FCC §15.247 (i) & §1.1307 (b) (3) & §2.1091- RF EXPOSURE

Applicable Standard

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

An alternative to the SAR-based exemption is provided in § 1.1307(b)(3)(i)(C), for a much wider frequency range, from 300 kHz to 100 GHz, applicable for separation distances greater or equal to $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power. For this case, a RF source is an RF exempt device if its ERP (watts) is no more than a frequency-dependent value, as detailed tabular form in Appendix B. These limits have been derived based on the basic specifications on Maximum Permissible Exposure (MPE) considered for the FCC rules in § 1.1310(e)(1).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1{,}920\ R^2$.
1.34-30	$3{,}450\ R^2/f^2$.
30-300	$3.83\ R^2$.
300-1,500	$0.0128\ R^2 f$.
1,500-100,000	$19.2 R^2$.

f = frequency in MHz;
R = minimum separation distance from the body of a nearby person (appropriate units, e.g., m);

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Result

For worst case:

For Module YL43752:

Mode	Frequency (MHz)	Tune up conducted power# (dBm)	Antenna Gain# (dBi)	(dBd)	ERP (dBm)	(mW)	Evaluation Distance (m)	ERP Limit (mW)
2.4G Wi-Fi	2412-2462	18.5	3.08	0.93	19.43	87.70	0.2	768
5G Wi-Fi	5180-5240	12.0	4.17	2.02	14.02	25.23	0.2	768
	5260-5280	13.0	4.17	2.02	15.02	31.77	0.2	768
	5500-5700	12.0	4.17	2.02	14.02	25.23	0.2	768
	5745-5825	14.5	4.17	2.02	16.52	44.87	0.2	768

For Module YL43456:

Mode	Frequency (MHz)	Maximum power# (dBm)	Antenna Gain# (dBi)	(dBd)	ERP (dBm)	(mW)	Evaluation Distance (m)	ERP Limit (mW)
2.4G Wi-Fi	2412-2462	20.71	3.22	1.07	21.78	150.66	0.2	768
5G Wi-Fi	5150-5850	16.28	4.17	2.02	18.30	67.61	0.2	768

Note 1: The tune-up power was refer the module report
Note2: The antenna gain was declared by the applicant.
Note 2: 0dBd=2.15dBi.

Simultaneous transmitting consideration:

According to applicant, the 2.4G Wi-Fi and 5G Wi-Fi cannot transmit at same time, the two Wi-Fi module cannot transmit as same time.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant