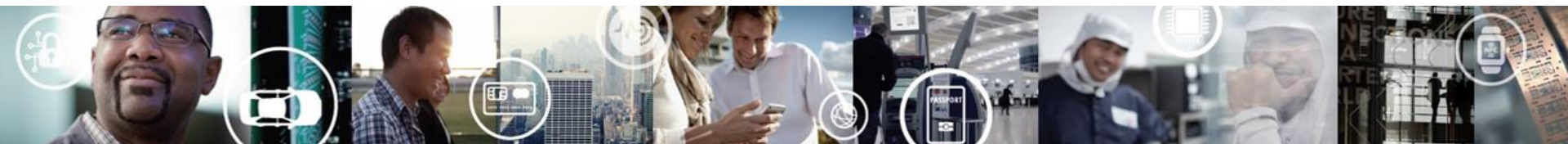


# DEVKIT-S12XE

## QUICK START GUIDE (QSG)

ULTRA-RELIABLE MCUs FOR  
INDUSTRIAL AND AUTOMOTIVE



EXTERNAL USE

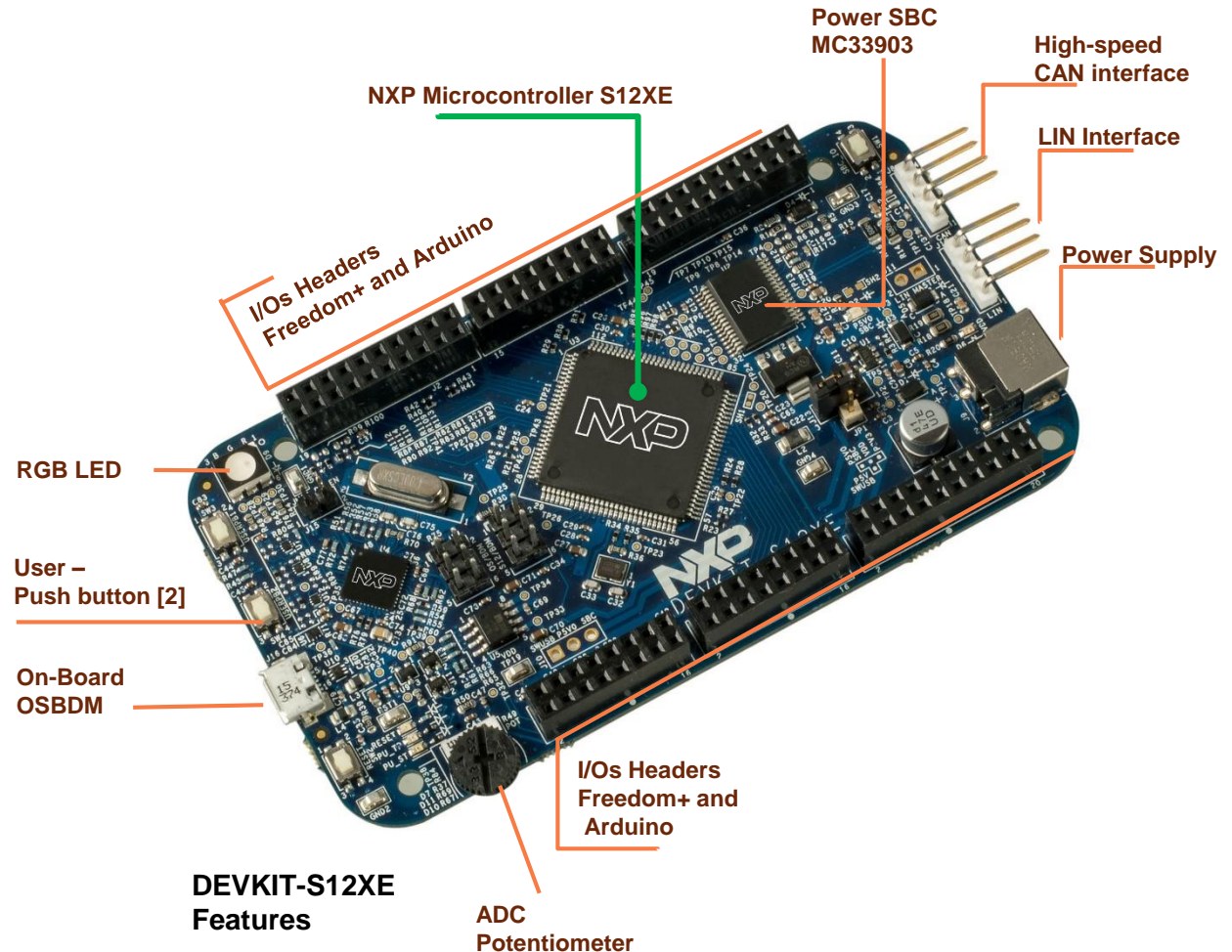


SECURE CONNECTIONS  
FOR A SMARTER WORLD

# Get to know the DEVKIT-S12XE

The DEVKIT-S12XE is an ultra-low-cost development platform for S12 Microcontrollers.

Features include easy access to all MCU I/O's, a standard-based form factor compatible with the Arduino™ pin layout, providing a broad range of expansion board options, and an USB serial port interface for connection to the IDE, the board has option to be powered via USB or an external power supply.



