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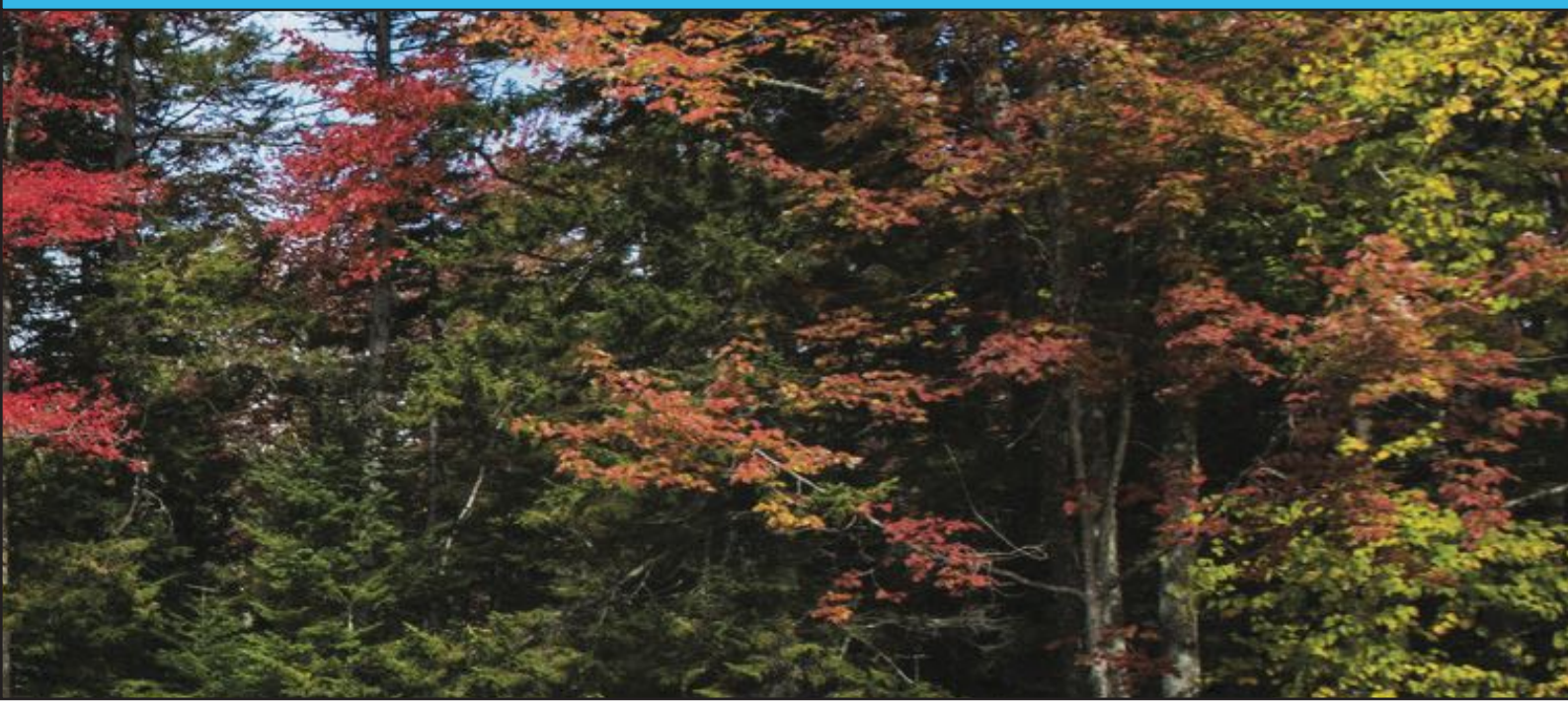
AutoDevKit

AutoDevKit™ a new development approach to Automotive & Transportation applications

Contents

AutoDevKit
An Overview



A VIABLE, SIMPLE, LOW-COST TOOLSET FOR AUTOMOTIVE APPLICATION ENGINEERS

A new development flow and toolset dedicated to the Automotive & Transportation market delivering engineers the best and easiest way for quick evaluation and rapid prototyping in a common, integrated and flexible environment supporting complete ECU-like development.

AutoDevKit is an Eclipse plug-in running under the SPC5Studio Integrated Development Environment.

KEY FEATURES

- Focus on developing your application without bothering about hardware and software implementation details.
- Assemble and re-assemble hardware and software components without compatibility issues.
- Expand and customize your application adding new components, scaling your microcontroller for cost optimization, changing the compiler, adding a real-time operating system and other Eclipse-compatible plug-ins.

AutoDevKit Ecosystem

AEK MCU Discovery and Functional Boards

AEKD System Solution Demonstrators

AutoDevKit

STSW Embedded Software

Find out more at **www.st.com/autodevkit**
Software download **www.st.com/autodevkitsw**
Join our Community at **https://community.st.com/autodevkit**

AutoDevKit
In numbers

Current Version: 1.7.0

78 Boards

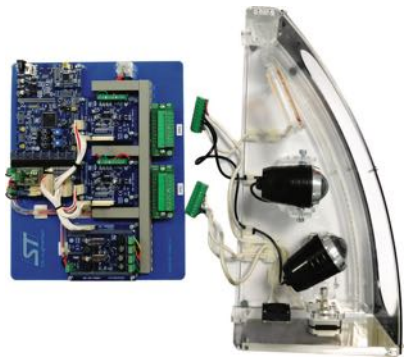
Additional products **60**

AutoDevKit

28 Software Components

Core products **58**

8 Demonstrator kits



42 Example codes

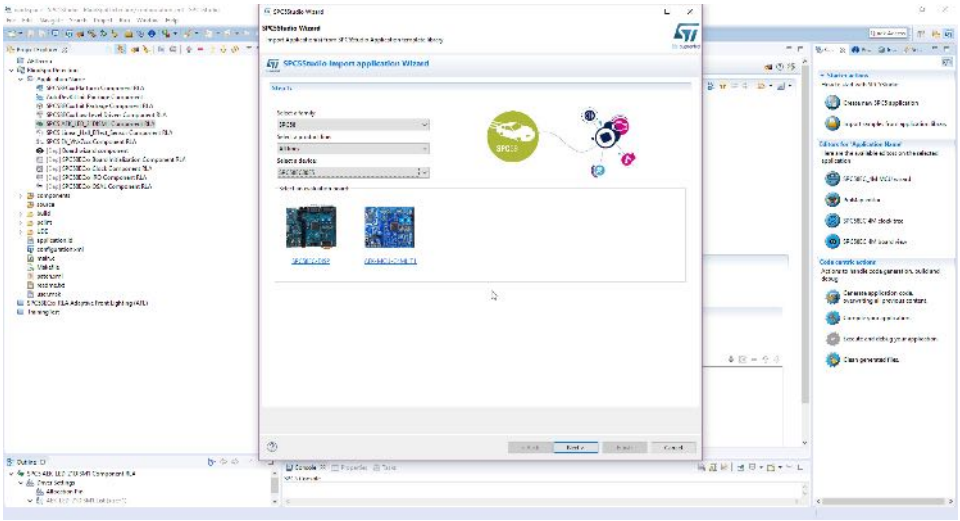
- **Init & Turn Off**
  init100W4V1(); turnOffBus()
- **Voltage open loop regulation**
  SetOpenLoopProgrammableOutputVoltage (SET_VOLTAGE, V_BUS_TO_SET, CURRENT_VALUE)
- **Fixed & programmable voltage**
  setFixedOutputVoltage(VOLT,CURR)
  setProgrammableOutputVoltage(VOLT,CURR)

19 Videos on YouTube

118 Products covered by the AutoDevKit ecosystem and counting…

AutoDevKit Software Environment

AutoDevKit ecosystem includes software and firmware components to develop your application prototype.



With its graphical user interface for easy configuration and setup, the AutoDevKit library (STSW-AUTODEVKIT) contains software components for functional boards where engineers can benefit from very high-level and easy-to-use methods or access very low-level board/chip advanced functionalities and features.

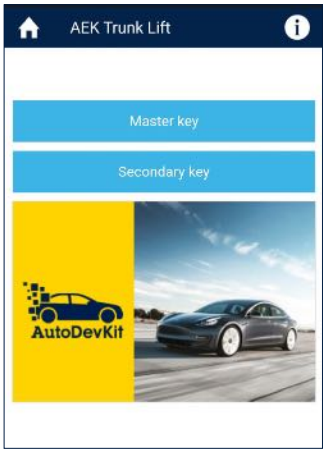
MOBILE APP

AEK Explorer

STSW-AEKEXPLORER for Android/iOS is a fast and smart way to explore ST's AutoDevKit™ development ecosystem using your smartphone or tablet to quickly generate a project on the fly to be downloaded and imported in SPC5Studio.

AEK Controller

The AEK Controller app is the easiest way to control our AEKD system solution demonstrators, kits and assemblies. Using this mobile app (Android only) on a handheld device, developers can easily test and debug prototypes via Bluetooth for an enhanced interaction, speeding up the development phase for a wide range of automotive applications.



AutoDevKit
AEK MCU discovery and functional boards

NUMBER OF BOARDS BY APPLICATION

MCU Discovery Boards	7
Motor Control Boards	14
Power & Lighting Boards	6
Audio Boards	3
Sensor Boards	9
Communication Boards	3
Actuator Boards	32
Total Boards	74

Automotive-grade functional boards

Part number	Application	Description	Page
AEK-LED-21DISM1	Lighting	LED driver based on L99LD21	14
AEK-MOT-SM81M1	Motor Control	Stepper motor driver based on L99SM81V	15
AEK-MOT-2DC40Y1	Motor Control	Dual DC motor driver based on VNH7040AY	16
AEK-MOT-2DC70S1	Motor Control	Dual DC motor driver based on VNH7070BAS	17
AEK-MOT-3PP99081	Motor Control	Specific CAN-controlled brushless motor evaluation board based on SPC560P and L9908	18
AEK-MOT-3PP9908M	Motor Control	Specific CAN-controlled brushless motor evaluation board based on SPC560P and L9908 with BLDC motor included	18
AEK-MOT-TK200G1	Motor Control	Power liftgate controller board based on L99DZ200G multioutput driver and SPC582B60E1 Chorus 1M microcontroller	19
EV-VNH7x	Motor Control	H-Bridge for driving DC motors	20
EV-VNHD7x	Motor Control	Full Bridge for driving DC motors	20
EV-VN7x	Actuator	High-side driver actuator	21
EV-VND7x	Actuator	Dual high-side driver actuator	21
EV-VNQ7x	Actuator	Quad high-side driver actuator	21
AEK-POW-L5964V1	Smart Power	Adjustable dual DC-DC converter based on L5964	22
AEK-POW-100W4V1	Smart Power	100W DC-DC converter for USB-PD and in-vehicle supply	23
AEK-POW-LDOV01J	Smart Power	Automotive-grade LDO with configurable output voltage based on the L99VR01STR	24
AEK-POW-LDOV01S	Smart Power	Automotive-grade LDO with configurable output voltage based on the L99VR01STR	25
AEK-USB-2TYPEC1	USB Type-C	Dual USB Type-C and PD dual port interface based on STUSB1702	26
AEK-AUD-D903V1	Audio	45W Class D audio amp based on FDA903D	27
AEK-AUD-C1D9031	Audio	AVAS solution based on SPC582B60E1 Chorus family MCU and FDA903D Class D audio amplifier	28
AEK-LCD-DT028V1	Mini-infotainment	Display expansion board with resistive touch for Chorus family	29
AEK-CON-AFLVIP2	Connector	Adaptive Front-Lighting dedicated connector	30
AEK-CON-BSPOTV1	Connector	Blindspot application dedicated connector	31
AEK-CON-C1D9031	Connector	AVAS application dedicated connector	32
AEK-CON-5SLOTS1	Connector	Generic AutoDevKit connector	33

