

15. Simultaneous Transmission analysis

No.	Simultaneous Transmission Configurations	Head	Body-worn	Hotspot	Note
1	GSM(voice) + Bluetooth (data)	Yes	Yes		
2	GSM(voice) + WIFI (data)	Yes	Yes		
3	GPRS (data) + Bluetooth (data)	Yes	Yes	NA	
4	GPRS (data) + WIFI (data)	Yes	Yes	Yes	
5	LTE + Bluetooth (data)	Yes	Yes	NA	
6	LTE + WIFI (data)	Yes	Yes	Yes	
7	GSM (data) + Bluetooth (data) +PTT	NA	Yes	NA	
8	GSM (data) + WIFI (data) +PTT	NA	Yes	NA	
9	LTE + Bluetooth (data) +PTT	NA	Yes	NA	
10	LTE + WIFI (data) +PTT	NA	Yes	NA	

General note:

1. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. EUT will choose either GSM, LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. The reported SAR summation is calculated based on the same configuration and test position
4. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01 based on the formula below
 - a) $[(\text{max. Power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})/x}] \text{W/kg}$ for test separation distances $\leq 50\text{mm}$; when $x=7.5$ for 1-g SAR, and $x=18.75$ for 10-g SAR.
 - b) When the minimum separation distance is $<5\text{mm}$, the distance is used 5mm to determine SAR test exclusion
 - c) 0.4 W/kg for 1-g SAR and 1.0W/kg for 10-g SAR, when the test separation distances is $>50\text{mm}$.

Bluetooth Max power	Exposure position	Head	Hotspot	Body worn
	Test separation	0mm	10mm	10mm
9.0 dBm	Estimated SAR (W/kg)	0.332 W/kg	0.166 W/kg	0.166 W/kg

Maximum reported SAR value for Head

WWAN PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR (W/kg)
			WWAN PCS	WLAN DTS	
GSM	GSM850	Left Cheek	0.402	0.281	0.682
		Left Tilted	0.307	0.238	0.545
		Right Cheek	0.372	0.270	0.642
		Right Tilted	0.282	0.227	0.509
	PCS1900	Left Cheek	0.324	0.281	0.605
		Left Tilted	0.260	0.238	0.498
		Right Cheek	0.311	0.270	0.581
		Right Tilted	0.245	0.227	0.471
LTE	B2 1RB	Left Cheek	0.230	0.281	0.511
		Left Tilted	0.189	0.238	0.427
		Right Cheek	0.224	0.270	0.494
		Right Tilted	0.179	0.227	0.406
	B2 50RB	Left Cheek	0.178	0.281	0.459
		Left Tilted	0.156	0.238	0.394
		Right Cheek	0.165	0.270	0.435
		Right Tilted	0.140	0.227	0.367
	B4 1RB	Left Cheek	0.230	0.281	0.511
		Left Tilted	0.172	0.238	0.410
		Right Cheek	0.223	0.270	0.493
		Right Tilted	0.173	0.227	0.400
	B4 50RB	Left Cheek	0.174	0.281	0.455
		Left Tilted	0.138	0.238	0.376
		Right Cheek	0.158	0.270	0.428
		Right Tilted	0.112	0.227	0.339
	B5 1RB	Left Cheek	0.262	0.281	0.543
		Left Tilted	0.219	0.238	0.457
		Right Cheek	0.253	0.270	0.523
		Right Tilted	0.201	0.227	0.427
	B5 25RB	Left Cheek	0.214	0.281	0.495
		Left Tilted	0.166	0.238	0.404
		Right Cheek	0.213	0.270	0.483
		Right Tilted	0.174	0.227	0.401
	B7 1RB	Left Cheek	0.185	0.281	0.465
		Left Tilted	0.162	0.238	0.400
		Right Cheek	0.178	0.270	0.448
		Right Tilted	0.152	0.227	0.378
	B7 50RB	Left Cheek	0.149	0.281	0.429
		Left Tilted	0.135	0.238	0.373
		Right Cheek	0.142	0.270	0.411
		Right Tilted	0.116	0.227	0.342

