S32K ISELED SOLUTION FOR AUTOMOTIVE AND INDUSTRIAL LED LIGHTING

Smart LEDs + high-speed ISELED communication protocol + S32K Arm® Cortex®-based MCU with ISELED SDK software driver

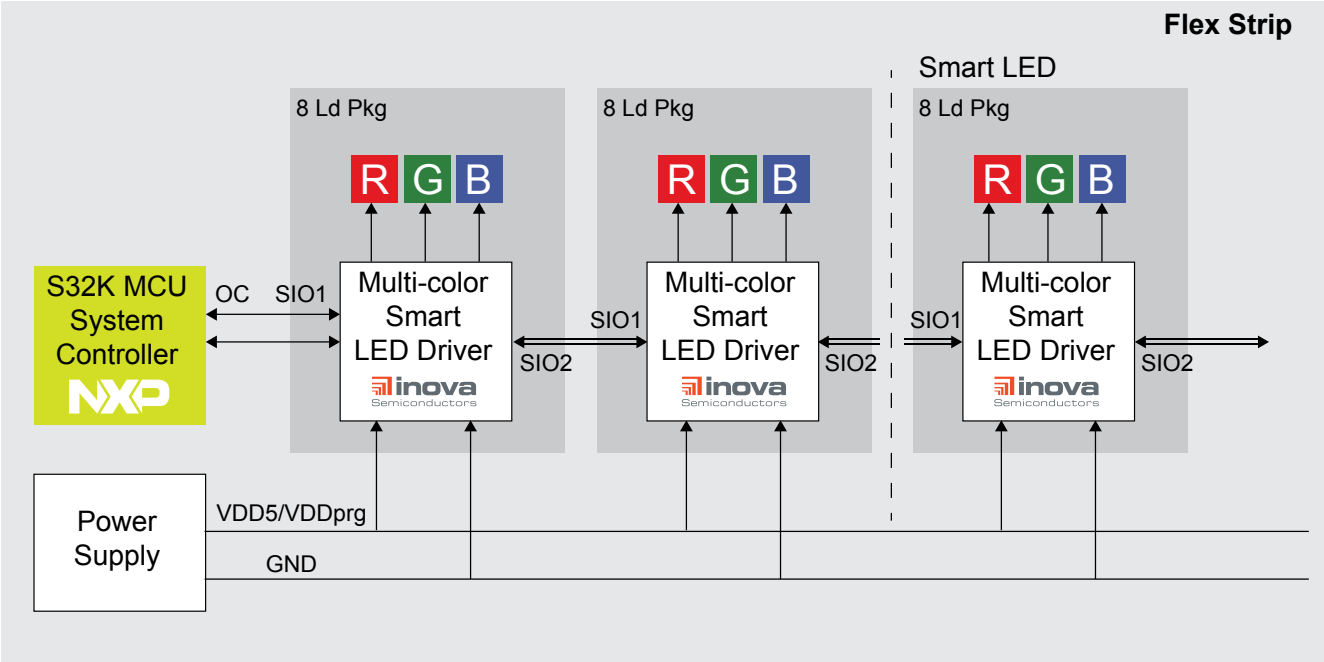
ISELED is a new communication protocol for controlling static and dynamic LED arrays in automotive and industrial lighting applications. It addresses calibration and communication issues in today's LED systems by moving the costly external processes for ensuring stable light parameters (brightness and color stability), to embedded processing in the RGB LED.

NXP's automotive-qualified S32K MCUs support the ISELED protocol with an ISELED software driver available for use with its production-grade SDK or in the AUTOSAR™ environment.

FEATURES

- Smart LED Module
  - Contains RGB LEDs + INLC100Q16 ISELED Driver IC (from Inova Semiconductor) in single package. LED pre-calibrated during manufacture with data stored in driver IC – no speed-binning or look-up table in main S32K MCU.
  - Color control using standard RGB value sent from S32K MCU. Temperature sensor for auto-compensation.
- ISELED Communication Protocol
  - Address up to 4079 LEDs at video speed.
  - Half-duplex, bi-directional 2 Mbit/s communication with low latency.
  - Single-ended communication between main control MCU and first LED. Differential communication in LED chain. Diagnostic support and optional CRC.
- S32K automotive-qualified MCUs:
  - Six Arm Cortex-M0+/M4F-based S32K1 MCU families.
  - Thirteen Arm Cortex-M7-based S32K3 MCU families.
  - Communication using FlexIO and LPSPI – fast, low CPU overhead.
  - Custom ISELED part numbers include production license for software driver.
  - Application Development Kit (ADK) S32K144 EVB, power adaptor board and 16-LED bar. Also adaptable with S32K3 EVB