Part number	Description	Page
AEK-MCU-C1MLIT1	SPC58 2B Line Chorus (1 Mbyte) discovery board	34
AEK-MCU-C4MLIT1	SPC58 C Line Chorus (4 Mbytes) discovery board	35
SPC582B-DIS	Discovery Kit for SPC58 2B line	36
SPC58EC-DISP	Discovery Kit for SPC58 C line	37
SPC584B-DIS	Discovery Kit for SPC58 4B line in eQFP64	38
SPC584B-DISP	Discovery Kit for SPC58 4B Line in eTQFP144	39

Industrial-grade functional boards

Part number	Application	Description	Page
AEK-COM-BLEV1	Communication	Bluetooth communication board based on BlueNRG-1	40
AEK-COM-GNSST31	Communication	GNSS positioning board based on Teseo-LIV3F	41
X-NUCLEO-NFC05A1	Communication	NFC Board based on ST25R3911B	42
VL53L1X-SATEL	Sensors	Time-of-Flight (TOF) laser ranging	43
AEK-SNS-2TOFM1	Sensors	Predefined gesture detection system based on FlightSense technology sensors	44
AEK-CON-SENSOR1	Connector	Connector board for SPC5 MCU discovery boards and MEMS sensor boards	45

Third-party functional components

Part number	Application	Description	Page
RLIDAR_A1M8	Sensors	LIDAR Sensor	46
	Sensors	Ratiometric Hall effect sensor	47

Demonstrators

Part number	Description	Page
AEKD-AFLLIGHT1	Automotive-Grade Headlight mockup	48
AEKD-AFLPANEL1	Adaptive Front Light testing and prototyping kit arranged on plexiglass panel	48
AEKD-AFL001	AutoDevKit adaptive front lighting kit	48
AEKD-BLINDSPOTA1	Blind-spot detection simulation kit	49
AEKD-BLINDSPOTB1	Set of assembled boards for blind-spot detection simulation	49
AEKD-TRUNKL1	Power liftgate zonal ECU implemented with model-based design approach	50
AEKD-AICAR1	Automotive AI on the edge for car state classification	51

AutoDevKit Featured ST core products

56 ST core products

ST core products and their corresponding AutoDevKit boards

Core product	# of products	Function	Boards hosting the core products
AIS2DW12	1	Automotive 3-axis accelerometer	AEK-CON-SENSOR1
ASM330LHH	1	Automotive 6-axis inertial module	AEK-CON-SENSOR1
BlueNRG-1	1	Bluetooth network processor	AEK-COM-BLEV1
FDA903D	1	Class D audio amp	AEK-AUD-D903V1
IIS2ICLX	1	2-axis Digital Inclinometer	AEK-CON-SENSOR1
IIS3DWB	1	3-axis digital vibration sensor	AEK-CON-SENSOR1
L5964	1	DC-DC buck converters	AEK-POW-L5964V AEK-POW-100W4V1
L9908	1	Automotive 3-phase motor gate driver unit	AEK-MOT-3P99081 AEK-MOT-3P9908M
L99DZ200G	1	Automotive Door Zone device	AEK-MOT-TK200G1
L99LD21Q6	1	LED driving	AEK-LED-21DISM1
L99SM81VQ6	1	Stepper motor drive	AEK-MOT-SM81M1
L99VR01J	1	Linear Voltage Regulator	AEK-POW-LDOV01J
L99VR01S	1	Linear Voltage Regulator	AEK-POW-LDOV01S
SPC560P50L5	1	Single core MCU 512kB flash	AEK-MOT-3P99081 AEK-MOT-3P9908M
SPC582B60E1	1	Single core MCU 1MB flash	AEK-MCU-C1MLIT1 AEK-MOT-TK200G1 AEK-SNS-2TOFM1
SPC58EC80E5	1	Dual core MCU 4MB flash	AEK-MCU-C4MLIT1
ST25R3911B	1	HF reader / NFC initiator with 1.4 W supporting VHBR and AAT	X-NUCLEO-NFC05A1
STUSB1702	1	USB Type-C interface	AEK-USB-2TYPEC1
Teseo-LIV3F	1	GNSS global positioning	AEK-COM-GNSST31
VL53L1X	1	Time-of-Flight(TOF) laser ranging	VL53L1X-SATEL AEK-SNS-2TOFM1
VN7xxx	33	High-side actuator	EV-VNx7xxx
VNH7xxx	5	Multi DC motor drive	AEK-MOT-2DC70S1 AEK-MOT-2DC40Y1

AutoDevKit
Additional featured ST products

60 Additional ST products

Part number	Brief Description
A5973AD	Up to 1.5 A step-down switching regulator
BALF-NRG-01D3	50Ω nominal input balun for BlueNRG transceiver
BAT20J	23 V, 1A Signal Schottky Diode
BAT46JFILM	100V, 150mA Signal Schottky Diode
ESDA25LY	Automotive dual Transil
ESDARF02-1BU2CK	ESD protection device for high-speed Interface
L4995AJ	5V, 500mA Low Drop Voltage Regulator
L4995RJ	5V, 500mA Low Drop Voltage Regulator
L7987L	61V, 2A step-down switching regulator
L9616	CAN bus transceiver
LD1117	Low drop adjustable voltage regulator
LD1117A	Low drop adjustable voltage regulator
LD1117S33TR	Low drop adjustable voltage regulator
LD1117S50TR	Low drop adjustable voltage regulator
LD39050	500mA voltage regulator
LD39100PURY	1A voltage regulator
LDS3985	300mA voltage regulator
LK112	Voltage regulator with shutdown
M93S46-WMN6TP	1-Kbit serial EEPROM
M93S46-W	1-Kbit serial EEPROM

Part number	Brief Description
SM4T26AY	Automotive 400W TVS
SM6T36A	600W, 30.8V TVS in SMB package
SM6T36CAY	600W, 30.8V TVS in SMB package
SM6TY	Automotive 600W TVS
SMA6T56AY	Automotive 600W TVS
SMAJ40CA-TR	400W TVS in SMA package
SMCJ24CA-TR	1500 W, 24 V TVS in SMC
ST2378ETTR	8-bit Dual supply ESD protection
ST3232EB	15kV RS-232 interface with ESD protection
STD105N10F7AG	NMOS 100V 0.068Ω STripFET MOSFET
STD28P3LLH6AG	PMOS -30V 0.027Ω STripFET MOSFET
STD45P4LLF6AG	PMOS -40 V, 12 mΩ typ. STripFET MOSFET
STD94N4F3 (STD95N4F3)	NMOS 40 V, 5.0 mΩ typ. STripFET MOSFET
STD95P3LLH6AG	PMOS -30 V, 5.0 mΩ typ. STripFET MOSFET
STL260N4F7	NMOS 40V, 1.05 mΩ typ. STripFET MOSFET
STL64N4F7AG	NMOS 40V, 7.0 mΩ typ. STripFET MOSFET
STL76DN4LF7AG	NMOS 40V, 5.0 mΩ typ. STripFET MOSFET
STM6315RBW13F	Open drain microprocessor reset
STPS0540-Y	Automotive 40 V, 0.5A Schottky Rectifier
STPS2H100A	100V, 2A Schottky Rectifier

Part number	Brief Description
STPS2H100ZFY	100V, 2A Schottky Rectifier
STPS2L40	40V, 2A Schottky Rectifier
STPS2L60-Y	60V, 2A Schottky Rectifier
STPS2L60A	60V, 2A Schottky Rectifier
STPS340	40V, 3A Schottky rectifier
STPS3L40UF	40 V, 3A SMD Low Drop Schottky Rectifier
STPS5L60	60V, 5A Schottky Rectifier
STPS5L60-Y	60V, 5A Schottky Rectifier
STR2N2VH5	NMOS 20V, 0.025Ω typ. STripFET MOSFET
STS10P4LLF6	PMOS -40 V, 0.0125Ω typ. STripFET MOSFET
STL9P3LLH6	PMOS -30 V, 12 Ω STripFET MOSFET
STL6N2VH5	NMOS 20 V, 0.025 Ω STripFET MOSFET
STTH102AY	Automotive 200V, 1A ultrafast diode
STTH3R02AFY	Automotive 200V, 3A ultrafast diode
TSC103IYPT	High voltage, HS current sense amplifier
TSX711ILT	Precision rail-to-rail 16V CMOS op amp
USBLC6-2P6	ESD protection device for USB 2.0
USBLC6-2SC6Y	ESD protection device for USB 2.0
STM6315	Microprocessor reset circuit
TSC1031	Current sense amplifier

AutoDevKit
Automotive Grade Board ID Cards & Key Product

AEK-LED-21DISM1

Automotive-grade LED driver featuring **L99LD21Q6**

Board Picture

Key Product features

- SPI bus for control and diagnostics
- Watchdog and limp home protection
- Boost in peak current mode control
- Bucks with Integrated switching MOSFETs
- Very accurate LED current setting
- Integrated PWM generation unit with 10-bit resolution and phase shift
- Protection and diagnostics

Demonstrators

- **AEKD-AFL001**
  AutoDevKit adaptive front lighting kit
- **AEKD-AFLPANEL1**
  Adaptive Front Light testing and prototyping kit on plexiglass panel
- **AEKD-BLINDSPOTB1**
  Blind-spot detection simulation kit

Additional Products

- **STL40N75LF3** - N-channel 75 V, 16 mOhm typ. STripFET MOSFET
- **STD45P4LLF6AG** - P-channel -40 V, 12 mOhm typ. STripFET F6 MOSFET
- **STPS2L60-Y** - 60V,2A Schottky rectifier
- **STPS5L60-Y** - 60V,5A Schottky rectifier
- **SM6T36A** - 600W, 30.8 V TVS in SMB

Component & Key Primitives

AEK-LED-21DISM1 Component RLA

- **Init**
  ClearAndTrigger(AEK_LED_21DISM1_DEV0)
- **Turn-on LED light**
  ActivateBuckDev(AEK_LED_21DISM1_DEV0,DEV1, BUCK1)
- **Turn-off LED light**
  DeActivateBuckDev(AEK_LED_21DISM1_ DEV0,DEV1, BUCK1)

