



Kierunek Elektronika i Telekomunikacja,
Studia II stopnia
Specjalność: Systemy wbudowane

Aspekty prawne (czyli \$\$\$☹️) w projektach systemów wbudowanych

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Program wykładu

- Royalty business model na przykładzie smartfonu
- Magistrale
 - SPI, I2C, USB, ETH, HDMI, SDCard, CAN
- Protokoły
 - Bluetooth, WiFi, NFC
- Moduły deweloperskie
- Licencje na oprogramowanie



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Royalty business model



Rok 2012 - hipotetyczny smartphone za 400\$

Cena komponentów 120...150\$

The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones
Ann Armstrong, Joseph J. Mueller, and Timothy D. Syrett1

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Royalty business model – LTE portfolio

Company	Announced LTE Rate	Royalty (\$400 device)
Qualcomm	3.25% of device ³¹	\$13.00
Motorola	2.25% of device	\$9.00
Alcatel-Lucent	Up to 2% of device	\$8.00
Huawei	1.5% of device	\$6.00
Ericsson	1.5% of device	\$6.00
Nokia	1.5% of device	\$6.00
Nortel ³²	1% of device	\$4.00
ZTE	1% of device	\$4.00 ³³
Siemens	0.8% of device	\$3.20
Via Licensing	Per Unit Sliding-Scale Fee Based on Volume ³⁴	\$2.10 per unit (sales over 10M units)
Sisvel Patent Pool	0.99 Euros per device ³⁵	\$1.36
Vodafone	Free ³⁶	\$0.00
Total		\$54.30

In the table, we identify the companies that have publicly disclosed royalty rates for their LTE portfolios. For each company, we then calculated the royalty that would be applicable to a \$400 device based on the announced rate.

The list of parties above with declared LTE rates accounts for only approximately 50-60% of LTE SEPs declared essential to the European Telecommunications Standards Institute (ETSI) and therefore omits many LTE SEP holders, including parties with large portfolios.³⁷ Of the top ten holders of declared LTE SEP families, three are missing from this list because they have not publicly announced LTE rates: Samsung (ranked 2nd at 11%), InterDigital (ranked 5th at 7.1%), and LG (ranked 8th at 5.4%).

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Royalty business model – Combo Chip (Wi-Fi, Bluetooth, GPS, and NFC)

Company	Royalty (\$400 device)	Royalty Rate/Unit
Lucent Technologies	\$10,000 + 5% of product ¹¹⁰ (requested)	~\$20.00
Agere	5% of product (requested) ¹¹¹	\$20.00
Motorola	2.25% of product (requested) \$0.008 (court awarded) ¹¹² \$0.03 (court awarded for Xbox) ¹¹³ \$3.39 - \$36.90 ¹¹⁴ (requested)	\$9.00
Innovatio IP Ventures	\$0.0956 per Wi-Fi chip (court awarded)	\$7.20 ¹¹⁵
...	€0.71 per device (if licensee grants Nokia a license to its 802.11 SEPs) (requested)	
Ericsson	\$0.50 (requested) \$0.05 per patent per product (court awarded)	\$0.50 ¹¹⁹
Total		\$50.23

Cost of such a combo chip can be approximately \$3-4

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Royalty business model – Audio AAC

Advanced Audio Coding, or AAC, is a successor to MP3 audio compression. AAC allows for higher quality audio playback at smaller file sizes than MP3. It is the format supported by, for example, the iTunes store. AAC was first defined in the MPEG 2 Part 7 specification (ISO/IEC 13818-7), and it was updated in the MPEG 4 Part 3 specification (ISO/IEC 14496-3).

Via Licensing, a subsidiary of Dolby Laboratories, Inc., maintains an AAC patent pool

Volume (per unit ²³⁵ , annual reset)	Per Unit Fee
For the first 1 to 500,000 units	\$0.98
For units 500,001 to 1,000,000	\$0.76
For units 1,000,001 to 2,000,000	\$0.62
For units 2,000,001 to 5,000,000	\$0.52
For units 5,000,001 to 10,000,000	\$0.42
For units 10,000,001 to 20,000,000	\$0.24
For units 20,000,001 to 50,000,000	\$0.20
For units 50,000,001 or more	\$0.15

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Royalty business model – Audio MP3

The MP3 format, which uses an advanced type of audio compression, became an International Organization for Standardization (ISO) standard in 1993. 238 MP3 is the short name for the MPEG-1/MPEG-2 Layer 3 standard, and it is a format for storing digital audio. Fraunhofer IIS has been recognized as the most important SEP holder for MP3 technology because it was the primary developer of the MP3 format. Fraunhofer has combined its MP3 patent portfolio with another significant contributor, Thomson Multimedia (now Technicolor). Italian company Sisvel has formed another MP3 patent pool with patents from Philips, TDF S.A.S., and France Telecom, among others.

Pool	Annual Units	Fee Per Device
Technicolor ²⁴⁴ (Thomson and Fraunhofer)	N/A	\$0.75
Sisvel ²⁴⁵ (Bayerische Rundfunkwerbung GmbH; Institut für Rundfunktechnik GmbH; Koninklijke Philips N.V.; Orange; TDF S.A.S.; U.S. Philips Corporation; formerly France Telecom)	1 to 800,000 800,001 to 4,000,000 4,000,001 to 8,000,000 8,000,001 to 12,000,000 12,000,001 to 20,000,000 More than 20,000,000	\$0.60 ²⁴⁵ \$0.40 \$0.36 \$0.32 \$0.28 \$0.20

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Royalty business model – Audio MP3

The basic MP3 decoding and encoding technology is patent-free in the European Union, all patents having expired there. In the United States, the technology will be substantially patent-free on 31 December 2017 (see below). The majority of MP3 patents expired in the US between 2007 and 2015.

A ile to kosztowało ?

mp3licensing.com

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technicolor



Playing Everywhere™

Royalty Rates

Overview PC Software Hardware ICs / DSPs Games Music Services

Hardware Products

Hardware devices which incorporate mp3 / mp3PRO decoding (such as mp3 / mp3PRO audio players or mp3 / mp3PRO CD-ROM/DVD devices) and hardware devices incorporating mp3 / mp3PRO encoding capabilities (such as audio players or home stereo devices with mp3 / mp3PRO recording capabilities).

Note: If hardware devices use a licensed IC or DSP, the license fee is paid for by the IC/DSP supplier. Please contact us in order to check if a specific mp3/mp3PRO encoder/decoder IC/DSP is licensed.

mp3PRO patent and software license (mp3PRO software by Coding Technologies)	
Decoder	• US\$ 1.25 per unit
Codec	• US\$ 5.00 per unit

mp3 patent and software license (mp3 software by Fraunhofer IIS-A)	
Decoder	• US\$ 0.75 per unit
Codec	• US\$ 1.25 per unit

mp3 patent only license (third party mp3 software)	
This patent only license is needed in case the mp3 software is developed in-house or licensed from a third party.	
Decoder	• US\$ 0.75 per unit
Codec	• US\$ 1.25 per unit

Minimum Royalties	
Annual minimum royalties are payable upon signature and each following year in January and are fully creditable against annual royalties.	
• US\$ 15 000.00 per calendar year	

https://en.wikipedia.org/wiki/MP3#Licensing_2C_ownership_and_legislation

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Royalty business model – Video

