

APPENDIX D: TOTAL EXPOSURE RATIO

The total exposure ratio (TER) is calculated by combining all SAR measurements and power density measurements after normalizing to their respective limits. The general expression is below.

$$TER = \sum_{n=1}^N \frac{SAR_n}{SAR_n, limit} + \sum_{m=1}^M \frac{S_{m,avg}}{S_{m, limit}} < 1$$

The TER shall be less than unity to ensure compliance with the limits.

(*) For test positions that were not required to be evaluated for WLAN SAR per FCC KDB publication 248227, the worst case WLAN SAR result for the applicable exposure conditions was used for simultaneous transmission analysis.

Worst-case power density results for each test configuration among all antenna arrays (J Patch, K Patch, L Patch, J Dipole) were considered for TER analysis. Some bands and modes may be evaluated at a higher power or at a closer separation distance representing a more conservative TER analysis. LTE ULCA and LTE Band 30 Antenna A (DLCA) operations are not available during EN-DC operations with 5G NR. Since LTE Band 4 frequency range falls completely within LTE Band 66's larger transmission frequency range, only LTE Band 66 was considered for TER.

**Table D-1
NR Band n260 Head Total Exposure Ratio**

Anchor Band	LTE Reported SAR	2.4 GHz WLAN Ant1 Reported SAR	2.4 GHz WLAN Ant2 Reported SAR	Bluetooth Reported SAR	5 GHz WLAN Ant1 Reported SAR	5 GHz WLAN Ant2 Reported SAR	n260 S	LTE + 2.4 GHz WLAN Ant1 + n260	LTE + 2.4 GHz WLAN Ant2 + n260	LTE + 2.4 GHz WLAN MIMO + n260	LTE + BT + 5 GHz WLAN Ant1 + n260	LTE + BT + 5 GHz WLAN Ant2 + n260	LTE + BT + 5 GHz WLAN MIMO + n260	LTE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO + n260
	W/kg	W/kg	W/kg	W/kg	W/kg	W/kg	mW/cm ²							
	1	2	3	4	5	6	7	1+2+7	1+3+7	1+2+3+7	1+4+5+7	1+4+6+7	1+4+5+6+7	1+2+3+5+6+7
Applicable Limit	1.6	1.6	1.6	1.6	1.6	1.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LTE B12	Reported Value: 0.150	0.457	0.027	0.254	0.324	0.057	0.107							
LTE B12	Ratio to Limit: 0.094	0.286	0.017	0.159	0.203	0.036	0.107	0.487	0.218	0.504	0.563	0.396	0.599	0.743
LTE B13	Reported Value: 0.177	0.457	0.027	0.254	0.324	0.057	0.107							
LTE B13	Ratio to Limit: 0.111	0.286	0.017	0.159	0.203	0.036	0.107	0.504	0.235	0.521	0.580	0.413	0.616	0.760
LTE B5	Reported Value: 0.177	0.457	0.027	0.254	0.324	0.057	0.107							
LTE B5	Ratio to Limit: 0.111	0.286	0.017	0.159	0.203	0.036	0.107	0.504	0.235	0.521	0.580	0.413	0.616	0.760
LTE B66	Reported Value: 0.152	0.457	0.027	0.254	0.324	0.057	0.107							
LTE B66	Ratio to Limit: 0.095	0.286	0.017	0.159	0.203	0.036	0.107	0.488	0.219	0.505	0.564	0.397	0.600	0.744
LTE B2	Reported Value: 0.156	0.457	0.027	0.254	0.324	0.057	0.107							
LTE B2	Ratio to Limit: 0.098	0.286	0.017	0.159	0.203	0.036	0.107	0.491	0.222	0.508	0.567	0.400	0.603	0.747
LTE B30 Ant B	Reported Value: 0.149	0.457	0.027	0.254	0.324	0.057	0.107							
LTE B30 Ant B	Ratio to Limit: 0.093	0.286	0.017	0.159	0.203	0.036	0.107	0.486	0.217	0.503	0.562	0.395	0.598	0.742

Worst-case front side total power density value was considered for Head TER analysis.