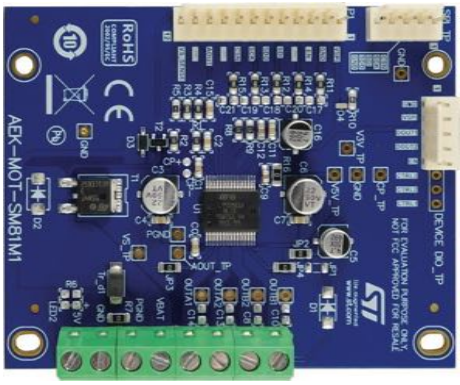
Demo available on SPC58EC

- SPC58ECxx_RLA AEK-LED-21DISM1
  Test Application for Discovery
  Turn-on a LED string
- SPC58ECxx_RLA
  Adaptive Front-Lighting
  Adaptive Front-Lighting application
- SPC58ECxx_RLA
  BlindSpot Application
  Code for the Blindspot application

AEK-MOT-SM81M1

Automotive-grade stepper motor driver featuring **L99SM81VQ6**

Board Picture



Key Product features

- Up to 1.35 A current capability
- Settable: Full step, Half step, Mini step, 1/8 Micro step, 1/16 Micro step
- 10-bit equivalent current loop
- 4 programmable decay modes
- Thermal warning and shutdown
- SPI bus for control and diagnostics

Demonstrators

- **AEKD-AFL001**
  AutoDevKit adaptive front lighting kit
- **AEKD-AFLPANEL1**
  Adaptive Front Light testing and prototyping kit on plexiglass panel

Additional Products

- **STPS3L40UF** - 40 V, 3 A SMD low drop power Schottky rectifier
- **STPS0540-Y** - Automotive 40 V, 0.5 A power Schottky rectifier
- **SMAJ40CA-TR** - 400 W TVS in SMA package
- **STD94N4F3** - N-channel 40 V, 5.0 mOhm, 80 A, DPAK STripFET MOSFET

Component & Key Primitives

AEK-MOT-SM81M1 Component RLA

- **Init**
  init_AEK_MOT_SM81M1(AEK_MOT_SM81M1_DEV0)
- **Turn right**
  RotationGrade(AEK_MOT_SM81M1 DEV0,270,RIGHT,1)
- **Delay**
  osalThreadDelayMilliseconds(500)
- **Turn Left**
  RotationGrade(AEK_MOT_SM81M1_DEV0,360,LEFT,1)

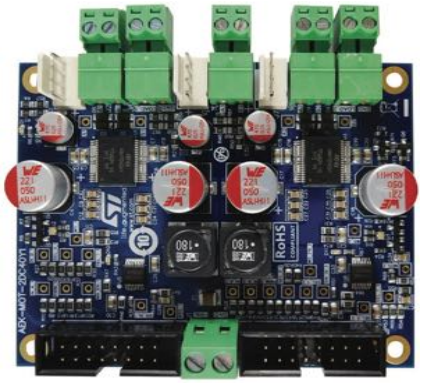
Demo available on SPC58EC

- SPC58ECxx_RLA AEK_MOT_SM81M1
  Test Application for Discovery
  Basic test with left and right rotation
- SPC58ECxx_RLA
  Adaptive Front-Lighting
  Adaptive Front-Lighting application

AEK-MOT-2DC40Y1

Automotive-grade multiple DC motor driver up to 35A featuring **VNH7040AY**

Board Picture



Key Product features

- Integrated H-bridge motor driver
- 3 V CMOS-compatible inputs
- PWM operation up to 20 kHz
- Standby mode
- Undervoltage & thermal shutdown
- Overvoltage clamp
- Cross-conduction protection
- Current and power limitation
- Current Sense diagnostic functions
- 38V V_{CC} (max.)

Demonstrators

NOT AVAILABLE

Additional Products

- **VN7E010AJ -** High-side driver with MultiSense analog feedback with improved high precision current sensing
- **VN7050AJ -** High-side driver with MultiSense analog feedback

Component & Key Primitives

AEK-MOT-2DCxxx Component RLA

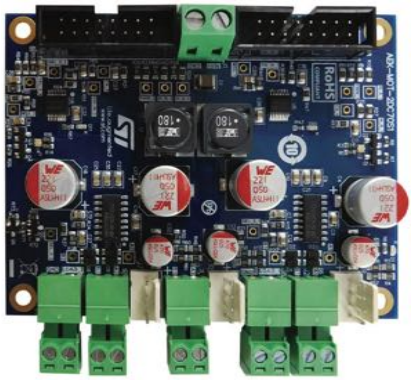
- **Init**
  AEK_MOT2D_initMotor(AEK_MOT_2D_DEV0, MOTOR1)
- **Set motor speed and direction**
  AEK_MOT2D_setSpeedMotor(AEK_MOT_2D_DEV0, MOTOR1, CLOCKWISE, 1400)
- **Brake motor**
  AEK_MOT2D_brakeMotor(AEK_MOT_2D_DEV0, MOTOR1)

Demo available on SPC58EC

- SPC58ECxx_RLA AEK_MOT_2DCxxx
  Basic test setting motor rotation speed
- SPC58ECxx_RLA AEK_MOT_2DCxxx
  Proportional Integrative Derivative Test
- SPC58ECxx_RLA AEK_MOT_2DCxxx
  Incremental Encoder Test

AEK-MOT-2DC70S1

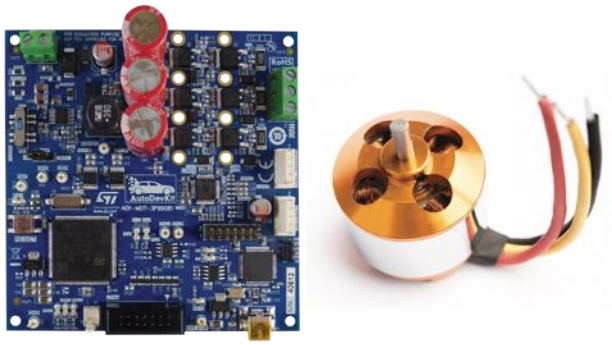
Automotive-grade multiple DC motor driver up to 15A featuring **VNH7070BAS**

Board Picture	Key Product features
	• Integrated H-bridge motor driver • 3 V CMOS-compatible inputs • PWM operation up to 20 kHz • Standby mode • Undervoltage & thermal shutdown • Overvoltage clamp • Cross-conduction protection • Current and power limitation • Current Sense diagnostic functions
Demonstrators	**Additional Products**
NOT AVAILABLE	• **VN7E010AJ -** High-side driver with MultiSense analog feedback with improved high precision current sensing • **VN7050AJ -** High-side driver with MultiSense analog feedback
Component & Key Primitives	**Demo available on SPC58EC**
AEK-MOT-2DCxxx Component RLA • **Init** AEK_MOT2D_initMotor(AEK_MOT_2D_DEV0, MOTOR1) • **Set motor speed and direction** AEK_MOT2D_setSpeedMotor(AEK_MOT_2D_DEV0, MOTOR1, CLOCKWISE, 1400) • **Brake motor** AEK_MOT2D_brakeMotor(AEK_MOT_2D_DEV0, MOTOR1)	• SPC58ECxx_RLA AEK_MOT_2DCxxx **Basic test setting motor rotation speed** • SPC58ECxx_RLA AEK_MOT_2DCxxx **Proportional Integrative Derivative Test** • SPC58ECxx_RLA AEK_MOT_2DCxxx **Incremental Encoder Test**

AEK-MOT-3P9908M / AEK-MOT-3PP99081

CAN-controlled brushless motor evaluation board featuring **L9908** with or without BLDC motor included

Board Picture



Key Product features

- Automotive BLDC motor pre-driver
- Wide range of systems compatibility (12V – 24V - 48V)
- 3 independent low-side Current Sense Amplifiers
- Smart Logic for current acquisition and processing
- MOSFET High Side Driver pins robustness at -14V (transient)

Additional Products

- **STPS5L60** - 60 V, 5 A Low Drop Power Schottky Rectifier
- **SMA6T56AY** - Automotive 600 W, 47.6 V TVS in SMA
- **STPS2L60** - 60 V, 2 A Low Drop Power Schottky Rectifier
- **STPS2H100** - 100 V, 2 A Power Schottky Rectifier
- **STPS2L40** - 40 V, 2 A Low Drop Power Schottky Rectifier
- **STD105N10F7AG** - Automotive-grade N-channel 100 V, 6.8 mOhm typ., 80 A STripFET F7 Power MOSFET in a DPAK package
- **LD1117** - Adjustable and fixed low drop positive voltage regulator

Additional Products

- **L7987L** - 61 V 2 A asynchronous step-down switching regulator with adjustable current limitation
- **L4995** - Automotive 5V, 500mA Low Drop Voltage Regulator
- **SPC560P50L5** - 32-bit Power Architecture MCU for Automotive Chassis and Safety Applications
- **STM6315** - Open drain microprocessor reset
- **USBLC6-2** - ESD Protection for USB 2.0 High Speed
- **M93S46-W** - 1-Kbit MICROWIRE serial access EEPROM with block protection

Component & Key Primitives

key-press - to switch the application between the START/STOP of the BLDC motor

turnUpRampSpeedBLDC - to increase the target speed of the BLDC motor

turnDownRampSpeedBLDC - to decrease the target speed of the BLDC motor

Demo available on SPC5

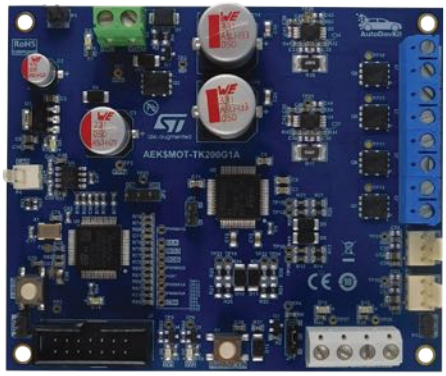
SSPC560Pxx_RLA_**AEK_MOT_3P99081_3Phase_Motor_Control_L9908_via_CAN** Demo

SPC58ECxx_RLA_**MainEcuForBLDCControl-L9908**-Test Application

AEK-MOT-TK200G1

Power liftgate controller board based on **L99DZ200G** multioutput driver

Board Picture



Key Product features

- AEC-Q100 qualified
- Operating range: from 6 to 28 V
- Fully programmable control logic via Serial communication: ST-SPI 24-bit
- Advanced high-speed CAN transceiver (ISO 11898-2:2003 /-5:2007, SAE J2284 compliant, SAE J2962-2 compliant)
- LIN 2.2a compliant (SAEJ2602 compatible, SAE J2962-1 compliant) transceiver

Additional Products

- **SM6T36CA**Y - Automotive 600 W, 30.8 V TVS in SMB
- **STTH3R02-Y** - Automotive 200 V, 3 A Ultrafast Diode
- **STL64N4F7AG -** Automotive-grade N-channel 40 V, 7.0 mOhm typ., 4 A STripFET F7 Power MOSFET in a PowerFLAT 5x6 package
- **STL260N4F7 -** N-channel 40 V, 1.05 mOhm typ., 120 A STripFET F7 Power MOSFET in a PowerFLAT 5x6 package

