



# Industrial and high-speed 16C UARTs

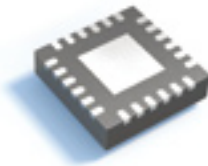
Advanced serial-interface solutions



Fastest baud rate: 5 Mbps  
SC16CxxxB



Deepest FIFO: 256 Bytes  
SC28L202



Smallest footprint: 25 mm<sup>2</sup>  
SC16CxxxBIBS

NXP UARTs offer industry-leading performance, size, and FIFO depth

## NXP UART applications

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### ▶ General datacom

Datacom controller part of LAN/WAN, step between processor and transceiver

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### ▶ Servers and concentrators

Internet access equipment: routers, high-end modems, remote-access service, modem-access equipment for ISPs Industrial: warehouse control, POS terminals, equipment control through serial connection, remote measurement Telecom and networking communications: basestations, PABX systems, serial-to-fiber optic converters, ADSL boxes, Bluetooth®-based phones, hubs, switches, WLAN/802.11 GPRS, smart phones, navigation systems

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### ▶ Computing

PC, server, POS, storage, PDAs and internet appliances, printers, scanners, fax servers, Smart Card readers

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### ▶ Appliances and terminals

Cash registers connected via serial cable to CPU, simple fixed data-entry terminals for warehouse control, card readers connected with central unit for park-house control

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### ▶ Entertainment

Midi interface on musical devices and stage equipment, data exchange and control of gambling equipment, toys, MP3, DTV, STB, projectors, digital cameras

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### ▶ Home Security

Remote control of audio equipment from central unit, light and heating control devices in homes or offices, security sensors and surveillance devices

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### ▶ Robotics

Industrial control of CNC equipment, remote sensor equipment, motor control

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### ▶ Industrial

Elevators, car-control boxes, security, medical equipment, data exchange via serial ports, lighting/gas metering, GPS

- ▶ Global supplier of a very broad portfolio
- ▶ High-performance solutions (speed, FIFO depth, baud rate)
- ▶ Focus on miniaturization (smaller packaging)
- ▶ In-house manufacturing and assembly
- ▶ Direct customer support: [interface.support@nxp.com](mailto:interface.support@nxp.com)

# NXP UARTs

NXP, an established leader as a long-term supplier in UARTs, provides innovative solutions to meet the application requirements of today and tomorrow

## Industrial UARTs

NXP, the number-one supplier of industrial UARTs, offers a broad line of single- to eight-channel devices that deliver higher baud rates, superior error handling, deeper FIFOs, improved character recognition, responsive interrupt systems, and very fast host-bus cycle times. The latest implementation of the basic NXP UART architecture, the IMPACT family, offers special features – like lower operating voltage, programmable interrupt priority, and selectable Motorola/Intel bus interfaces – that lower overall cost, speed time-to-market, and improve system performance. A single IMPACT device can be used in multiple operating systems and in multiple applications, so designers can bring several systems to market using the same high-performance, simple-to-use UART.

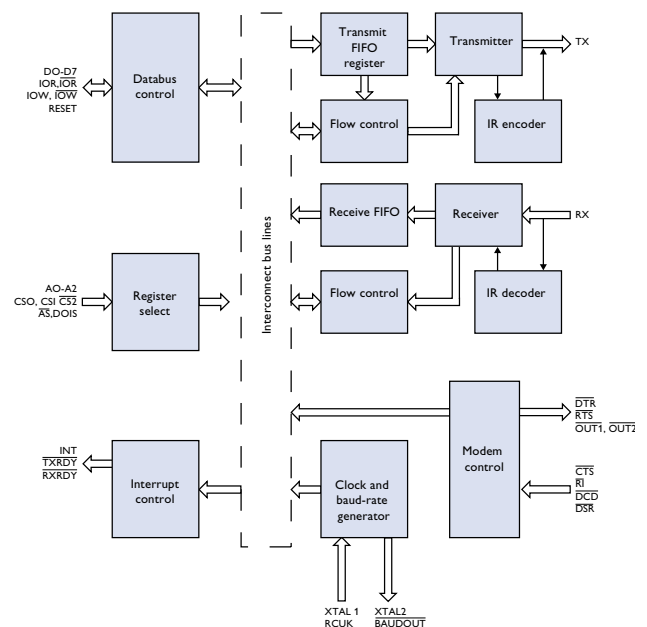
## 16C UARTs

NXP's enhanced 16C UARTs are drop-in compatible with industry-standard devices and offer added features without a price premium. The family includes CMOS-based, single- to quad-channel UARTs that support the widest supply voltage range (2.5, 3.3, and 5 V), operate within the industrial temperature range (-45 to 80 °C), deliver baud rates up to 5 Mbps, and offer bus cycle times that are up to 20% faster than traditional devices. Many are available in tiny HVQFN packages that reduce PCB space by as much as 70%. The 16C UARTs are fully compatible with Linux and Windows OS drivers, thus saving precious design time and lowering overall cost.

