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Federal Communications Commission
Equipment Authorization Division
7435 Oakland Mills Road
Columbia, MD 21046
USA

Date:

Subject; **Modular Transmitter Application**

Company name: Alereon, Inc.
FCC ID: U9YAL5932

Dear Sir/Madam,

This letter includes the FCC application requirements for Modular Transmitter Approval Request for;-

FCC KDB 996369 D01 'Module Certification Guide v02; and
FCC KDB 996369 D03 OEM Manual v01

In accordance with 47CFR 15.212 Modular Transmitters and KDB 996369 D01 'Module Equip Auth Guide v02'. FCC ID U9YAL5932 has been examined against the following requirements.

Requirement per 15.212 and KDB 996369 D01	Explanation from Grantee (do not write yes/no, but explain why product complies/how it is achieved)
The radio elements must have the radio frequency circuitry shielded. Physical components and tuning capacitor(s) may be located external to the shield, but must be on the module assembly.	All shielding necessary for normal operation is accomplished by the multi-layer construction of the printed wiring board which incorporates multiple ground layers in its construction. As this transmitter is designed to operate stand-alone in its own enclosure, connected to an industry-standard USB 2.0 interface, no additional shielding is incorporated to minimize coupling such as may occur if the module were incorporated into another unit. In addition, a tamper proof coating will cover a majority of the module, making it impossible to adjust any of the RF parameters. This firmware is locked down with a strict requirement not to allow any changes.

The module must have buffered modulation/data inputs to ensure that the device will comply with Part 15 requirements with any type of input signal.	The Alereon modules receive data via the industry-standard USB 2.0 interface. All interfaces are implemented within the AL5350 integrated circuit as may be seen on the schematic diagram included in the filing for FCC Equipment Authorization. These interfaces limit the data rate to those defined by their standards
The module must contain power supply regulation on the module.	The Alereon modules receive power from the host system. The +5.0 Volt source from the host system is regulated on the module to power a +3.3V domain and the main +1.2V digital subsystem domain. The +3.3V domain is also regulated on the module to produce two additional power domains required by the module circuitry; +2.4V and +1.2V. The power regulation topology may be seen on the schematic diagram included in the filing for FCC Equipment Authorization.
The module must contain a permanently attached antenna, or contain a unique antenna connector, and be marketed and operated only with specific antenna(s), per §§ 15.203, 15.204(b), 15.204(c), 15.212(a), 2.929(b).	The antenna of the Alereon UWB is a chip antenna as tested in the report. The antenna can be connected via a 40mm coaxial cable with a type U.FL connector. The antenna is intended to be permanently attached to or within the product housing and the connector is not accessible to the user. The U.FL connector complies with the requirement of FCC 15.203 for a unique coupling.
The module must demonstrate compliance in a stand-alone configuration.	As described in the test report included in the filing for FCC Equipment Authorization, the UWB Modules plus antenna were tested without a housing. For the tests reported the module was attached to an Alereon designed test environment which provided power and a USB interface to the controlling computer.
The module must be labeled with its permanently affixed FCC ID label, or use an electronic display (see KDB Publication 784748).	The Alereon modules are intended to be placed within the host system enclosure unique to the brand I.D. of the host system. The

	prescribed label with the FCC Identifier will be included in the compliance statement.
The module must comply with all specific rules applicable to the transmitter, including all the conditions provided in the integration instructions by the grantee.	Part 15.519 of the FCC rules and Regulations requires that a UWB transmitter shall transmit only when it is sending information to an associated receiver. That rules part also requires that the UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting. This requirement is met by design and is implemented by the firmware encoded into the device.
The module must comply with RF exposure requirements	An MPE evaluation has been conducted and the part meets RF exposure requirements.

Integration Instructions for host product manufacturers

The following items are submitted in support of application for Modular Transmitter FCC ID as noted above as required by the FCC KDB 996369 D03 OEM Manual v01.

These items are provided as integration instructions for host product manufacturers (e.g., OEM instruction manual) to use when integrating a module in a host product.

Any requirements that are not applicable to the Module are as indicated below.

Summary of requirements and Checklist. Refer to the KDB for description of the complete requirements;

KDB Ref Sect	Requirements of KDB 996369 D03	User Manual Page Number reference
2.2	List of applicable FCC rules	15.519 (UWB), 15.212 (Modular Approval)
2.3	Summarize the specific operational use conditions	N/A. Only equivalent antennas(same type with equal or less antenna gain) can be used. Other antennas will require additional evaluations. All modules are pre-calibrated to the

		appropriate FCC limits from the module supplier. The integrator cannot change the TX power. Also, the modules ship with the same antenna that was used when performing FCC certification testing.
2.4	Limited module procedures	N/A. This requirement does not apply since this is not a limited modular certification.
2.5	Trace antenna designs	N/A. The module does not contain a trace antenna.
2.6	RF exposure considerations	Section 10.6. Page 25. Please also refer to RF Exposure, Report No. ALER02 MPE RevA.
2.7	Antennas	Section 10.6. Page 25
2.8	Label and compliance information	Section 10.6. Page 25
2.9	Information on test modes and additional testing requirements	N/A. This requirement does not apply because our modules are FIPS 140-2 compliant. Due to this, there are no test modes or additional testing requirements exposed to the integrator.
2.10	Additional testing, Part 15 Subpart B disclaimer	Section 10.6. Page 25

Name: *Parminder Singh* Date: *11/22/2019*
 Title: *Director of Systems Applications*
 Signature of applicant: 