Additional Products

- **STL76DN4LF7AG -** Automotive-grade N-channel 40 V, 5 mOhm typ., 40 A STripFET F7 Power MOSFET in a PowerFLAT 5x6 package double island package
- **LD1117 -** Adjustable and fixed low drop positive voltage regulator
- **TSC103IYPT -** High voltage, high side current sense amplifier
- **SPC582B60E1 -** 32-bit Power Architecture MCU for Automotive General Purpose Applications – Chorus family

Component & Key Primitives

AEK_MOT_TK200G1_Init()
- Initializes the driver and clears the L99DZ200G status registers

AEK_MOT_TK200G1_HSOutputsControl()
- Sets the high-side outputs and their configuration

MotorCounterClockwise()
- Turns the motors counterclockwise

MotorClockwise()
- Turns the motors clockwise

StopMotor()
- Breaks the motor

Demos available on SPC5

- **SPC582Bxx_RLA_AEK-MOT -TK200G1_**
  MotorControl
  Test Application for discovery
  To drive two DC motors and turn on/off two LED strings
- **SPC582Bxx_RLA_AEK-MOT-TK200G1_ MotorControl_via_CAN**
  Test Application
  To show how the microcontroller SPC58ECxx hosted on the AEK-MCU-C4MLIT1 board is able to control the AEK-MOT-TK200G1 board via the CAN bus
- **SPC58ECxx_RLA_ MainECUFor_AEK-MOT-TK200G1Control**
  Test Application
  To drive the AEK-MOT-TK200G1 board through a domain controller (the AEK-MCU-C4MLIT1 board) via CAN messages

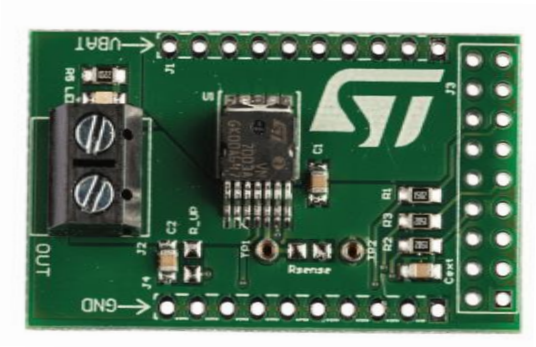
EV-VNH7040AY – EV-VNH7070AS
EV-VNH7070AY – EV-VNH7100AS
EV-VNH7100BAS – EV-VNHD7008AY – EV-VNHD7012AY

Automotive-grade DC motor driver featuring **VNH7xxx** fully integrated H-Bridge Motor Driver

Board Picture	Key Product features
EV-VNH7070BAS 	• Integrated H-bridge motor driver • 3 V CMOS-compatible inputs • PWM operation up to 20 kHz • Standby mode • Undervoltage & thermal shutdown • Overvoltage clamp • Cross-conduction protection • Current and power limitation • Current Sense diagnostic functions • 38V V_{CC} (max.)
Demonstrators	**Additional Products**
NOT AVAILABLE	**NOT APPLICABLE**
Component & Key Primitives	**Demo available on SPC58EC**
AEK-EV-VNHx7xxx Component RLA • **Init Motor** initMotor(EV_VNHx7xxx_DEV0) • **Set motor speed and direction** setSpeedMotor(EV_VNHx7xxx_DEV0, CLOCKWISE, 20) • **Brake motor** brakeMotor(EV_VNHx7xxx_DEV0)	• SPC58ECxx_RLA EV-VNHx7xxx **Test Application for Discovery** Spin motor clockwise and counterclockwise with different speeds

EV-VN7x: High-side driver actuator
EV-VND7x: Dual high-side driver actuator
EV-VNQ7x: Quad high-side driver actuator

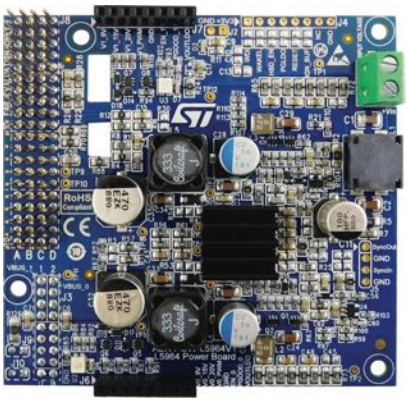
33 boards featuring various currents, number of channels and diagnostics

Board Picture	Key Product features
EV-VN7050AS 	• Operating voltage range 4 to 28 V • Max. transient supply voltage 40 V • Typ. on-state resistance (per channel) 50 mΩ • Current limitation (typ.) 30 A • MultiSense analog feedback • Protection: Undervoltage shutdown, overvoltage clamp, load current limitation, fast thermal transients, ground & V_{CC} loss • Configurable latch-off protection • Reverse battery with external components
Demonstrators	**Additional Products**
• **AEKD-AFL001** AutoDevKit adaptive front lighting kit • **AEKD-AFLPANEL1** Adaptive Front Light testing and prototyping kit on plexiglass panel • **AEKD-BLINDSPOTB1** Blind-spot detection simulation kit	**NOT APPLICABLE**
Component & Key Primitives	**Demo available on SPC58EC**
AEK-EV-VNx7xxx Component RLA • **Init Multisense diagnostics** ActiveSEnable(EV_VNx7xxx_DEV0) • **Turn-on the actuator switch** ActiveINChannel(0, EV_VNx7xxx_DEV0) • **Read diagnostic data with ADC** ADCinit(EV_VNx7xxx_DEV0) ADCstartConversion(EV_VNx7xxx_DEV0)	• SPC58ECxx_RLA EV_VNx7xxx **Test Application for Discovery** Turn-on an LED string • SPC58ECxx_RLA **Adaptive Front-Lighting** Adaptive Front-Lighting application • SPC58ECxx_RLA **BlindSpot Application** Code for the Blindspot application

AEK-POW-L5964V1

Automotive-grade dual-channel DC-DC converter featuring **L5964**

Board Picture



Key Product features

- Two step-down synchronous switching voltage regulators with internal power switches
- Operating input voltage range: 3.3 to 26 V
- DC/DCs can work in low-power mode
- 125 kHz < f < 2.3 MHz synchronization range
- Programmable current limits at 2 A and 4 A
- Independent hardware enabling pins
- 180° phase shift between outputs
- Soft-start, thermal protection
- One standby/linear regulator

Demonstrators

NOT AVAILABLE

Additional Products

- **STPS2H100ZFY** - 100 V, 2 A power Schottky rectifier
- **BAT46JFILM** - 100 V, 150 mA signal Schottky diode
- **TSX711ILT** - Precision (200 uV), rail-to-rail 16 V CMOS op-amp, single, GBP 2.7 MHz

Component & Key Primitives

AEK-POW-L5964V1 Component LRA

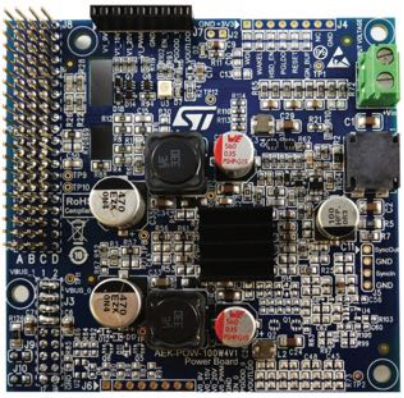
- **Init**
  initL5964V1()
- **Voltage Open loop regulation**
  setOpenLoopProgrammableOutputVoltage(SET_VOLTAGE, V_BUS_TO_SET, CURRENT_VALUE)
- **Closed-loop & Overtemperature**
  closeLoopVoltageAndCurrent()
  outputPowerLimitingVsTj()

Demo available on SPC58EC

- SPC58ECxx_RLA **USB Type-C Power Delivery Application for Discovery**
  Full stack USB Power Delivery version 2.0 with dual channel power board
- SPC58ECxx_RLA **AEK_POW_L5964V1**
  Adjustable DC-DC mode Test Application
- SPC58ECxx_RLA **AEK_POW_L5964V1 USB PD**
  Full features-mode Test Application

AEK-POW-100W4V1

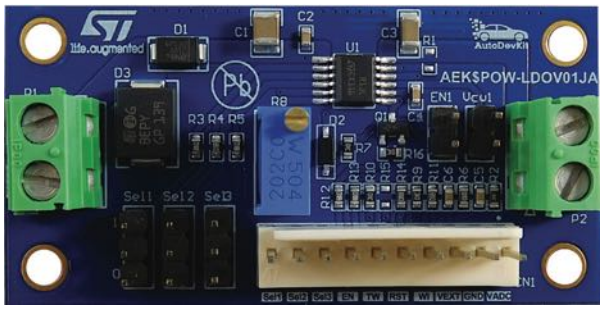
Automotive-grade 100W DC-DC converter featuring **L5964**

Board Picture	Key Product features
	• Two step-down synchronous switching voltage • regulators with internal power switches • Operating input voltage range: 3.3 to 26 V • DC/DCs can work in low-power mode • 125 kHz < f < 2.3 MHz synchronization range • Programmable current limits at 2 A and 4 A • Independent hardware enabling pins • 180° phase shift between outputs • Soft-start, thermal protection • One standby/linear regulator
Demonstrators	**Additional Products**
NOT AVAILABLE	• **STPS2H100ZFY** - 100 V, 2 A power Schottky rectifier • **BAT46JFILM** - 100 V, 150 mA signal Schottky diode • **TSX711ILT** - Precision (200 µV), rail-to-rail 16 V CMOS op amp, single, GBP 2.7 MHz
Component & Key Primitives	**Demo available on SPC58EC**
AEK-POW-100W4V1 Component LRA • **Init & Turn Off** init100W4V1() turnOffBus() • **Voltage Open loop regulation** setOpenLoopProgrammableOutputVoltage(SET_VOLTAGE, V_BUS_TO_SET, CURRENT_VALUE) • **Fixed & Programmable Voltage** setFixedOutputVoltage(VOLT,CURR) setProgrammableOutputVoltage(VOLT,CURR)	• SPC58ECxx_RLA **AEK_POW_100W4V1** Adjustable DC-DC mode Test Application • SPC58ECxx_RLA **AEK_POW_100W4V1 USB PD** Full features-mode Test Application

AEK-POW-LDOV01J

Automotive-grade LDO with configurable output voltage and diagnostic features based on **L99VR01JTR**

Board Picture



Key Product features

- AEC-Q100 qualified
- Operating DC power supply voltage range from 2.15 V to 28 V
- Low quiescent current consumption
- User-selectable output voltage (0.8 V; 1.2 V; 1.5 V; 1.8 V; 2.5 V; 2.8 V; 3.3 V or 5 V)
- Output voltage precision ±2%
- Programmable autonomous watchdog through external capacitor
- Fast output discharge
- Advanced thermal warning and output overvoltage diagnostic
- Programmable short-circuit output current
- Wide operating temperature range (TJ = -40°C to 175°C)