## Special NXP features

Both families of UARTs employ an architecture that has been carefully optimized for superior performance. Programmable channel modes increase flexibility and make diagnostics easier to run. Multi-drop support (also known as "wake-up" or "9-bit" mode) saves power and improves efficiency. Hardware handshaking uses modem control signals to control the data stream, preventing FIFO overflow without interrupting the CPU.

## Common UART architecture

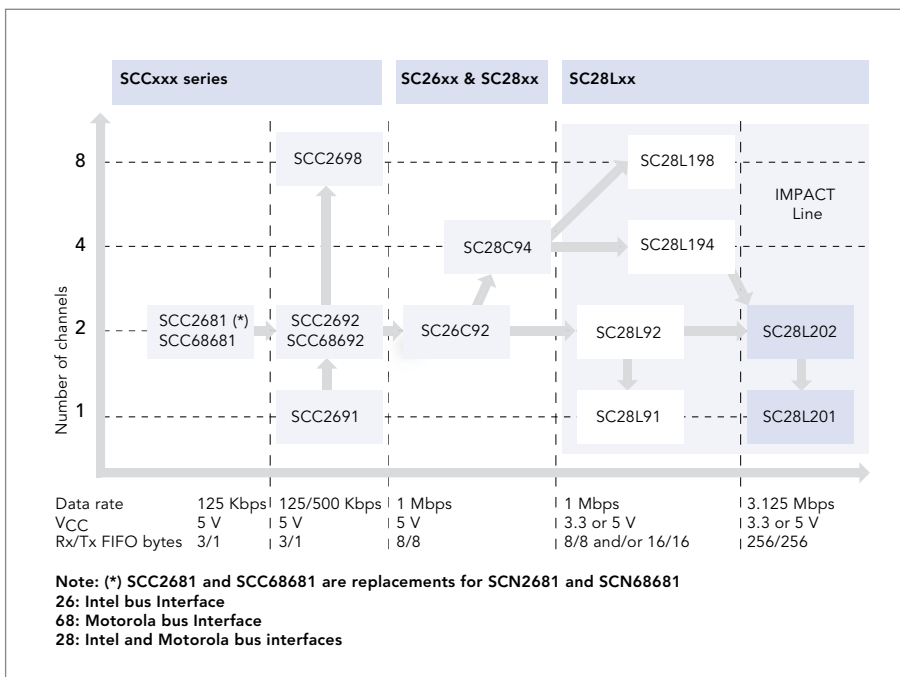


NXP UARTs are easy to design into a very broad range of applications

# NXP industrial UARTs

Features	Benefits
Broad line of single- to eight-channel UARTs	Variety of choices for different applications
Industrial-grade temperature range (-45 to 80 °C)	Rugged performance in extreme conditions
Power-down mode	Ideal for battery-operated systems
Extensive interrupt support	Reduced software overhead
Automatic RS485 half-duplex control	Reduced CPU overhead (multi-drop support)
Automatic out-band flow control	Avoids loss of data
Rx/Tx-independent with respect to speed & clock frequency	Rx/Tx can operate at different baud rates
Flexible and programmable I/O structure	Allows usage of I/O pins for general purposes
RTS/CTS (hardware) flow control signals	Prevent receiver overrun
3.3- and 5-V operating range (IMPACT family)	Broader range of applications
Motorola/Intel interfaces (IMPACT family)	Industry-standard compatibility and faster design-in
Deep FIFO	Very high data throughput

