ENABLING MARKET ACCESS

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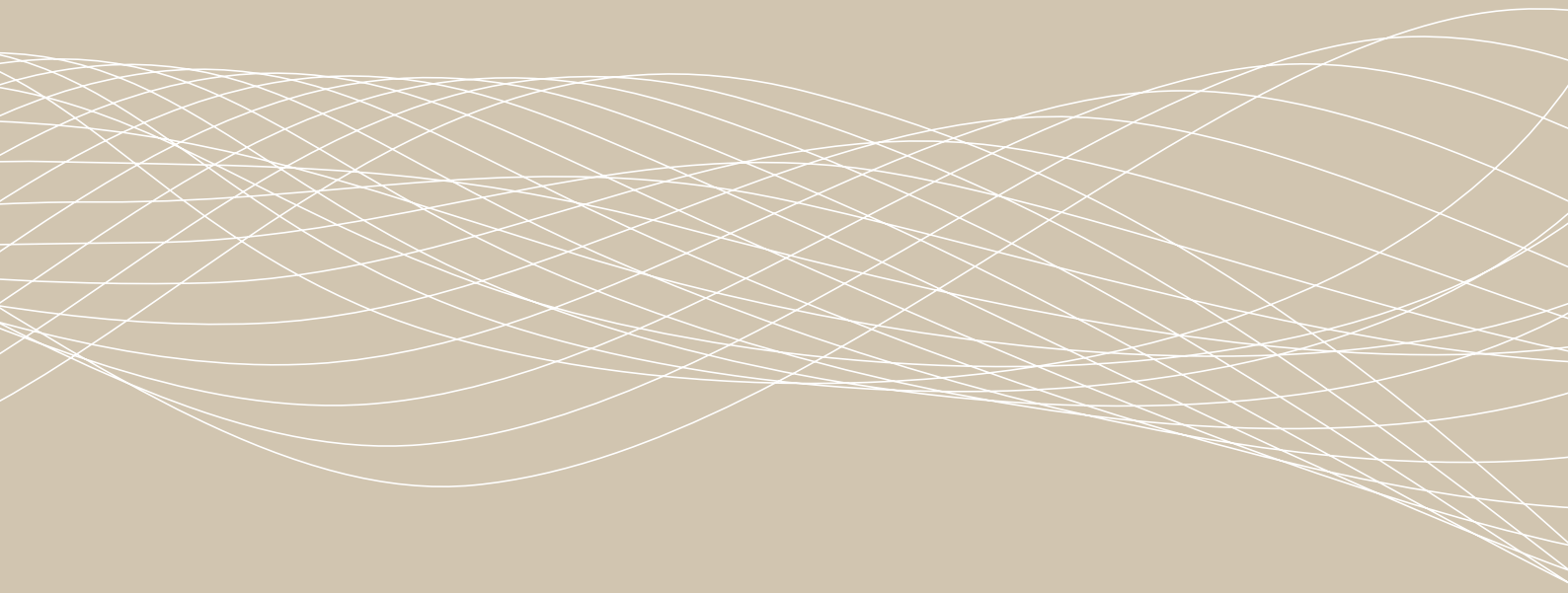


PRODUCTS WITH BLUETOOTH AND WLAN TECHNOLOGY

What must be considered for device certification?

Before the market launch of products with integrated radio technologies, manufacturers need the required certification of the devices. Without this certification and the preceding tests, the manufacturer has no possibility to sell the products to their target markets.

The certification process is generally one of the last steps before a product can be launched. The exact nature of the certification process and which tests are required for certification is decided much earlier in the development process of the products.

When considering a product with integrated radio technologies, manufacturers essentially have three options with respect to the integration of the technology:

A manufacturer has three options for integration of radio technology.