The H.264 Standard is a video coding standard, also known as MPEG-4 Part 10, or AVC (Advanced Video Coding). Video compression uses modern coding techniques to reduce redundancy in video data by transforming video into a compressed form that requires less data storage. The first version of the H.264 Standard was adopted in May 2003 by the Joint Video Team (JVT), which was a collaboration between the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC JTC1 Moving Picture Experts Group (MPEG).³⁰¹
There are at least 2,500 patents worldwide declared essential to the H.264 Standard, including over 360 U.S. patents.³⁰²

Company	Maximum Royalty Rate	Royalty (\$400 device)	Share of Standard ³¹⁰
MPEG LA	Per unit sliding-scale fee based on annual volume: - for unit volumes between 100,000 and five million, the royalty is \$0.20 per unit, and - for unit volumes above five million, the royalty rate is \$0.10 per unit.	\$0.10 (assuming sales of 30 million units per year) ³¹¹	76% ³¹²
MPT	\$1.50	\$1.50	0.6% ³¹³
Motorola	2.25% of device price	\$9.00	4% ³¹⁴
Total		\$10.60	80.6%

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Royalty business model – Video



AVC Patent Portfolio License Briefing*

*This presentation is for information purposes only. Actual license agreements will provide the only definitive and reliable statement of license terms.

V05/02/16

<http://www.mpegla.com/main/programs/AVC/Documents/avcweb.pdf>

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Royalty business model – Video

Current Patent Owners

Essential Patent Holders currently include:

- Apple Inc.
- CableTelevision Laboratories, Inc.
- Cisco Systems Canada Co.
- Cisco Technology, Inc.
- Dolby International A.B.
- Dolby Laboratories Licensing Corporation
- Electronics and Telecommunications Research Institute (ETRI)
- Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V.
- Fujitsu Limited
- GE Video Compression, LLC
- Godo Kaisha IP Bridge1
- Google Inc.
- HP Inc.
- Hitachi Maxell, Ltd.
- JVC KENWOOD Corporation*
- Koninklijke Philips N.V.
- Korea Advanced Institute of Science and Technology (KAIST)
- LG Electronics Inc.
- Microsoft Corporation
- Mitsubishi Electric Corporation
- NEC Corporation
- NEWRACOM, Inc.*
- NTT DOCOMO, Inc.
- Nippon Telegraph and Telephone Corporation (NTT)
- Orange SA*
- Panasonic Corporation
- Polycom, Inc.
- Robert Bosch GmbH
- Samsung Electronics Co., Ltd.
- Sharp Corporation
- Siemens AG
- Sony Corporation
- Tagivan II, LLC
- Telefonaktiebolaget LM Ericsson
- The Trustees of Columbia University in the City of New York
- Toshiba Corporation
- Vidy, Inc.
- ZTE Corporation*

7

*Up to and through date of last patent expiration



<http://www.mpegla.com/main/programs/AVC/Documents/avcweb.pdf>

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Royalty business model – Video

AVC/H.264 License Terms Codec Manufacture and Sale

- **Products sold to end users and OEM for PC but not part of OS (decoder, encoder or product consisting of one decoder and one encoder = “unit”)**
 - 0 - 100,000 units/year = no royalty (available to one legal entity in an affiliated group)
 - US \$0.20 per unit after first 100,000 units/year
 - Above 5 million units/year, royalty = US \$0.10 per unit
 - Enterprise cap: \$3.5M per year 2005-2006, \$4.25M per year 2007-08, \$5M per year 2009-10, \$6.5M per year 2011-2015; \$8.125M in 2016 and \$9.75M per year in 2017 through 2020
- **An Enterprise selling branded OEM for PC OS may pay for its customer**
 - 0 - 100,000 units/year = no royalty (available to one legal entity in an affiliated group)
 - US \$0.20 per unit after first 100,000 units/year
 - Above 5 million units/year, royalty = US \$0.10 per unit
 - Enterprise cap: \$3.5M per year 2005-2006, \$4.25M per year 2007-08, \$5M per year 2009-10, \$6.5M per year 2011-2015; \$8.125M in 2016 and \$9.75M per year in 2017 through 2020
- **Includes right to manufacture and sell AVC encoders and decoders with the right of End Users to use them for personal and consumer (including internal business) purposes without remuneration but not for other uses**
- 8• **Royalties begin January 1, 2005**



<http://www.mpegla.com/main/programs/AVC/Documents/avcweb.pdf>

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Royalty business model – Video

AVC/H.264 License Terms Participation Fees

- Where End User pays for AVC Video
 - Subscription (not limited by title) – 100,000 or fewer subscribers/yr = no royalty; > 100,000 to 250,000 subscribers/yr = \$25,000; >250,000 to 500,000 subscribers/yr = \$50,000; >500,000 to 1M subscribers/yr = \$75,000; >1M subscribers/yr = \$100,000
 - Title-by-Title - 12 minutes or less = no royalty; >12 minutes in length = lower of (a) 2% or (b) \$0.02 per title
- Where remuneration is from other sources
 - Free Television - (a) one-time \$2,500 per transmission encoder or (b) annual fee starting at \$2,500 for > 100,000 HH rising to maximum \$10,000 for >1,000,000 HH
 - Internet Broadcast AVC Video (not title-by-title, not subscription) – no royalty for life of the AVC Patent Portfolio License
- Enterprise cap: \$3.5M per year 2006-07, \$4.25M per year 2008-09, \$5M per year 2010, \$6.5M per year 2011-2015; \$8.125M in 2016 and \$9.75M per year in 2017 through 2020
- Royalties begin January 1, 2006



<http://www.mpegla.com/main/programs/AVC/Documents/avcweb.pdf>

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Royalty business model – software

Windows Phone operating system software from Microsoft at a rate of around \$15 to \$23 per device
Microsoft has been reported to charge smartphone suppliers not using Windows Phone a royalty rate of \$5 to \$8 per unit.

Alternatively, a smartphone supplier could adopt the royalty-free Android operating system from Google. In that scenario, the smartphone supplier could also be required to pay a licensing fee to Microsoft. Microsoft has been quite successful at licensing Android handset manufacturers—reportedly obtaining royalties on over 70 percent of Android handsets—at rates estimated to be \$5 to \$8 per unit.

Opublikowana kalkulacja firmy RIM (Research In Motion potem BlackBerry)

- RIM-CPA license, which covered 10 or more U.S. patents, including security and authentication technology, resulting in a calculation of \$0.14 per device;
- RIM paid Certicom (encryption technology) \$1.50 per unit for first 250,000 units then \$1 per unit for approximately 18 million devices;
- RIM paid 4thPass (browser feature) \$0.50 per device for the first 500,000 devices, and \$0.25 per device for the remainder;
- RIM paid Tele Atlas (map functionality) \$0.50 per device; and
- RIM paid Glyph & Cog (software to view .pdf attachments) a total of \$18,000 for the software (or less than \$0.01 per device).³⁴⁹

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Royalty business model – protokoły internetowe są wolne od obciążeń ☺ World Wide Web Consortium (W3C)

Although W3C members pay dues, any member of the public may participate in the development of standards.374 W3C's royalty-free policy is intended to promote "the widest adoption of Web standards." If the licensing status of a technology developed outside of W3C "become[s] a barrier to implementation of the technology according to the W3C Royalty-Free (RF) Licensing Requirements," W3C "may choose not to publish" a recommendation document for the technology, or it could launch a Patent Advisory Group (PAG) A PAG's mission under such a scenario is to "resolve the conflict" of a patent "that may be essential" to a specification but is not available royalty-free.

