

LETTER OF REQUEST

PERMISSIVE CHANGE

04 November 2022

We, as a manufacturer of following equipment, hereby submit Class 2 Permissive Change application for the FCC and the ISED to change components in the filings.

MODEL	FCC		ISED	
TM03LNNNAHD0	FCC ID	BEJTM03LNNNAHD0	Certification Number	2703H- TM03LNNNAHD0
	Original Grant Date	29 July 2021	Original Grant Date	29 July 2021
	Equipment Type	Single Modular		

A. Antenna Information

We have additional external antenna and gain was measured in each band as below. The worst-case scenarios have been chosen based on these values. We also confirm the measured the gains are the highest gain in all directions and all frequencies.

Frequency Range UL (MHz)	Band	Original ANT. [Original Grant]	Cable loss	Additional ANT. [C2PC]	Final additional ANT. [C2PC]	Increased Gain
699 - 716	B12	-2.85 dBi	0.5 dBi	-2.2 dBi	-2.7 dBi	0.15 dB
824 - 849	B5	0.32 dBi	0.5 dBi	0.4 dBi	-0.1 dBi	-0.6 dB
1 710 - 1 755	B4	2.86 dBi	0.8 dBi	0.4 dBi	-0.4 dBi	-1.2 dB
1 850- 1 910	B2	2.83 dBi	0.9 dBi	-0.1 dBi	-1.0 dBi	-1.0 dB

B. WORST CASE SELECTION

Full RSE test have been completed for additional external ANT. which is considered have generally higher gains than the original internal ANT. Additional test were performed at each higher gain on a mode which got worst RSE margin.

Frequency-Range UL (MHz)	Band	Increased Gain	RSE Margin [Original Grant]			Additional RSE
			GSM	WCDMA	LTE	
699 - 716	B12	<u>0.65 dB</u>	-	-	43.39 dB	<u>37.90</u>
824 - 849	B5	<u>0.08 dB</u>	-	47.06 dB	45.87 dB	<u>30.58</u>

C. E.R.P./ E.I.R.P.

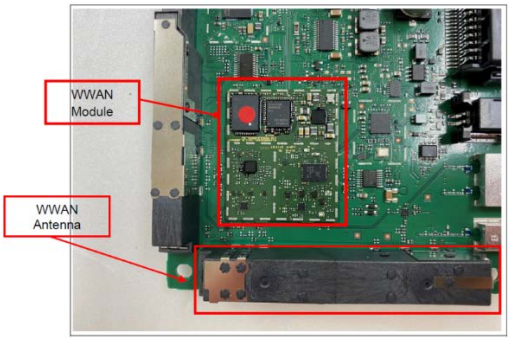
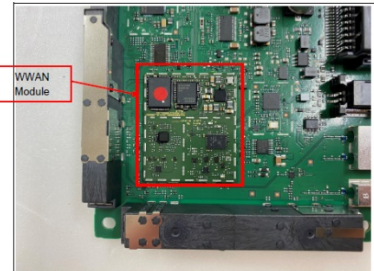
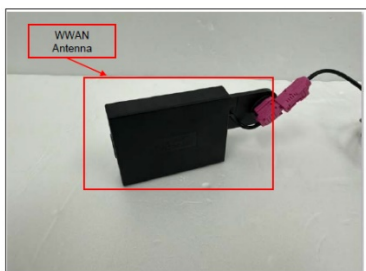
Due to increasing some antenna gain, E.R.P./ E.I.R.P. was recalculated to comply the limits in Parts 22, 24, 27 of FCC rules and RSS standards.

Band	Frequency (MHz)	Target Power (dBm)	Max Tune-up Tolerance (dB)	Maximum Conducted Power (dBm)	Maximum Conducted Power (W)	Antenna Gain (dBi)	Maximum E.I.R.P. (dBm)	Maximum E.I.R.P. (W)	Maximum E.R.P. (dBm)	Maximum E.R.P. (W)	Output Power Limit
WCDMA II	1 850 - 1 910	23.00	1.0	24.00	0.251	-1.0	23.0	0.200			2 W E.I.R.P.
WCDMA V	824 - 849	23.00	1.0	24.00	0.251	-0.1	23.9	0.245	21.75	0.150	7 W E.R.P.
LTE 2	1 850 - 1 910	23.00	1.0	24.00	0.251	-1	23.0	0.200			2 W E.I.R.P.
LTE 4	1 710 - 1 780	23.00	1.0	24.00	0.251	-0.4	23.60	0.229			1 W E.I.R.P.
LTE 5	824 - 849	23.00	1.0	24.00	0.251	-0.1	23.9	0.245	21.75	0.150	7 W E.R.P.
LTE 12	699 - 716	23.00	1.0	24.00	0.251	-2.7	21.3	0.135	19.15	0.082	3 W E.I.R.P.

Remark;

1. E.I.R.P. (dB m) = Maximum Conducted Power (dB m) + Antenna Gain (dB i)
2. E.R.P. (dB m) = E.I.R.P. (dB m) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.

D. Comparison information

Before	After
View of Antenna & Module 	View of Module  View of Antenna 



E. Declaration

The model with additional antenna comply ERP/EIRP requirements, power thresholds for exemption from routine evaluation, MPE limits at 20cm and the limits in Parts 22, 24, 27 of FCC rules and RSS standards.

Based on technical analysis mentioned above, we hereby request permissive change for both FCC and ISED certification.

A handwritten signature in black ink, appearing to read 'Sungsoo Kim'.

Mr. Sungsoo Kim

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