**Table D-2
NR Band n260 Body-Worn Total Exposure Ratio - Back Side at 15 mm**

Anchor Band	LTE Reported SAR	2.4 GHz WLAN Ant1 Reported SAR	2.4 GHz WLAN Ant2 Reported SAR	2.4 GHz WLAN MIMO at 19 dBm Reported SAR	Bluetooth Reported SAR	5 GHz WLAN Ant1 Reported SAR	5 GHz WLAN Ant2 Reported SAR	5 GHz WLAN MIMO at 16 dBm Reported SAR	n260 S	LTE + 2.4 GHz WLAN Ant1 + n260	LTE + 2.4 GHz WLAN Ant2 + n260	LTE + 2.4 GHz WLAN MIMO + n260	LTE + BT + 5 GHz WLAN Ant1 + n260	LTE + BT + 5 GHz WLAN Ant2 + n260	LTE + BT + 5 GHz WLAN MIMO at 16 dBm + n260	LTE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO at 16 dBm + n260
	W/kg	W/kg	W/kg	W/kg	W/kg	W/kg	W/kg	W/kg	mW/cm ²							
	1	2	3	4	5	6	7	8	9	1+2+9	1+3+9	1+4+9	1+5+6+9	1+5+7+9	1+5+8+9	1+4+8+9
Applicable Limit	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LTE B12	Reported Value: 0.333	0.109	0.177	0.092	0.034	0.181	0.313	0.177	0.233							
LTE B12	Ratio to Limit: 0.208	0.068	0.111	0.058	0.021	0.113	0.196	0.111	0.233	0.509	0.552	0.499	0.575	0.658	0.573	0.610
LTE B13	Reported Value: 0.239	0.109	0.177	0.092	0.034	0.181	0.313	0.177	0.233							
LTE B13	Ratio to Limit: 0.149	0.068	0.111	0.058	0.021	0.113	0.196	0.111	0.233	0.450	0.493	0.440	0.516	0.599	0.514	0.551
LTE B5	Reported Value: 0.307	0.109	0.177	0.092	0.034	0.181	0.313	0.177	0.233							
LTE B5	Ratio to Limit: 0.192	0.068	0.111	0.058	0.021	0.113	0.196	0.111	0.233	0.493	0.536	0.483	0.559	0.642	0.557	0.594
LTE B66	Reported Value: 0.863	0.109	0.177	0.092	0.034	0.181	0.313	0.177	0.233							
LTE B66	Ratio to Limit: 0.539	0.068	0.111	0.058	0.021	0.113	0.196	0.111	0.233	0.840	0.883	0.830	0.906	0.989	0.904	0.941
LTE B2	Reported Value: 0.799	0.109	0.177	0.092	0.034	0.181	0.313	0.177	0.233							
LTE B2	Ratio to Limit: 0.499	0.068	0.111	0.058	0.021	0.113	0.196	0.111	0.233	0.800	0.843	0.790	0.866	0.949	0.864	0.901
LTE B30 Ant B	Reported Value: 0.348	0.109	0.177	0.092	0.034	0.181	0.313	0.177	0.233							
LTE B30 Ant B	Ratio to Limit: 0.218	0.068	0.111	0.058	0.021	0.113	0.196	0.111	0.233	0.519	0.562	0.509	0.585	0.668	0.583	0.620

- Worst-case back side total power density at 2 mm was considered as a more conservative evaluation for 15mm Body-Worn TER.





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Table D-4
NR Band n260 Phablet Total Exposure Ratio