LTE	B26 1RB	Left Cheek	0.279	0.281	0.560
		Left Tilted	0.245	0.238	0.483
		Right Cheek	0.269	0.270	0.538
		Right Tilted	0.214	0.227	0.441
	B26 36RB	Left Cheek	0.205	0.281	0.486
		Left Tilted	0.155	0.238	0.393
		Right Cheek	0.203	0.270	0.473
		Right Tilted	0.176	0.227	0.403
	B41 1RB	Left Cheek	0.091	0.281	0.372
		Left Tilted	0.075	0.238	0.313
		Right Cheek	0.089	0.270	0.359
		Right Tilted	0.071	0.227	0.298
	B41 50RB	Left Cheek	0.063	0.281	0.344
		Left Tilted	0.046	0.238	0.284
		Right Cheek	0.059	0.270	0.329
		Right Tilted	0.052	0.227	0.279

WWAN PCE + Bluetooth DSS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR (W/kg)
			WWAN PCS	Bluetooth DSS	
GSM	GSM850	Left Cheek	0.402	0.332	0.733
		Left Tilted	0.307	0.332	0.639
		Right Cheek	0.372	0.332	0.704
		Right Tilted	0.282	0.332	0.614
	PCS1900	Left Cheek	0.324	0.332	0.655
		Left Tilted	0.260	0.332	0.592
		Right Cheek	0.311	0.332	0.643
		Right Tilted	0.245	0.332	0.576
LTE	B2 1RB	Left Cheek	0.230	0.332	0.562
		Left Tilted	0.189	0.332	0.520
		Right Cheek	0.224	0.332	0.556
		Right Tilted	0.179	0.332	0.510
	B2 50RB	Left Cheek	0.178	0.332	0.510
		Left Tilted	0.156	0.332	0.488
		Right Cheek	0.165	0.332	0.496
		Right Tilted	0.140	0.332	0.472
	B4 1RB	Left Cheek	0.230	0.332	0.561
		Left Tilted	0.172	0.332	0.503
		Right Cheek	0.223	0.332	0.555
		Right Tilted	0.173	0.332	0.505
	B4 50RB	Left Cheek	0.174	0.332	0.506
		Left Tilted	0.138	0.332	0.469
		Right Cheek	0.158	0.332	0.490
		Right Tilted	0.112	0.332	0.444
	B5 1RB	Left Cheek	0.262	0.332	0.593
		Left Tilted	0.219	0.332	0.551
		Right Cheek	0.253	0.332	0.584
		Right Tilted	0.201	0.332	0.532
	B5 25RB	Left Cheek	0.214	0.332	0.546
		Left Tilted	0.166	0.332	0.498
		Right Cheek	0.213	0.332	0.545
		Right Tilted	0.174	0.332	0.506
	B7 1RB	Left Cheek	0.185	0.332	0.516
		Left Tilted	0.162	0.332	0.494
		Right Cheek	0.178	0.332	0.509
		Right Tilted	0.152	0.332	0.483
	B7 50RB	Left Cheek	0.149	0.332	0.480
		Left Tilted	0.135	0.332	0.467
		Right Cheek	0.142	0.332	0.473
		Right Tilted	0.116	0.332	0.447

LTE	B26 1RB	Left Cheek	0.279	0.332	0.611
		Left Tilted	0.245	0.332	0.576
		Right Cheek	0.269	0.332	0.600
		Right Tilted	0.214	0.332	0.546
	B26 36RB	Left Cheek	0.205	0.332	0.537
		Left Tilted	0.155	0.332	0.486
		Right Cheek	0.203	0.332	0.535
		Right Tilted	0.176	0.332	0.508
	B41 1RB	Left Cheek	0.091	0.332	0.423
		Left Tilted	0.075	0.332	0.407
		Right Cheek	0.089	0.332	0.421
		Right Tilted	0.071	0.332	0.403
	B41 50RB	Left Cheek	0.063	0.332	0.395
		Left Tilted	0.046	0.332	0.378
		Right Cheek	0.059	0.332	0.391
		Right Tilted	0.052	0.332	0.384