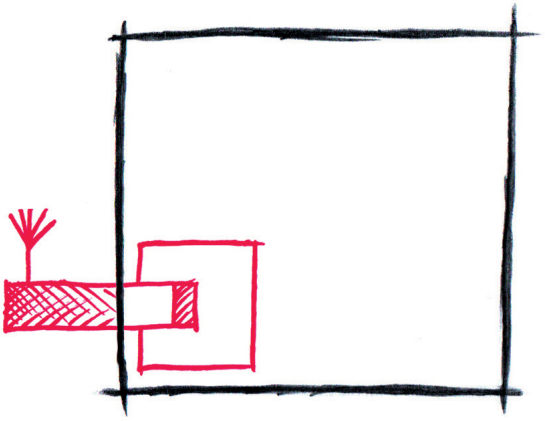


Fig. 1:
Device with external radio dongle

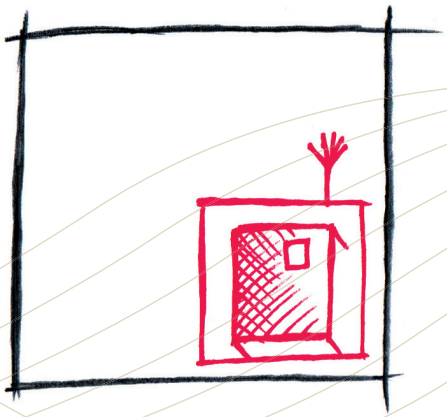


Fig. 2:
Device with certified radio module and antenna configuration

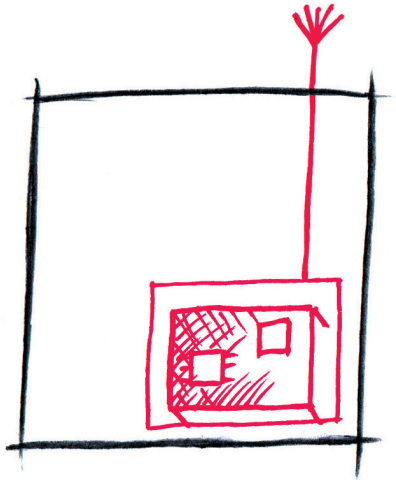


Fig. 3:
Device with radio chip which is not yet certified and antenna configuration

Whereas the device in option 1 (figure 1) uses an external radio dongle which is not permanently connected to the device, option 2 (figure 2) is represented by a device with an integrated and already (pre-)certified radio module and antenna configuration. Option 3 (figure 3) is a device with a radio chip of its own or that has not yet been certified and an antenna configuration.

Effects on the certification process
One of the three options above must be chosen already at a very early stage of development of the device. Just as this decision is central to development, the later certification process also heavily depends on it.

Whereas, in option 1 with the external radio dongle, only the dongle must be certified on the basis of the technologies used, the certification process for the other two options is more complex.

It is important to understand that in the case of a permanently installed radio chip with associated antenna configuration, a final product certification must be performed. This is also the case if the installed radio module or the antenna configuration was already certified. A successfully (pre-)certified radio module reduces the testing expense for the overall product, but only the certification of the overall product is relevant for the market launch.

Which certifications do the target markets require?
In order to bring a product into global circulation, various certifications are required, since there is no globally valid certification regime. These certifications specify that the product meets the applicable requirements in the target market or geography and thereby enable market access.

There are three different primary certification regimes to be observed when launching products with integrated radio technology:

For a market launch in Europe, the CE mark is indispensable. The manufacturer independently affixes the CE mark on the basis of completion and passing of defined test scenarios. The test can be performed both by the manufacturer as well as by accredited laboratories.

CE

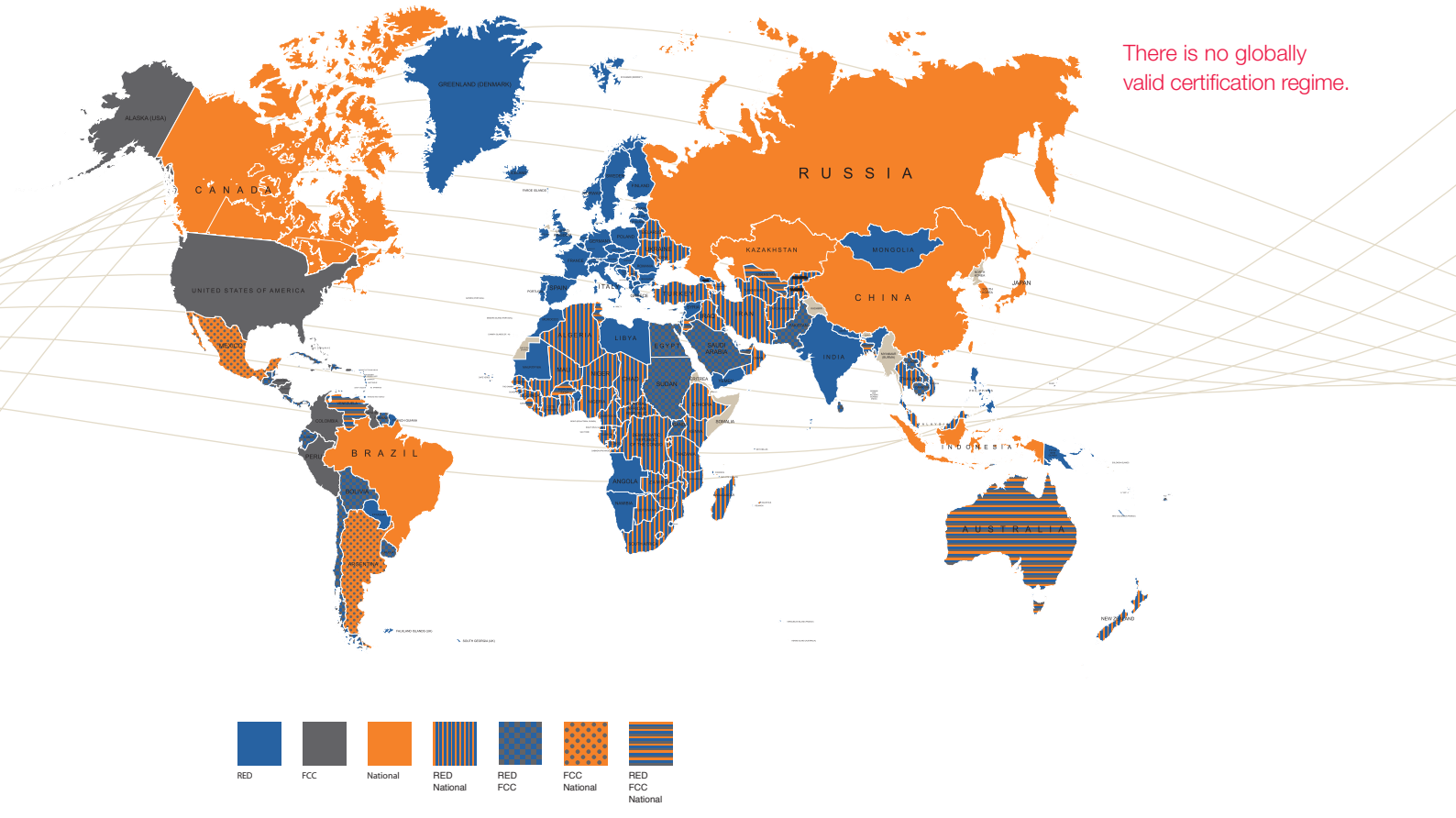
On the other hand, products can only be launched in North America/Canada, if they have an FCC, respectively an ISED certification.

FC

Innovation, Science and Economic Development Canada

To launch products with radio technologies in Japan, compliance with the regulations according to the Association of Radio Industries and Businesses (ARIB) is required.

By definition, a certification on the basis of EN standards (CE marking), the FCC/ISED and the ARIB solely represent guaranteed access to the EU, North American/Canadian and Japanese markets. Independent certification of products with radio technologies for other markets is therefore required. However, the required testing efforts are manageable, since other regulations for market access are oriented based on the aforementioned certification regimes.



There is no globally valid certification regime.

The technology selection determines the testing efforts

Many technical products today are equipped with interfaces for Bluetooth and/or WLAN. The use of these technologies results in various testing scenarios which are required for the certification of a device and, consequently, for the market launch.

In this context, differentiation can be made between regulatory tests that are mandatory for a certification and test scenarios on the basis of the specifications of private certification regimes. In addition to the regulatory tests and the certification based on them, there is also the option to certify the product according to the specifications of the Wi-Fi Alliance®. when using WLAN modules.

The Wi-Fi Alliance® deals with the advancement of Wi-Fi® technology.

The Wi-Fi Alliance® is a network of companies that deals with the quality and advancement of Wi-Fi® technology and, in this context, also publishes certification specifications according to which manufacturers can certify their devices.

WLAN:

When using a WLAN module, the manufacturer must make a decision regarding the frequency bands in which the module will broadcast: 2.4 and/or 5 GHz.

This decision has effects on the scope of regulatory testing which is required for certification in the target market. The following table provides an overview of the relevant testing norms and standards which must be used for certification of a WLAN module:

During this certification, which is not of a regulatory nature but which is considered a seal of quality around the world, the devices undergo various tests. Not only WLAN functionality is tested, but simultaneously also interoperability with other Wi-Fi® certified products.

A Wi-Fi Alliance® certification is not binding for a market launch, but is now perceived by consumers as a positive purchasing criterion and makes a successful market entry easier.

The Wi-Fi Alliance® certification as a quality indicator.

Frequency Band	EU (CE Marking)	FCC/ISED	ARIB
2,4 GHz	EN 300 328	FCC Part 15.247	Ordinary Regulatory Radio Equipment Art. 2 Item 19
5 GHz	EN 301 893	FCC Part 15.407 RSS 247	

BLUETOOTH:

The manufacturer must also make a precise technology selection when certifying devices with Bluetooth technology. There are now various versions of Bluetooth technology. Regulatory tests are required for all variants based on the certification regime:

	EU (CE-Mark)	FCC/ISED	ARIB
Bluetooth 2.x Bluetooth 3.x Bluetooth LE Bluetooth 4.x Bluetooth 5	EN 300 328	FCC Part 15.247 RSS-247	Standard T66

In addition to the regulatory approvals for Bluetooth products, an approval according to the requirements of Bluetooth SIG is also required for market launch.

