Q&A for Tech Talk Topic: Module vs. SoC Tradeoffs

Q: Can we use custom antennas with the module?
A: Yes you can. Many of our modules come with an option to use either the internal antenna or an external antenna. But bear in mind if you use an external antenna you might need to complete additional compliance testing. For our modules with external antenna options, we have already certified with a standard 2.14dBi dipole antenna, which still gives you the benefit of a modular approval as long as you use an antenna of the same type/gain.

Q: Is the temperature sensor in the silicon? or connected via thermistor?
A: The temperature sensor is built into the silicon, not an external thermistor.

Q: Do any modules support multiple antennas with antenna diversity? Does the stack support antenna diversity?
A: We do not offer modules today that support antenna diversity, however some of our SoCs support it.

Q: Do the modules support a co-existence interface with Wi-Fi modules?
A: Yes, we have an IEEE PTA (packet traffic arbitration) interface implementation which works with both our SoCs and modules. We've designed our implementation to be very flexible to ensure lots of options for working with various Wi-Fi chipsets. It can support interfaces with 1 to 4 wire signaling, selectable polarity and drive strength, and other configurable options.

Q: How do the power numbers compare between Module vs SoC?
A: There should be no difference in power consumption between a module and SoC. Think of the module as a repackaging of the SoC - if the same SoC is in the module then the power would also be the same.

Q: What is output impedance of the port/pin that connects to the antenna? Is it documented somewhere?
A: It is described in AN930.2: https://www.silabs.com/documents/public/application-notes/an930.2-efr32-series-2.pdf

Q: What kind of support will SL provide for very low volume usage? We are low volume and many vendors won't even talk to us.
A: We support module customers at all volume levels. We've spent a lot of time optimizing and testing the module designs to make using them easier for you to use and they typically don't require much support.

Q: Was the study presented (break even) done for a specific module? Or was for general Silabs modules?
A: The data presented was based on our BG22 SoC and BGM220 modules, but the method is generally applicable to any module vs. SoC analysis.

Q: If the module is encased in a product, can that product's metal case detune the antenna system? In this case, would you potentially see better RF performance from a chips down design if it were tuned for the system?
A: It depends on the module. Our SIP modules have a very robust antenna which is also easy to tune for your specific application if necessary. See: https://www.silabs.com/whitepapers/antenna-robustness-of-2-4-ghz-sip-modules. If your application requires the module to be inside a metal enclosure, then the external antenna might be a better option (although an onboard antenna could still work for you - it depends on the enclosure).

Q: If we use a module is it okay to use the on-board DC/DC converter to power a small amount of external circuitry? e.g. an accelerometer with < 6mA current.
A: Absolutely. The BG22 DC/DC converter has enough current drive to supply a load up to 60mA, leaving plenty of additional power for external circuitry. The xG13 increases the max load current to 200mA. You'll need to check the capability of the part you're considering.

Q: What are the advantages of having one supplier provide both chip down and modules, as Silicon Labs does?
A: As mentioned in the presentation, the biggest advantage is that the software and tools are the same, so moving between SoC and module is seamless. You will also have same support team and local contacts to work with you.

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Q: Is the module also optimized for low power consumption for battery life?
A: The same tools we provide for maximizing battery life are available to you regardless whether you choose the SoC path or the module path.

Q: Have mobile operator carrier certifications encroached on these testing requirements for convergence applications?
A: Our IoT modules don't require carrier certifications like cellular modems would, so the only certifications required are agency (FCC, etc.) and IoT protocol specific (i.e. Zigbee or Bluetooth)

Q: How about external antennas? Our products have stainless steel enclosures.
A: Yes, our modules are typically available with either a u.FL connector or RF pin output that can be routed to an external antenna. The modules are also certified with a standard dipole antenna that can be used as well to take advantage of the existing module certification.

Q: What percent of your modules are sourced thru China?
A: Some of our modules are manufactured in China, but not all. Many are dual-sourced. You will need to check the specific module.

Q: Modules always seem to be launched after the SoC, so are not always an option for using a newer part.
A: Yes, that's correct. Typically a module is launched within one or two quarters after the SoC launch.

Q: Does Silicon Labs work with other manufacturers to offer a second source to their modules?
A: Yes we have module partners, however they are often not a second source because the pinouts and features are likely different.

Q: What are the disadvantages when starting with a module and when scaling up production, swapping the module for the bare chip?
A: You will still have to go through all the necessary steps for a chip-down hardware design, however you have the advantage that your module-based product is already producing revenue and since your code is identical, your software effort is minimal.

Q: I'm convinced the module is the most efficient way to go for my first SiLabs project. How do I use it to communicate the results from my sensing and control app and is the source for your iPhone app available to be modified for my use? Great presentation, Thanks!
A: To get started, I would recommend the $99 Bluetooth module starter kit: https://www.silabs.com/products/development-tools/wireless/bluetooth/bluegecko-bluetooth-low-energy-module-wireless-starter-kit

And yes - we do provide the source code for our EFR Connect apps:
https://github.com/SiliconLabs/EFRConnect-android
https://github.com/SiliconLabs/EFRConnect-ios

Q: Hi, I use the MGM12. The EN300 328 changed to V2.2.2. Do you plan new certification? When? Many thanks.
A: We will be updating all of our modules to v2.2.2 before the end of 2020, which should give you lots of time before the August 2021 cut-in date.

