



Date: November 6th, 2019

To:	From:
Regulatory Certification Body DEKRA Testing and Certification, S.A.U. Parque Tecnológico de Andalucía C/ Severo Ochoa 2 & 6 29590 Campanillas Málaga, Spain	Silicon Laboratories Finland Oy, Alberga Business Park, Bertel Jungin aukio 3, 02600 Espoo, Finland

Related to product:

Type of equipment:	Wi-Fi bgn wireless radio module with embedded full stack
Brand name:	Silicon Labs
Model name:	WGM160P22A and WGM160P22N
FCC ID:	QQQWGM160P
IC:	5123A-WGM160P

To whom it may concern,

We hereby declare that we would like to perform a Class 2 Permissive Action for FCC and ISED to update the WGM160P family homologation of Wi-Fi modules (802.11 b/g/n 2.4 GHz with 20MHz of bandwidth), because of some changes that are explained below.

The WGM160P offers two RF ports that can also provide the support for switched antenna diversity, if desired, using an internal switch.

The Wi-Fi modules can make use of an integral antenna connected to the primary RF port, or an external antenna that can be connected to either the primary or secondary RF ports, or two external antennas connected to both RF ports when the switched diversity is desired:

Model WGM160P22A:

- RF1: Internal chip antenna (1.86 dBi)
- RF2: External dipole antenna (2.14 dBi)

- Model WGM160P22N:

- RF1: External dipole antenna (2.14 dBi)
- RF2: External dipole antenna (2.14 dBi)

The first change concerns the center frequency of the internal chip antenna, because some modulation errors were found to exceed the Wi-Fi specifications with the WGM160P variants having the integrated chip antenna (model WGM160P22A), when such antenna was used.



This is a Bill of Materials change of one impedance match component of the integral antenna and the change does not affect any conducted results. The element that changed is an inductor and its new value is 0.2 nH (the previous one was 0.3 nH).

The internal antenna, which is assembled in the WGM160P22A models, consists of the chip antenna itself with three matching components. See below Figures 1 and 2 where it is indicated the location of the inductor L2 in the Schematics and in the photo (internal photos are identical than before).

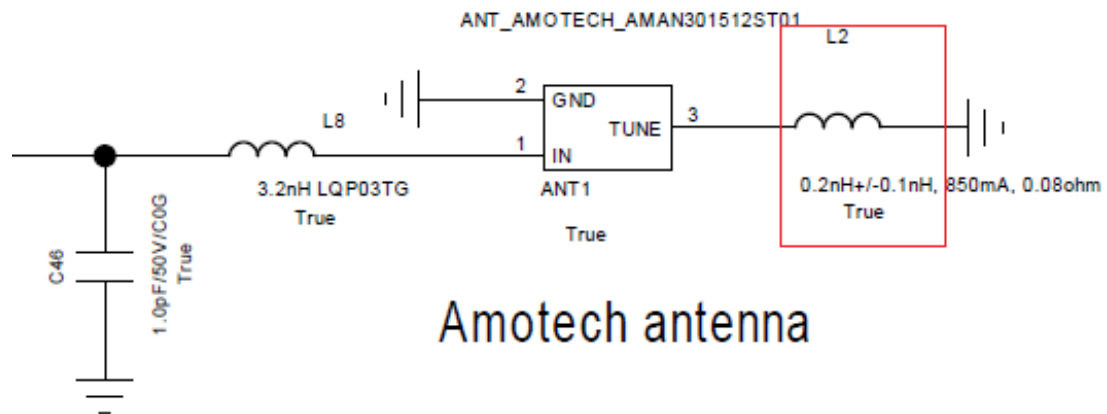


Figure 1 Internal Antenna - Schematics

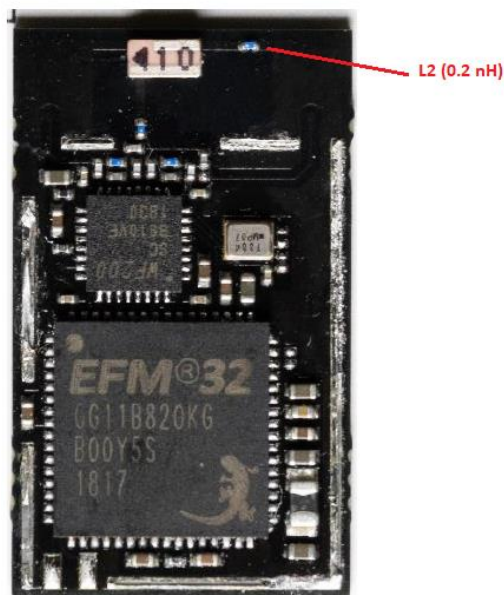


Figure 2 Internal Antenna – Internal photo



The second change is not to the module itself but actually relates to the installation guide and to the band edge testing.

The originally reported emissions were tested with an application PCB with width of 50mm which gives the highest radiated power. However, we had later realized that even though the 50mm board gives the highest radiated power, it is still not the worst case for the band edge at 2483.5MHz.

The worst case for the band edge is actually observed with an application PCB being 40mm wide. So now we would like to retest with 40mm-wide board while lowering further the Transmission Power of the two highest channels, so to remain compliant, and have the best confidence to pass band edge under all circumstances. Notice that the configuration to further decrease the Transmission Power affects equally the primary and secondary RF ports.

We are also adding the response from the FCC concerning an inquiry about this Permissive Change (Tracking Number 770543).

In addition to all the above, it is to be noticed that no test reports related the unintentional radiator part are being submitted. In fact, we have determined that for JAB part the change is a Class I. In other words, the behavior as unintentional radiator (EMC) is the same as before.

Considering these changes, we have performed new testing and got a new RF test report for radiated emissions of the model WGM160P22A to ensure that it is still in compliance with FCC and ISED (notice that the external antenna variants are not affected and conducted measurements remain the same)

For this, we are submitting the following new evidences related to the product:

- New RF test report for radiated emissions of the model WGM160P22A
- New Schematics
- New Bill of materials (they were not sent in the initial homologation)

Sincerely,

P.A.

A handwritten signature in blue ink, appearing to read 'Edyford' or similar, with a horizontal line underneath.

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