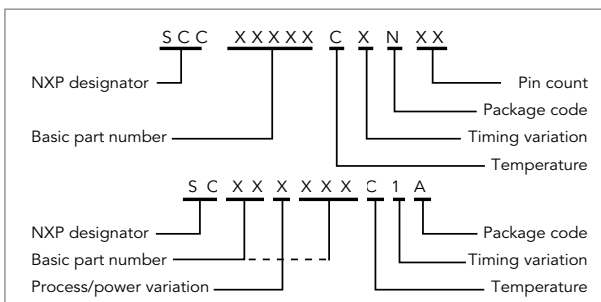
## Industrial UART family



## Added features of the IMPACT family

- ▶ Single part for multiple operating environments
- ▶ 3.3- and 5-V operation
- ▶ Compatible with Intel and Motorola bus interfaces
- ▶ FIFO depth up to 256 bytes
- ▶ Three bytes of character recognition
- ▶ Xon/Xoff in-band flow control
- ▶ Watchdog™ timer
- ▶ Character count mode
- ▶ Receiver time-out mode
- ▶ Programmable FIFO interrupt level
- ▶ Intelligent interrupt arbitration
- ▶ Real-time data error detection

## Naming conventions



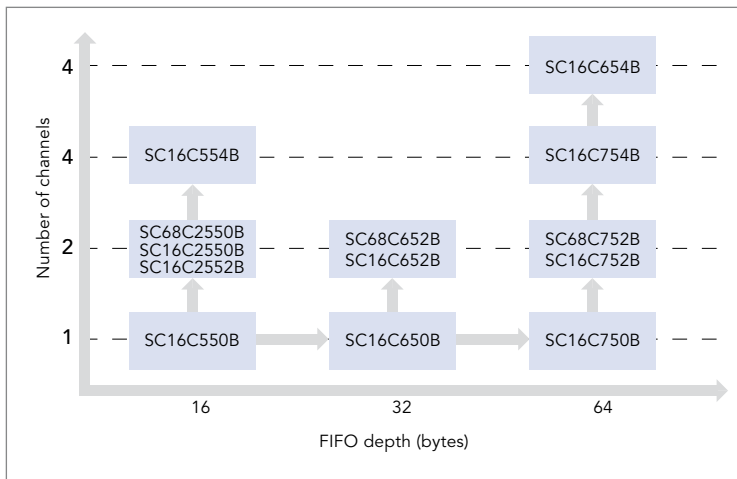
# Industrial UART selection

UART device	Comment	Channel	V <sub>cc</sub> (±10%)	Data rate at V <sub>cc</sub> (Kbps)	Rx/Tx FIFO bytes	Arbitrating interrupt	I/O pins	16-bit counter/timer	Rx/Tx FIFO counters	Rx/Tx FIFO INT trigger	Software flow control	Intel or Motorola databus interface	Power-down mode	Package	Part number (temp range 0 to 70 °C)	Part number (temp range -40 to 85 °C)
SCC2691	Single-channel version of SCC2692	1	5 V	125	3/1	Normal	2	1	No	3/1 level	No	Intel	Yes	DIL24	SCC2691AC1N24	SCC2691AE1N24
														SO24	SCC2691AC1D24	
														PLCC28	SCC2691AC1A28	SCC2691AE1A28
SC28L91	Low power, single-channel version of SC28L92	1	3.3 or 5 V	1000	16/16 or 8/8	Normal Multi-level Vectored IACK/DACK	15	1	Yes	All	No	Intel or Motorola (Pin select)	Yes	PLCC44		SC28L91A1A
														QFP44		SC28L91A1B
SC28L201	Single-channel version of SC28L202. Enhanced, faster version of SC28L91	1	3.3 or 5 V	3125	256/256	Normal Multi-level IACK/DACK I2A	16	2	Yes	All	Auto	Intel or Motorola (Pin select)	Yes	TSSOP48		SC28L201A1DGG
SCC2681	CMOS version of SCN2681	2	5 V	125	3/1	Normal	15	1	No	3/1 level	No	Intel	No	DIL28	SCC2681AC1N28	SCC2681AE1N28
														DIL40	SCC2681AC1N40	SCC2681AE1N40
														PLCC44	SCC2681AC1A44	SCC2681AE1A44
SCC68681	CMOS version of SCN68681	2	5 V	125	3/1	Normal Vectored	14	1	No	3/1 level	No	Motorola	No	DIL40	SCC68681AC1N40	SCC68681AE1N40
														PLCC44	SCC68681AC1A44	SCC68681AE1A44
SCC2681T	CMOS version of SCN2681T	2	5 V	500	3/1	Normal	15	1	No	3/1 level	No	Intel	Yes	PLCC84	SCC2681TC1A44	
SCC2692	CMOS version of SCN2681	2	5 V	125	3/1	Normal	15	1	No	3/1 level	No	Intel	Yes	DIL28	SCC2692AC1N28	SCC2692AE1N28
														DIL40	SCC2692AC1N40	SCC2692AE1N40
														PLCC44	SCC2692AC1A44	SCC2692AE1A44
														QFP44	SCC2692AC1B44	SCC2692AE1B44
SCC68692	CMOS version of SCN68681	2	5 V	125	3/1	Normal Vectored IACK/DACK	14	1	No	3/1 level	No	Motorola	Yes	DIL40	SCC68692AC1N40	SCC68692AE1N40
														PLCC44	SCC68692AC1A44	SCC68692AE1A44
SCC26C92	High-speed version of SCC2692	2	5 V	1000	8/8	Normal Multi-level	15	1	Yes	All	No	Intel	Yes	DIL40		SCC26C92A1N
														PLCC44		SCC26C92A1A
														QFP44		SCC26C92A1B
SC28L92	Low-power, faster version of SC26C92	2	3.3 or 5 V	1000	16/6 or 8/8	Normal Multi-level Vectored IACK/DACK	15	1	Yes	All	No	Intel or Motorola	Yes	PLCC44		SC28L92A1A
														QFP44		SC28L92A1B
SC28L202	Enhanced, faster version of SC28L92	2	3.3 or 5 V	3125	256/256	Normal Multi-level IACK/DACK I2A	16	2	Yes	All	Auto	Intel or Motorola (Pin select)	Yes	TSSOP56		SC28L202A1DGG
SC28C94	Enhanced quad version of SC26C92	4	5 V	1000	8/8	Normal Multi-level IACK/DACK I2A	16	2	Yes	All	No	Intel or Motorola	Yes	PLCC52		SC28C94A1A
SC28L194	Enhanced version of SC28C94	4	3.3 or 5 V	1000	16/16	Normal Multi-level IACK/DACK I2A	16	2	Yes	All	Auto	Intel or Motorola	Yes	PLCC68		SC28L194A1A
														LQFP80		SC28L194A1BE
SCC2698B	Quad version of SCC2692	8	5 V	125	3/1	Normal	32	4	No	3/1 level	No	Intel	Yes	PLCC84	SCC2698BC1A84	SCC2698BE1A84
SC28L198	Enhanced version of SCC2698B	8	3.3 or 5 V	1000	16/16	Normal Multi-level IACK/DACK I2A	32	2	Yes	All	Auto	Intel or Motorola	Yes	PLCC84		SC28L198A1A
														LQFP100		SC28L198A1BE