W3C's royalty-free standards include:

- Uniform Resource Locator (URL) – a "single naming scheme" used "to give access to any resource on the Web in a uniform way";
- Hypertext Markup Language (HTML) – the "publishing language of the World Wide Web";
- Hypertext Transfer Protocol (HTTP) – created in conjunction with the Internet Engineering Task Force (IETF), it is used to transfer data across the World Wide Web;
- Cascading Style Sheet (CSS) – a "mechanism for adding style (e.g., fonts, colors, spacing) to Web documents";
- Extensible Markup Language (XML) – "a simple text-based format for representing structured information" such as "documents, data, configuration, books, transactions, [and] invoices";
- Java Script – scripting language developed by Ecma International, with many of the Application Programming Interfaces (APIs) developed by W3C.
- Transmission Control Protocol (TCP) and the Internet Protocol (IP).

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Royalty business model – User Interface czyli ciekawostki ze świata walki gigantów

In 2012, Apple asserted three utility patents against Samsung related to user interface aspects of the operating system. These patents were:

- U.S. Patent No. 7,844,915 ('915 patent) entitled "Application programming interfaces for scrolling operations" relates to gesture control on a touch screen. The patent covers a method by which a device differentiates between a one-fingered gesture (employed for scrolling) and a two-finger gesture (employed, for example, in pinch-to-zoom).
- U.S. Patent No. 7,864,163 ('163 patent) is entitled "Portable electronic device, method, and graphical user interface for displaying structured electronic documents." It covers a UI graphical method that zooms in on and substantially centers a portion of an electronic document in response to a user's double-tap on a touch screen.
- U.S. Patent No. 7,469,381 ('381 patent) is entitled "List scrolling and document translation, scaling, and rotation on a touch-screen display." This patent is the so-called "rubber banding" patent that covers a UI graphical feature that creates the illusion of the screen "bouncing back" when the user scrolls to the bottom of an electronic document.

The jury found infringement of these three patents and awarded over a billion dollars in damages—but this award also included damages for infringement of design patents and trade dress dilution. After a retrial on certain damages issues—at which a second jury awarded Apple \$290 million—the total damages from the original trial and retrial (including design patents, trade dress, and utility patents) were over \$900 million.



[https://en.wikipedia.org/wiki/Apple_Inc._v._Samsung_Electronics_Co.](https://en.wikipedia.org/wiki/Apple_Inc._v._Samsung_Electronics_Co)

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Royalty business model



Technology	Potential Royalty Demands
Cellular Baseband Chip (Standardized)	\$54
Wi-Fi/802.11	\$50
AAC	\$0.20
MP3	\$0.95
H.264	\$10.60
Operating system software (Microsoft or Android)	\$5-8
Total (approx.)	\$121-124

Smartphone 400\$
 Części 120..150\$
 Royalties 120\$

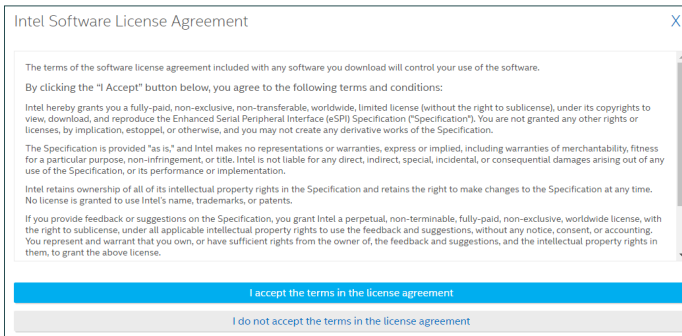


Magistrala SPI

Magistrala SPI (Motorola) –

The SPI bus is broadly accepted because it has little or no patent issues. This is partly because Motorola, its' creator, provides no specification or central support. Those applying SPI can create hardware and software solutions without patent issues, but also without support or definition of supporting protocols

Modyfikacje SPI – eSPI (Enhanced Serial Peripheral Interface Bus) – następcza LPC bus





Magistrala I2C <http://www.nxp.com/>



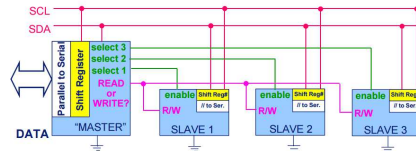
Magistrala I2C (Philips Semiconductor - teraz NXP Semiconductors)

Legal information

March 24, 2003

The I2C bus is protected by patents held by Philips. Licensed IC manufacturers that sell devices incorporating the technology already have secured the rights to use these devices, relieving the burden from the purchaser. A license is required for implementing an I2C interface on a chip (IC, ASIC, FPGA, etc). It is Philips's position that all chips that can talk to the I2C bus must be licensed. It does not matter how this interface is implemented. The licensed manufacturer may use its own know how, purchased IP cores, or whatever. This also applies to FPGAs. However, since the FPGAs are programmed by the user, the user is considered a company that builds an I2C-IC and would need to obtain the license from Philips.

http://www.nxp.com/documents/application_note/AN10216.pdf



Legal information

April 4, 2014

I2C-bus — logo is a trademark of NXP Semiconductors N.V.

http://www.nxp.com/documents/user_manual/UM10204.pdf

Atmel interfejs TWI seria AVR

Since October 10, 2006, no licensing fees are required to implement the I2C protocol. However, fees are still required to obtain I2C slave addresses allocated by NXP

Z raportu finansowego Microchip

(a) In the three-month period ended June 30, 2004, we recorded a special charge of \$21.1 million with a related tax benefit of \$8.1 million for a patent license litigation settlement with U.S. Philips Corp. and Philips Electronics North America Corp. (together "Philips") which had been ongoing for the past several years. The settlement included a dismissal of the pending litigation and the cross-license of certain patents between Philips and Microchip.

<http://www.businesswire.com/news/home/20050726005940/en/Microchip-Technology-Announces-Record-Net-Income-Quarter>

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Magistrala USB <http://www.usb.org/>

USB Implementers Forum

The USB Implementers Forum, Inc. (USB-IF) was established in 1995 to support and accelerate the market and consumer adoption of USB compliant peripherals. Today, the USB-IF has more than 800 member companies and has led the way in helping companies introduce hundreds of USB-compliant products to the market. Members of the USB-IF enjoy many benefits including eligibility to participate in the USB-IF [Compliance Program](#).

How to Join the USB Implementers Forum

Membership Agreement

The **Membership Agreement** is downloadable from [here](#). This is a .pdf document that can be printed, signed and mailed with a membership fee to 3855 SW 153rd Dr., Beaverton, Oregon 97003. The annual membership fee is US\$4,000.

USB-IF Antitrust Guidelines

The Board of Directors of the USB-IF have adopted [Antitrust Guidelines](#) intended to educate and to govern the conduct of members and participants at USB-IF sponsored activities.

USB-IF Code of Conduct

The [USB-IF Code of Conduct](#) is designed to allow the USB-IF to comply with the law and to preserve its integrity and credibility with the public, the industry, and within the Forum. This Code applies to all staff, volunteers, directors, members, and any third-party service providers or contractors working with the USB-IF.

USB-IF Confidentiality Policy

The USB-IF Board of Directors have adopted a [confidentiality policy](#) that applies to Members of the USB-IF and employees of Members, as well as officers, directors, committee members, chairs, staff, volunteers and participants in the USB-IF.