# Power Supply and Communications

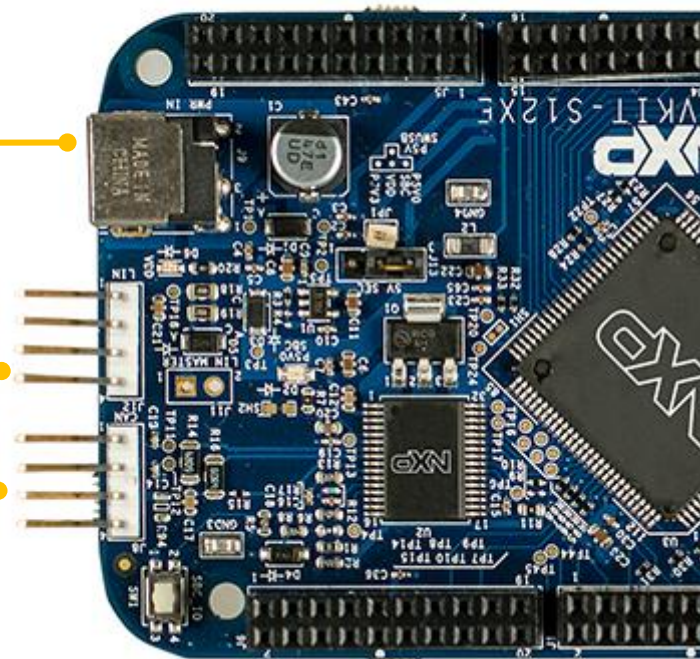
DESCRIPTION	NAME	PIN
	VBAT	J9-01
	GND	J9-02
	GND	J9-03

DESCRIPTION	NAME	PIN
	LIN	J12-01
	VBAT	J12-02
	NC	J12-03
	GND	J12-04

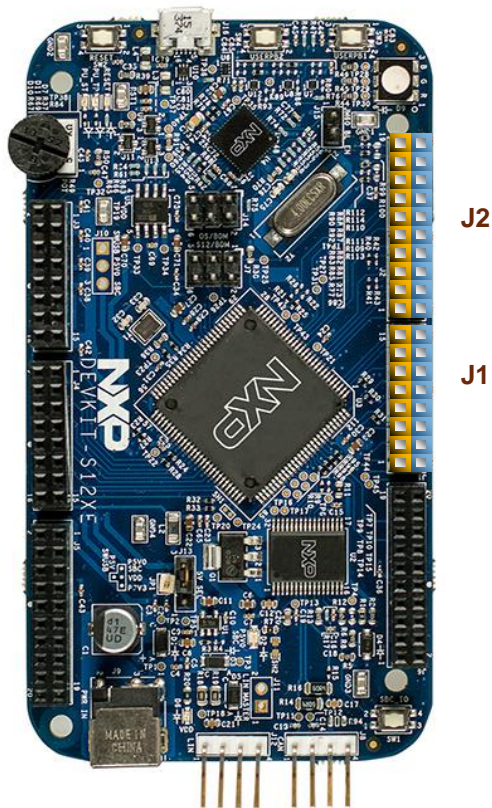
DESCRIPTION	NAME	PIN
	CANH	J8-01
	CANL	J8-02
	VBAT	J8-03
	GND	J8-04



High-speed  
CAN interface



# Input/Output Connectors



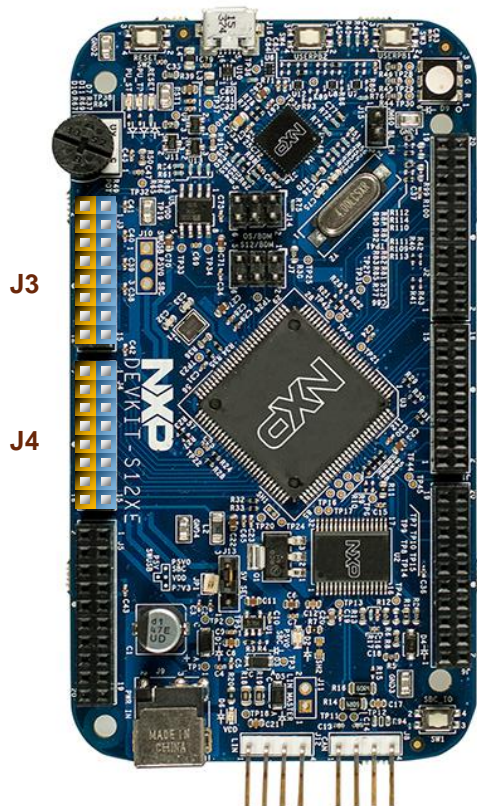
## Arduino Compatibility

The internal rows of the I/O headers on the DEVKIT-S12XE are arranged to fulfill Arduino™ shields compatibility.

PIN	PORT	FUNCTION	J1	PIN	PORT	FUNCTION
J1-01	PS0	RXD0		J1-02	PA7	GPIO
