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Технические характеристики

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Interfaces and Transceivers

Overview

ST's portfolio of **interfaces** includes **standard interfaces** (such as RS-232, RS-422, RS-423, RS-485, LVDS, and USB), **I/O expanders**, **level translators**, application-specific **interfaces** for smart cards and **Ethernet**, and **IO-Link Transceivers**.

RS232



Transceivers with auto-power-down, standby functions and high ESD protections.

RS485



Low-power, high speed transceivers with high protection level from 16 up to 256 nodes.

USB



Products designed for USB data (transceivers) and/or power delivery applications (battery chargers and charger detection).

Smartcard Interfaces



Asynchronous 1.8V, 3V and 5V smartcards interfaces.

I/O Expanders & Level translators



I/O expanders, Interface between multi-voltage chipsets and system I/Os.

Power Line Transceivers



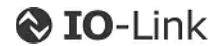
Come with an extensive toolbox that includes evaluation boards, software and certified protocol stacks, providing designers with a comprehensive development environment.

Darlington Arrays



High-voltage, high-current switch arrays containing multiple open-collector Darlington pairs or multiple Darlington transistors.

IO-Link Transceivers



IO-Link is a factory automation fieldbus-independent communication standard dedicated to connecting sensors and actuators.

Darlington Arrays

Overview

Darlington devices are high-voltage, high-current switch arrays containing multiple open-collector Darlington pairs or multiple **Darlington transistors** with common emitters, and integral suppression diodes for inductive loads. The nominal current rating of each output is 500 mA for the 7- and 8-output devices and up to 1.5 A for quad-output devices. The inputs are pinned opposite the outputs to simplify the application board layout. These devices interface **standard logic families**.

Interfaces and Transceivers/Darlington Arrays

Part Number	General Description	Package	Grade	Input Voltage Max (V) nom	Output Voltage (V) max	Output Current-Max (A) nom	Number of Devices typ	Operating Temperature (°C) min	Operating Temperature (°C) max
ULN2001	Seven Darlington Arrays	PDIP 16,SO-16	Industrial	30	50	0.5	7	-40	85
ULN2002	Seven darlington array	PDIP 16,SO-16	Industrial	30	50	0.5	7	-40	85
ULN2003	Seven Darlington Arrays	PDIP 16,SO-16,TSSOP-16L	Industrial	30	50	0.5	7	-40	85
ULN2004	Seven Darlington Arrays	PDIP 16,SO-16	Industrial	30	50	0.5	7	-40	85
ULN2064B	50 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	15	50	1.5	4	-20	85
ULN2065B	80 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	15	50	1.5	4	-20	85
ULN2068B	50 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	15	50	1.5	4	-20	85
ULN2801A	Eight Darlington Arrays	PDIP 18	Industrial	30	50	0.5	8	-20	85
ULN2802A	Eight Darlington Arrays	PDIP 18	Industrial	30	50	0.5	8	-20	85
ULN2803A	Eight Darlington Arrays	PDIP 18	Industrial	30	50	0.5	8	-20	85
ULN2804A	Eight Darlington Arrays	PDIP 18	Industrial	30	50	0.5	8	-20	85
ULQ2001	Seven darlington array	PDIP 16	Industrial	30	50	0.5	7	-40	105
ULQ2003	Seven Darlington array	PDIP 16,SO-16	Automotive,Industrial	30	50	0.5	7	-40	105
ULQ2004	Seven darlington array	PDIP 16,SO-16	Industrial	30	50	0.5	7	-40	105
ULQ2801	Eight Darlington array	PDIP 18	Industrial	30	50	0.5	8	-40	85
ULQ2802	Eight Darlington array	PDIP 18	Industrial	30	50	0.5	8	-40	85
ULQ2803	Eight Darlington array	PDIP 18	Industrial	30	50	0.5	8	-40	85
ULQ2804	Eight Darlington array	PDIP 18	Industrial	30	50	0.5	8	-40	85
ULN2066B	50 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	30	50	1.5	4	-20	85
ULN2067B	80 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	30	80	1.5	4	-20	85
ULN2069B	80 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	15	80	1.5	4	-20	85
ULN2074B	50 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	30	50	1.5	4	-20	85
ULN2075B	80 V - 1.5 A quad Darlington switches	PDIP 16	Industrial	60	80	1.5	4	-20	85