Maximum reported SAR value for Body

WWAN PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR (W/kg)
			WWAN PCS	WLAN DTS	
GSM	GSM850	Front	0.130	0.098	0.228
		Back	0.197	0.144	0.341
	PCS1900	Front	0.075	0.098	0.173
		Back	0.115	0.144	0.259
LTE	B2 1RB	Front	0.133	0.095	0.228
		Back	0.201	0.139	0.341
	B2 50RB	Front	0.088	0.095	0.183
		Back	0.134	0.139	0.273
	B4 1RB	Front	0.166	0.095	0.261
		Back	0.280	0.139	0.419
	B4 50RB	Front	0.108	0.095	0.203
		Back	0.248	0.139	0.387
	B5 1RB	Front	0.134	0.095	0.229
		Back	0.198	0.139	0.337
	B5 25RB	Front	0.082	0.095	0.177
		Back	0.149	0.139	0.289
	B7 1RB	Front	0.196	0.095	0.291
		Back	0.278	0.139	0.417
	B7 50RB	Front	0.135	0.095	0.230
		Back	0.199	0.139	0.338
	B26 1RB	Front	0.121	0.095	0.216
		Back	0.187	0.139	0.326
	B26 36RB	Front	0.082	0.095	0.177
		Back	0.127	0.139	0.266
	B41 1RB	Front	0.114	0.095	0.209
		Back	0.176	0.139	0.315
	B41 50RB	Front	0.093	0.095	0.188
		Back	0.122	0.139	0.261

WWAN PCE + Bluetooth DSS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR (W/kg)
			WWAN PCS	Bluetooth DSS	
GSM	GSM850	Front	0.130	0.166	0.296
		Back	0.197	0.166	0.363
	PCS1900	Front	0.075	0.166	0.241
		Back	0.115	0.166	0.281
LTE	B2 1RB	Front	0.133	0.166	0.299
		Back	0.201	0.166	0.367
	B2 50RB	Front	0.088	0.166	0.254
		Back	0.134	0.166	0.299
	B4 1RB	Front	0.166	0.166	0.332
		Back	0.280	0.166	0.446
	B4 50RB	Front	0.108	0.166	0.274
		Back	0.248	0.166	0.414
	B5 1RB	Front	0.134	0.166	0.299
		Back	0.198	0.166	0.364
	B5 25RB	Front	0.082	0.166	0.247
		Back	0.149	0.166	0.315
	B7 1RB	Front	0.196	0.166	0.362
		Back	0.278	0.166	0.444
	B7 50RB	Front	0.135	0.166	0.301
		Back	0.199	0.166	0.365
	B26 1RB	Front	0.121	0.166	0.287
		Back	0.187	0.166	0.353
	B26 36RB	Front	0.082	0.166	0.248
		Back	0.127	0.166	0.292
	B41 1RB	Front	0.114	0.166	0.280
		Back	0.176	0.166	0.342
	B41 50RB	Front	0.093	0.166	0.259
		Back	0.122	0.166	0.288

WWAN + WLAN/Bluetooth + PLMRS simultaneously transmitting

According to KDB 447498 Section 7.2, the initial simultaneous transmission SAR test exclusion is to be based on ratios of SAR to the applicable limit for each transmit mode (similar to basic concept of ratios for "mixed limits").

Simultaneous transmission test exclusion applies when the sum of the ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0 .

Without PLMRS Antenna

Type	Maximum body SAR value (w/kg@1g)
WWAN (without PLMRS Antenna)	0.280
WLAN (without PLMRS Antenna)	0.144
Bluetooth	0.166
PLMRS	2.04

- 1) Simultaneous transmission SAR test exclusion ratios of hypothetical WWAN, PLMRS, WLAN SAR values to the respective applicable limits

$$\text{Simultaneous transmission SAR ratio} = 0.280/1.6 + 0.144/1.6 + 2.04/8 = 0.265 + 0.255 = 0.520 < 1.0$$

- 2) Simultaneous transmission SAR test exclusion ratios of hypothetical WWAN, PLMRS, Bluetooth SAR values to the respective applicable limits

$$\text{Simultaneous transmission SAR ratio} = 0.280/1.6 + 0.166/1.6 + 2.04/8 = 0.279 + 0.255 = 0.534 < 1.0$$

With PLMRS Antenna

Type	Maximum body SAR value (w/kg@1g)
WWAN (with PLMRS Antenna)	0.273
WLAN (with PLMRS Antenna)	0.139
Bluetooth	0.166
PLMRS	2.04