J1-03	PS1	TXD0		J1-04	PA6	GPIO
J1-05	PP7	PWM7		J1-06	PA5	GPIO
J1-07	PP6	PWM6		J1-08	PA4	GPIO
J1-09	PP5	PWM5		J1-10	PA3	GPIO
J1-11	PP4	PWM4		J1-12	PA2	GPIO
J1-13	PP3	PWM3		J1-14	PA1	GPIO
J1-15	PP2	PWM2		J1-16	PA0	GPIO
PIN	PORT	FUNCTION	J2	PIN	PORT	FUNCTION
J2-01	PP1	PWM1		J2-02	PT0	IOC
J2-03	PP0	PWM0		J2-04	PT1	IOC
J2-05	PH3	PWM5 / SPI1_SS		J2-06	PT2	IOC
J2-07	PH1	PWM2 / SPI1_MOSI		J2-08	PT3	IOC
J2-09	PH0	SPI1_MISO		J2-10	PT4	IOC
J2-11	PH2	SPI1_SCK		J2-12	PT5	IOC
J2-13	GND	GND		J2-14	PE0	GPIO
J2-15	VRH_MCU	VRH_MCU		J2-16	PE1	GPIO
J2-17	PJ6	SDA		J2-18	PE2	GPIO
J2-19	PJ7	SCL		J2-20	PE3	GPIO