Anchor Band		LTE Reported 10g SAR	5 GHz WLAN Ant 1 Reported 10g SAR	5 GHz WLAN Ant 2 Reported 10g SAR	5 GHz WLAN MIMO at 16 dBm Reported 10g SAR	n260 S	LTE + 5 GHz WLAN Ant1 + n260 S	LTE + 5 GHz WLAN Ant2 + n260 S	LTE + 5 GHz WLAN MIMO + n260 S
		W/kg	W/kg	W/kg	W/kg	mW/cm ²			
		1	2	3	4	5	1 + 2 + 5	1 + 3 + 5	1 + 4 + 5
Applicable Limit		4.0	4.0	4.0	4.0	1.0	1.0	1.0	1.0
LTE B66	Back Side at 7 mm	Reported Value	1.320	0.559*	0.621*	0.122	0.233		
		Ratio to Limit	0.330	0.140	0.155	0.031	0.233	0.703	0.718
	Back Side at 0 mm	Reported Value	1.100	0.559	0.621	0.887	0.233		
		Ratio to Limit	0.275	0.140	0.155	0.222	0.233	0.648	0.663
	Front Side at 0 mm	Reported Value	1.432	0.559*	0.621*	0.887*	0.107		
		Ratio to Limit	0.358	0.140	0.155	0.222	0.107	0.605	0.620
	Top Edge at 0 mm	Reported Value	0	0.559*	0.621*	0.887*	0.160		
		Ratio to Limit	0	0.140	0.155	0.222	0.160	0.300	0.315
	Bottom Edge at 0 mm	Reported Value	1.656	0	0	0	0.012		
		Ratio to Limit	0.414	0	0	0	0.012	0.426	0.426
	Right Edge at 0 mm	Reported Value	0.471	0	0	0	0.423		
		Ratio to Limit	0.118	0	0	0	0.423	0.541	0.541
	Left Edge at 0 mm	Reported Value	0.567	0.559*	0.621*	0.273	0.413		
		Ratio to Limit	0.142	0.140	0.155	0.068	0.413	0.695	0.710
LTE B2	Back Side at 7 mm	Reported Value	1.173	0.559*	0.621*	0.122	0.233		
		Ratio to Limit	0.293	0.140	0.155	0.031	0.233	0.666	0.681
	Back Side at 0 mm	Reported Value	1.096	0.559	0.621	0.887	0.233		
		Ratio to Limit	0.274	0.140	0.155	0.222	0.233	0.647	0.662
	Front Side at 0 mm	Reported Value	1.341	0.559*	0.621*	0.887*	0.107		
		Ratio to Limit	0.335	0.140	0.155	0.222	0.107	0.582	0.597
	Top Edge at 0 mm	Reported Value	0	0.559*	0.621*	0.887*	0.160		
		Ratio to Limit	0	0.140	0.155	0.222	0.160	0.300	0.315
	Bottom Edge at 0 mm	Reported Value	1.828	0	0	0	0.012		
		Ratio to Limit	0.457	0	0	0	0.012	0.469	0.469
	Right Edge at 0 mm	Reported Value	0.396	0	0	0	0.423		
		Ratio to Limit	0.099	0	0	0	0.423	0.522	0.522
	Left Edge at 0 mm	Reported Value	0.467	0.559*	0.621*	0.273	0.413		
		Ratio to Limit	0.117	0.140	0.155	0.068	0.413	0.670	0.685
LTE B30 Ant B	Back Side at 7 mm	Reported Value	0.581	0.559*	0.621*	0.122	0.233		
		Ratio to Limit	0.145	0.140	0.155	0.031	0.233	0.518	0.533
	Back Side at 0 mm	Reported Value	1.165	0.559	0.621	0.887	0.233		
		Ratio to Limit	0.291	0.140	0.155	0.222	0.233	0.664	0.679
	Front Side at 0 mm	Reported Value	1.003	0.559*	0.621*	0.887*	0.107		
		Ratio to Limit	0.251	0.140	0.155	0.222	0.107	0.498	0.513
	Top Edge at 0 mm	Reported Value	0	0.559*	0.621*	0.887*	0.160		
		Ratio to Limit	0	0.140	0.155	0.222	0.160	0.300	0.315
	Bottom Edge at 0 mm	Reported Value	1.022	0	0	0	0.012		
		Ratio to Limit	0.256	0	0	0	0.012	0.268	0.268
	Right Edge at 0 mm	Reported Value	0.401	0	0	0	0.423		
		Ratio to Limit	0.100	0	0	0	0.423	0.523	0.523
	Left Edge at 0 mm	Reported Value	1.143	0.559*	0.621*	0.273	0.413		
		Ratio to Limit	0.286	0.140	0.155	0.068	0.413	0.839	0.854

- Per FCC guidance, the device edges that are not required to be evaluated for SAR are indicated as 0 for TER analysis.
- Per FCC guidance, the bands/modes that are not required to be evaluated for Phablet SAR are not considered for TER analysis.
- For back side at 7 mm, power density results for back side at 2 mm were considered as a more conservative evaluation.
- Per FCC guidance, for power density measurements, a test separation distance of 2 mm was used for phablet configuration due to probe restraints.
- For TER analysis for front at 0 mm and bottom at 0 mm, the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.

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