Annex: Product Specification of Equipment Under Test

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

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