I/O Expanders and Level Translators

Overview

ST's **Xpander family** of general-purpose input/output port expanders are used to interface digital ASICs via a two-line bidirectional bus (I²C).
ST's dual-supply **level translators** are used as interface between multi-voltage chipsets and system I/Os, ranging from 5.5 V down to 1.2 V.

A companion device that expands:

- Input/output capability
- Control capability
- Mixed signal capability



Interfaces and Transceivers / I/O Expanders and Level Translators/Level Translators

Part Number	General Description	Package	Number of Bits Supported nom	Supply Voltage (V) min	Supply Voltage (V) max	Device Speed (tpd) (ns) nom	Vi Range
ST2378E	8-bit Dual supply 1.71 V to 5.5 V level translator with I/O VCC +/-15 kV ESD protection	TSSOP-20	8	1.71	5.5	15	0 to Vcc

IO-Link Transceivers

Overview

IO-Link is a Factory Automation fieldbus-independent communication standard dedicated to connecting sensors and actuators as described in the IEC 61131-9 standard. Easily integrated with any of the most commonly used communication protocols found in factory automation systems through dedicated interfaces or bridges, it is a simple solution for extending existing networks to connect remote sensors and actuators. Developers will take full advantage of the Industry 4.0 or Industrial Internet of Things (IIoT) concept where every sensor and associated data point is used to control and optimize even the most complex industrial processes in real time.

ST's and enable a master and device solution for IO-Link and general-purpose (SIO-mode) transceivers via a single 3-wire connection (PHY2) supporting COM1 (4.8 kbaud), COM2 (38.4 kbaud) and COM3 (230.4 kbaud) modes.

The half-bridge output stages can be configured as high-side, low-side or push-pull for maximum design flexibility. The two ICs meet all the remote service, standardization, functionality verification, diagnostics and monitoring requirements of the latest sensors and actuators and are suitable for all automation systems.



Key Features

Wide application spectrum

- Wide supply voltage range: 18 to 32.5 V (L6360), 7 to 36 V (L6362A)
- High output current capability: up to 500 mA (L6360), 220 mA (L6362A)

Maximum design flexibility

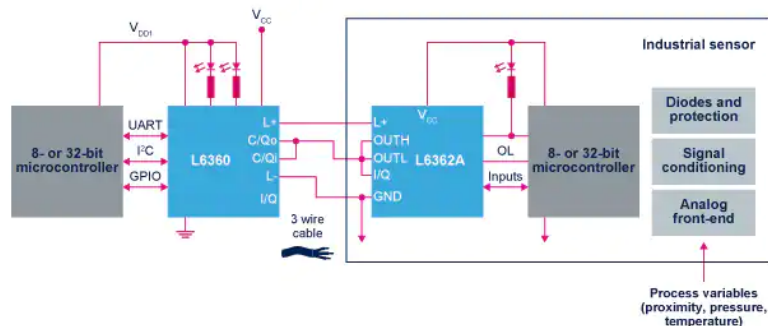
- Selectable output stage: high-side, low-side, and push-pull
- Easy access and full configurability in I2C mode with L6360
- Selectable linear regulators: 3.3 / 5 V 50 mA (L6360), 10 mA (L6362A)

Minimum power dissipation and maximum efficiency

- Best-in-class $R_{DS(on)}$ < 1.6 Ω (L6362A), < 2 Ω (L6360)

Maximum reliability

- Full set of protection functions
- LED diagnostics sequence for fast reaction to fault conditions



Interfaces and Transceivers/IO-Link Transceivers

Part Number	General Description	Package	Digital Inputs	Supply Voltage (V) max	Supply Voltage (V) min	Supply Voltage (V) typ	Input Voltage (V) max	Output Current (A) max
L6360	IO-Link communication master transceiver IC	VDFFPN 26 3.5x5	1	32.5	18	24	36	0.5
L6362A	IO-Link communication transceiver device IC	VDFFPN 12 3X3X0.9	-	36	7	24	36	0.2
L6364	Dual channel transceiver IC for SIO and IO-Link sensor applications	FLIP CHIP CSPS0.45 17-20,VFQFPN 20 4x4x1.0	-	35	5	24	35	0.5

Isolated Interfaces

Overview

Isolate high-speed digital signals with ST's robust, reliable and flexible digital isolated interfaces.