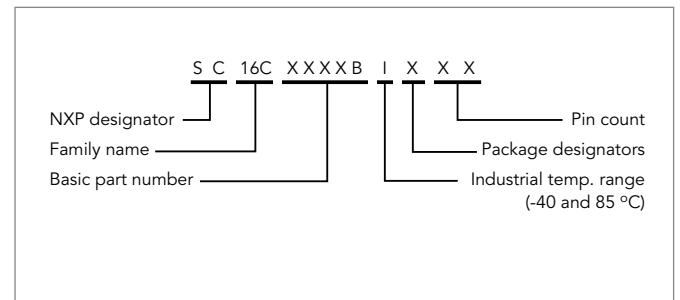
# NXP high-speed 16CxxB UARTs

Features	Benefits
Broad line of single- to quad-channel UARTs	One-stop shopping
Widest supply voltage range (2.5, 3.3, 5 V) at industrial temperature range (-40 to 85 °C) without price premium	Single part can be used for multiple systems, multiple operating environments Lower overall cost of ownership – can replace up to four competitor parts
Fastest devices on the market with over 20% faster bus cycle times and baud rates up to 5 Mbps	Compatible with high-speed processors
Power-down mode	Ideal for Bluetooth applications
HVQFN and BGA package options	Ideal for battery-operated systems
Windows and Linux OS-compatible	Ideal for small, portable systems
Infrared (IrDA) interface	Simplifies software development
Software readily available	Enables wireless, short-range applications
Automatic software and hardware flow control	Shortens design cycle
DMA mode and wide variety of FIFO depths	Reduces CPU overhead and data loss
Drop-in compatibility with existing 16C devices	Increases system throughput
	Alternative manufacturing source