Demonstrators

NOT AVAILABLE

Additional Products

- **STTH102AY** - Automotive 200 V, 1 A ultrafast diode
- **STPS0540ZY** - Automotive 40 V, 0.5 A power Schottky rectifier
- **SMCJ24CA-TR** - 1500 W, 24 V TVS in SMC

Component & Key Primitives

AEK-POW-LDOV01x Component RLA

- **Init & Power**
  AEK_POW_LDOV01x_init(uint8_t AEK_POW_LDOV01x_n_device)
  AEK_POW_LDOV01x_power_on(uint8_t AEK_POW_LDOV01x_n_device)
- **Voltage Settings**
  AEK_POW_LDOV01x_setOperationMode(AEK_POW_LDOV01x_op_mode_t AEK_POW_LDOV01x_op_mode,uint8_t AEK_POW_LDOV01x_n_device)
  AEK_POW_LDOV01x_getVout(uint8_t AEK_POW_LDOV01x_n_device)
- **Warning Detection**
  AEK_POW_LDOV01x_getWarningStatus(uint8_tAEK_POW_LDOV01x_n_device)

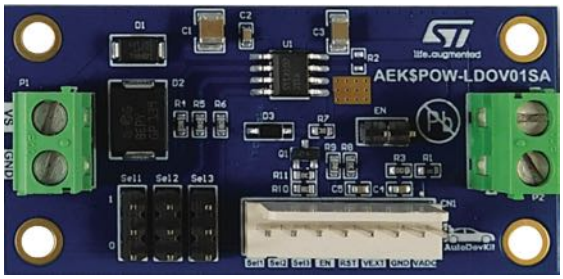
Demo available on SPC58

- SPC58ECxx_RLA AEK_POW_LDOV01x **DC-DC Voltage Regulator** Test Application for Discovery
- SPC582Bxx_RLA AEK_POW_LDOV01x **DC-DC Voltage Regulator** Test Application for Discovery

AEK-POW-LDOV01S

Automotive-grade LDO with configurable output voltage featuring **L99VR01STR**

Board Picture



Key Product features

- AEC-Q100 qualified
- Operating DC power supply voltage range from 2.15 V to 28 V
- Low quiescent current consumption
- User-selectable output voltage (0.8 V; 1.2 V; 1.5 V; 1.8 V; 2.5 V; 2.8 V; 3.3 V or 5 V)
- Output voltage precision ±2%
- Fast output discharge
- Thermal shutdown and short-circuit current limitation

Demonstrators

NOT AVAILABLE

Additional Products

- **STPS2H100ZFY** - 10 V, 2 A Power Schottky Rectifier
- **BAT46JFILM** - 100 V, 150 mA Signal Schottky Diode
- **TSX711ILT** - Precision (200 µV), rail-to-rail 16 V CMOS op amp, single, GBP 2.7 MHz

Component & Key Primitives

AEK-POW-LDOV01x Component RLA

- **Init & Power**
  AEK_POW_LDOV01x_init(uint8_t AEK_POW_LDOV01x_n_device)
  AEK_POW_LDOV01x_power_on(uint8_t AEK_POW_LDOV01x_n_device)
- **Voltage Settings**
  AEK_POW_LDOV01x_setOperationMode(AEK_POW_LDOV01x_op_mode_t AEK_POW_LDOV01x_op_mode,uint8_t AEK_POW_LDOV01x_n_device)
  AEK_POW_LDOV01x_getVout(uint8_t AEK_POW_LDOV01x_n_device)
- **Warning Detection**
  AEK_POW_LDOV01x_getWarningStatus(uint8_tAEK_POW_LDOV01x_n_device)

Demo available on SPC58

- SPC58ECxx_RLA AEK_POW_LDOV01x **DC-DC Voltage Regulator** Test Application for Discovery
- SPC582Bxx_RLA AEK_POW_LDOV01x **DC-DC Voltage Regulator** Test Application for Discovery

AEK-USB-2TYPEC1

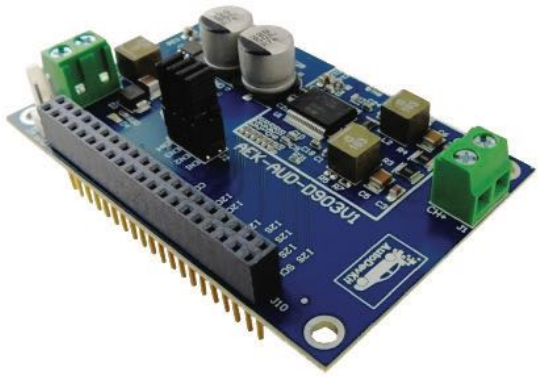
Automotive-grade USB Type-C interface featuring **STUSB1702**

Board Picture	Key Product features
	• Type-C™ attach and cable orientation detection • Power role support: source • Integrated power switch for V_{CONN} supply • I²C interface and interrupt • Integrated V_{BUS} voltage monitoring • Integrated V_{BUS} and V_{CONN} discharge path • Integrated BMC transceiver • V_{BUS} switch gate driver • Accessory mode support
Demonstrators	**Additional Products**
• **AEKD-USBTYPEC1** USB Type-C™ and USB Power Delivery evaluation kit based on automotive-grade SPC58 MCU	• **USBLC6-2SC6Y** – ESD protection • **TSC1031** - Current sense amplifier • **LD1117A** - Low drop voltage regulator • **SM4T26AY** - Automotive 400W TVS • **ESDA25LY** - Automotive dual Transil • **STL9P3LLH6** - PMOS -30 V, 12 Ω • **STL6N2VH5** - NMOS 20 V, 0.025 Ω • **STD28P3LLH6AG** - PMOS -30 V 0.027 Ω
Component & Key Primitives	**Demo available on SPC58EC**
Driver is embedded in USB PD version 2.0 application	SPC58ECxx_RLA **USB Type-C Power Delivery Application for Discovery** Full stack USB Power Delivery version 2.0

AEK-AUD-D903V1

Automotive-grade single channel digital audio featuring **FDA903D**

Board Picture



Key Product features

- 1 x 45 W class D digital input power amp
- I2S and TDM digital input (4/8/16CH TDM)
- Input sampling frequency: 44.1 kHz, 48 kHz,
- 96 kHz, 192 kHz
- Full I2C bus driving (3.3/1.8 V)
- Wide operating supply range from 3.3 to 18 V
- 2 Ω load driving
- Power limiting function
- I2C bus diagnostics
- I_{LOAD} current monitoring through I2S

Demonstrators

AVAS KIT Including:
- **AEK-MCU-C1MLIT1**
- **AEK-CON-C1D9031**

Engine Sound Simulator with Connector Board

Additional Products

- **STS10P4LLF6 -** P-channel 40 V, 0.0125Ω typ., 10 A MOSFET
- **SM6TY -** Automotive 600 W TVS

Component & Key Primitives

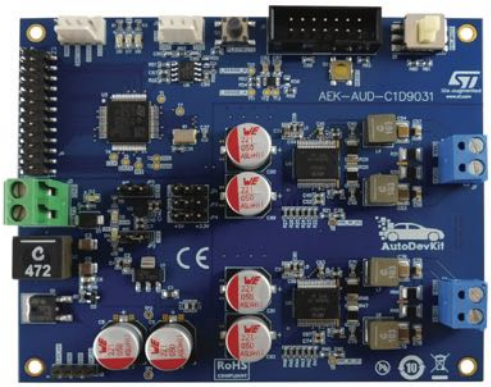
AEK-AUD-D903V1 Component LRA
- **Init & set PLAY status**
  AEK_903D_Init(DEV0)
  AEK_903D_SetDefaultRegisters(DEV0)
  AEK_903D_SelectOverCurrentProtectionLevel(...)
  AEK_903D_Play(AEK_AUD_D903V1_DEV0)
- **Play a wave file stored in Flash memory**
  playSound(volume, userFunction)
- **Diagnostic functions**
  AEK_903D_Diagnostic(AEK_AUD_D903V1_DEV0)
  AEK_903D_TriggerOpenLoadInPlayDetection(DEV0)
  AEK_903D_CheckOpenLoadInPlayDetection(DEV0)

Demo available on SPC58

- SPC582Bxx_RLA AEK_AUD_D903V1 **Test Application**
- SPC582Bxx_RLA AEK_AUD_D903V1 **I2C SW Mono audio**
- SPC582Bxx_RLA AEK_AUD_D903V1 **Mono audio & Diagnostic**
- SPC582Bxx_RLA AEK_AUD_D903V1 **Sound Generation by mathematical function**
- SPC582Bxx_RLA AEK_AUD_D903V1 **Stereo audio and Diagnostic**
- SPC582Bxx_RLA AEK_AUD_D903V1 **Engine Sound Simulator with Connector**
- SPC582Bxx_RLA AEK_AUD_D903V1 **Engine Sound Simulator**

AEK-AUD-C1D9031

AVAS solution based on **FDA903D** Class D audio amplifier

Board Picture	Key Product features
	• 1 x 45 W class D digital input power amp • I2S and TDM digital input (4/8/16CH TDM) • Input sampling frequency: 44.1 kHz, 48 kHz, • 96 kHz, 192 kHz • Full I2C bus driving (3.3/1.8 V) • Wide operating supply range from 3.3 to 18 V • 2 Ω load driving • Power limiting function • I2C bus diagnostics • I_{LOAD} current monitoring through I2S
Demonstrators	**Additional Products**
NOT AVAILABLE	• **SPC582B60E1** - 32-bit Power Architecture MCU for Automotive General Purpose Applications - Chorus family • **STS10P4LLF6** - P-channel 40 V, 0.0125Ω typ., 10 A MOSFET • **SM6TY** - Automotive 600 W TVS
Component & Key Primitives	**Demo available on SPC58EC**
AEK-AUD-D903V1 Component LRA • **Init & set PLAY status** AEK_903D_Init(DEV0) AEK_903D_SetDefaultRegisters(DEV0) AEK_903D_SelectOverCurrentProtectionLevel(...) AEK_903D_Play(AEK_AUD_D903V1_DEV0) • **Play a wave file stored in Flash memory** playSound(volume, userFunction) • **Diagnostic functions** AEK_903D_Diagnostic(AEK_AUD_D903V1_DEV0) AEK_903D_TriggerOpenLoadInPlayDetection(DEV0) AEK_903D_CheckOpenLoadInPlayDetection(DEV0)	SPC582Bxx_RLA_AEK_AUD_C1D9031 **Avas Compact** - Test Application

AEK-LCD-DT028V1

Display expansion board with resistive touch for Chorus family

Board Picture

Board features

- 2.8 “(240x320 pixel) TFT SPI LCD with resistive touch managed by an SPI touch screen controller available on the board
- PCB header connector interfacing with SPC5 MCU discovery boards
- 3.3V LDO voltage regulator for I/O signals
- 53 mm x 87 mm
- WEEE and RoHS compliant

Demonstrators

NOT AVAILABLE

Additional Products

- **STR2N2VH5** - N-channel 20 V, 0.025 Ohm typ., 2.3 A STripFET H5 Power MOSFET
- **LD1117S33TR** - Adjustable and fixed low drop positive voltage regulator