Every device that wants to use Bluetooth technology and the Bluetooth logo must be subjected to tests according to the „Bluetooth SIG Qualification Programs." Only after passing these test, the manufacturer is officially authorized to use the Bluetooth technology and the associated Bluetooth trademark logo, which is known as a seal of quality for the compatibility of Bluetooth devices around the world.

Official tests according to the Bluetooth SIG specifications may only be performed by so-called „Bluetooth Qualification Test Facilities" (BQTF). Acceptance of the tests and the resulting approval according to the Bluetooth guidelines can only be granted by a certified „Bluetooth Qualification Expert" (BQE).

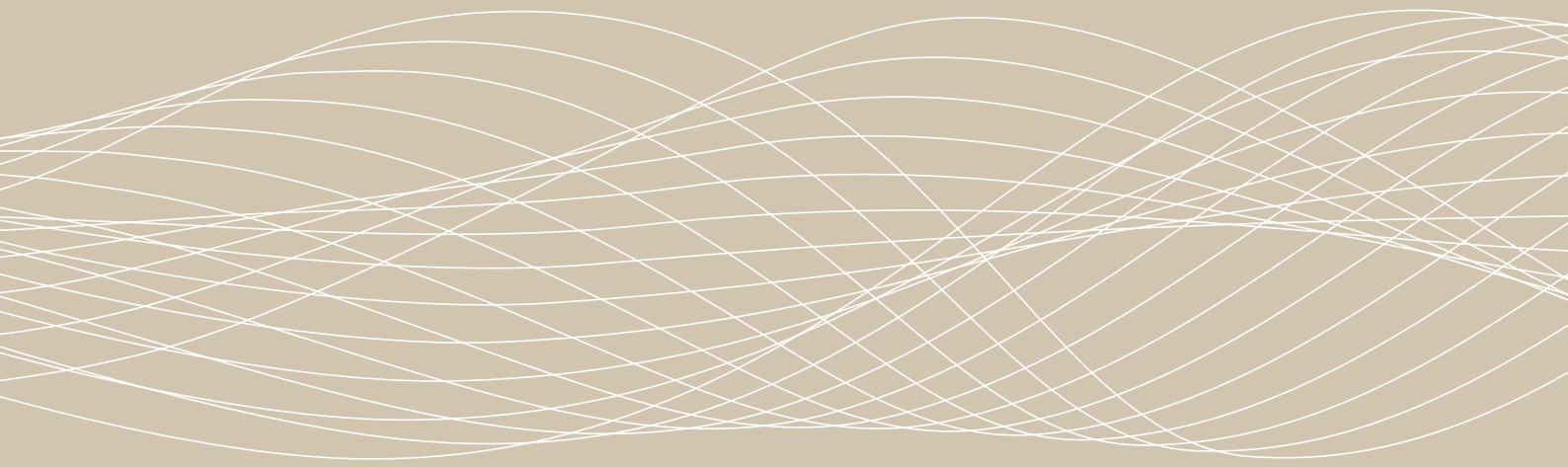
Certification via regulatory and private certification regimes

With the decision of how to design their devices and the selection of suitable technologies, manufacturers smooth the way for the pending certification process. For products that use Bluetooth and/or WLAN technology, the three dominant certification regimes for the EU (CE marking), North American (FCC/ISED) and for Japan (ARIB) define clear rules on the scope of regulatory tests for an approval on the target markets. However, these certification regimes also provide the foundation for approval in various other countries, on the basis of national approval specifications.

Manufacturers cannot avoid these regulatory tests during market launch; at the same time, the positive effect of certification according to the specifications of the private certification regimes (Wi-Fi Alliance® and Bluetooth SIG) should not be underestimated, even if it means additional effort. The regimes have been too strongly established; they are now considered as a mark of quality on the market.

CETECOM is a leading provider of testing and certification services, particularly for Bluetooth and WLAN technologies. In addition to accreditation for performing regulatory tests, CETECOM is a recognized laboratory with the Wi-Fi Alliance® and Bluetooth SIG and also offers coexistence tests for the compatibility of technologies. Furthermore, the CETECOM certification team, including BQE, controls all certification processes.

The regulatory tests are binding for manufacturers. Private regimes serve as an additional mark of quality.



ABOUT CETECOM

For over twenty years, CETECOM has been renowned as an independent provider for test and certification services. With test labs in Europe, North America and Asia, CETECOM provides consulting, testing and certification for wireless technologies such as Cellular, Bluetooth, Wi-Fi, RFID, NFC and Radar. We furthermore perform a wide range of testing in the areas of EMC, Radio, OTA, SAR, field trials and acoustics.

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