Member Benefits

- Eligibility to participate in free USB-IF sponsored quarterly Compliance Workshops
- Free Vendor ID (if one has not been previously assigned)
- Opportunities to participate in USB-IF marketing programs and events, such as retail newsletters, store endcaps, featured products, etc
- A company listing in the USB key contacts list
- Eligibility for inclusion in the USB current products list on the usb.org web site and in periodic USB-IF retail newsletters
- A waived logo administration fee when joining the USB-IF logo program
- Discounts on Developer Conferences, products in the e-store, etc
- Eligibility to participate in [Device Working Groups](#)

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Magistrala USB
<http://www.usb.org/>

http://www.usb.org/developers/logo_license/USB-IF_TLA_Usage_Guidelines_011416.pdf



THE USB-IF LOGOS MAY BE USED ONLY IN CONJUNCTION WITH PRODUCTS WHICH HAVE PASSED USB-IF COMPLIANCE TESTING AND ARE CURRENTLY ON THE INTEGRATORS LIST. THIS REQUIRES THAT THE COMPANY BE ASSIGNED A USB VENDOR ID NUMBER.

COMPANY: _____
 Address: _____
 Attention: _____
 Telephone: _____
 Fax: _____
 Email: _____

USB-IF TRADEMARK LICENSE AGREEMENT

This Trademark License Agreement ("License Agreement") is made and entered into as of the Effective Date described below by and between USB Implementers Forum, Inc., an Oregon, USA corporation ("USB-IF"), and _____, a _____ corporation ("COMPANY").

6. LOGO ADMINISTRATION FEE

If COMPANY is not a USB-IF member, it shall pay a logo administration fee of Three Thousand Five Hundred Dollars (\$3,500.00) upon COMPANY's execution of this Agreement. No logo administration fee shall be required from USB-IF members.



Magistrala USB
Zagadnienie PID/VID

A USB device that is plugged in identifies itself by its VID/PID combination. A VID is a 16-bit vendor number (Vendor ID). A PID is a 16-bit product number (Product ID). The PC uses the VID/PID combination to find the drivers (if any) that are to be used for the USB device. For this to work, the VID/PID combination must be unique, in the sense that each USB device with the same VID/PID will use the same driver. So, whenever you need a specific driver for your USB product, you will need a unique VID/PID for that product

Home About USB-IF Channel Press **Developers** Members Products

Home > Developers > Getting a Vendor ID

Getting a Vendor ID

If you are a new USB product developer looking to get a vendor ID for your company, there are two preferred options for doing this:

- 1) Become a member of the USB-IF. Among the many [benefits](#) of being a member is the assignment of a vendor ID to your company (if one has not been previously assigned). The annual membership fee is US\$4,000. Download the [membership application](#).
- 2) Become a USB-IF non-member logo licensee. Logo licensees are eligible to use the USB logo in conjunction with products that pass USB-IF compliance testing. In addition, you must also purchase a vendor ID if one has not been previously assigned to your company. The licensing fee is US\$3,500 for a two year term (this fee is waived for USB-IF members). Click on the link to download the [Logo Trademark License Agreement and Logo Usage Guidelines](#) and [vendor ID form](#) in order to become a logo licensee. If your company does not already have a Vendor ID number, your company must execute and return the Vendor ID form along with your USB-IF Trademark License Agreement. The Vendor ID is US\$5,000. Please keep in mind that becoming a USB-IF Logo Licensee alone does not entitle your company to USB-IF membership benefits.

If you would like to purchase a [vendor ID](#) without signing the logo license agreement, the fee for this purchase is US\$5,000. If you do not execute the logo license agreement, you are not authorized to use the USB logo in conjunction with your products regardless of their testing status.



Magistrala USB Zagadnienie PID/VID - Wikipedia

A vendor ID is necessary for obtaining a certification of compliance from the USB-IF. The USB-IF is responsible for issuing USB vendor IDs to product manufacturers. The cost for issuing this number is US\$5,000. Additionally, the use of a trademarked USB logo to identify certified devices requires license fee of US\$3,500 for a 2-year term.^[1] Some microcontroller manufacturers offer a free or low cost sublicense of their vendor ID for development/testing and limited production (generally under 10,000 units). Vendors offering this free service include:

- [Dream S.A.S.](#)^[2]
- [Energy Micro](#)^[3]
- [FTDI](#)^[4]
- [Luminary Micro](#)^[5]
- [Microchip](#)^[6]
- [NXP](#)^[7]
- [Silicon Labs](#)^[8]
- [STMicroelectronics](#)^[9]
- [Texas Instruments](#)^[10]

Alternatively, many members of the open source community promote the use of USB VID 0xF055 (visually similar to [FOSS](#)) for open-source hardware projects. Although this VID is not registered to any company (as of October 2015), the USB-IF did not released any confirmation about reserving it for this particular purpose.^[11]

Ciekawostka
<http://hackaday.com/2015/04/03/usb-pids-for-all/>

https://en.wikipedia.org/wiki/USB_Implementers_Forum 06.06.2016

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Magistrala USB – Zagadnienie PID/VID

Zapytanie do stm.warsaw@st.com 2015-04-13
Dzień dobry!

Chciałbym dowiedzieć się jaka jest oficjalna wykładnia Waszej firmy dla klientów korzystających z Waszych mikrokontrolerów (np. rodziny STM32) w zakresie stosowania identyfikacji PID/VID dla standardu USB

Pozdrawiam,
Jerzy Kasperek

Odpowiedź od STM

Dzień dobry,
Udzielamy licencji na używanie naszego VID/PID na czas trwania projektu. Formalnie, przed przystąpieniem do produkcji klient powinien wykupić własny VID. W praktyce nie zdarzyło się jeszcze abyśmy cofnęli klientowi przyznany PID (mamy jeszcze spory zapas), więc klienci małoseryjni używają naszego VID + przyznany PID także do produkcji.

Jeżeli chciałby Pan skorzystać z naszej pomocy to potrzebujemy:

- pełne dane firmy (nazwa, adres)
- dane kontaktowe osoby odpowiedzialnej (nazwisko, mail, telefon)
- typ użytego procesora STM32
- nazwę projektu
- spodziewana datę startu i wielkość produkcji oraz czas życia

Pozdrawiamy,
STMicroelectronics

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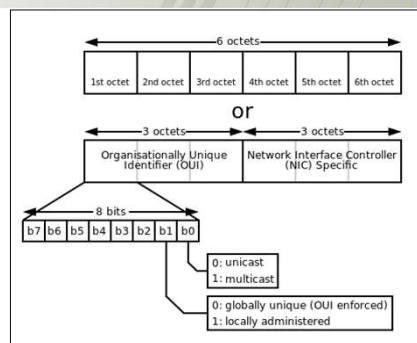
IEEE standaryzacja

The screenshot shows the IEEE Standards Association website. At the top left is the AGH logo. The main header features the IEEE logo and the text "IEEE STANDARDS ASSOCIATION". Below this is a navigation menu with options like "Find Standards", "Develop Standards", "Get Involved", "News & Events", "About Us", "Buy Standards", and "eTools". The main content area is titled "Registration Authority" and includes a sub-header "FINDING THE RIGHT MAC ADDRESS FOR YOUR BUSINESS". To the right, there is a "PUBLIC LISTING" section with a search bar and a list of download links for various IEEE assignment files (e.g., IEEE M-L Assignments, IEEE MA-M Assignments, etc.). At the bottom of the page, there is a footer with the text: „Metodyki projektowania i modelowania systemów” Cyganek & Kasperek & Rajda © 2016 Katedra Elektroniki AGH



Ethernet – zagadnienie unikatowego adresu MAC

["Guidelines for 48-Bit Global Identifier \(EUI-48\)" \(PDF\)](#). IEEE Standards Association. IEEE. Retrieved 16 April 2015.
^ [Jump up to: a b "Guidelines for 64-Bit Global Identifier \(EUI-64\)" \(PDF\)](#). IEEE Standards Association. IEEE. Retrieved 16 April 2015.
[Jump up^ "Guidelines for 64-bit Global Identifier \(EUI-64\)" \(PDF\)](#). IEEE. Retrieved 2015-10-11.