# Input/Output Connectors

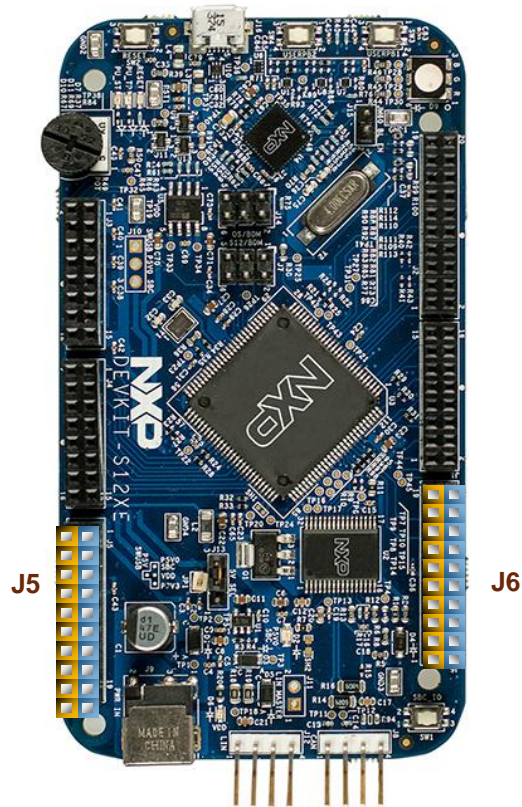


## Arduino Compatibility

The internal rows of the I/O headers on the DEVKIT-S12XE are arranged to fulfill Arduino™ shields compatibility.

PIN	PORT	FUNCTION	J3	PIN	PORT	FUNCTION
J3-02	PE7	GPIO		J3-01		VIN
J3-04	PE6	GPIO		J3-03		VDD
J3-06	PE5	GPIO		J3-05		RESET
J3-08	PE4	GPIO		J3-07		P3V3
J3-10	PK1	GPIO		J3-09		P5V0
J3-12	PK0	GPIO		J3-11		GND
J3-14	PM3	TXCAN1		J3-13		GND
J3-16	PM2	RXCAN1		J3-15		VIN
PIN	PORT	FUNCTION	J4	PIN	PORT	FUNCTION
J4-02	PB7	GPIO		J4-01	PAD0	ADC0
J4-04	PB6	GPIO		J4-03	PAD1	ADC1
J4-06	PB5	GPIO		J4-05	PAD2	ADC2
J4-08	PB4	GPIO		J4-07	PAD3	ADC3
J4-10	PB3	GPIO		J4-09	PAD4	ADC4
J4-12	PB2	GPIO		J4-11	PAD5	ADC5
J4-14	PB1	GPIO		J4-13	PAD6	ADC6
J4-16	PB0	GPIO		J4-15	PAD7	ADC7

# Input/Output Connectors

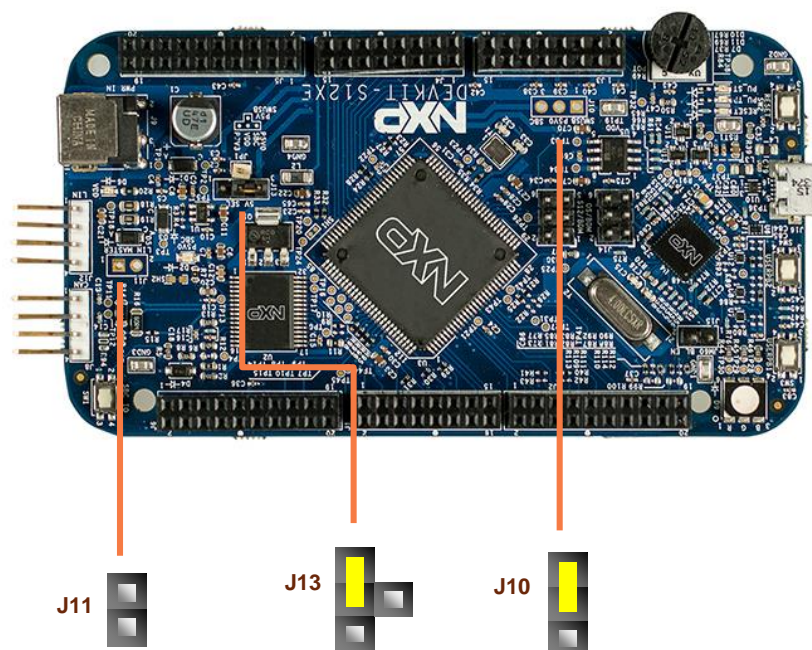


## Arduino Compatibility

The internal rows of the I/O headers on the DEVKIT-S12XE are arranged to fulfill Arduino™ shields compatibility.