## 16C UART family

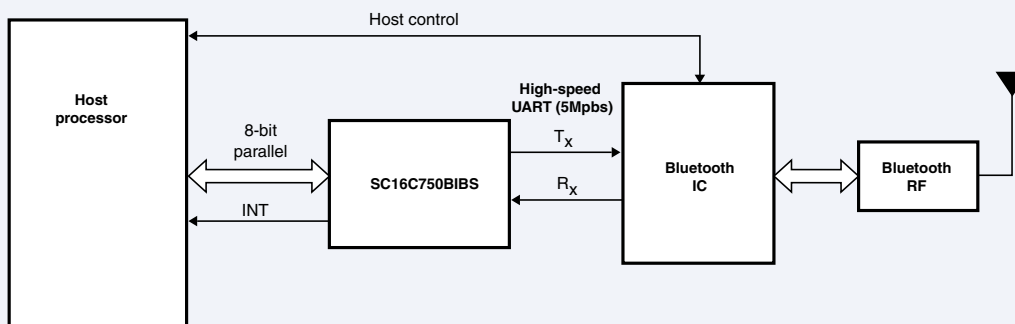


## Naming conventions



## NXP UART in a Bluetooth-enabled W-CDMA phone

### Low-voltage, high-speed Bluetooth interface



- Advantages:**
- 64-byte FIFO
  - Auto flow controls
  - Low-power mode
  - Sleep mode <math><30\mu\text{A}</math>
  - HVQFN32 (5 x 5 x 0.85 mm)
  - Enhanced features

# 16C UARTs with Intel databus interface

UART device	Channel	V <sub>cc</sub> (±10%)	Data rate at 5/3.3/2.5 V (Mbps)	Rx/Tx FIFO bytes	IrDA	I/O pins	Rx/Tx FIFO INT trigger	RTS/CTS flow control	Software flow control	Power-down mode	Package	Part number (temp range -40 to 85 °C)
SC16C550B	1	2.5-5.5 V	3.0/2.0/1.0	16	No	81	Four levels/None	Yes	No	No	PLCC44	SC16C550BIA44
											LQFP48	SC16C550BIB48
											DIP40	SC16C550BIN40
											HVQFN32	SC16C550BIBS
SC16C650B	1	2.5-5.5 V	3.0/2.0/1.0	32	Yes	81	Four levels/ Four levels	Yes	Yes	Yes	PLCC44	SC16C650BIA44
											LQFP48	SC16C650BIB48
											HVQFN32	SC16C650BIBS
											DIP40	SC16C650BIN40
SC16C750B	1	2.5-5.5 V	3.0/2.0/1.0	16 or 64	No	81	Four levels/ None	Yes	No	Yes	PLCC44	SC16C750BIA44
											LQFP64	SC16C750BIB64
											HVQFN32	SC16C750BIBS
SC16C2550B	2	2.5-5.5 V	5.0/5.0/3.0	16	No	142	Four levels/None	No	No	No	PLCC44	SC16C2550BIA44
											LQFP48	SC16C2550BIB48
											DIP40	SC16C2550BIN40
											HVQFN32	SC16C2550BIBS
SC16C2552B	2	2.5-5.5 V	5.0/5.0/3.0	16	No	142	Four levels/None	No	No	No	PLCC44	SC16C2552BIA44
SC16C652B	2	2.5-5.5 V	5.0/5.0/3.0	32	Yes	142	Four levels/ Four levels	Yes	Yes	Yes	LQFP48	SC16C652BIB48
											HVQFN32	SC16C652BIBS
SC16C752B	2	2.5-5.5 V	5.0/5.0/3.0	64	No	142	Programmable	Yes	Yes	Yes	LQFP48	SC16C752BIB48
											HVQFN32	SC16C752BIBS
SC16C754B	4	2.5-5.5 V	5.0.5.0/3.0	64	No	243	Programmable	Yes	Yes	Yes	PLCC68	SC16C754BIA68
											LQFP80	SC16C754BIB80
											LQFP644	SC16C754BIBM
SC16C554B	4	2.5-5.5 V	5.0/5.0/3.0	16	No	243	Four levels/None	Yes	No	No	LQFP64	SC16C554BIA68
											LQFP64	SC16C554BIB64
											LQFP80	SC16C554BIB80
											HVQFN48	SC16C554BIBS
											LQFP644	SC16C554BIBM
SC16C654B	4	2.5-5.5 V	5.0.5.0/3.0	64	Yes	243	Four levels/ Four levels	Yes	Yes	Yes	LQFP64	SC16C654BIB64
											LQFP64	SC16C654BIB64
											LQFP644	SC16C654BIBM
											LFBGA64	SC16C654BIEC
											HVQFN48	SC16C654BIBS