- 1) Simultaneous transmission SAR test exclusion ratios of hypothetical WWAN, PLMRS, WLAN SAR values to the respective applicable limits

$$\text{Simultaneous transmission SAR ratio} = 0.273/1.6 + 0.139/1.6 + 2.04/8 = 0.258 + 0.255 = 0.513 < 1.0$$

- 2) Simultaneous transmission SAR test exclusion ratios of hypothetical WWAN, PLMRS, Bluetooth SAR values to the respective applicable limits

$$\text{Simultaneous transmission SAR ratio} = 0.273/1.6 + 0.166/1.6 + 2.04/8 = 0.274 + 0.255 = 0.529 < 1.0$$

So, the all simultaneously transmitting SAR is comply for the standard requirement.






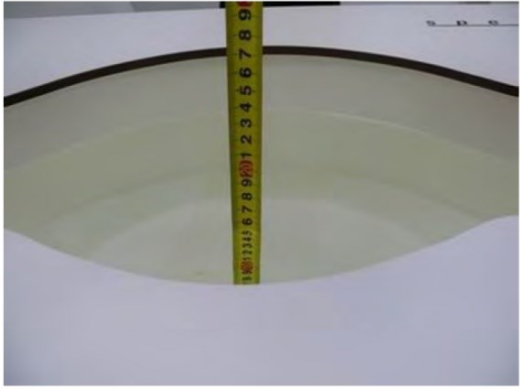

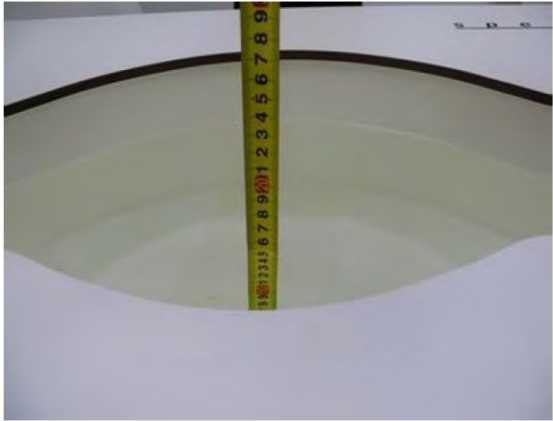
Maximum reported SAR value for Hotspot mode

WWAN PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR (W/kg)
			WWAN PCS	WLAN DTS	
GSM	GSM850	Front	0.130	0.095	0.225
		Back	0.197	0.139	0.336
		Left side	0.090	0.062	0.152
		Right side	0.085	0.053	0.138
		Top side	-	0.091	0.091
		Bottom side	0.134	-	0.134
	PCS1900	Front	0.075	0.095	0.170
		Back	0.115	0.139	0.255
		Left side	0.066	0.062	0.128
		Right side	0.052	0.053	0.105
		Top side	-	0.091	0.091
		Bottom side	0.079	-	0.079
LTE	B2 1RB	Front	0.133	0.095	0.228
		Back	0.201	0.139	0.341
		Left side	0.112	0.062	0.174
		Right side	0.091	0.053	0.145
		Top side	-	0.091	0.091
		Bottom side	0.146	-	0.146
	B2 50RB	Front	0.088	0.095	0.183
		Back	0.134	0.139	0.273
		Left side	0.077	0.062	0.139
		Right side	0.060	0.053	0.113
		Top side	-	0.091	0.091
		Bottom side	0.098	-	0.098
LTE	B4 1RB	Front	0.166	0.095	0.261
		Back	0.280	0.139	0.419
		Left side	0.160	0.062	0.221
		Right side	0.115	0.053	0.168
		Top side	-	0.091	0.091
		Bottom side	0.181	-	0.181
	B4 50RB	Front	0.108	0.095	0.203
		Back	0.248	0.139	0.387
		Left side	0.141	0.062	0.203
		Right side	0.109	0.053	0.162
		Top side	-	0.091	0.091
		Bottom side	0.164	-	0.164

