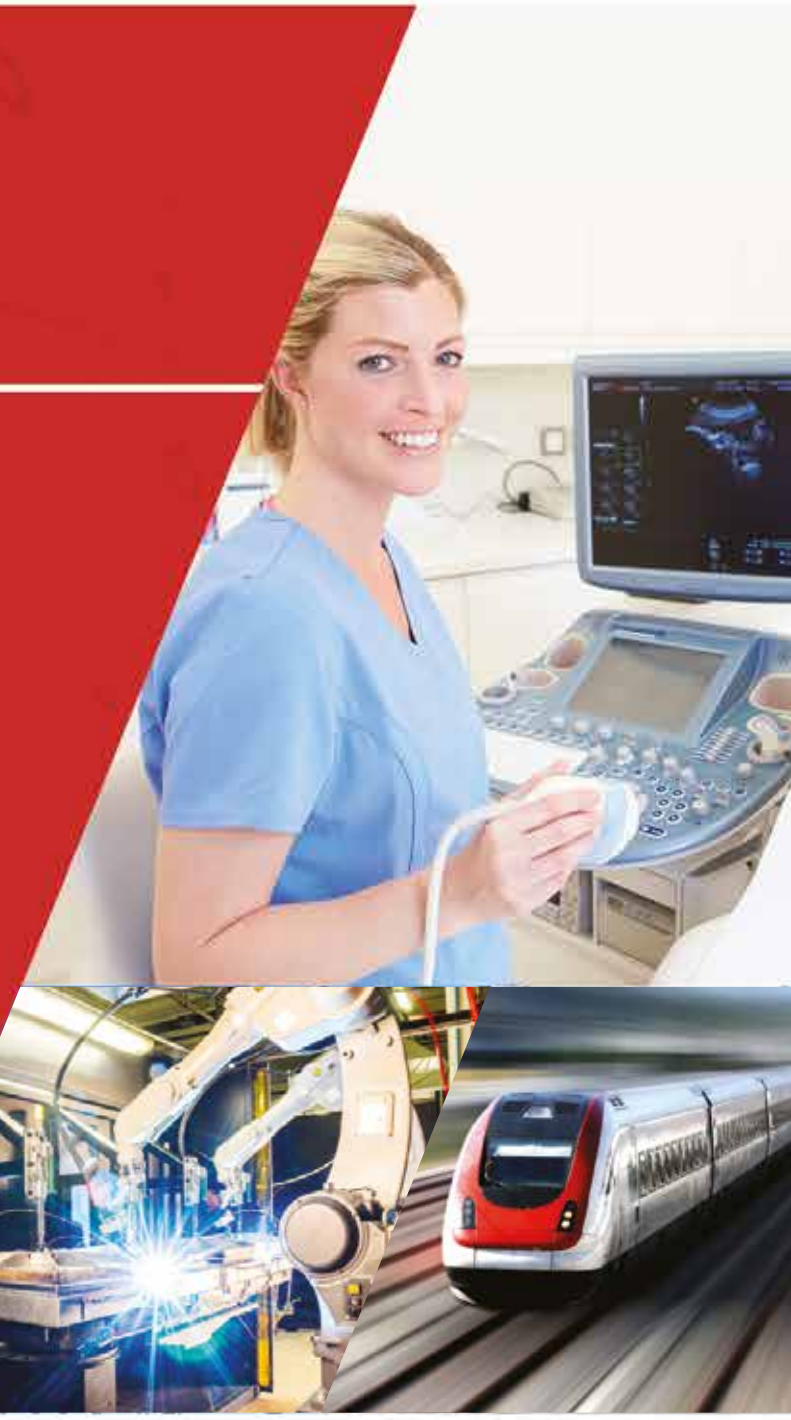
ADLINK
Leading EDGE COMPUTING

High Performance for Mobile Applications and IoT Devices

SMARC®

Smallest Computer-on-Module Form Factor:
Short Size and Full Size Modules



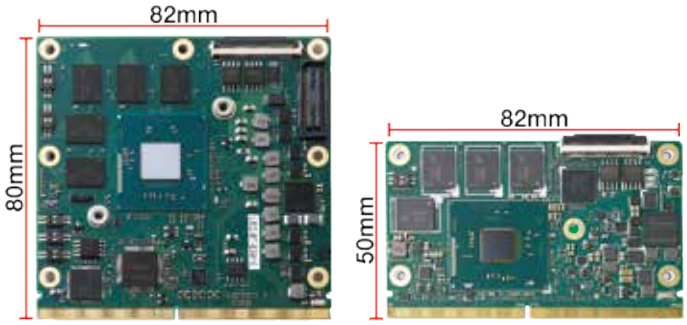
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SMARC Overview

ADLINK provides a wide range of embedded computing products and services to the test & measurement, automation & process control, gaming, communications, medical, network security, and transportation industries. ADLINK products include those based on various computer-on-modules (COMs) standards like SMARC (Smart Mobility ARCHitecture). As an initial member of SGeT (Standardization Group for Embedded Technologies), ADLINK has pioneered on the development of SMARC modules. SMARC is a versatile small form factor computer module definition targeting applications that require ultra-low power, low cost and high performance. SMARC modules are used as building blocks for portable and stationary embedded systems. SMARC modules can also be used in conjunction with carrier boards that implement application specific features such as audio codecs, touch controllers, wireless devices, etc. This modular approach allows scalability, faster time to market and performance diversification while maintaining lower costs, low power and small physical size.

The SMARC 1.1 pin-out is optimized for features common to ARM and SOCs rather than those of the current x86 architecture. Some of these ARM/SOC features include parallel LCD display interfaces, provisions for serial and parallel camera input, multiple I²C, I²S and serial port options, USB client/host mode operation, and SD/eMMC card operation. The SMARC specification, with its 314-pin