PIN	PORT	FUNCTION	J5	PIN	PORT	FUNCTION
J5-02	PK2	GPIO		J5-01	PAD8	ADC8
J5-04	PK3	GPIO		J5-03	PAD9	ADC9
J5-06	PK4	GPIO		J5-05	PAD10	ADC10
J5-08	PK5	GPIO		J5-07	PAD11	ADC11
J5-10	VDD	VDD		J5-09	PAD12	ADC12
J5-12	GND	GND		J5-11	PAD13	ADC13
J5-14	PK7	GPIO		J5-13	PAD14	ADC14
J5-16	NC	NC		J5-15	PAD15	ADC15
J5-18	NC	NC		J5-17	NC	NC
J5-20	NC	NC		J5-19		SBC_SAFE
PIN	PORT	FUNCTION	J6	PIN	PORT	FUNCTION
J6-19	PH7	SPI2_SS		J6-20	NC	NC
J6-17	PH6	SPI2_SCK		J6-18	NC	NC
J6-15	PH5	SPI2_MOSI		J6-16	PM4	RXCAN2
J6-13	PH4	SPI2_MISO		J6-14	PM5	TXCAN2
J6-11	PJ1	TXD2		J6-12	GND	GND
J6-09	PJ0	RXD2		J6-10	VDD	VDD
J6-07	NC	NC		J6-08	PM6	RXCAN3
J6-05	NC	NC		J6-06	PM7	TXCAN3
J6-03	NC	NC		J6-04	NC	NC
J6-01	NC	NC		J6-02	NC	NC

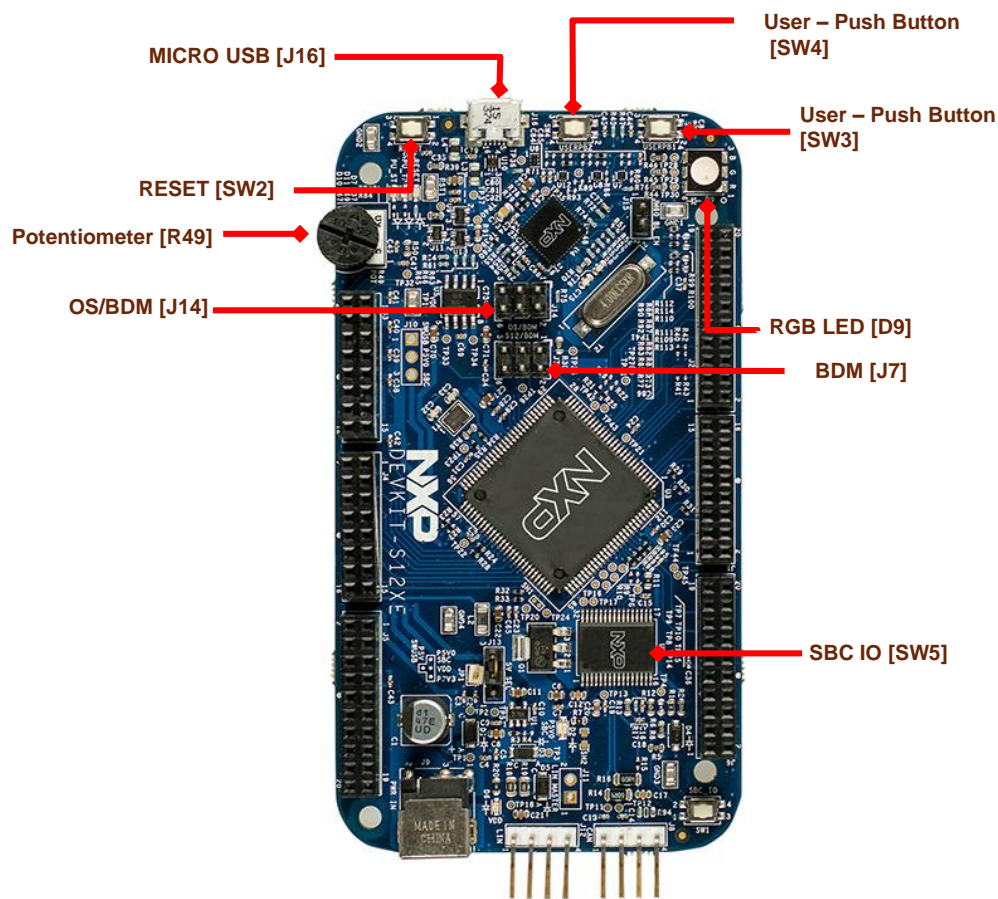
# Default jumpers



REF	POSITION	DESCRIPTION
J11	OPEN	Enable LIN Master mode
J13	1 - 2	VDD Power MCU linked to 3.3V
	2 - 3	VDD Power MCU linked to 5.0V
	[DEFAULT]	
J10	2 - JP1	VDD Power MCU linked to USB
	1 - 2	P5V0 reference is linked to P5V_SWUSB
	[DEFAULT]	P5V0 reference is linked to P5V_SBC