Adres MAC (ang. *MAC address*) jest 48-bitowy i zapisywany jest heksadecymalnie (szesnastkowo). Pierwsze 24 bity oznaczają producenta karty sieciowej, pozostałe 24 bity są unikatowym identyfikatorem danego egzemplarza karty. Na przykład adres **00:0A:E6:3E:FD:E1** oznacza, że karta została wyprodukowana przez Elitegroup Computer System Co. (ECS) i producent nadał jej numer 3E:FD:E1. Czasami można się spotkać z określeniem, że adres MAC jest 6-bajtowy. Ponieważ 1 bajt to 8 bitów, więc 6 bajtów odpowiada 48 bitom. Pierwsze 3 bajty (*vendor code*) oznaczają producenta, pozostałe 3 bajty oznaczają kolejny (unikatowy) egzemplarz karty. Nowsze karty ethernetowe pozwalają na zmianę nadanego im adresu MAC. Istnieją zarezerwowane adresy MAC służące chociażby sterowaniu przepływem, testom czy zarezerwowane dla przyszłych zastosowań^[1].

https://pl.wikipedia.org/wiki/Adres_MAC



Ethernet – zagadnienie unikatowego adresu MAC

IEEE STANDARDS ASSOCIATION



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Registration Authority

IEEE offers Registration Authority programs or registries which under standards and issue unique identifiers to those wishing Registration Authority assigns unambiguous names to objects; assignment available to interested parties.

Registration Authority Improvements: Introducing more use

IEEE Registration Authority (IEEE RA) assignment of identifiers

The OUI, CID, EUI-48 and EUI-64 assignments available from the IEEE RA are summarized in Table 1. As one might infer from the names, the most common use of EUI block assignments is for MAC addresses for networking equipment, but that is not the only use.

Table 1. OUI and CID IEEE RA assignment summary

IEEE RA Assignment	Number of IEEE assigned bits	Block size of EUI-48 (may be used as unique 48-bit addresses)	Block size of EUI-64 (may be used as unique 64-bit addresses)	May be used as a company or organization identifier (yes/no)
CID (Company ID)	24	0 (zero)	0 (zero)	yes (24-bit CID)
MAC Addresses – Large (MA-L)	24	2 ²⁴ (16,777,216)	2 ⁴⁰ (1,099,511,627,776)	yes (24-bit OUI)
MAC Addresses – Medium (MA-M)	28	2 ²⁰ (1,048,576)	2 ³⁶ (68,719,476,736)	no
MAC Addresses – Small (MA-S)	36	2 ¹² (4096)	2 ²⁸ (268,435,456)	yes (36-bit OUI-36 only)

<https://standards.ieee.org/develop/regauth/tut/eui.pdf>

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Ethernet – zagadnienie unikatowego adresu MAC

Products	Fees	Total Due
Publicly Registered MA-L (company name & address on the public listing)	US \$2,655	US \$2,655
Privately Registered MA-L (company name and address NOT on the public listing)	US \$2,655 + \$3,070 (privacy fee addition)	US \$5,725
Yearly Confidentiality Renewal Fee* (for privately registered assignments only)	US \$3,070	US \$3,070

MAC Address Block Large (MA-L)

Products	Fees	Total Due
Publicly Registered MA-M (company name & address on the public listing)	US \$1,595	US \$1,595
Privately Registered MA-M (company name and address NOT on the public listing)	US \$1,595 + \$2,010 (privacy fee addition)	US \$3,605
Yearly Confidentiality Renewal Fee* (for privately registered assignments only)	US \$2,010	US \$2,010

MAC Address Block Medium (MA-M)

Products	Fees	Total Due
Publicly Registered MA-S (company name & address on the public listing)	US \$665	US \$665
Privately Registered MA-S (company name and address NOT on the public listing)	US \$665 + \$1,080 (privacy fee addition)	US \$1,745
Yearly Confidentiality Renewal Fee* (for privately registered assignments only)	US \$1,080	US \$1,080

MAC Address Block Small (MA-S)

Ciekawostka
<http://standards-oui.ieee.org/oui36/oui36.txt>
 Polskie firmy:
 FIDELTRONIK, CREOTECH, ENTE, RADMOR, itp..

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Ethernet – zagadnienie unikatowego adresu MAC



24AA02E48/24AA025E48/ 24AA02E64/24AA025E64

2K I²C™ Serial EEPROMs with EUI-48™ or EUI-64™ Node Identity

Device Selection Table

Part Number	Vcc Range	Max. Clock Frequency	Temp. Ranges	Cascadable	Page Size	Node Address
24AA02E48	1.7-5.5V	400 kHz ⁽¹⁾	I	No	8-Byte	EUI-48™
24AA025E48	1.7-5.5V	400 kHz ⁽¹⁾	I	Yes	16-Byte	EUI-48™
24AA02E64	1.7-5.5V	400 kHz ⁽¹⁾	I	No	8-Byte	EUI-64™
24AA025E64	1.7-5.5V	400 kHz ⁽¹⁾	I	Yes	16-Byte	EUI-64™

Note 1: 100 kHz for Vcc < 2.5V

Features:

- Pre-programmed Globally Unique, 48-bit or 64-bit Node Address
- Compatible with EUI-48™ and EUI-64™
- Single Supply with Operation Down to 1.7V
- Low-Power CMOS Technology:
 - Read current 1 mA, max.
 - Standby current 1 µA, max.
- 2-Wire Serial Interface, I²C™ Compatible
- Schmitt Trigger Inputs for Noise Suppression
- Output Slope Control to Eliminate Ground Bounce
- 100 kHz and 400 kHz Clock Compatibility



MICROCHIP TECHNOLOGY 24AA02E48-I/SN

Pamięć; EEPROM; I2C; 2x128x8bit; 1,7-5,5V; 400kHz; SO8

Symbol: 24AA02E48-I/SN Dokumentacja: (1)
 Oznaczenie producenta: 24AA02E48-I/SN Opis katalogowy: szc260
 Producent: MICROCHIP TECHNOLOGY

DODAJ DO ZAMÓWIENIA

3

Stan magazynowy: 0 [szt]
 Dostawy na magazyn:

Ilość min.: 3
 Wielkość opak.: 1
 Opakowanie zbiorcze: 100 szt.

PROGI CENOWE

Ilość [szt] Cena netto * PLN

3+ 1.34 zł
 10+ 1.23 zł
 25+ 1.19 zł
 100+ 1.07 zł

* Wskazanie ceny za sztukę netto (bez VAT) nie zawiera kosztów transportu, które zostaną doliczone do zamówienia. Opłat transportu dostępnym jest w zakładce „JAK ZAMÓWIĆ”.

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SD Logo

简体中文

WELCOME TO SD-3C, LLC

SD-3C, LLC is a limited liability company established by Panasonic Corporation, SanDisk Corporation, and Toshiba Corporation (collectively "SD Group").