Explore new ST digital isolators to transmit high-speed bit streams up to 100 Mbps over the isolation barrier for high-performance industrial applications working in harsh temperatures and system noise.

ST's digital isolators leverage our 6kV thick-oxide galvanic-isolation technology to transfer data between isolated domains in a variety of industrial applications, providing lifetime reliability and high-voltage protection.

STISO621: a new digital isolator outperforming conventional optical isolators

The first release, the dual-channel digital isolator, features two independent channels with Schmitt trigger inputs that ensure high noise immunity and keeps pulse distortion below 3ns. With a maximum data rate of 100Mbit/s, 6000V impulse withstand voltage (VIOTM), and 1200V maximum repeating isolation voltage (VIORM), the STISO621 ensures faster data transmission, longer lifetime, and higher reliability than conventional optical isolators.

Dedicated evaluation boards to get started

To help developers get their design to market more quickly, the lets you get started exploring the STISO family of dual-channel digital isolators.

Combining low-cost sensors and robust galvanic isolation, the integrates the and the advanced STISO621 digital isolator, with customizable turn-key firmware running on STM32 microcontroller to compute metrology and power-quality data. The sensing circuitry and PCB layout are optimized to ensure robustness against EMI, and a strong signal-to-noise ratio for high-accuracy measurement and post-processing computation.

Interfaces and Transceivers/Isolated Interfaces

Part Number	General Description	Number of Channels	Isolation Voltage (kV) max peak	V _{IOTM} (kV) max	CMTI (V/μs) min	Data Rate (Mbps) max	Supply Voltage (V) min	Supply Voltage (V) max	Package
STISO620	Dual channel digital isolator	2	1.2	4	50000	100	3	5.5	SO-8
STISO621	Dual channel digital isolator	2	1.2	6	50000	100	3	5.5	SO 8 WIDE 300,SO-8

Power Line Transceivers

Overview

Since the early 90s, ST is committed to supporting advances in **narrow-band power-line communication** (PLC) technologies that are now largely adopted by Automatic Meter Reading (AMR) and Automatic Meter Infrastructures (AMI) solutions at the heart of the Smart Grid concept.

Our large and expanding offer ranges from analog **FSK transceivers** with an integrated power-line driver to multi-core, multi-protocol, system-on-chip platforms with integrated power-line driver, analog front-end and AES encryption that support B-FSK, B-PSK, Q-PSK, 8-PSK and OFDM modulations.



The fully programmable, multi-core **STCOMET** integrates a programmable modem, the AFE, the power-line driver and the application micro-processor together with a fully-integrated smart meter SoC that embeds high-performance metrology functions.

To cope with the Smart Grid networks of the future, which will be multi-layered and multi-dimensional to manage the complexity of smart energy systems with bidirectional communication and power exchange between suppliers and consumers, the new multi-standard, programmable and ultra-low power **powerline communication platform**, along with the , provides the highest performing, lowest power solution and flexibility for modular communication architectures.

To further reduce encourage sustainable technology in Smart Homes and Buildings, ST also offers , a tiny transceiver certified to work on the KNX international building control standard that enables the integration and programming of sensors or actuators in home and building automation networks.

Evaluation boards and software, together with certified protocol stacks, provide designers with a comprehensive development environment enabling easy integration into new and existing designs and shorter time to market.

