NH(U),<br>2SMC3ND-<br>ROHS(U),<br>2SMC3NE-<br>ROHS(D) |
| 67 |   | ✓ | ✓ | ✓ | ✓ | 738 – 758       |                 | N/A   | FDD | 700  | EU 700                                   |        | N/A    | 3G2NGE   | 3SMC2NT                                     | 2H2NJK                  | 2SMC2NG  |

|    |   |   |   |   |   |             |             |           |     |      |                        |  |     |          |                                     |        |                                     |
|----|---|---|---|---|---|-------------|-------------|-----------|-----|------|------------------------|--|-----|----------|-------------------------------------|--------|-------------------------------------|
| 68 |   | ✓ | ✓ | ✓ |   | 698 – 728   | 753 – 783   | 55        | FDD | 700  | ME 700                 |  | 55  | 3G2NGE   | 3SMC2NT                             | 2H2NJK | 2SMC2NG                             |
| 69 |   | ✓ |   |   |   | 2570 – 2620 |             | N/A       | FDD | 2600 | IMT-E (Duplex spacing) |  | N/A | 3G4NGE   | 3SMC3NX                             | 2H4NMK | 2SMC3NF                             |
| 70 |   | ✓ | ✓ | ✓ |   | 1695 – 1710 | 1995 – 2020 | 295 – 300 | FDD | 2000 | AWS-4                  |  | 300 | 3G4NGB   | 3SMC3NR-ROHS(U),<br>3SMC3NT-ROHS(D) | 2H4NMB | 2SMC3ND-ROHS(U),<br>2SMC3NE-ROHS(D) |
| 71 |   | ✓ | ✓ | ✓ | ✓ | 663 – 698   | 617 – 652   | -46       | FDD | 600  | US Digital Dividend    |  | -46 | 3G2NGE   | 3SMC2NT                             | 2H2NJK | 2SMC2NG                             |
| 72 | ✓ | ✓ | ✓ |   |   | 451 – 456   | 461 – 466   | 10        | FDD | 450  | PMR/PAMR Europe        |  | 10  | 3G2NGD   | 3SMC2NR                             | 2H2NJJ | 2SMC2NF                             |
| 73 | ✓ | ✓ | ✓ |   |   | 450 – 455   | 460 – 465   | 10        | FDD | 450  |                        |  | 10  | 3G2NGD   | 3SMC2NR                             | 2H2NJJ | 2SMC2NF                             |
| 74 |   |   |   |   |   | 1427 – 1470 | 1475 – 1518 | 48        | FDD | 1500 | L-Band 1500 (US)       |  | 48  | 3G3NAC-1 | 3SMC3NR-ROHS                        | 2H3NDF | 2SMC3ND-ROHS                        |
| 75 |   |   |   |   |   | 1432 – 1517 |             | N/A       | FDD | 1500 | L-Band (EU)            |  | N/A | 3G3NAC-1 | 3SMC3NR-ROHS                        | 2H3NDF | 2SMC3ND-ROHS                        |
| 76 |   |   |   |   |   | 1427 – 1432 |             | N/A       | FDD | 1500 | Extended L-Band (EU)   |  | N/A | 3G3NAC-1 | 3SMC3NR-ROHS                        | 2H3NDF | 2SMC3ND-ROHS                        |