LTE	B5 1RB	Front	0.134	0.095	0.229
		Back	0.198	0.139	0.337
		Left side	0.113	0.062	0.175
		Right side	0.086	0.053	0.139
		Top side	-	0.091	-
		Bottom side	0.120	-	0.120
	B5 25RB	Front	0.082	0.095	0.177
		Back	0.149	0.139	0.289
		Left side	0.085	0.062	0.147
		Right side	0.065	0.053	0.118
		Top side	-	0.091	0.091
		Bottom side	0.098	-	0.098
LTE	B7 1RB	Front	0.196	0.095	0.291
		Back	0.278	0.139	0.417
		Left side	0.168	0.062	0.229
		Right side	0.149	0.053	0.202
		Top side	-	0.091	0.091
		Bottom side	0.150	-	0.150
	B7 50RB	Front	0.135	0.095	0.230
		Back	0.199	0.139	0.338
		Left side	0.104	0.062	0.166
		Right side	0.099	0.053	0.153
		Top side	-	0.091	0.091
		Bottom side	0.110	-	0.110
LTE	B26 1RB	Front	0.121	0.095	0.216
		Back	0.187	0.139	0.326
		Left side	0.095	0.062	0.157
		Right side	0.090	0.053	0.144
		Top side	-	0.091	0.091
		Bottom side	0.106	-	0.106
	B26 36RB	Front	0.082	0.095	0.177
		Back	0.127	0.139	0.266
		Left side	0.077	0.062	0.138
		Right side	0.068	0.053	0.121
		Top side	-	0.091	0.091
		Bottom side	0.073	-	0.073

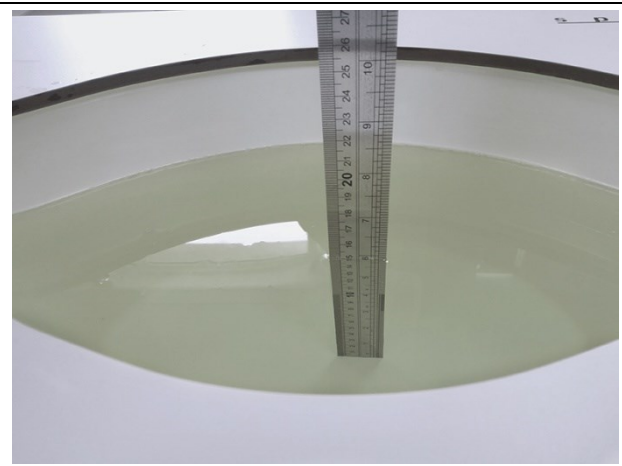
LTE	B41 1RB	Front	0.114	0.095	0.209
		Back	0.176	0.139	0.315
		Left side	0.096	0.062	0.158
		Right side	0.090	0.053	0.143
		Top side	-	0.091	0.091
		Bottom side	0.099	-	0.099
	B41 50RB	Front	0.093	0.095	0.188
		Back	0.122	0.139	0.261
		Left side	0.074	0.062	0.136
		Right side	0.069	0.053	0.122
		Top side	-	0.091	0.091
		Bottom side	0.070	-	0.070

16. TestSetup Photos

	
Liquid depth the flat Phantom for Head (450MHz)	Liquid depth the flat Phantom for Body (450MHz)
	
Liquid depth in the head phantom (835MHz)	Liquid depth in the body phantom (835MHz)
	
Liquid depth in the head phantom (1750MHz)	Liquid depth in the body phantom (1750MHz)
	
Liquid depth in the head phantom (1900MHz)	Liquid depth in the body phantom (1900MHz)



Liquid depth in the head phantom (2450MHz)



Liquid depth in the body phantom (2450MHz)