Q: Do you have design notes for the EFR dual bands to allow Bluetooth and proprietary design?
A: This web page should be a good starting point for you: https://www.silabs.com/products/wireless/multiprotocol-connectivity/dynamic-multiprotocol-introduction

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Q: Any guideline, reference design or test procedure for certifying 900 MHz for Japan?
A: Although we provide design guidance, region specific certification assistance is generally outside of our area of engagement and we recommend you contact a local test lab. Our modules are pre-certified for Japan, but typically only for 2.4GHz protocols.

Q: We tried the MGM12P module (with and without the LNA), and were unable to see single digit uA sleep current, whereas with a chip-down we're able to see good power numbers.
A: The modules are capable of the same single-digit uA current as the SoC, so this is likely a software setup issue. Please submit a support case at www.silabs.com/support and we can help you.

Q: Do you have any combo BT/Wi-Fi modules?
A: Silicon Labs recently acquired Redpine Signals which brings combo Bluetooth+Wi-Fi modules into our portfolio.

Q: Is there preliminary info/docs available for the BG22 modules?
A: For early access to these you will need to work with your local Silicon Labs sales rep.

Q: What type of functional additions can be made to your reference design and still minimize effects on RFI and FCC / Europe radio qualification? Can I add a computation uP and even CPU+Linux to a package and remain RF qualified w/o affect on its RFI?
A: Yes, you can. Your circuitry won't change the RF certifications. Our modules are certified as an international radiator (e.g. FCC Part 15C). Your end product still needs to be tested for unintentional emmissions (e.g. FCC part 15B) regardless of having our module in the design or not.

Q: Can you repeat the URL for the virtual workshop?
A: https://www.silabs.com/about-us/events/virtual-bluetooth-workshop

Q: So, is the coex at 2.4GHz only?
A: Yes, coexistence is typically only needed for 2.4 GHz to arbitrate between 2.4 GHz IoT and 2.4 GHz Wi-Fi.

Q: Does this presentation include the impact of the assets from your Redpine acquisition? Full modules available with the same IDE tools, etc.?
A: The Redpine Signals acquisition was only closed a few weeks ago, and it will take some significant time for all of the tools to be integrated. Please note that there will be an upcoming Tech Talk covering the Redpine products on May 28th.

Q: How much application logic can we stuff into the module that you provide? ... Is it possible to co-host the application in your modules?
A: Yes, for sure. Our modules have plenty of extra processing capacity and memory to host your application code, and the tools are designed to help you integrate your application with the protocol stacks for full standalone operation.

Q: Are you planning a module with the MG22?
A: Please work with your local Silicon Labs rep for questions about future roadmaps.

Q: Any reason for choosing chip-down design on Thunderboard vs using a module?
A: Great question. We have used modules on previous versions of the Thunderboard kit, but the primary reason we use the chip-down approach is that the Thunderboard often becomes a reference design for customers using the SoC. We also have other reference designs for customers using modules.

Q: Some of your competitors will do a complementary design review for RF... does Silicon Labs have a comparable/similar program? If not, what is the NRE cost if we needed such support? (yes, I know it depends).
A: Yes, we do provide design reviews free of charge through either our FAEs or through our support ticket system at www.silabs.com/support

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Q: Can the processor support Linux?
A: No, our SoCs use Cortex-M class processors which do not have the memory management unit necessary for running Linux.

Q: Btw, the chat answers are a great feature of your presentations!
A: Thank you for your valuable feedback!

Q: You only need the Bluetooth listing if you want to use the logo, correct?
A: No, that's not correct. When you use Bluetooth (or other protocols for that matter), you are using IP which belongs to the SIG, and the terms of use require you to file an End Product Listing. If you skip this step, you could be subject to enforcement actions including injunctions against shipping your product.

Q: I found your GitHub for source files. Can you give a link to the Altium design files?
A: They're available through our Simplicity Studio IDE.

Q: Does Silabs provide a reference layout for modules?
A: Yes. We provide radio boards to use with our development kits for every SoC and module we offer, and these also serve as hardware reference designs. We provide all the design files including schematics, BoM and Gerbers. You can find them in Simplicity Studio when the kit documentation package is installed.

Q: I need to do some tweeting about your presentations IMO they are some of the best I've ever attended!
A: Thank you!

Q: Will more BG22 Thunderboards be available soon ?
A: The BG22 Thunderboard can be purchased through any of our distributors with the part number SLTB010A.

Q: Where do you post the Q&A's? These are gold!
A: All previous Tech Talks, with the video replay, presentations and Q&A are available at
https://www.silabs.com/support/training