# 16C UARTs with Motorola databus interface

SC68C2550B	2	2.5-5.5 V	5.0/5.0/3.0	16	No	142	4 Levels/None	No	No	No	LQFP48	SC68C2550BIB48
SC68C652B	2	2.5-5.5 V	5.0/5.0/3.0	32	Yes	142	4 Levels/4 Levels	Yes	Yes	Yes	LQFP48	SC68C652BIB48
SC68C752B	2	2.5-5.5 V	5.0/5.0/3.0	64	No	142	Programmable	Yes	Yes	Yes	LQFP48	SC68C752BIB48
SC16C554B	4	2.5-5.5 V	5.0/5.0/3.0	16	No	243	4 Levels/None	Yes	No	No	PLCC68	SC16C554DBIA68
SC16C654B	4	2.5-5.5 V	5.0.5.0/3.0	64	Yes	243	4 Levels/4 Levels	Yes	Yes	Yes	PLCC68	SC16C654BIA68

- Note 1: Six of these pins might be used for control signaling, such as RTS, DTR, CTS, DSR, RI, CD. HVQFN package only has 5 I/O pins
- Note 2: Twelve of these pins might be used for control signaling, such as RTS, DTR, CTS, DSR, RI, CD. HVQFN package only has 6 I/O pins
- Note 3: All of these pins might be used for control signaling, such as RTS, DTR, CTS, DSR, RI, CD. HVQFN package has only 12 I/O pins
- Note 4: "LQFP64 small" is 7 x 7 mm versus conventional LQFP 10 x 10 mm



# 16C competitive cross-reference

Number of channels	FIFO number bytes	Temperature	Package	NXP	Exar	Texas Instruments	National Semiconductor		
1	0	Commercial	DIP40	SC16C550BIN40	ST16C450CP40	TL16C450N	--		
		Industrial			ST16C450IP40	--	--		
		Commercial	PLCC44	SC16C550BIA44	ST16C450CJ44	TL16C450FN	--		
		Industrial			ST16C450IJ44	--	--		
	16	0	Commercial	LQFP48	SC16C550BIB48	ST16C450CQ48	--	--	
			Industrial			ST16C450IQ48	--	--	
			Commercial	DIP40	SC16C550BIN40	ST16C550CP40	TL16C550CN	PC16550DN	
			Industrial			ST16C550IP40	--	--	
		16	Commercial	PLCC44	SC16C550BIA44	ST16C550CJ44	TL16C550CFN	PC16550DV	
			Industrial			ST16C550IJ44	TL16C550CIFN	--	
			Commercial	LQFP48	SC16C550BIB48	--	TL16C550CPT/DPT	--	
			Industrial			--	TL16C550CIPT/DIPT	--	
	32	0	Commercial	LQFP48	SC16C550BIB48	ST16C550CQ48	TL16C550CPFB	--	
			Industrial			ST16C550IQ48	--	--	
		32	Industrial	DIP40	SC16C650BIN40	ST16C650AIP40			
			Commercial	LQFP48	SC16C650BIB48	ST16C650ACQ48			
	64	0	Industrial			ST16C650AIQ48			
			Commercial	PLCC44	SC16C650BIA44	ST16C650ACJ44			
		64	Industrial			ST16C650AIJ44			
			Commercial	PLCC44	SC16C750BIA44	--	TL16750FN	--	
2	0	Industrial	LQFP64	SC16C750BIB64	--	TL16C750IPM	--		
		Commercial			--	TL16C750PM	--		
		Commercial	DIP40	SC162550BIN40	ST16C2450CP40	--	--		
		Industrial			ST16C2450IP40	--	--		
	16	0	Commercial	LQFP48	SC162550BIB48	ST16C2450CQ48	--	--	
			Industrial			ST16C2450IQ48	--	--	
			0	Commercial	PLCC44	SC162550BIA44	XR16C2450IM48	--	--
				Industrial			ST16C2450CJ44	--	--
		16	0	Industrial			ST16C2450IJ44	--	--
				Commercial	DIP40	SC16C2550BIN40	ST16C2550CP40	--	--
			16	Industrial			ST16C2550IP40	--	--
				Commercial	LQFP48	SC16C2550BIB48	ST16C2550CQ48	--	--
	32	0	Industrial			ST16C2550IQ48	--	--	
			Commercial	PLCC44	SC16C2550BIA44	ST16C2550CJ44	--	--	
		32	Industrial			ST16C2550IJ44	--	--	
			Commercial	PLCC44	SC16C2552BIA44	ST16C2552CJ44	--	PC16552DV	
	64	0	Commercial	LQFP48	SC16C2552IJ44	--	PC16552VX		
			Industrial			--	--		
		64	Industrial	LQFP48	SC16C752BIB48	--	TL16C752BPT	--	
			Commercial			--	--		
4	0	Commercial	PLCC68	SC16C554BDIA68	ST16C454CJ68	--	--		
		Industrial			ST16C454IJ68	--	--		
		Commercial	PLCC68		ST66C454CJ68	--	--		
		Industrial			ST66C454IJ68	--	--		
	16	0	Commercial	LQFP80	SC16C554IB80	--	TL16C544APN/APN	--	
			Industrial			--	TL16C544IPN/AIPN	--	
			Commercial			--	--	--	
			Commercial	PLCC68	SC16C554BDIA68	ST16C544DCJ68	TL16C544FN/ TL16C554AFN	--	
		16	0	Industrial			ST16C544DIJ68	TL16C554IFN/ TL16C554AIFN	--
				Commercial			ST68C554DCJ68	--	--
			16	Industrial			ST68C544DIJ68	--	--
				Commercial	LQFP64	SC16C554BIB64	ST16C544CQ64	--	--
	4	16	0	Industrial		ST16C544IQ64	--	--	
				Commercial	LQFP64	SC16554DBIB64	ST16C544DCQ64	--	--
			16	Industrial			ST16C544DIQ64	--	--
				Commercial	LQFP64	SC16C654BIB64	ST16C654CQ64	--	--
			16	Industrial			ST16C654IQ64	--	--
				Commercial	LFQP64	SC16C654BDIB64	ST16C654DCQ64	--	--
		4	16	0	Industrial		ST16C654DIQ64	--	--
					Commercial	PLCC68	SC16C654BIA68	ST16C654CJ68	--
16				Industrial			ST16C654IJ68	--	--
			Commercial	PLCC68	SC16C754BIA68	--	TL16C754BFN	--	
			Industrial	LQFP80	SC16C754BIB80	--	TL16C754BPN	--	