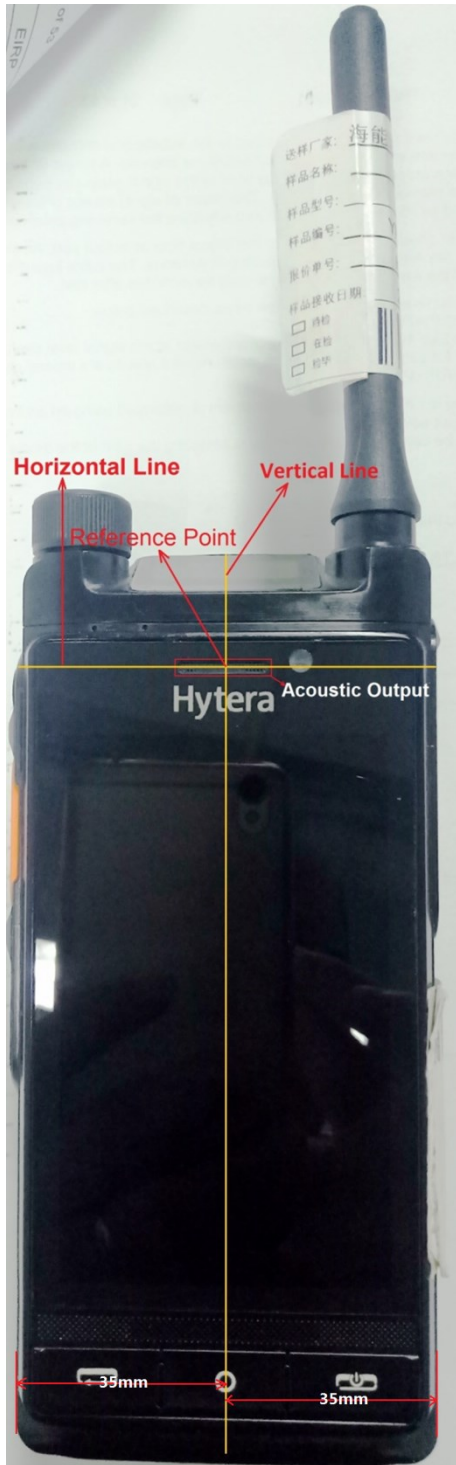
Liquid depth in the head phantom (2600MHz)



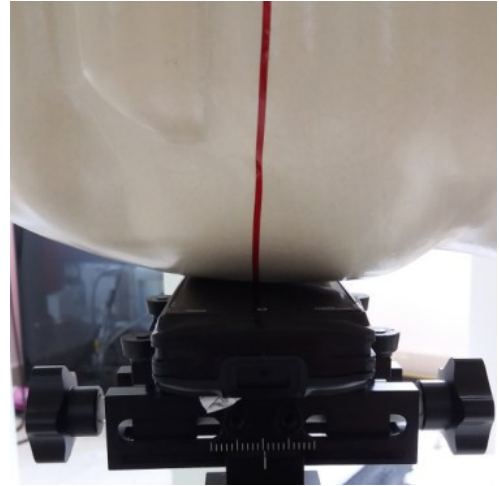
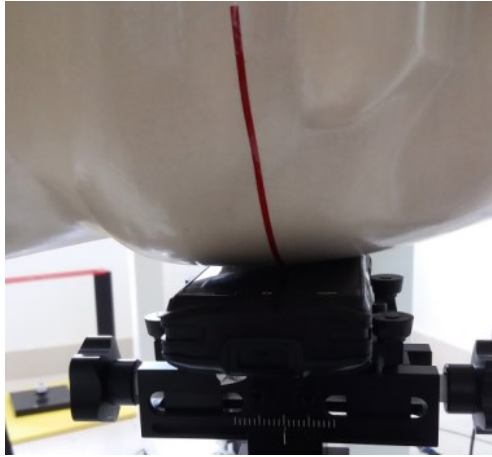
Liquid depth in the body phantom (2600MHz)

Reference Point for Head

With TETRA Antenna / Without TETRA Antenna

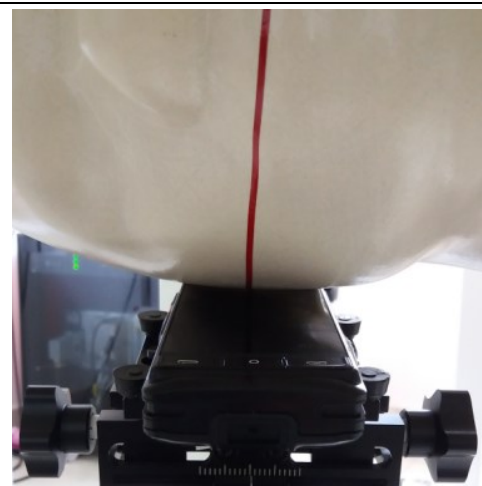
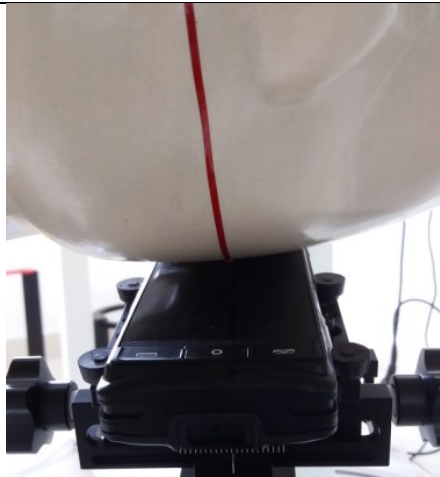