**CAUTION:**  
When powered from the USB bus, do not exceed the 500mA maximum allowable current drain. Damage to the target board or host PC may result.

# Programming interface and User Peripherals



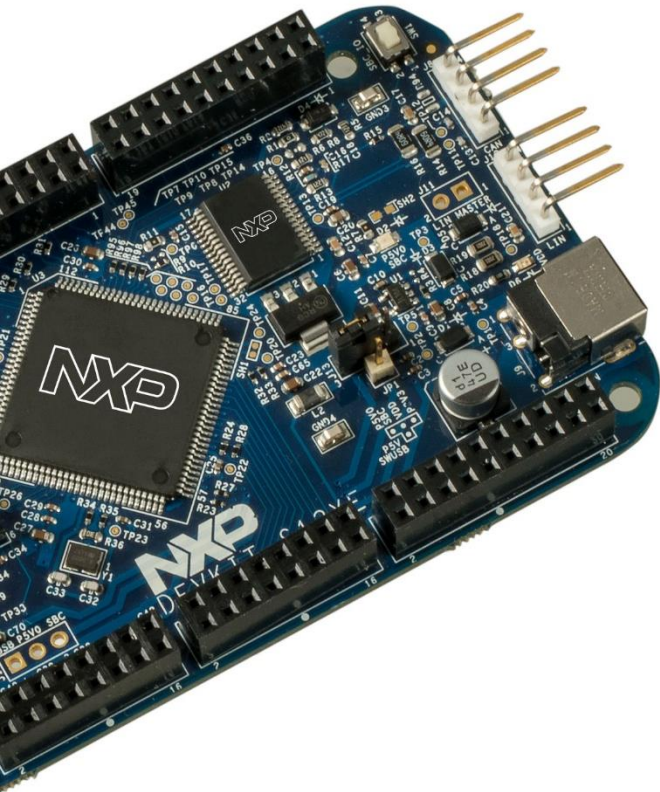
REFERENCE		MCU PORT	DESCRIPTION
Potentiometer	R49	AN0	Rotary Potentiometer
Push Button	SW1	PWRSBC	
	SW2	RESET	
	SW3	PT6	
	SW4	PT7	
LED	D2	PWRSBC	GREEN LED power Indicator
	D7	RESET	RESET LED indicator
	D9	PP3	User LED
	RGB	PP4	User LED
		PP6	User LED
	D10		
Programming and Debug Interface	D11		
	J16		On-board JTAG connection via open source OSBDM circuit using the MC9S08JM60 microcontroller
	J7		Support for USB Multilink Interface BDM





# Step-by-Step Installation Instructions

In this quick start guide, you will learn how to set up the **DEVKIT-S12XE** board and run the default exercise.



1

## Install Software and Tools

Install CodeWarrior Development Studio for S12 V5.1 or later. CodeWarrior Dev Tools for HCS12(X) MCUs

2

## Connect the USB Cable

Connect one end of the USB cable to the PC and the other end to the mini-B connector on the DEVKIT-S12XE board. Allow the PC to automatically configure the USB drivers if needed.

3

## Using the Example Project

The pre-loaded example project utilizes the RGB LED. Once the board is plugged in you can see how the RGB LEDs change the color.

4

## Learn More About the S12XE

Read the release notes and documentation on the [nxp.com/S12XE](http://nxp.com/S12XE).