Component & Key Primitives

AEK-LCD-DT028V1 Component RLA

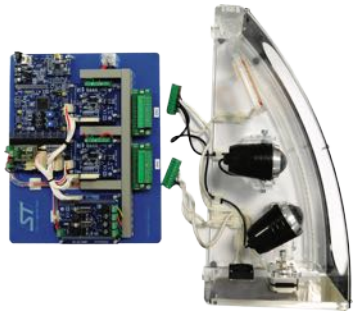
- **Reset the LCD Touch in order to detect a new touch**
  AEK_LCD_set_touchFeedback(…)
- **Detect if LCD touch has been touched**
  AEK_LCD_get_touchFeedback(…)
- **Draw a line**
  AEK_ILI9341_drawLine(…)
- **Clear the screen**
  AEK_ILI9341_clearScreen(…)
- **Draw a string**
  AEK_ILI9341_drawstring(…)

Demos available on SPC58

- SPC58ECxx_RLA AEK-LCD-DT028V1 **LCD Touch -** Test Application
- SPC582Bxx_RLA AEK_LCD_DT028V1 **1LCD NO touch -** Test Application
- SPC582Bxx_RLA AEK_LCD_DT028V1 **1LCD touch -** Test Application

AEK-CON-AFLVIP2

Automotive-grade adaptive front lighting connector board with VIPower board slot

Board Picture	Key Product features
	**NOT APPLICABLE**
Demonstrators	**Additional Products**
• **AEKD-AFL001** AutoDevKit adaptive front lighting kit • **AEKD-AFLPANEL1** Adaptive Front Light testing and prototyping kit on plexiglass panel 	• **VNx7xxx –** High-side driver
Component & Key Primitives	**Demo available**
NOT APPLICABLE	**NOT AVAILABLE**

AEK-CON-BSPOTV1

Automotive-grade blind-spot connector

Board Picture	Key Product features
	**NOT APPLICABLE**
Demonstrators	**Additional Products**
• **AEKD-BLINDSPOTB1** Blind-spot detection simulation kit 	• **VNx7xxx –** High-side driver
Component & Key Primitives	**Demo available**
NOT APPLICABLE	**NOT AVAILABLE**

AEK-CON-C1D9031

Automotive-grade audio board connector

Board Picture	Key Product features
	**NOT APPLICABLE**
Demonstrators	**Additional Products**
AVAS KIT Including: • **AEK-MCU-C1MLIT1** • **AEK-AUD-D903V1** Engine Sound Simulator with Connector Board 	• **Sliders** for volume and acceleration • **LK112** - VREG with shutdown • **L9616** - CAN bus transceiver
Component & Key Primitives	**Demo available**
NOT APPLICABLE	**NOT AVAILABLE**

AEK-CON-5SLOTS

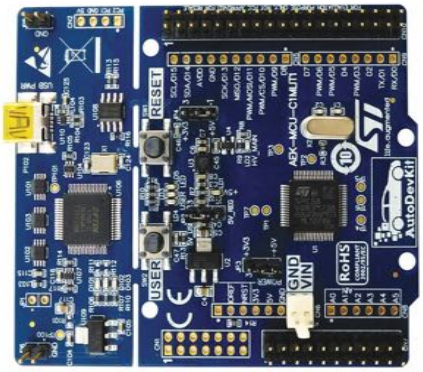
Automotive-grade generic MCU connector

Board Picture	Key Product features
	**NOT APPLICABLE**
Demonstrators	**Additional Products**
• **AEKD-AFL001** AutoDevKit adaptive front lighting kit	**NOT APPLICABLE**
Component & Key Primitives	**Demo available**
NOT APPLICABLE	**NOT AVAILABLE**

AEK-MCU-C1MLIT1

Automotive-grade MCU Discovery board featuring **SPC582B60E1** Microcontroller

Board Picture



Key Product features

- 32-bit Power Architecture technology CPU
- e200z2 single core
- Core frequency as high as 80 MHz
- Variable Length Encoding (VLE)
- 1088 KB (1024KB code + 64KB data) on-chip flash memory
- Boot assist Flash (BAF) supports factory programming
- 6x LINFlex, 4x DSPI, 7x CAN-FD
- 1x 12-bit SAR with up to 27 channels

Demonstrators

AVAS KIT Including:
- **AEK-MCU-C1MLIT1, AEK-AUD-D903V1, AEK-CON-C1D9031**

Engine Sound Simulator with Connector Board

- **AEK-AUD-C1D903V1**
  AVAS compact solution

Additional Products

- **LD39050** - 500 mA VREG
- **USBLC6-2** - Protection for USB 2.0
- **M93S46-W** - 1-Kbit serial EEPROM
- **LD1117** - Low drop adjust VREG
- **STM6315** - Microprocessor reset

Component & Key Primitives

SPC582BXX Platform Component LRA
- **Basic low-level drivers for MCU peripherals**

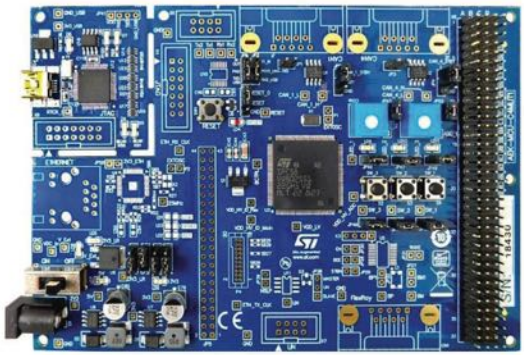
Demo available

MCU Peripherals demo available

AEK-MCU-C4MLIT1

Automotive-grade MCU Discovery board featuring **SPC58EC80E5** Microcontroller

Board Picture



Key Product features

- 32-bit Power Architecture technology CPU
- e200z420n3 dual core
- Core frequency as high as 180 MHz
- Variable Length Encoding (VLE)
- 4224 KB (4096 KB code + 128 KB data) on-chip flash memory
- Low power capabilities
- Integrated HSM for security hardware
- 18x LINFlex, 8x DSPI, 8x CAN-FD, 2x FlexRay,
- 1x Ethernet controller

Demonstrators

- **AEKD-AFL001**
  AutoDevKit adaptive front lighting kit
- **AEKD-AFLPANEL1**
  Adaptive Front Light testing and prototyping kit on plexiglass panel
- **AEKD-BLINDSPOTB1**
  Blind-spot detection simulation kit
- **AEKD-USBTYPEC1**
  USB Type-C™ and USB Power Delivery evaluation kit

Additional Products

- **STPS340** - 40 V, 3 A Schottky rectifier
- **LD1117A** - Low drop adjust VREG
- **LD1117** - Low drop adjust VREG
- **A5973AD** - Up to 1.5 A step-down
- **ST3232EB** - 15kV ESD for RS-232
- **USBLC6-2** - Protection for USB 2.0
- **M93S46-W** - 1-Kbit serial EEPROM
- **STM6315** - Microprocessor Reset

Component & Key Primitives

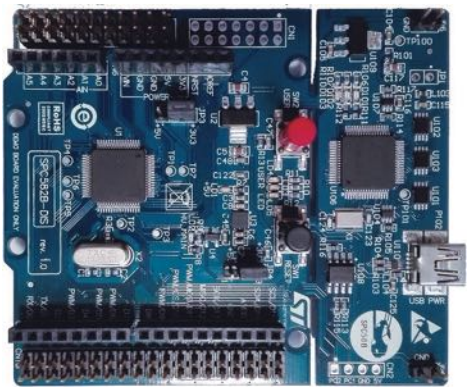
SPC582BXX Platform Component LRA
- **Basic low-level drivers for MCU peripherals**

Demo available

MCU Peripherals demo available

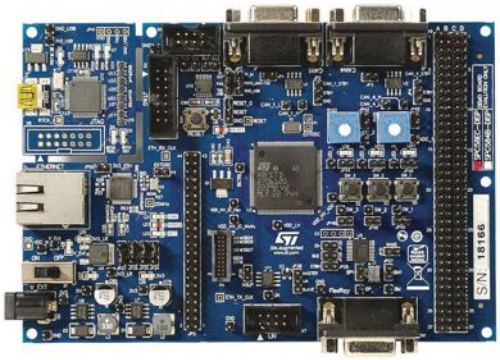
SPC582B-DIS

Automotive-grade MCU Discovery board featuring **SPC582B60E1** Microcontroller

Board Picture	Key Product features
	• 32-bit Power Architecture technology CPU • e200z2 single core • Core frequency as high as 80 MHz • Variable Length Encoding (VLE) • 1088 KB (1024KB code + 64KB data) on-chip flash memory • Boot assist Flash (BAF) supports factory programming • 6x LINFlex, 4x DSPI, 7x CAN-FD • 1x 12-bit SAR with up to 27 channels
Demonstrators	**Additional Products**
NOT AVAILABLE	• **LD39050** - 500 mA VREG • **USBLC6-2** - Protection for USB 2.0 • **M93S46-W** - 1-Kbit serial EEPROM • **LD1117** - Low drop adjust VREG • **STM6315** - Microprocessor Reset
Component & Key Primitives	**Demo available**
SPC582Bxx Platform Component LRA • **Basic low-level drivers for MCU peripherals**	**MCU Peripherals demo available**

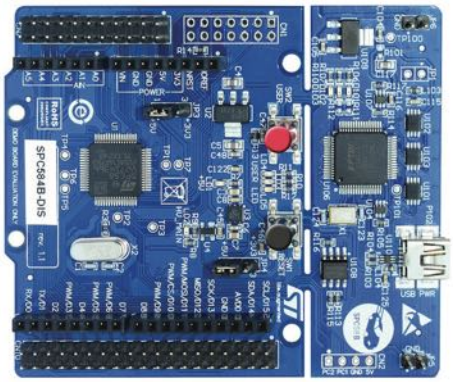
SPC58EC-DISP

Automotive-grade MCU Discovery Plus board featuring **SPC58EC80E5** Microcontroller

Board Picture	Key Product features
	• 32-bit Power Architecture technology CPU • e200z420n3 dual core • Core frequency as high as 180 MHz • Variable Length Encoding (VLE) • 4224 KB (4096 KB code + 128 KB data) on-chip flash memory • Low power capabilities • Integrated HSM for security hardware • 18x LINFlex, 8x DSPI, 8x CAN-FD, 2x FlexRay • 1x Ethernet controller
Demonstrators	**Additional Products**
NOT AVAILABLE	• **STPS340** - 40 V, 3 A Schottky rectifier • **LD1117A** - Low drop adjust VREG • **LD1117** - Low drop adjust VREG • **A5973AD** - Up to 1.5 A step-down • **ST3232EB** - 15kV ESD for RS-232 • **USBLC6-2** - Protection for USB 2.0 • **M93S46-W** - 1-Kbit serial EEPROM • **STM6315** - Microprocessor reset
Component & Key Primitives	**Demo available**
SPC58ECxxxx Platform Component LRA • **Basic low-level drivers for MCU peripherals**	**MCU Peripherals demo available**

