

SONY

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SAR Characterization

1. SAR Characterization

1.1 DSI and SAR Determination

This device uses only one Device State Index (DSI) for all exposure scenarios.

When 1g SAR and 10g SAR exposure comparison is needed, the worst-case was determined from SAR normalized to 1g or 10g SAR limit.

The device state index (DSI) conditions used in Table 1 represent different exposure scenarios.

Table 1
DSI and Corresponding Exposure Scenarios

Scenario	Description	SAR Test Cases
Head (DSI = 3)	- Device positioned next to head and a sensor is triggered. - Ear speaker is activated.	Head SAR per KDB Publication 648474 D04.
Body-Worn (DSI = 3)	- Device being used with a body-worn accessory and a sensor is triggered. - Ear speaker is not activated.	Body-worn SAR per KDB Publication 648474 D04.
Hotspot (DSI = 3)	- Device transmits in hotspot mode near body. - Hotspot Mode Active	Hotspot SAR per KDB Publication 941225 D06.
Phablet Grip (DSI = 3)	- Device being used with a body-worn accessory and a sensor is triggered. - Ear speaker is not activated.	Phablet SAR per KDB Publication 648474 D04.

1.2 SAR Design Target

SAR_design_target is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer (see Table 2).

Table 2
SAR_design_target Calculation

SAR_design_target			
$SAR_design_target < SAR_regulatory_limit \times 10^{\frac{-Total\ Uncertainty}{10}}$			
Head / Body SAR (W/kg)		Limbs SAR (W/kg)	
Total Uncertainty	1.0 dB	Total Uncertainty	1.0 dB
SAR_regulatory_limit	1.6 W/kg	SAR_regulatory_limit	4.0 W/kg
SAR_design_target	1.0W/kg	SAR_design_target	2.5 W/kg

1.3 SAR Char

SAR test results corresponding to Pmax for each antenna/technology/band/DSI can be found in Part 1 SAR Report.

Plimit is calculated by linearly scaling with the measured SAR at the Pmax to correspond to the SAR_design_target. Plimit determination for each exposure scenario corresponding to SAR_design_target are shown in Table 3.

Table 3
Limit Determination

Device State Index (DSI)	Plimit Determination Scenarios
3	Free space. SAR measurement is not applicable
3	Plimit is calculated based on the following scenarios: - 1g Head SAR
3	Plimit is calculated based on the following scenarios: - 1g Body-worn SAR measured at 10 mm - 1g Hotspot SAR measured at 10 mm for six surfaces - 10g Extremity SAR measured at 0 mm for six surfaces

Table 4 : SAR Characterizations

(1) Free Space (DSI=3)

Band	Antenna	P Limit* (dBm)	Pmax* (dBm)
GSM850	Main	23.3	23.3
GSM1900	Main	18.8	20.8
UMTS II	Main	19.0	24.0
UMTS IV	Main	21.0	24.0
UMTS V	Main	22.0	24.0
LTE B25/2	Main	18.0	24.0
LTE B66/4	Main	20.0	24.0
LTE B5	Main	21.0	24.3
LTE B12/17	Main	21.0	24.0
LTE B13	Main	21.0	24.3
LTE B41	Main	16.0	22.0

* Frame Averaged Power

** Time averaging is not used

(2) Head (DSI=3)

Band	Antenna	Test Distance (mm)	Measured Power* (dBm)	Measured 1g SAR (W/kg)	Position	Calculated upper power limit* (dBm)	P Limit* (dBm)	Pmax* (dBm)
GSM850	Main	0	23.3	0.09	Left	33.87	23.3	23.3
GSM1900	Main	0	18.8	0.02	Right	35.80	18.8	20.8
UMTS II	Main	0	19.0	0.03	Right	33.69	19.0	24.0
UMTS IV	Main	0	21.0	0.13	Right	29.73	21.0	24.0
UMTS V	Main	0	22.0	0.11	Right	31.59	22.0	24.0
LTE B25/2	Main	0	18.0	0.05	Right	31.01	18.0	24.0
LTE B66/4	Main	0	20.0	0.08	Right	30.76	20.0	24.0
LTE B5	Main	0	21.0	0.08	Left	31.76	21.0	24.3
LTE B12/17	Main	0	21.0	0.04	Right	35.09	21.0	24.0
LTE B13	Main	0	21.0	0.08	Right	31.92	21.0	24.3
LTE B41	Main	0	16.0	0.03	Right	31.38	16.0	22.0

* Frame Averaged Power

** Time averaging is not used

(3) Body-worn/Hotspot (DSI=3)

Band	Antenna	Test Distance (mm)	Measured Power* (dBm)	Measured 1g SAR (W/kg)	Position	Calculated upper power limit* (dBm)	P Limit* (dBm)	Pmax* (dBm)
GSM850	Main	10	23.3	0.16	Back	31.35	23.3	23.3
GSM1900	Main	10	18.8	0.32	Bottom	23.73	18.8	20.8
UMTS II	Main	10	19.0	0.33	Bottom	23.79	19.0	24.0
UMTS IV	Main	10	21.0	0.53	Bottom	23.79	21.0	24.0
UMTS V	Main	10	22.0	0.23	Back	28.38	22.0	24.0
LTE B25/2	Main	10	18.0	0.22	Bottom	24.60	18.0	24.0
LTE B66/4	Main	10	20.0	0.35	Bottom	24.62	20.0	24.0
LTE B5	Main	10	21.0	0.16	Back	29.10	21.0	24.3
LTE B12/17	Main	10	21.0	0.09	Left	31.71	21.0	24.0
LTE B13	Main	10	21.0	0.15	Back	29.21	21.0	24.3
LTE B41	Main	10	16.0	0.19	Bottom	23.17	16.0	22.0

* Frame Averaged Power

** Time averaging is not used

(4) Extremity (DSI=3)

Band	Antenna	Test Distance (mm)	Measured Power* (dBm)	Measured 10g SAR (W/kg)	Position	Calculated upper power limit* (dBm)	P Limit* (dBm)	Pmax* (dBm)
GSM850	Main	10	23.3	2.00	Back	24.28	23.3	23.3
GSM1900	Main	10	18.8	1.12	Bottom	22.30	18.8	20.8
UMTS II	Main	10	19.0	1.23	Bottom	22.08	19.0	24.0
UMTS IV	Main	10	21.0	1.36	Bottom	23.64	21.0	24.0
UMTS V	Main	10	22.0	1.04	Left	25.81	22.0	24.0
LTE B25/2	Main	10	18.0	0.87	Bottom	22.58	18.0	24.0
LTE B66/4	Main	10	20.0	0.90	Bottom	24.44	20.0	24.0
LTE B5	Main	10	21.0	0.79	Left	26.00	21.0	24.3
LTE B12/17	Main	10	21.0	1.05	Left	24.77	21.0	24.0
LTE B13	Main	10	21.0	0.72	Left	26.41	21.0	24.3
LTE B41	Main	10	16.0	0.57	Bottom	22.42	16.0	22.0

* Frame Averaged Power

** Time averaging is not used