

30th June 2017

Telecommunication Certification Body
UL Verification Services Ltd
Unit 3 Horizon
Wade Road, Kingsland
Basingstoke
Hampshire
RG24 8AH

RE: Multi-band RN2404-02 Base Station FCC ID: PKTNODEBBHM MPE Calculation.

To Whom It May Concern,

The General Dynamics Mission Systems Multi-Band RN2404-02 Base Station is considered to be fixed equipment and intended for operation with separation distances greater than 20cm between the user and the equipment. Therefore the RF Exposure performance can be assessed by a Maximum Permissible Exposure (MPE) calculation using the limits defined in Part 1.1310 Table 1B for the General Population/Uncontrolled Exposure category.

MPE Distance Calculation	Channel Size			
Channel Bandwidth	5MHz	10MHz	20MHz	
Antenna Gain	20	20	20	dBi
Line Loss	0	0	0	dB
Antenna Gain Ratio	100	100	100	
eNode B Tx Output Power (per branch)	33	33	33	dBm
Upper Power Tolerance (per branch)	2	2	2	dB
Number of Transmitter Branches	2	2	2	
Total Output Power - all branches	6324.56	6324.56	6324.56	mW
Maximum EIRP - all branches	632455.53	632455.53	632455.53	mW
Frequency	2110	2110	2110	MHz
MPE Limit from 1.1310	1.000	1.000	1.000	mW/cm ²
Un-controlled/General Public Limit				
Minimum Distance to meet MPE Limit	224.34	224.34	224.34	cm
(100% Duty Cycle)	88.25	88.25	88.25	inches

Table 1: Band 4 MPE Calculation 100% Duty Cycle

MPE Distance Calculation	Channel Size			
Channel Bandwidth	5MHz	10MHz	20MHz	
Antenna Gain	20	20	20	dBi
Line Loss	0	0	0	dB
Antenna Gain Ratio	100	100	100	
eNode B Tx Output Power (per branch)	33	33	33	dBm
Upper Power Tolerance (per branch)	2	2	2	dB
Number of Transmitter Branches	2	2	2	
Total Output Power - all branches	6324.56	6324.56	6324.56	mW
Maximum EIRP - all branches	632455.53	632455.53	632455.53	mW
Frequency	2620	2620	2620	MHz
MPE Limit from 1.1310	1.000	1.000	1.000	mW/cm ²
Un-controlled/General Public Limit				
Minimum Distance to meet MPE Limit	224.34	224.34	224.34	cm
(100% Duty Cycle)	88.25	88.25	88.25	inches

Table 2: Band 7 MPE Calculation 100% Duty Cycle

MPE Distance Calculation	Channel Size			
Channel Bandwidth	5MHz	10MHz	20MHz	
Antenna Gain	20	20	20	dBi
Line Loss	0	0	0	dB
Antenna Gain Ratio	100	100	100	
eNode B Tx Output Power (per branch)	33	33	33	dBm
Upper Power Tolerance (per branch)	2	2	2	dB
Number of Transmitter Branches	2	2	2	
Total Output Power - all branches	6324.56	6324.56	6324.56	mW
Maximum EIRP - all branches	632455.53	632455.53	632455.53	mW
Frequency	728	728	728	MHz
MPE Limit from 1.1310	0.485	0.485	0.485	mW/cm ²
Un-controlled/General Public Limit				
Minimum Distance to meet MPE Limit	322.03	322.03	322.03	cm
(100% Duty Cycle)	126.68	126.68	126.68	inches

Table 3: Band 12 MPE Calculation 100% Duty Cycle

MPE Distance Calculation	Channel Size			
Channel Bandwidth	5MHz	10MHz	20MHz	
Antenna Gain	20	20	20	dBi
Line Loss	0	0	0	dB
Antenna Gain Ratio	100	100	100	
eNode B Tx Output Power (per branch)	33	33	33	dBm
Upper Power Tolerance (per branch)	2	2	2	dB
Number of Transmitter Branches	2	2	2	
Total Output Power - all branches	6324.56	6324.56	6324.56	mW
Maximum EIRP - all branches	632455.53	632455.53	632455.53	mW
Frequency	758	758	758	MHz
MPE Limit from 1.1310	0.505	0.505	0.505	mW/cm ²
Un-controlled/General Public Limit				
Minimum Distance to meet MPE Limit	315.59	315.59	315.59	cm
(100% Duty Cycle)	124.15	124.15	124.15	inches

Table 4: Band 14 MPE Calculation 100% Duty Cycle

The calculations above show the General Dynamics Mission Systems Multi-Band RN2404-02 Base Station complies with the following un-controlled /General Public limits at a minimum separation distance of 3.23m for all operating bands using either 5MHz, 10MHz or 20MHz channel sizes.

Operating Band	Uncontrolled/General Public Limit (mW/cm ²)	Minimum Separation Distance (m)
Band 4	1.0	2.25
Band 7	1.0	2.25
Band 12	0.485	3.23
Band 14	0.505	3.16

Table 5: MPE Limits and Minimum Separation Distances

Yours Faithfully



P Warburg
Principal Engineer
General Dynamics UK Ltd.