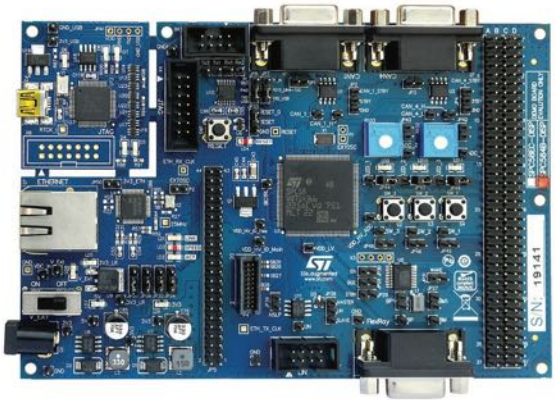
SPC584B-DIS

Automotive-grade MCU Discovery board featuring **SPC584B70E1** Microcontroller

Board Picture	Key Product features
	• 32-bit Power Architecture technology CPU • High performance e200z420 • Core frequency as high as 120 MHz • Variable Length Encoding (VLE) • 2112 KB (2048 KB code flash + 64 KB data flash) on-chip flash memory • Low power capabilities • Integrated HSM for security hardware • 14x LINFlex, 7x DSPI, 8x MCAN interfaces • 1x Ethernet controller
Demonstrators	**Additional Products**
NOT AVAILABLE	• **STPS340** - 40 V, 3 A Schottky rectifier • **LD1117** - Low drop adjust VREG • **LD39050** - Linear reg 3V3 • **ST3232EB** - 15kV ESD for RS-232 • **USBLC6-2** - Protection for USB 2.0 • **M93S46-W** - 1-Kbit serial EEPROM • **STM6315** - Microprocessor reset
Component & Key Primitives	**Demo available**
NOT APPLICABLE	**MCU Peripherals demo available**

SPC584B-DISP

Automotive-grade MCU Discovery Plus board featuring **SPC584B70E5** Microcontroller

Board Picture	Key Product features
	• 32-bit Power Architecture technology CPU • High performance e200z420 • Core frequency as high as 120 MHz • Variable Length Encoding (VLE) • 2112 KB (2048 KB code flash + 64 KB data flash) on-chip flash memory • Low power capabilities • Integrated HSM for security hardware • 14x LINFlexD, 7x DSPI, 8x MCAN interfaces • 1x Ethernet controller
Demonstrators	**Additional Products**
NOT AVAILABLE	• **STPS340** - 40 V, 3 A Schottky rectifier • **LD1117A** - Low drop adjust VREG • **LD1117** - Low drop adjust VREG • **A5973AD** - Up to 1.5 A step-down • **ST3232EB** - 15kV ESD for RS-232 • **USBLC6-2** - Protection for USB 2.0 • **M93S46-W** - 1-Kbit serial EEPROM • **STM6315** - Microprocessor reset
Component & Key Primitives	**Demo available**
NOT APPLICABLE	**MCU Peripherals demo available**

AutoDevKit
Industrial-grade Board ID Cards & Key Product

AEK-COM-BLEV1

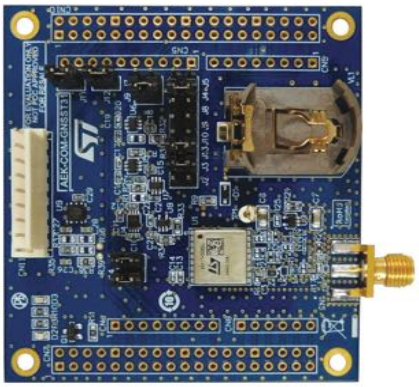
Industrial-grade Bluetooth Network Processor featuring **BlueNRG-1**

Board Picture	Key Product features
	• Compliant with Bluetooth v5.0 • Operating supply voltage: 1.7 to 3.6 V • Integrated linear regulator and DC-DC step-down converter • Ultra-low power Cortex-M0 32-bit core • Excellent RF link budget (up to 96 dB) • Up to +8 dBm available output power (at antenna connector) • 8.3 mA TX current (@ -2 dBm, 3.0 V) • Down to 1 µA current consumption with active BLE stack (sleep mode)
Demonstrators	**Additional Products**
NOT AVAILABLE	• **LDS3985** - 300 mA voltage regulator • **BALF-NRG-01D3** - 50Ω nominal input / conjugate matching balun to BlueNRG transceiver, with integrated harmonic filter
Component & Key Primitives	**Demo available on SPC58EC**
AEK-COM-BLEV1 Component RLA • **Init & get connection status** BLENRG_reset(AEK_COM_BLEV1_DEV0) BLENRG_Start_Device(AEK_COM_BLEV1_DEV0) status = getStatus() • **Add list of commands to respond to** BLENRG_Add_Cmd(commands_list, command,1) • **Decode command received** BLENRG_Decode_Command(command, counter)	• SPC58ECxx_RLA AEK_COM_BLEV1 **Test Application** Turn on LED on the board based on commands received from an APP via Bluetooth

AEK-COM-GNSST31

Industrial-grade GNSS transceiver for global positioning featuring **Teseo-LIV3F**

Board Picture



Key Product features

- Simultaneous multi-constellation
- -163 dBm tracking sensitivity
- 1.5 m CEP position accuracy
- 16 Mbit embedded Flash
- 2.1 V to 4.3 V supply voltage range
- Tiny LCC 18 pin package (9.7x10.1)
- Free Firmware configuration
- 17 µW standby current and 75 mW tracking

Demonstrators

NOT AVAILABLE

Additional Products

- **LDS3985** - 300 mA voltage regulator
- **ESDARF02-1BU2CK** - ESD Protection for high-speed Interface
- **BAT20J** - 23 V, 1 A Signal Schottky Diode

Component & Key Primitives

AEK-COM-GNSST31 Component RLA

- **Init & get connection status**
  AEK_COM_GNSST31_Reset(DEV0)
  cleanBuffer()
- **Activates the serial driver**
  AEK_COM_GNSST31_StartSerialCfg(DEV0)
- **Reading from serial port GNSS data**
  AEK_COM_GNSST31_Enable_Read(DEV0)
- **Getting the GNSS status and decoding the data**
  getStatusGNSS()
  getSpeed()
  getAltitude()
  getPosition(&position)
  getDate(&date)
  getTime(&time)

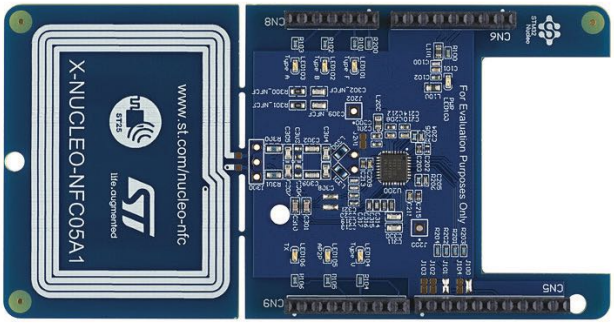
Demo available on SPC58EC

- SPC58ECxx_RLA AEK-COM-GNSST31
  Test Application for Discovery

GNSS is enabled and data from GPS read and decoded

X-NUCLEO-NFC05A1

Industrial-grade NFC board featuring **ST25R3911B**

Board Picture	Key Product features
	• ISO 18092 (NFCIP-1) Active P2P • SO14443A, ISO14443B, ISO15693 and FeliCa™ • Supports VHBR (3.4 Mbit/s PICC to PCD framing, 6.8 Mbit/s AFE and PCD to PICC framing) • Capacitive sensing - Wake-up • Automatic antenna tuning system providing tuning of antenna LC tank • AM and PM demodulator channels with automatic selection • DPO (Dynamic power output) • Transparent and stream modes to implement MIFARE™ classic compliant or other custom protocols
Demonstrators	**Additional Products**
NOT AVAILABLE	**NOT APPLICABLE**
Component & Key Primitives	**Demo available on SPC58EC**

AEK-COM-NFC05A1 Component RLA
• **Init**
st25r3911OscOn(AEK_NFC_DEVICE dev); // Oscillator On
st25r3911TxRxOn(AEK_NFC_DEVICE dev); // TX & RX On
st25r3911Initialize(AEK_NFC_DEVICE dev); // Init
st25r3911CalibrateAntenna(AEK_NFC_DEVICE dev, uint8_t *result) // Internal antenna calibration
• **Operations**
st25r3911GetNumFIFOLastBits(AEK_NFC_DEVICE dev)
st25r3911IsCmdValid(uint8_t cmd)
st25r3911ReadRegister()
st25r3911WriteRegister()
	• SPC54Bxx_RLA AEK COM NFC05A1
	Read Passive TAG

VL53L1X-SATEL

Industrial-grade Time-of-Flight (TOF) laser ranging featuring **VL53L1X**

Board Picture	Key Product features
	• Fully integrated miniature module Time-of-Flight (ToF), laser-ranging sensor • Emitter: 940 nm invisible laser (Class1) • SPAD (single photon avalanche diode) receiving array with integrated lens • Fast and accurate long-distance ranging • Up to 400 cm distance measurement • Up to 50 Hz ranging frequency • Typical full field-of-view (FoV): 27° • Programmable region-of-interest (ROI) size on the receiving array, allowing the sensor FoV to be reduced • Programmable ROI position on the receiving array
Demonstrators	**Additional Products**
NOT AVAILABLE	**NOT APPLICABLE**
Component & Key Primitives	**Demo available on SPC58EC**
AEK-SNS-VL53L1X1 Component RLA • **Init** DataInit(AEK_TOF_DEV0) StaticInit(AEK_TOF_DEV0) SetDistanceMode() SetMeasurementTimingBudgetMicroSeconds() SetInterMeasurementPeriodMilliSeconds() • **Operations** StartMeasurement(AEK_TOF_DEV0) WaitMeasurementDataReady() GetRangingMeasurementData() ClearInterruptAndStartMeasurement()	• SPC58ECxx_RLA AEK_SNS_VL53L1X1 **FULL Demo I2C SW -** Test Application (4M) • SPC58ECxx_RLA AEK_SNS_VL53L1X1 **FULL Demo Double Sensor Ranging -** Test Application (4M) • SPC58ECxx_RLA AEK_SNS_VL53L1X1 **ULD Demo Set Threshold** - Test Application (4M) • SPC584Bxx_RLA AEK_SNS_VL53L1X1 **ULD Threshold Demo** - Test Application (2M)

AEK-SNS-2TOFM1

Predefined gesture detection system based on FlightSense technology sensors

Board Picture

Key Product features

Time of Flight Sensors

- Multi-zone ranging sensor able to create a 64-zone mini depth map up to 4 m.
- All-in-one (emitter, receiver, and processor)
- System for an easy, cost effective and small footprint integration
- True distance measurement, independent of target size, color, and reflectance
- Accurate and high-speed distance measurement
- Low power consumption