Note: Competitive cross-reference only. The complete listing of NXP 16C products appears on page 7.



# Application notes (industrial)

	SCC2681	SCC2681T	SCC68681	SCC2691	SCC2692	SCC68692	SCC2698B	SC26C92	SC28L91	SC28L92	SC28C94	SC28L194	SC28L198	SC28L202	SC28L201
AN405 SCN2681/SCN68681 and SCC2691 data communications	◆	◆	◆	●	◆	◆	◆	◆	◆	◆	◆			◆	●
AN410B SC2698B Octal Universal Asynchronous Receiver/Transmitter	◆	◆	◆	◆	◆	◆	●	◆	◆	◆	◆				
AN413 Using the Datacom product's on-chip oscillator	●	●	●	●	●	●	●	◆	◆	◆	◆				
AN414 SCC2692 differences from the SCN68681			◆		●	◆									
AN415 SCC68692 differences from the SCN68681			◆		◆	●									
AN421 SCC2698A differences from the SCC2698B							●								
AN462 Hardware and software verification procedure	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN4004 Electrostatic discharge protection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10251 Automatic '485' turn-around	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10313 Reduce CPU overhead with Intelligence Interrupt Arbitration (I2A) feature												◆	◆	●	●
AN10319 8051 microcontroller to UART serial interface evaluation board	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10320 Addressing migrations of SCN devices to more advanced technologies	●	●	●	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10339 UART serial interface through USB evaluation board	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10307 UART to Bluetooth interfacing	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10353 Application of UART in GPS navigation system	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10380 Ensure data integrity with real-time data error detection												◆	◆	●	●
Article Extended baud rates for SCN2681/68681, SCC2691, SCC2692/68681 and SCC2698B	◆	◆	◆	●	●	◆	●	◆							
Article Functional description of Philips arbitrating interrupt systems											●	◆	◆	◆	◆

