

# Annex: Product Specification of Equipment Under Test

| Product Specification          |  |
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| <b>Brand Name</b>              | CAT  |
| <b>Model Name</b>              | S31  |
| <b>GSM Operating Band(s)</b>   | GSM 850/1900 MHz   |
| <b>GPRS Multi-Slot Class</b>   | GPRS Class 33, EGPRS Class 33, DTM Class 11  |
| <b>WCDMA Operating Band(s)</b> | FDD Band 2 / 4 / 5   |
| <b>WCDMA Release, Category</b> | HSDPA Rel. 8, Cat. 24 / HSUPA Rel. 6, Cat. 6   |
| <b>LTE Operating Band(s)</b>   | FDD Band 2, Bandwidth: 1.4 M/3 M/5 M/10 M/15 M/20 M<br>FDD Band 4, Bandwidth: 1.4 M/3 M/5 M/10 M/15 M/20 M<br>FDD Band 5, Bandwidth: 1.4 M/3 M/5 M/10 M<br>FDD Band 7, Bandwidth: 5 M/10 M/15 M/20 M   |
| <b>LTE Release, Category</b>   | Rel. 9, Cat. 4   |
| <b>Wi-Fi Specification</b>     | 802.11b/g/n HT20   |
| <b>Bluetooth Version</b>       | Bluetooth EDR/LE   |
| <b>Antenna Type / Gain</b>     | <p><b>WWAN: Coupling type (LDS) Antenna</b><br/>           GSM850: -0.84 dBi<br/>           GSM1900: 1.17 dBi<br/>           WCDMA Band 2: 1.17 dBi<br/>           WCDMA Band 4: 0.27 dBi<br/>           WCDMA Band 5: -0.84 dBi<br/>           LTE Band 2: 1.17 dBi<br/>           LTE Band 4: 0.27 dBi<br/>           LTE Band 5: -0.84 dBi<br/>           LTE Band 7: 1.27 dBi</p> <p><b>WLAN: PIFA Antenna / 1.14 dBi</b><br/> <b>Bluetooth: PIFA Antenna / 1.14 dBi</b><br/> <b>GPS / Glonass / BDS: PIFA Antenna</b><br/> <b>FM Receiver: Integral Antenna</b><br/> <b>(Earphone acting as FM antenna deemed as an integral antenna)</b></p> |
| <b>Type of Modulation</b>      | GSM / GPRS: GMSK<br>EGPRS: GMSK for MCS 0 ~ 4 & 8PSK for MCS5 ~9<br>WCDMA: QPSK (Uplink)<br>HSDPA: 64QAM (Downlink) / HSUPA : QPSK (Uplink)<br>LTE: QPSK / 16QAM /64QAM (Downlink)<br>Bluetooth: GFSK, $\pi/4$ -DQPSK, 8-DPSK<br>WLAN 802.11b: DSSS (DBPSK / DQPSK / CCK)<br>WLAN 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)<br>GPS / Glonass / BDS: BPSK<br>FM Receiver: FM  |

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| <b>Transmitter Frequency Range</b> | GSM850: 824.2 MHz ~ 848.8 MHz<br>GSM1900: 1850.2 MHz ~ 1909.8 MHz<br>WCDMA Band 2: 1852.4 MHz ~ 1907.6 MHz<br>WCDMA Band 4: 1712.4 MHz ~ 1752.6 MHz<br>WCDMA Band 5: 826.4 MHz ~ 846.6 MHz<br>LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5 : 824.7 MHz ~ 848.3 MHz<br>LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz<br>WLAN 802.11b/g/n: 2412 MHz ~ 2472 MHz<br>Bluetooth: 2402 MHz ~ 2480 MHz  |
| <b>Receiver Frequency Range</b>    | GSM850: 869.2 MHz ~ 893.8 MHz<br>GSM1900: 1930.2 MHz ~ 1989.8 MHz<br>WCDMA Band 2: 1932.4 MHz ~ 1987.6 MHz<br>WCDMA Band 4: 2112.4 MHz ~ 2152.6 MHz<br>WCDMA Band 5: 871.4 MHz ~ 891.6 MHz<br>LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz<br>LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz<br>LTE Band 5 : 869.7 MHz ~ 893.3 MHz<br>LTE Band 7 : 2622.5 MHz ~ 2687.5 MHz<br>WLAN 802.11b/g/n: 2412 MHz ~ 2472 MHz<br>Bluetooth: 2402 MHz ~ 2480 MHz<br>GNSS : 1559-1610MHz<br>(GPS / Glonass / BDS)<br>FM Receiver: 88 MHz - 108 MHz |