SD-3C, LLC licenses and enforces intellectual property rights essential to SD Memory Cards and SD Host/Ancillary Products. SD Memory Cards are one of the most popular removable memory cards commercially available today. SD-3C, LLC licenses companies that plan to manufacture and sell SD Memory Cards and/or Host/Ancillary Products. In order to manufacture and sell SD Memory Cards and/or Host/Ancillary Products, a prospective licensee may obtain the rights to the essential patents, trademarks, copyrights and design patents from one source by executing the SD Memory Card License Agreement ("CLA") and/or SD Host/Ancillary Products License Agreement ("HALA") with SD-3C, LLC.

For further information on obtaining and executing the HALA, please see the HALA Frequently Asked Questions (FAQs). For further information on obtaining and executing the CLA, please see the CLA Frequently Asked Questions (FAQs).

To manufacture and sell SD Memory Cards and SD Host/Ancillary products using SD technology, you may need to obtain the SDA License Agreement ("SDALA") from the SD Association ("SDA"). The SDA is a separate membership organization, independent from SD-3C, LLC.

Please see SD-3C, LLC's Intellectual Property (IP) Information for additional background with respect to patents, trademarks and copyrights involved with these agreements.

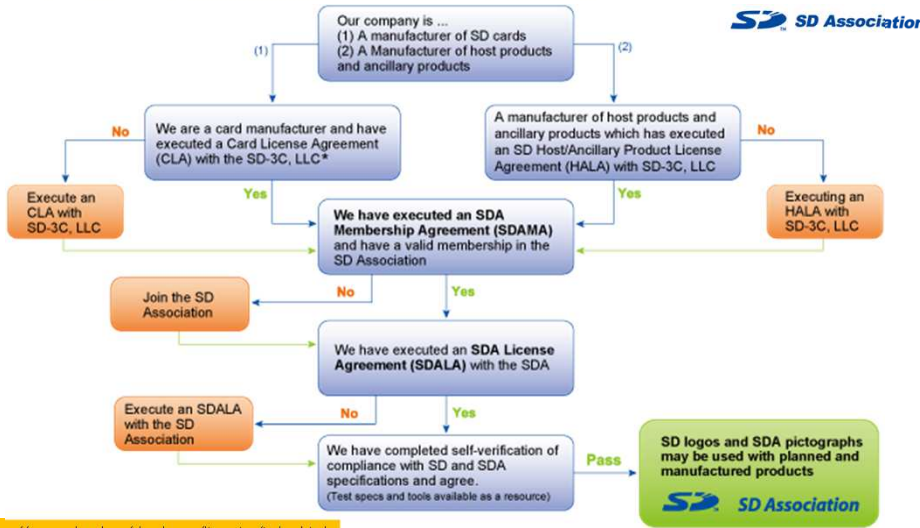
SD-3C, LLC protects its trademark rights throughout the world, which includes working with Customs Authorities and other entities. Unauthorized use of any of the SD family of trademarks may result in seizure and loss of goods detained by Customs authorities, as well as monetary damages and penalties.

3/30/2015: SD-3C LLC Wins \$69 Million Judgment in Fraud and Trademark Infringement Case

Uwaga:

Nie ma żadnych opłat za korzystanie z kart SD w trybie SPI (sprawa kart MMC)

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<https://www.sdcard.org/developers/licensing/index.html>

Member Companies

3kUSD/year ☺

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FAQ

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SD Association Interest Group

NOTE: Membership with the SD Card Association does not confer rights to use the SD logos, essential patents or other technology. These rights are only granted through appropriate license agreements, such as, but not limited to the CLA or HALA.

Click on a button below to view member companies by membership level.

-

All SD Card Association Member Companies

[1] The list of members can change regularly. If a question arises concerning a company's membership, please contact helpdesk@sdcard.org at the SD Card Association. By including a company's website link in this membership list, the SD Card Association does not intend to endorse the contents of any site or representations made at a site regarding the products or intellectual property rights.

- AKD CO. LTD
- AI Corporation
- Absolute USA Inc.
- ABUS Security-Center GmbH & Co. KG
- Honda Tsushin Kogyo Co., Ltd.
- HORIBA, Ltd.
- Horizon Hobby
- Hosanna, Inc.
- Hosiden Corporation
- Qualcomm
- QuanTao IT Solutions GmbH
- Quintec
- Radionika Sp. z o.o.
- RAIKOKU GmbH



HDMI

<http://www.hdmi.org/>



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- HDMI 1.4
- Specification
- Becoming an Adopter
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- Approved Connector List
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- HDMI 2.0b 概述
- 成为一个采纳者
- 采纳者外联码
- 许可的连接器
- 测试方针

Terms

Annual Fee

HDMI Adopters pay an annual fee of ten thousand dollars (US\$10,000). The annual fee is due upon the execution of the Adopter Agreement, and must be paid on the anniversary of this date each year thereafter. Note that HDMI does provide an alternative annual fee payment for small-volume manufacturers (10,000 units or less). Please see Attachment B of the Adopter Agreement for details.

Royalty

HDMI royalty rates are as follows:

- For each end-user Licensed Product, fifteen cents (US\$0.15) per unit sold.
- If the Adopter reasonably uses the HDMI logo on the product and promotional materials, then the rate drops to five cents (US\$0.05) per unit sold.
- If the Adopter implements HDCP content protection as set forth in the HDMI Specification, then the royalty rate is further reduced by one cent (US\$0.01) per unit sold, for a lowest rate of four cents (US\$0.04) per unit. Adopters must license HDCP separately from Digital Content Protection, LLC, an Intel subsidiary. Please see www.digital-cp.com for details.

Products Subject to Royalty

The HDMI royalty is only payable on Licensed Products that will be sold on a stand-alone basis (i.e. that are not incorporated into another Licensed Product that is subject to an HDMI royalty). For example, if a cable or IC is sold to an Adopter who then includes it in a television subject to a royalty, then the cable or IC maker would not pay a royalty, and the Adopter television manufacturer would pay the royalty on the final product. If the cable is sold directly to consumers, then it would be subject to a royalty.

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CAN bus

http://www.bosch-semiconductors.de/media/automotive_electronics/pdf_2/ipmodules_3/can_protocol_license_1/Bosch_CAN_Protocol_License_Conditions.pdf



Important Notice

The CAN Protocol and CAN FD Protocol are developed by the Robert Bosch GmbH and protected by intellectual property rights. The CAN Protocol and CAN FD Protocol License is required for any implementation of the CAN Protocol and CAN FD Protocol, i.e. self-developed CAN IP modules, CAN IP modules purchased from Bosch or another vendor. TTCAN Protocol and TTCAN FD Protocol intellectual property rights are included in the license conditions.



CAN Protocol and CAN FD Protocol License

License Fee

- Lump-sum payment of 2 500 EUR for the first 10 000 CAN and/or CAN FD products. For exceeding volumes a royalty of 1% (maximum of 0.051 EUR) of the net sales price of the CAN and/or CAN FD product will be charged.

Benefits

- The right to use the CAN Protocol, CAN FD Protocol intellectual property rights for the design, manufacture and sale of integrated circuits or the programming of FPGAs
- Only one license fee for both protocols
- Includes a CAN (FD) VHDL Reference Model (to be delivered on demand mid of 2015)
- Delivery of the Bosch CAN Specification 2.0 (remains unchanged) and the Bosch CAN FD Protocol Specification

CAN IP Modules

In addition Bosch offers several CAN IP Modules to support the integration of CAN, CAN FD and TTCAN.