- The Processor Expert graphical initialization software included in your CodeWarrior installation will help reduce your time to market
- CodeWarrior for S12 with examples

# CAUTIONARY NOTES

- Electrostatic Discharge (ESD) prevention measures should be used when handling this product. ESD damage is not a warranty repair item.
- NXP does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under patent rights or the rights of others.
- EMC Information on the DEVKIT-S12XE board:
  - This product as shipped from the factory with associated power supplies and cables, has been verified to meet with requirements of CE and the FCC as a CLASS A product.
  - This product is designed and intended for use as a development platform for hardware or software in an educational or professional laboratory.
  - Attaching additional wiring to this product or modifying the products operation from the factory default as shipped may effect its performance.

# Documentation and References

## Datasheet

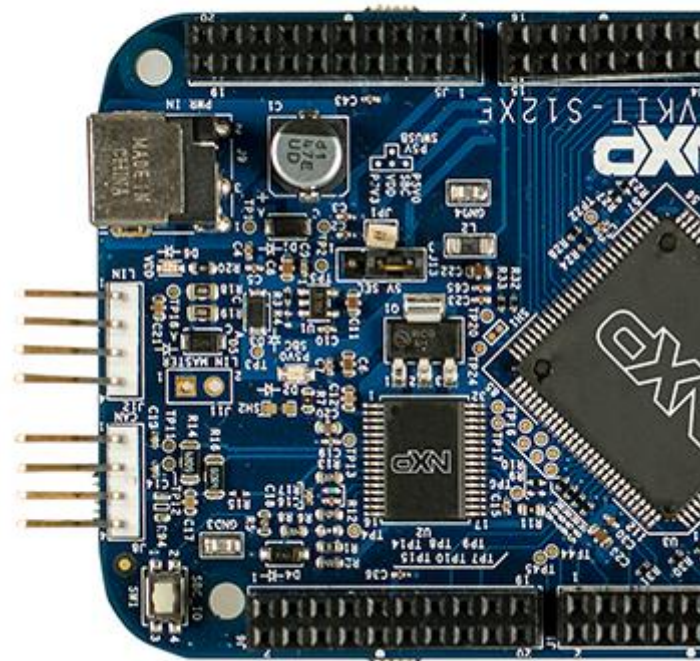
- [S12XE Family - Data Sheet](#)

## Application Notes

- [AN4731, Understanding Injection Current on Freescale Automotive Microcontrollers - Application Note \(REV 1\)](#)
- [AN4483, Emulated EEPROM Routines for the S12P Family - Application Note](#)
- [AN4258, Serial Bootloader for S12\(X\) Microcontrollers Based on 180 nm Technology - Application Note](#)

## Reference Manuals

- [S12 & S12S S12X & S12XS & S12XE Microcontrollers - Reference Manual](#)



For more information please visit : [www.nxp.com/s12xe](http://www.nxp.com/s12xe)

# Development Tools Ecosystem

## Compilers

- Codewarrior S12
- Cosmic

## IDE

- Codewarrior
- Cosmic Zap

## Programmers

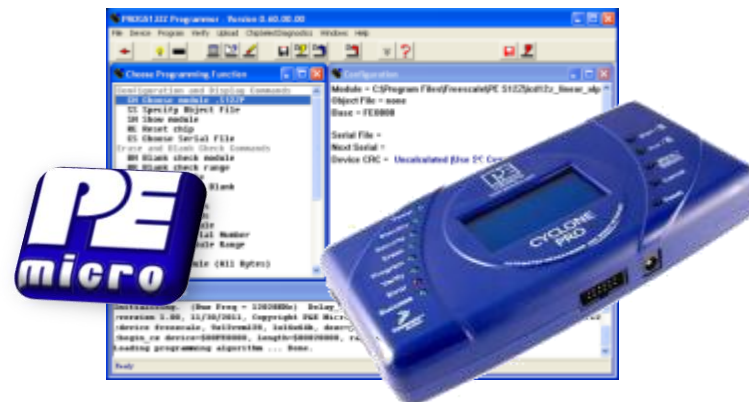
- P&E
- Cyclone Pro Programmer

## Debugger

- CW & P&E S12 Debugger
- Cosmic Zap Debugger
- iSYSTEM winIDEA

## Support Tools:

- FREEMASTER run time debugger and for instrumentation/calibration







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