CENELEC B-certified Turnkey PLC chipset for smart-energy infrastructure

ST's new powerline communication (PLC) platform consists of the ST8500 system-on-chip that includes a powerline modem, higher layer communication stack, PLC analog front end and other peripherals along with the STLD1 companion chip that provides the line driver (power amplifier) function.

Key features and benefits:

- Fully programmable real-time 400 MHz DSP and 200 MHz ARM® 32-bit Cortex®-M4F core, to meet today's and the future's smart grid requirements
- Ultra-low power-supply consumption <100 mW in Receive mode for the highest energy efficiency operations
- Embedded AES cryptography engine, supporting up to 256-bit security key and multi-security modes to satisfy the most stringent requirements in terms of data security
- Full 500 kHz bandwidth support for the best exploitation of worldwide bandwidth (CENELEC, ARIB, FCC)
- Operating temperature range up 105 °C suitable for critical applications

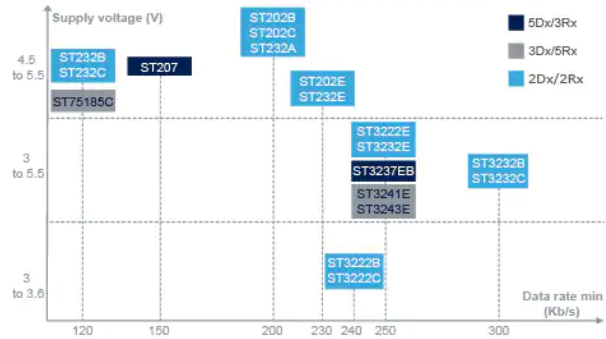
Interfaces and Transceivers/Power Line Transceivers

Part Number	General Description	Package	Communication standards supported	Data Bit Rate (Bd) typ	High-Level Output Current (Arms) typ
ST2100	Broadband powerline communication SoC optimized for audio/video streaming and consumer applications	TFBGA 373 12x12x1.0	HomePlug AV	20000000 0	-
ST7540	FSK power line transceiver	HTSSOP28	Protocol independent	4800	0.5
ST7580	FSK, PSK multi-mode power line networking system-on-chip	VFQFPN 48 7x7x1.0 mm	Protocol independent	28800	1
ST75MM	METERS AND MORE® compliant power line communication	VFQFPN 48 7x7x1.0 mm	METERS AND MORE	4800	1
ST8500	Programmable power-line communication modem system-on-chip	VFQFPN 56 7x7x1.0	Programmable PLC standards (G3-PLC, PRIME)	500000	-
STCOM	Powerline communication and application system-on-chip	TQFP 176 20x20x1.0	Programmable PLC standards (G3-PLC, PRIME, Meters and More, etc)	500000	1
STCOMET	Smart meter and powerline communication system-on-chip	TQFP 176 20x20x1.0	Programmable PLC standards (G3-PLC, PRIME, Meters and More, etc)	500000	1
STKNX	Miniature KNX transceiver with voltage regulators	QFN-24L	KNX	9600	-
STLD1	Power-line communication dual line driver	QFN-24L	Suitable for CENELEC, FCC, ARIB regulations	-	1
ST7538Q	FSK power line transceiver	TQFP 44 10x10x1.4	Protocol independent	4800	0.25

RS-232

Overview

The **RS-232** family includes **transceivers** with auto-power-down and standby functions, multi-channel interfaces and driver/receiver circuits. These devices have a 5 V supply or a 3 V to 5 V supply and are ESD protected enabling true **RS-232** performance.