Demonstrators

AEKD-TRUNKL1

Additional Products

- **SM6T36CAY** - Automotive 600 W, 30.8 V TVS in SMB
- **STS10P4LLF6** - P-channel 40 V, 0.0125Ω typ., 10 A MOSFET
- **LD39100PURY** - 1A voltage regulator
- **LD1117S50TR** - Low drop voltage regulator
- **LD1117S33TR** - Low drop voltage regulator
- **SPC582B60E1** - Single Core MCU 1MB flash
- **L9616** - High Speed CAN bus transceiver
- **ST2378ETTR** - 8-bit Dual supply ESD protection

Component & Key Primitives

AEK-SNS-VL53L1X1 Component RLA

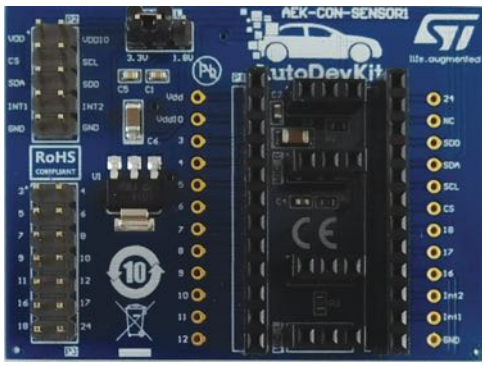
- **Initialize_TOF()**
  It initializes the sensors structures and I2C interface
- **Detect_foot()**
  Detects the event of a foot predefined path
- **getDistance(uint16_t *distance, uint8_t sensor)**
  Measure the distance between sensors and an object

Demo available on SPC58

- SPC582Bxx_RLA AEK_SNS_2TOFM1_1M_with_CAN_for_footdetection – Trunk System Control

AEK-CON-SENSOR1

Industrial-grade Connector board for SPC5 MCU discovery boards and MEMS sensor boards

Board Picture	Key Product features
	• **AIS2DW12** - Ultra-low-power 3-axis accelerometer for automotive applications • **ASM330LHH** - Automotive 6-axis inertial module: 3D accelerometer and 3D gyroscope • **IIS2ICLX** - High-accuracy, High-resolution, Low-power, 2-axis Digital Inclinometer with Embedded Machine Learning Core • **IIS3DWB** - Ultra-wide bandwidth, low-noise, 3-axis digital vibration sensor
Demonstrators	**Additional Products**
NOT AVAILABLE	• **LD1117S18 -** Low drop adjust VREG
Component & Key Primitives	**Demo available on SPC58**
AEK-CON-SENSOR1 Component RLA • **Init_mems()** it initializes the sensors structures and SPI interface • **Configure_sensor()** to configure the sensor • **Enable_interrupt_for_event()** to route an event to interrupt pin 1 or 2 • **Configure_interrupts_mode()** to choose between latched and pulsed interrupts • **Configure_freefall()** configure freefall event • **Detect_freefall()** to detect freefall event	• SPC58ECxx_RLA_AEK_CON_SENSOR1: **Detect Activity and Get Accelerations** **Detect Freefall** **Detect Tap** **Detect Wakeup and Orientation Change** • SPC582Bxx_RLA_AEK_CON_SENSOR1 **Detect Freefall** • SPC584Bxx_RLA_AEK_CON_SENSOR1 **Detect Freefall**

AutoDevKit
Third-party modules and sensors

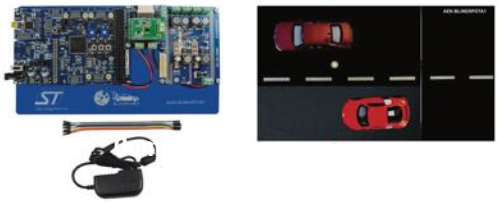
RPLIDAR A1M8

Third-party 1 dimension LIDAR module

Board Picture	Key Product features
	**NOT APPLICABLE**
Demonstrators	**Additional Products**
NOT AVAILABLE	**NOT APPLICABLE**
Component & Key Primitives	**Demo available on SPC58EC**
AEK-SNS-LIDA1M8 Component RLA • **Init** RPLIDAR_A1M8_initPlatform(AEK_SNS_LIDA1M8_DEV0,80) • **Read Data from LIDAR** RPLIDAR_A1M8_getMeasure() RPLidar_A1M8_scan(AEK_SNS_LIDA1M8_DEV0) • **Stop scanning and reset** RPLidar_A1M8_stop(AEK_SNS_LIDA1M8_DEV0) RPLidar_A1M8_coreReset(AEK_SNS_LIDA1M8_DEV0	• SPCSPC58ECxx_RLA AEK_SNS_LIDA1M8 **Test Application for Discovery** Example of receiving stream data from LIDAR device

Ratiometric Hall effect sensor

Board Picture	Key Product picture
NOT AVAILABLE	

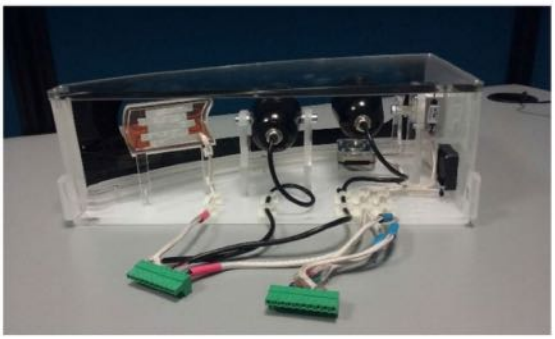
Demonstrators	Additional Products
• **AEKD-BLINDSPOTB1** Blind-spot detection simulation kit  Blindspot Educational Kit	**NOT APPLICABLE**

Component & Key Primitives	Demo available on SPC58EC
AEK Linear Hall Effect Sensor Component RLA • **Init** LinearHallADCinit(LINEAR_HALL_DEV0) • **Read the magnetic field corresponding voltage on the ADC channel 91** LinearHallADCstartConversion(LINEAR_HALL_DEV0)	• SPC58ECxx_RLA Linear_Hall_Effect_Sensor **Test Application for Discovery** Capture voltage from Hall sensor

AutoDevKit Demonstration kits

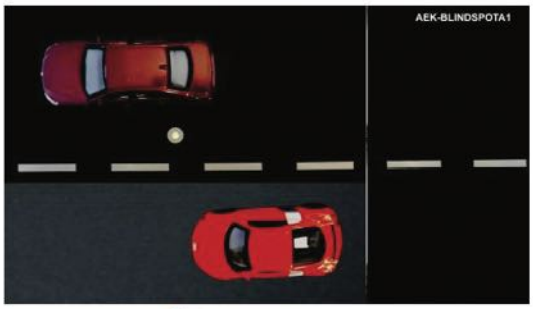
AEKD-AFLLIGHT1

Automotive-grade AFL assembly for multiple-load simulation and development purposes

Board Picture	Key Product features
	**NOT APPLICABLE**
Demonstrators	**Additional Products**
• **AEKD-AFL001** AutoDevKit adaptive front-light kit • **AEKD-AFLPANEL1** Adaptive front-light panel  Adaptive Front-Lighting User Manual UM2623	**NOT APPLICABLE**
Component & Key Primitives	**Demo available**
NOT APPLICABLE	**NOT AVAILABLE**

BLIND-SPOT SIMULATION KIT

Educational tool

AEKD-BLINDSPOTA1	AEKD-BLINDSPOTB1
	
Demonstrators	**Key Products**
• **AEKD-BLINDSPOTA1** Blind-spot detection simulation kit • **AEKD-BLINDSPOTB1** Set of assembled evaluation boards	• **SPC58EC** - 32-bit Power Architecture MCU for Automotive General Purpose Applications • **L99LD21** - High power LED driver for automotive applications • **VN7050AS** - High-side driver with MultiSense analog feedback for automotive application
Component & Key Primitives	**Boards**
NOT APPLICABLE	• **AEK-MCU-C4MLIT1** - MCU discovery board for SPC5 Chorus 4M automotive microcontroller with CAN transceivers • **AEK-LED-21DISM1** - Digitally controlled LED driver board for automotive lighting applications • **EV-VN7050AS** - VN7050AS evaluation board • **AEK-CON-BSPOTV1** - Blind-spot educational tool connector board with EV-VN7xxx connector

Watch the Video

AEKD-TRUNKL1

Power liftgate zonal ECU implemented with model-based design approach

Demonstrator front picture	Demonstrator rear picture
	

Key Products

- **SPC58EC80E5** - 32-bit Power Architecture MCU for Automotive General Purpose Applications - Chorus family
- **L99DZ200G** - Automotive Front Door device with LIN and HS-CAN providing Dual H-bridge driving
- **ST25R3916** - High performance NFC universal device and EMVCo reader
- **AIS2DW12** - MEMS digital output motion sensor: ultra-low-power 3-axis accelerometer for automotive applications
- **L99LD21** - High power LED driver for automotive applications
- **FDA903D** - 1 x 45 W class D digital input automotive power amplifier

- **AEK-MCU-C4MLIT1** - MCU discovery board for SPC5 Chorus 4M automotive microcontroller with CAN transceivers
- **AEK-MOT-TK200G1** - Power liftgate controller board based on L99DZ200G multioutput driver
- **AEK-SNS-2TOFM1** - Predefined gesture detection system based on FlightSense technology sensors
- **X-NUCLEO-NFC06A1** - NFC card reader expansion board based on ST25R3916 for STM32 and STM8 Nucleos
- **AEK-CON-SENSOR1** - Connector board for SPC5 MCU discovery boards and MEMS sensor boards in DIL 24 socket
- **AEK-LCD-DT028V1** - Display expansion board with resistive touch for Chorus family
- **AEK-LED-21DISM1** - Digitally controlled LED driver board for automotive lighting applications
- **AEK-AUD-C1D9031** - AVAS solution based on SPC582B60E1 Chorus family MCU and FDA903D Class D audio amplifier

Watch the Video

AEKD-AICAR1

Artificial neural network able to provide a car state classification

Demonstrator picture	Key Features

	• Artificial Intelligence on the edge for Automotive applications
	• Run a pre-trained neural network on a 'simple' MCU
	• Sensor accelerations analyzed on a 6 seconds time period
	• Dedicated Long-Short Term Memory (LSTM) Recurrent Neural Network for time series analysis
	• Capable to work battery operated or with 12 V supply
	• Four car state recognized by the demo:
	  • car parked or stopped
	  • car driving on normal conditions road
	  • car driving on a bumpy road
	  • car skidding or swerving

Key Products	
• **SPC58EC80E5** - 32-bit Power Architecture MCU for Automotive General Purpose Applications - Chorus family • **AIS2DW12** - MEMS digital output motion sensor: ultra-low-power 3-axis accelerometer for automotive applications	• **AEK-MCU-C4MLIT1** - MCU discovery board for SPC5 Chorus 4M automotive microcontroller with CAN transceivers • **AEK-CON-SENSOR1** - Connector board for SPC5 MCU discovery boards and MEMS sensor boards in DIL 24 socket • **AEK-LCD-DT028V1** - Display expansion board with resistive touch for Chorus family • **STEVAL-MKI206V1A** - AIS2DW12 adapter board for a standard DIL 24 socket

Watch the Video

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