LETTER OF REQUEST

PERMISSIVE CHANGE

26 April 2021

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	
TM04ANNABM0	FCC ID	BEJ-TM04ANNABM0	Certification Number	2703H-TM04ANNABM0
	Original Grant Date	14 July 2020	Original Grant Date	27 May 2020
	Equipment Type	Single Modular		

A. Antenna Information

We have additional antenna called 9825131_04 and gain was measured in each band.

Frequency-Range UL (㎒)	**Band**	**9825131_02** [Original Grant]	**9825131_04** [C2PC]	**Increased Gain**
663 – 698	B71	-4.2 dBi	-3.4 dBi	0.8 dB
699 - 716	B12	-2.1 dBi	-3.1 dBi	-1.0 dB
704 - 716	B17	-2.1 dBi	-3.1 dBi	-1.0 dB
777 - 787	B13	-0.1 dBi	-0.4 dBi	-0.3 dB
814 - 849	B26	-1.1 dBi	0.0 dBi	1.1 dB
824 - 849	B5	-1.9 dBi	-0.2 dBi	1.7 dB
1710 - 1755	B4	2.6 dBi	2.8 dBi	0.2 dB
1710 - 1780	B66	2.6 dBi	3.0 dBi	0.4 dB
1850- 1910	B2	2.0 dBi	2.3 dBi	0.3 dB
1850 - 1915	B25	2.1 dBi	2.3 dBi	0.2 dB
2496 - 2690	B41	2.7 dBi	N/A	N/A
2500 - 2570	B7	2.7 dBi	N/A	N/A

This product is a professional installation equipment and installed by vehicle manufacturer.
As antennas will be installed by vehicle manufacturer. Vehicle manufacturer will implement specific software version for each antenna and vehicle.
LTE B7 and B41 shall be disabled by the software when the antenna 98525131_04 is installed on this equipment.
Therefore, antenna gain of B7 and B41 from excluded from this C2PC request and remain unchanged as original grant.

According to the KDB 178919 and KDB 996369, host manufacturer can use antenna has gain less than following table.

Band	Frequency (㎒)	Antenna Gain (dBi)
GSM 1 900	1 850 - 1 910	2.3
GSM 850	824 - 849	-0.2
WCDMA Ⅱ	1 850 - 1 910	2.3
WCDMA Ⅳ	1 710 - 1 755	2.8

WCDMA Ⅴ	824 - 849	-0.2
LTE 7	2500 - 2570	2.7
LTE 12/17	699 – 716	-2.1
LTE 13	777 – 787	-0.1
LTE 25/2	1 850 – 1 915	2.3
LTE 26	814 – 824 (Only for FCC)	0.0
LTE 26/5	824 – 849	-0.2
LTE 41	2496 - 2690	2.7
LTE 66/4	1 710 - 1 780	3.0
LTE 71	663 - 698	-3.4

B. WORST CASE SELECTION

The worst-case scenarios have been chosen based on these Gain values and Margin of Radiated Spurious Emission.

- Bands which Increase above 0.5 dB (below 0.5 dB is expected to be affected by uncertainty)
- Bands which have below 5 dB on Margin of Radiated Spurious Emission [Original Grant]

Frequency-Range UL (㎒)	**Band**	**Increased Gain**	**RSE Margin [Original Grant]**			**Additional RSE**
			GSM	**WCDMA**	**LTE**	
663 – 698	B71	**0.8 dB**			29.58 dB	**LTE B71**
699 - 716	B12	-1.0 dB			50.46 dB	
704 - 716	B17	-1.0 dB			B12	
777 - 787	B13	-0.3 dB			47.58 dB	
814 - 849	B26	**1.1 dB**			-	***LTE B26**
824 - 849	B5	**1.7 dB**	34.41 dB	-	B26	
1710 - 1755	B4	0.2 dB		37.90 dB	B66	
1710 - 1780	B66	0.4 dB			20.05 dB	
1850- 1910	B2	0.3 dB	-	20.47 dB	B25	
1850 - 1915	B25	0.2 dB			**3.08**	**LTE B25**
2496 - 2690	B41	N/A			**3.03**	Not used
2500 - 2570	B7	N/A			**4.80**	Not used

*B26 is chosen by higher antenna gain than B5. [The Gain of B26 is 0.0 dBi / The Gain of B5 is -0.2 dBi]

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, and 90 of FCC rules and RSS standards.

Band	Frequency (㎒)	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
GSM 1 900	1 850 - 1 910	30.00	0.70	30.70	1.175	2.3	33.00	1.995			2 W E.I.R.P.
GSM 850	824 - 849	33.00	2.50	35.50	3.548	-0.2	35.30	3.388	33.15	2.065	7 W E.R.P.
WCDMA Ⅱ	1 850 - 1 910	24.00	1.70	25.70	0.372	2.3	28.00	0.631			2 W E.I.R.P.
WCDMA Ⅳ	1 710 - 1 755	24.00	1.70	25.70	0.372	2.8	28.50	0.708			1 W E.I.R.P.
WCDMA Ⅴ	824 - 849	24.00	1.70	25.70	0.372	-0.2	25.50	0.355	23.35	0.216	7 W E.R.P.
LTE 25/2	1 850 - 1 915	23.00	2.70	25.70	0.372	2.3	28.00	0.631			2 W E.I.R.P.
LTE 26	814 - 824 (Only for FCC)	23.00	2.70	25.70	0.372	0.0	25.70	0.372	23.55	0.226	100 W E.R.P.
LTE 26/5	824 - 849	23.00	2.70	25.70	0.372	-0.2	25.50	0.355	23.35	0.216	7 W E.R.P.
LTE 66/4	1 710 - 1 780	23.00	2.70	25.70	0.372	3.0	28.70	0.741			1 W E.I.R.P.
LTE 71	663 - 698	23.00	2.70	25.70	0.372	-3.4	22.30	0.170	20.15	0.104	3 W E.R.P.

*Maximum antenna gains for LTE B7, B12, B13, B17, and B41 are same as original grant.

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. 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, and 90 of FCC rules and RSS standards.

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

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