Currently the following Modules are available for ASIC and FPGA integration:

- M_CAN: Supports CAN, full CAN FD (up to 64 byte payload) and TTCAN
- C_CAN FD8: Support of CAN and CAN FD8 (up to 8 byte payload)

A separate flyer is available regarding the Module licensing conditions. For more information, please contact us.

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Bluetooth
<https://www.bluetooth.com/develop-with-bluetooth/step-by-step-guide-to-product-development>



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step-by-step guide to product development

Check out the step-by-step guide to bringing your product to market quickly.

Industry-standard Bluetooth technology makes it easy for developers to create innovative products that communicate with the billions of Bluetooth enabled devices already in the market. We can help you develop, qualify, and bring your product to market quickly and efficiently.

Just follow our step-by-step guide.

1. Register

If your company uses Bluetooth technology in its products (including rebranding or reselling Bluetooth enabled technology), the company must become a member of the Bluetooth SIG. When you become a member, you gain the license to use the Bluetooth technology and globally recognized brand, and you join hundreds of the world's most successful companies in developing and influencing Bluetooth technology.

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Bluetooth
<https://www.bluetooth.com/develop-with-bluetooth/step-by-step-guide-to-product-development>

do i need to list and/or qualify my product?

To sell, brand or rebrand a product using any of the Bluetooth trademarks (including the word, Bluetooth), you must complete the Bluetooth qualification and declaration process to demonstrate and declare your products satisfy the requirements of the Bluetooth [license agreements](#).

This process is sometimes referred to as "Qualification", "Listing", "Bluetooth Certified", or "Declaration." Only products completing both [qualification](#) and [declaration](#) (listing) may display, feature or be offered under the Bluetooth trademarks.

If you are a retailer or supplier simply selling or distributing another company's Bluetooth product and not branding or representing the product as your own, you do not need to qualify or declare the product.

Fees

Fees	Explanation	Promoter/ Associate Member	Adopter Member
Declaration / Listing Fees			
Declaration Fee	A Declaration fee must be paid for any new, changed, used or branded Bluetooth product	\$4,000	\$8,000
Innovation Incentive Program (IIP)	Start-up companies commercializing their first Bluetooth product can qualify for up to two declarations at a reduced price. The company must have annual revenue of less than USD \$1 million and no prior QDLs, EPLs or Declarations.	\$2,500	\$2,500
GATT-based Profile Client (app)	Applications that support the client role only and implement one or more Bluetooth SIG adopted GATT-based Profiles are qualified as a Profile Subsystem product type.	\$100	\$100
After Deprecation Notice Period Ends	A "new Qualified Design" that implements one or more Deprecated Specification (Core, CSA, Protocol, Service, or Profile) for the first time. (For more information download the Board of Directors resolution or visit the	\$25,000	\$25,000

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Bluetooth The Qualification & Declaration Process

Path 1: Previously Qualified Designs

If your Bluetooth portion (chip, module, stack or design) was previously qualified by another company and is not being changed or added to, only the declaration process is required.

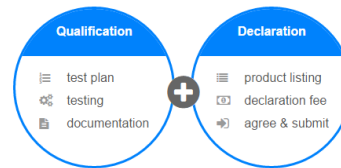


Follow Path 1 if you are using:

- An unmodified Bluetooth Qualified Design (a Bluetooth chip, module, stack or design you are leaving as-is)
- A factory or supplier that already qualified the Bluetooth portion (chip, module, stack or design) of your product
- An already qualified design for a product you are developing

Path 2: New & Changed Designs

Any new or changed Bluetooth portion (chip, module, stack or design) requires that both the qualification and declaration processes be completed.



Follow Path 2 if you are:

- Using an unqualified Bluetooth portion (chip, module, stack or design)
- Buying a Bluetooth Qualified Design from a company and modifying it for your product
- Using a design that was qualified as a "component" Product Type
- Have the rights or license to use another company's brand and want to sell those products with changes to the Qualified Design (chip, module, stack or design).

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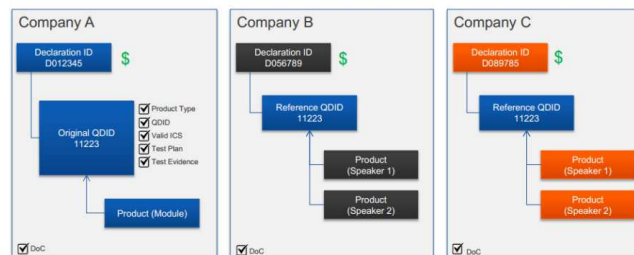


Bluetooth The Qualification & Declaration Process

http://www.mouser.com/pdfdocs/Bluetooth_WiFi_and_Regulatory_Certifications.PDF

End Product Listing

- Bluegiga (company A) builds and supplies a Bluetooth module
- Company B builds two new Products (speakers) with Bluetooth module
- Company C rebrands Company B's Products (speakers) as their own



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WiFi
<https://www.wi-fi.org/>



Program certyfikacji – czyli opłata za



Membership Application Process

If you would like to begin the membership application process, please confirm your company meets the requirements to submit an application for membership as stated in the Bylaws: Publicly displaying a legitimate business interest; AND Publicly supporting, in the form of a press release or as evidenced by shipping products or enabling technology, such as, for example, chip sets, software, etc. for Wi-Fi products, or deploying for public access products employing Wi-Fi specifications for wireless LANs. To submit your company information, please complete [this form](#) by selecting "Join Wi-Fi Alliance".

Regular Membership

Regular members may contribute to the development of our certification programs and enabling technologies, certify products, and access a range of other benefits.

Annual dues for Regular membership are US\$15,000.

Implementer Membership

Implementer members can leverage previously certified Wi-Fi products to certify their own end products. Implementer membership provides an easy path to take advantage of the Wi-Fi CERTIFIED brand, assurance of interoperability, and a proven track record of exceptional user experience.

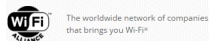
Additional benefits include participation in three annual member meetings, access to program roadmaps, and approved technical specifications.

Annual dues for Implementer membership are US\$5,000.

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WiFi
<https://www.wi-fi.org/>



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Who We Are

Our Brands

The Wi-Fi CERTIFIED™ logo is a globally-recognized seal of approval for Wi-Fi® products which have passed rigorous testing to validate device interoperability, adherence to the latest security mechanisms, and support for advanced features. Enterprises require it, consumers demand, and we provide it. Use of the Wi-Fi CERTIFIED logo and our Word Marks are available to Wi-Fi Alliance® members only.

Wi-Fi Alliance Word Marks

- Wi-Fi®
- Wi-Fi Alliance®
- WMM®
- Wi-Fi Protected Access®
- Wigig®
- Wi-Fi Direct®
- Miracast™
- Wi-Fi CERTIFIED™
- Wi-Fi ZONE™
- Wi-Fi Multimedia™
- Wi-Fi Protected Setup™
- WPA™, WPA2™
- Passpoint™
- Wi-Fi CERTIFIED Passpoint™
- Wi-Fi CERTIFIED Miracast™
- Wigig CERTIFIED™
- Wi-Fi Aware™
- Wi-Fi CERTIFIED Wi-Fi HaLow™
- Wi-Fi HaLow™

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Would you like to advertise your Wi-Fi hotspot? License-free logos below at no charge.