board to board edge connector, is future proof by offering additional space for modern interfaces found on today's devices such as LVDS, PCIe, SATA, HDMI and DisplayPort. Using SMARC, systems integrators can take full advantage of the user-interface options available to mobile device OEMs; options that are not usually found in x86-based embedded-computing systems. LEC is ADLINK's brand name for SMARC products. It means "Low Energy Computer-on-module" and is a new ADLINK product line.



As SGeT has published a new revision 2.0 of the SMARC specification in June 2016, ADLINK will support this new specification in all new SMARC module designs. The first new product designs are LEC-AL and LEC-iMX6/2GbE.

SMARC® 2.0 pinout

- Up to three parallel displays:
  - dual channel LVDS (18/24-bit)
  - HDMI or DP++
  - DP++
  - 3x MIPI CSI
- 2x Gigabit Ethernet
- 4x PCIe
- 1x SATA3
- 1x SDIO
- 1x SPI and 1x eSPI
- 1x I2S and 1x HDA
- 4x I2C
- 4x Serial
- 2x CAN
- 12x GPIO
- 2x USB 3.0
- 6x USB 2.0
- X86 power management signals
- IEEE 1588 trigger signals

Low power designs

- 2W to 6W typical module power draw during
- Active operation
- Fanless
- Passive cooling
- Low standby power
- Designed for battery operation
- 1.8V default I/O voltage



Model Name	LEC-Starterkit MINI
Features	• SMARC v1.1 compliant LEC-BASE MINI carrier board • SD card and USB Flash drive • 7" TFT LVDS, LVDS cable, Touch controller cable • AC/DC adapter, EU & US power cord and universal socket
Optional Items	• Module: LEC-BW • Heatsink: for LEC-BW • Software: BSP depending on operating system
Ordering Information	LEC-Starterkit MINI with LEC-BASE MINI carrier board, including SD card, USB Flash drive and power supply (LEC-BW module and cooling solution optional)