ISELED LED LIGHTING PROTOCOL



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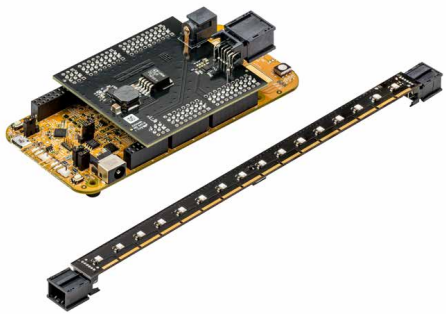
S32K-ISELED APPLICATION DEVELOPMENT KIT (ADK)

The S32K-ISELED ADK contains a standard S32K MCU sample which can only be used with the free-of-charge evaluation version of the ISELED software driver, allowing application to run in 15 minutes @ 50Hz

For production, developers should order one of the S32K ISELED part numbers below which include the full production license with unlimited driver functionality.



ISELED_ADK_D:

- S32K144EVB-Q100: M4F core, 512 KB
- ISELED power adaptor board
- 16-LED bar with Dominant Opto LEDs (Osram LED version planned)

ISELED_ADK_EXT_D:

- Single 16-LED bar for daisy-chain
  Available only from Premier/Farnell

S32K EVB compatibility with power adaptor board:

K142/4/6 EVBs = 100%
K116/8 EVBs = minor adjustments
K3 EVBs = minor adjustments
See nxp.com/S32K-ISELED

S32K MCU ISELED SOFTWARE

For S32K1, NXP provides the ISELED software driver that runs within the production-grade SDK or AUTOSAR MCAL. For S32K3, the ISELED software driver is based on Real Time Drivers (RTD), applicable for both AUTOSAR and non-AUTOSAR implementation. An application example is available via the FreeMASTER plug-in tool providing real-time data visualization and debugging.

S32K MCU ISELED PART NUMBERS

MCU Family	ISELED Part Number	Core	Flash/RAM	Package	Key Features	Ambient Temperature
S32K310	FS32K310NHTxMPAIT/R*	Arm M7	512 KB/64 KB	100MaxQFP	CAN FD, FlexIO, Standard HSE security, ISELED	-40 to 125°C
S32K311	FS32K311NHTxMPAIT/R*		1 MB/128 KB			
S32K312	FS32K312NHTxMPAIT/R*		2 MB/192 KB			
S32K314	FS32K314EHTxMPBIT/R*		4 MB/512 KB	172MaxQFP	CAN FD, FlexIO, Standard HSE security, Ethernet, ISELED	
S32K322	FS32K322EHTxMPAIT/R*		2 MB/256 KB	100MaxQFP		
S32K342	FS32K342NHTxVPAIT/R*				CAN FD, FlexIO, Standard HSE security, ISELED	
S32K342	FS32K342NHTxVPBIT/R*			172MaxQFP		
S32K344	FS32K344NHT1VPBIT/R*		4 MB/512 KB			
S32K116	FS32K116LIT0VFMT	Arm M0+	128 KB/17 KB	32QFN	48 MHz + DMA + FlexIO + ISELED	-40 to 105°C
	FS32K116LIT0VLFT			48LQFP	48 MHz + DMA + FlexIO + ISELED	
S32K118	FS32K118LIT0VLFT		256 KB/25 KB	48LQFP	48 MHz + DMA + FlexIO + ISELED	
S32K142	FS32K142UIT0VLHT	Arm M4F	256 KB/32 KB	64LQFP	112 MHz + DMA + FlexIO + ISELED	
S32K144	FS32K144UIT0VLHT		512 KB/64 KB	64LQFP	112 MHz + DMA + FlexIO + ISELED	
	FS32K144ULT0VLHT				112 MHz + DMA + FlexIO + ISELED + CAN FD + CSEc	
	FS32K144ULT0VLLT			100LQFP	112 MHz + DMA + FlexIO + ISELED + CAN FD + CSEc	
S32K146	FS32K146UIT0VLLT		1 MB/128 KB	100LQFP	112 MHz +DMA + FlexIO + ISELED	
	FS32K146ULT0VLLT				112 MHz + DMA + FlexIO + ISELED + CAN FD + CSEc	
S32K148	FS32K148UIT0VLQT		2 MB/256 KB	144LQFP	112 MHz + DMA + FlexIO + ISELED	
	FS32K148UGT0VLQT				112 MHz + DMA + FlexIO + ISELED + CAN FD + CSEc + ENET	

* Soon to be released

www.nxp.com/S32K-ISELED

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