Wi-Fi Standalone Logo



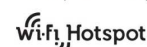
Wi-Fi Hotspot Cube Logo



Wi-Fi Cube Logo



Wi-Fi Hotspot Horizontal Logo



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NFC – Near Field Communication <http://nfc-forum.org/>

Certification Fees

Fee Schedule

Refer to Section 10 of the NFC Forum Certification Policy Document for fee applicability.

The fees described below are quoted net of applicable taxes and duties which, where appropriate, will be payable in addition by the Supplier to the NFC Forum (or to the relevant tax authorities as applicable).

Fee	Amount (US \$)	Payment Due
Certification Fee	\$2,000	Upon registration to certify a new implementation.
Certification Fee to Add a New Name for an Existing Certified Implementation	\$425	Upon registration to list a Certified Implementation in the Certification Register again under a new name, as per Section 10.1 of the NFC Forum Certification Policy.
Certification Fee for a Re-branded Product	\$600	Upon registration to certify a re-branded implementation, as per Section 10.2 of the NFC Forum Certification Policy.
Certification Fee for Inheritance of test results from an already certified product	\$1,800	Upon registration to certify a partly inherited implementation, as per Section 10.3 of the NFC Forum Certification Policy.
Certification Mark License Fee	\$1,000	Upon acceptance of the NFC Forum Certification Mark License Agreement. This is a one-time fee per registered organization.

http://members.nfc-forum.org/apps/group_public/download.php/20833/NFCForum-Certification-Program-Policy-1.4.pdf

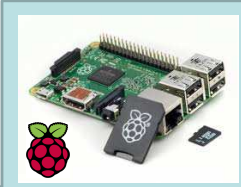
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Moduły deweloperskie



32F746GDISCOVERY
Discovery kit with STM32F746NG MCU



FRDM-K64F: Freescale Freedom Development Platform



Bardzo szeroka oferta na rynku od producentów IC do pomysłodawców różnorodnych aplikacji

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Arduino

Can I build a commercial product based on Arduino?



Yes, with the following conditions:

- Physically embedding an Arduino board inside a commercial product does not require you to disclose or open-source any information about its design.
- Deriving the design of a commercial product from the Eagle files for an Arduino board requires you to release the modified files under the same Creative Commons Attribution Share-Alike license. You may manufacture and sell the resulting product.
- Using the Arduino core and libraries for the firmware of a commercial product does not require you to release the source code for the firmware. The LGPL does, however, require you to make available object files that allow for the relinking of the firmware against updated versions of the Arduino core and libraries. Any modifications to the core and libraries must be released under the LGPL.
- The source code for the Arduino environment is covered by the GPL, which requires any modifications to be open-sourced under the same license. It does not prevent the sale of derivative software or its inclusion in commercial products.

In all cases, the exact requirements are determined by the applicable license. Additionally, see the previous question for information about the use of the name "Arduino".

<https://www.arduino.cc/en/Main/FAQ>

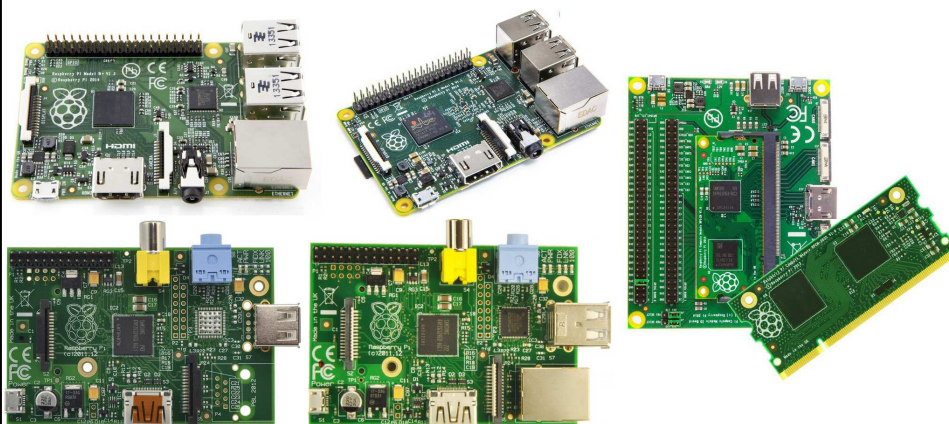
06.06.2016

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Raspberry Pi goes custom for industrial, commercial applications

<http://embedded-computing.com/26496-raspberry-pi-goes-custom-for-industrial-commercial-applications/#> (06.06.2016)



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Raspberry Pi

https://www.raspberrypi.org/blog/starting-a-business-with-a-raspberry-pi/

BLOGS DOWNLOADS COMMUNITY HELP FORUMS EDUCATION

STARTING A BUSINESS WITH A RASPBERRY PI

Posted by Liz Upton
Director of Communications
Raspberry Pi Foundation
Updated 30th Aug 2012 at 4:30 pm

43 Comments

+ SO: WHAT CAN I DO WITH THOSE VIDEO CODECS?

STARTING A BUSINESS WITH A RASPBERRY PI

EBEN AT POPTECH

BLOG FEED


VIEW THE ARCHIVE

RSS FEED

SIGN UP NOW

We're now reaching a point where people's Raspberry Pi business ideas are starting to appear in the wild. The Pi's strength for these entrepreneurial types is its price, before Pi, if you were, say, setting up a digital display business, you'd be spending a whole heap more than \$35 on the device that drives each of your displays.

Here's a really cute example of the sort of thing the Raspberry Pi makes possible for people to produce at an affordable price. It's the Shoop!, a Pi-powered souvenir photo printer. Brian de la Cruz, the maker, calls it a photo studio in a box.



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Rasperry Pi – model zarabiania na licencjach

My Account Order Status View Cart Sign in or Create an account

Raspberry Pi Store

Search

Home

Home > License keys > MPEG-2 license key

MPEG-2 license key

Price: £2.40

Serial number:

ADD TO CART

Related Products

VC-1 license key £1.20

You Recently Viewed...

MPEG-2 license key £2.40

COMPARE SELECTED

12 votes

3 answers

Q: Do I still need to purchase the MPEG-2 and VC-1 license keys for the Raspberry Pi 2?

Do I still need to purchase the MPEG-2 and VC-1 license keys for the Raspberry Pi 2? If so, will the same MPEG-2 and VC-1 licenses available in the Raspberry Pi store work with the Raspberry Pi 2? ...

asked Feb 8 '15 by Key

11 votes

1 answer

Q: Does an MPEG-2 license improve Flash video playback performance?

I'm running Raspbian. I installed Gnash to enable Flash support (i.e. YouTube playback). The videos come up, but they're too slow to be watchable. Does the MPEG-2 licence key improve YouTube playba ...

asked Mar 30 '13 by dangowan

Product Description

This key will enable a single Raspberry Pi to decode MPEG-2 video in hardware serial number as part of your order. Your serial number is not the number printed on the back of the board.

```
pi@raspberrypi:~$ cat /proc/cpuinfo
Processor       : ARMv6-compatible processor rev 7 (v6l)
BogoMIPS       : 697.55
Features        : swp half thumb fastmult vfp edsp java
CPU implementer : 0x41
CPU architecture: 7
CPU variant     : 0x0
CPU part       : 0xb76
CPU revision    : 7
```

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Moduły deweloperskie – przykłady licencji

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EVALUATION BOARD STATUS

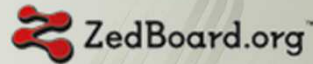
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<http://zedboard.org/sites/default/files/documentations/GS-AES-Z7EV-7Z020-G-V7.pdf>

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