Model Name	LEC-Starter Kit R1
Features	• SMARC v1.1 compliant LEC-BASE R1 carrier board • 7" at panel 800 x 400 display with assembly and USB touch cable • SD card and USB stick • Interface cables (one way open) for camera, GPIO, power management, I2S and SPI • AC/DC adapter, power cord and universal socket
Optional Items	Compatible Modules: LEC-iMX6
Ordering Information	LEC-Starter Kit R1 with LEC-BASE R1 carrier board, including SD card and power supply (LEC-iMX6 modules optional)



Model Name	LEC-Starter Kit R2
Features	• SMARC v1.1 compliant LEC-BASE R1 carrier board • SD card and USB stick • Interface cables (one way open) for camera, GPIO, power management, SPI, I²C and LVDS • AC/DC adapter, power cord and universal socket
Optional Items	• Modules: LEC-BT, LEC-BTS or LEC-BW • Heatsink: for LEC-BT, LEC-BTS or LEC-BW • Software: BSP depending on operating system
Ordering Information	LEC-Starter Kit R2 with LEC-BASE R1 carrier board, including SD card and power supply (LEC-BT, LEC-BTS or LEC-BW module and cooling solution optional)

Selection Guide

	x86-based				ARM-based	
						
Model Name	LEC-AL	LEC-BW	LEC-BT	LEC-BTS	LEC-iMX6	LEC-iMX6/2GbE
Form Factor & Compatibillity	SMARC short size, 82 x 50 mm SMARC Specifications v2.0	SMARC short size, 82 x 50 mm SMARC Specifications v1.1	SMARC full size, 82 x 80 mm SMARC Specifications v1.1	SMARC short size, 82 x 50 mm SMARC Specifications v1.1	SMARC short size, 82 x 50 mm SMARC Specifications v1.1	SMARC short size, 82 x 50 mm SMARC Specifications v2.0
CPU	Intel®Atom™ E3900 Series, Pentium N4200 or Celeron® N3350 SoC	Intel® Celeron®/ Pentium® N3000 Series SoC	Intel® Atom™ Processor E3800 series SoC	Intel® Atom™ Processor E3800 series SoC	NXP i.MX6 Quad, Dual, DualLite and Solo Processors	NXP i.MX6 Quad, Dual, DualLite and Solo Processors
Memory	Up to 8 GB DDR3L at 1867 MT/s	Up to 8GB DDR3L at 1333/1600 MT/s	Up to 8GB DDR3L at 1333/1066 MHz with ECC	Up to 4GB DDR3L at 1333/1066 MHz without ECC	Up to 2GB DDR3L at 1066 MHz	Up to 2GB DDR3L at 1066 MHz
Cache	L2: 2 MB	L2: 2 MB	L2: 512 kB to 2 MB	L2: 512 kB to 2 MB	L2: 512kB to 1 MB	L2: 512kB to 1 MB
Boot Loader	AMI UEFI BIOS	AMI UEFI BIOS	AMI UEFI BIOS	AMI UEFI BIOS	U-Boot	U-Boot
Connectivity	1x GbE	1x GbE	1x GbE	1x GbE	1x GbE	2x GbE
USB	2x USB 3.0 host 4x USB 2.0 host	1x USB 3.0 host 4x USB 2.0 host	1x USB 3.0 host 3x USB 2.0 host 1x USB 2.0 client	1x USB 3.0 host 3x USB 2.0 host 1x USB 2.0 client	2x USB 2.0 host 1x USB 2.0 OTG	4x USB 2.0 host 1x USB 2.0 OTG
Storage	1x SATA 6Gbit/s 1x SDIO 1x eMMC 5.0 onboard	2x SATA 6Gbit/s 1x SDIO/SD 1x eMMC 4.51	2x SATA 3Gbit/s 1x SDIO/SD 1x eMMC 4.51 onboard	2x SATA 3Gbit/s 1x SDIO/SD 1x eMMC 4.51	1x SATA 3Gbit/s (Quad and Dual only) 1x SDIO/SD 1x eMMC 4.41 onoard	1x SATA 3Gbit/s (Quad and Dual only) 1x SDIO/SD 1x eMMC 4.41 onboard
Audio	HDA	HDA	HDA	HDA	Located on carrier S/PDIF	Located on carrier S/PDIF
PCI Express	4x PCIe x1	3x PCIe x1	3x PCIe x1	3x PCIe x1	1x PCIe x1	-
SEMA® Support	Yes	Yes	Yes	Yes	Yes	Yes
Power Supply	3.0 V-5.25 V DC ±5%	3.0 V-5.25 V DC ±5%	5.0 V DC ±5%	5.0 V DC ±5%	3.0 V-5.25 V DC ±5%	3.0 V-5.25 V DC ±5%
Operating Temperature	0°C to +60°C -40°C to +85°C	0°C to +60°C	0°C to +60°C -40°C to +85°C	0°C to +60°C -40°C to +85°C	0°C to +60°C -40°C to +85°C	0°C to +60°C -40°C to +85°C