With TETRA Antenna



Left Head Touch

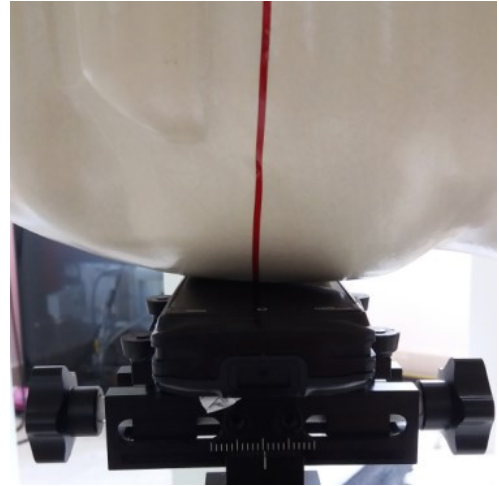
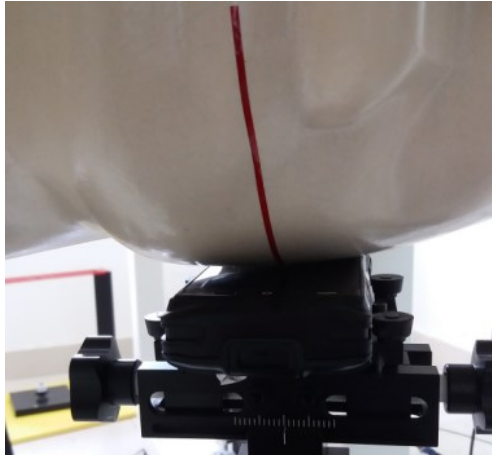
Right Head Touch



Left Head Tilt (15°)

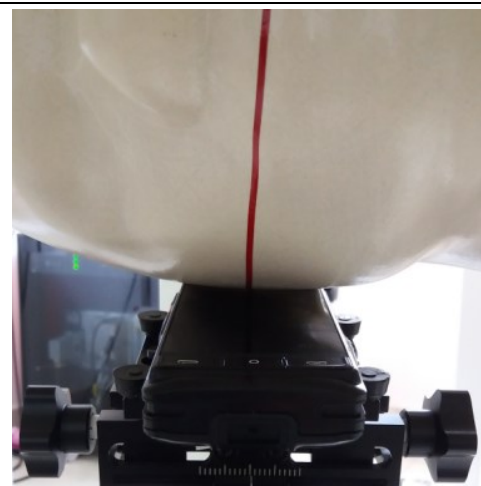
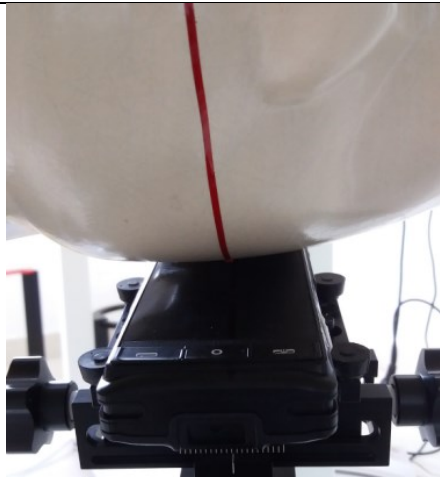
Right Head Tilt (15°)