- ◆ = Applicable
- = Recommended

# Application notes (16C)

	SC16C550B	SC16C650B	SC16750B	SC162550B	SC16B252B	SC16C652B	SC16C752B	SC16C554B	SC16C554DB	SC16C654B	SC16C654DB	SC16C754B
AN10219 Using SC16C650B to implement an IrDA interface	◆	●				◆				◆	◆	
AN10224 SC16C554B/SC16C654B ISA bus hardware interface example								●	◆	●	◆	◆
AN10249 SC16C752B/SC16C2550B ISA bus hardware interface example	◆	◆	◆	●	◆	◆	●					
AN10250 Using a Philips 16C UART to implement a simple RS-485 transmitter and receiver node	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10257 Differences between Philips SC16C devices and Philips low power SC16CxxxB devices	●	●	●	●	●	●	●					
AN10307 UART to Bluetooth interfacing	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10312 Differences between Philips 4-channel SC16C devices and Philips low power SC16CxxxB devices								●	●	●	●	●
AN10319 8051 microcontroller to UART serial interface evaluation board	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10333 SC16CXXXB baud rate deviation tolerance	◆	◆	◆	◆	◆	◆	◆					
AN10339 UART serial interface through USB evaluation board	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10353 Application of UART in GPS navigation system	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
AN10366 HVQFN application information	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	
AN10386 Baud rate calculation for NXP 16C UARTs	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

◆ = Applicable    ● = Recommended

## Differences between NXP industrial UARTs\* and NXP SC16CxxxB devices

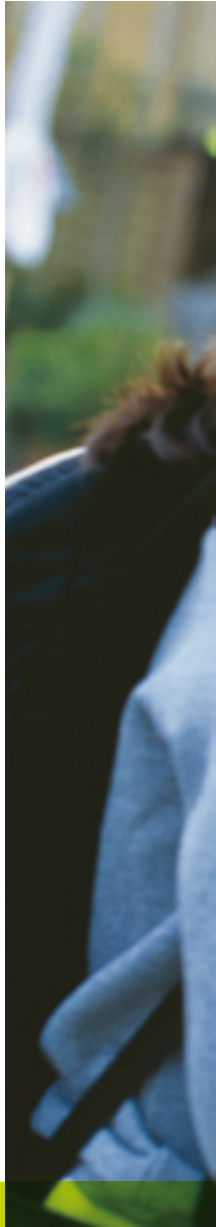
Feature	Industrial	SC16CxxxB
Supply voltage	3.3 and 5.0 V	2.5, 3.3 and 5.0 V
Temperature range	-40 to +85°C1	-40 to +85°C1
Channels	1, 2, 4, and 8	1, 2, and 4
Synchronous bus interface	Yes <sup>2</sup>	No
Independent transmit and receive baud rates	Yes	No
Maximum FIFO depth	Up to 256 bytes	64 bytes
Transmit and receive FIFOs	Yes <sup>3</sup>	Yes <sup>3</sup>
In-band (software) flow control (xon/xoff)	Yes	Yes
Out-of-band (hardware) flow control (RTS/CTS)	Yes	Yes
Multi-drop mode/RS485	Auto	Software required
Character recognition (also used for xon/xoff)	Yes	Yes
Bus cycle time (read strobe and read cycle delay)	40 ns – 125 ns	43 ns
Bus interface	Intel, Motorola, or both	Intel, Motorola, or both
Interrupt priority	Programmable	Fixed
Programmable interrupt vector format	Yes	No
IACKN and DACKN signal pins	Yes	No
Transmitter and receiver software reset	Yes	No
Independent transmitter and receiver enable/disable	Yes	No
Maximum baud rate	3.125 Mbps	5 Mbps
Receiver Watchdog timer	Yes	No
Programmable data format	5 to 8 data bits	5 to 8 data bits
Parity format	Odd, even, forced, none	Odd, even, forced, none
Number of stop bits	1, 1-1/2, or 2	1, 1-1/2, or 2
Baud rate selection	Programmable	Programmable
Parity, framing, and overrun detection	Yes	Yes
Line-break detection and generation	Yes	Yes
Automatic echo of received character	Yes	No
Local loop back	Yes	Yes
Remote loop back	Yes	No
Loop back error check	Yes	No
Programmable I/O port pins	Yes	No
Infrared IrDA interface	No	Yes
Change-of-state detection	CD, RI, CTS, DSR, and all I/O pins	CD, RI, CTS, DSR
Power-down mode	Yes <sup>4</sup>	Yes <sup>4</sup>
Clock frequency using on-chip oscillator and external crystal	Up to 16.2 MHz	Up to 24 MHz
TTL input levels	Yes	Yes
Software	Similar structures but different low-level routines	
Receiver time-out mode	Yes	Yes

\* Note: UART products falling into industrial category: SCCxxx, SC28xxx, SC26xxx, SC28Lxxx

<sup>1</sup> Industrial temperature at commercial price    <sup>2</sup> Synchronous use requires a clock from host  
<sup>3</sup> FIFO depth varies depending on UART    <sup>4</sup> Clock is shut off but register contents remain

# NXP UARTs in HVQFN -

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