Note: All specifications are subject to change without further notice.

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WORLDWIDE OFFICES

ADLINK Technology, Inc.

9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路166號9樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.

5215 Hellyer Avenue, #110 San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.

84 Genting Lane #07-02A, Cityneon Design Centre,
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte Ltd.
(Indian Liaison Office)

#50-56, First Floor, Spearhead Towers
Margosa Main Road (between 16th/17th Cross)
Malleswaram, Bangalore - 560 055, India
Tel: +91-80-65605817, +91-80-42246107
Fax: +91-80-23464606
Email: india@adlinktech.com

ADLINK Technology Japan Corporation

〒101-0045 東京都千代田区神田鍛冶町3-7-4
神田374ビル4F
KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho,
Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology, Inc.
(Korean Liaison Office)

137-881 서울시 서초구 서초대로 326, 802 (서초동, 모인터빌딩)
802, Mointer B/D, 326 Seocho-daero, Seocho-Gu,
Seoul 137-881, Korea
Tel: +82-2-2057-0565
Toll Free +82-80-800-0585
Email: korea@adlinktech.com

ADLINK Technology GmbH
(German Liaison Office)

Ulrichsbergerstrasse 17
94469 Deggendorf, Germany
Tel: +49 (0) 991 290 94 – 10
Fax: +49 (0) 991 290 94 - 29
Email: emea@adlinktech.com

ADLINK Technology (China) Co., Ltd.

上海市浦东新区张江高科技园区芳春路300号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5192-3588
Email: market@adlinktech.com

ADLINK Technology Beijing

北京市海淀区上地东路1号盈创动力大厦E座801室(100085)
Rm. 801, Power Creative E, No. 1 Shang Di East Rd.
Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8626
Email: market@adlinktech.com

ADLINK Technology Shenzhen

深圳市南山区科技园南区高新南七道数字技术园
A1栋2楼C区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

ADLINK Technology GmbH

Hans-Thoma-Strasse 11, D-68163 Mannheim, Germany
Tel: +49 621 43214-0
Fax: +49 621 43214-30
Email: emea@adlinktech.com

ADLINK Technology, Inc.
(French Liaison Office)

6 allée de Londres, Immeuble Ceylan 91940 Les Ulis, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology, Inc.
(Israel Liaison Office)

27 Maskit St., Corex Building PO Box 12777
Herzliya 4673300, Israel
Tel: +972-54-632-5251
Fax: +972-77-208-0230
Email: israel@adlinktech.com

ADLINK Technology, Inc.
(UK Liaison Office)

First Floor West Exeter House
Chichester Fields Business Park
Tangmere, West Sussex
PO20 2FU, United Kingdom
Tel: +44-1243-859677
Email: uk@adlinktech.com

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