Without TETRA Antenna



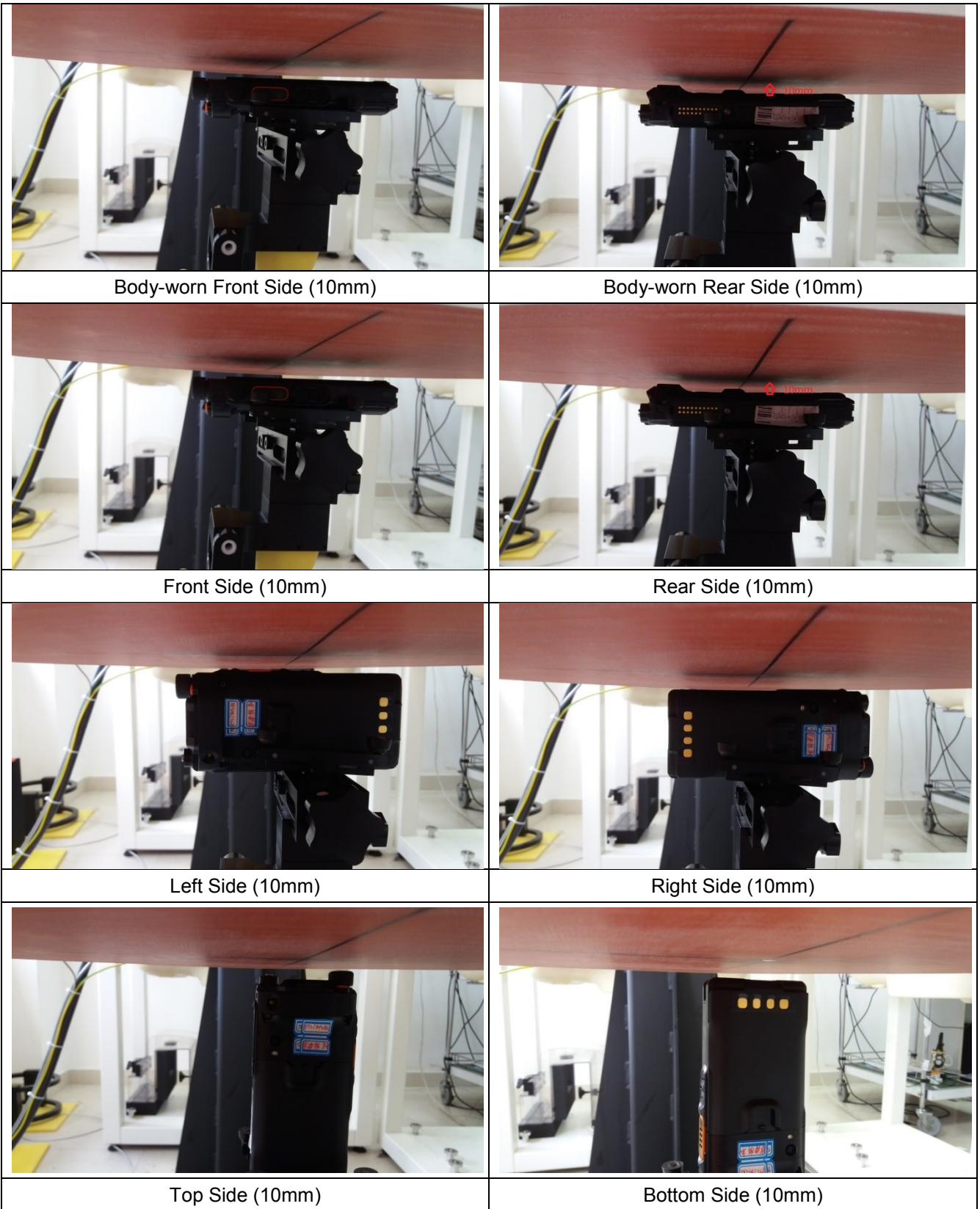
Left Head Touch




Right Head Touch



Left Head Tilt (15°)

Right Head Tilt (15°)



PTT mode	
	
<p>Rear side to Body with Back Clip (0mm)</p>	<p>Rear side to Body without Back Clip (10mm)</p>
	<p>-</p>
<p>Front of Face (25mm)</p>	<p>-</p>

17. External and Internal Photos of the EUT

Please reference to the report No.: TRE1705015001

-----End of Report-----