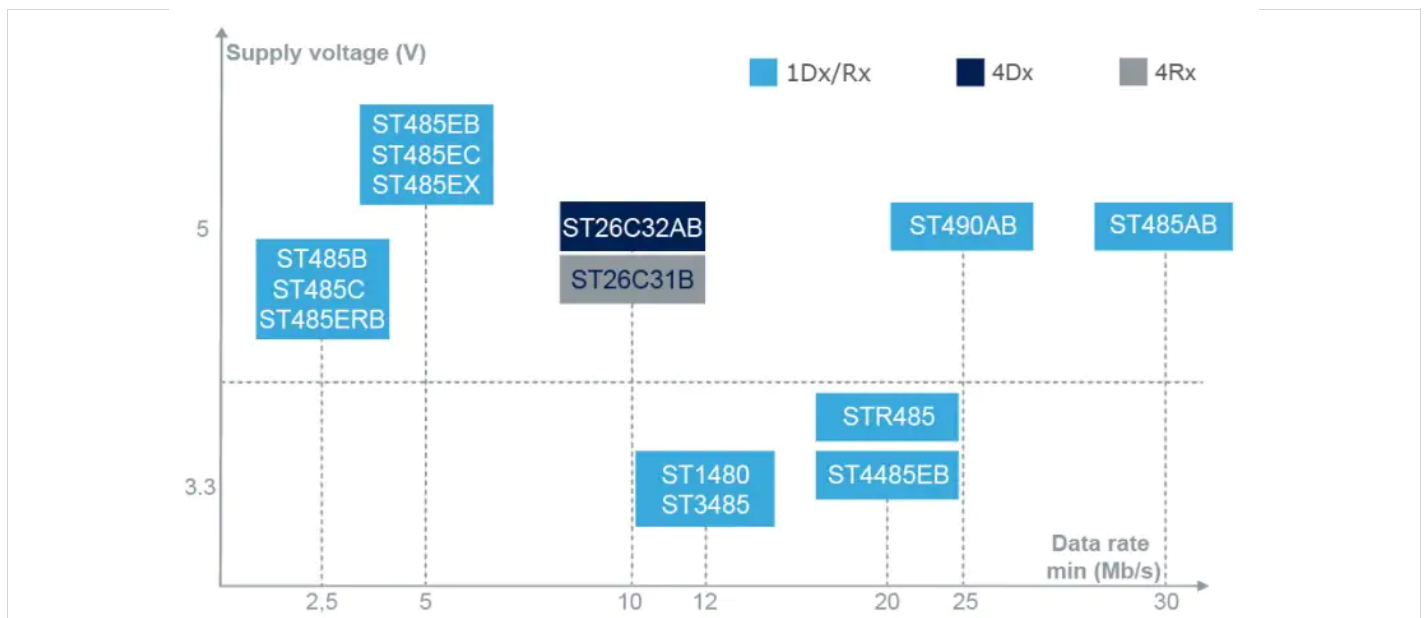
Interfaces and Transceivers/RS-232

Part Number	General Description	Number of Drivers typ	Number of Receivers typ	Supply Voltage (V) min	Supply Voltage (V) max	Data Rate (kbps) min	Data Rate (kbps) nom	Current Consumption (Icc) (mA) typ	Current Consumption (Icc) (mA) max	ESD: HBM Minimum (V) nom	IEC 61000-4-2 (kV) min	Operating Temperature (°C) min	Operating Temperature (°C) max	Features	Package
ST202B	5V powered multi-channel RS-232 drivers and receivers	2	2	4.5	5.5	200	400	1.5	4	1500	-	-40	85	4 x 0.1uF external caps	SO-16,TSSOP-16L
ST202C	5V POWERED MULTI-CHANNEL RS-232 DRIVERS AND RECEIVERS, [0oC, 70oC] TEMPERATURE RANGE	2	2	4.5	5.5	200	400	1.5	4	1500	-	0	70	4 x 0.1uF external caps	SO-16
ST202EB	15KV ESD PROTECTED 5V RS-232 TRANSCEIVER, [-40oC, 85oC] TEMPERATURE RANGE	2	2	4.5	5.5	230	400	5	10	1500,15000	6	-40	85	-	SO-16,TSSOP-16L
ST202EC	15KV ESD PROTECTED 5V RS-232 TRANSCEIVER, [0oC, 70oC] TEMPERATURE RANGE	2	2	4.5	5.5	230	400	5	10	1500,15000	6	0	70	-	SO-16,TSSOP-16L
ST232AB	VERY HIGH SPEED, ULTRA LOW POWER CONSUMPTION 5V POWERED RS-232 DRIVERS AND RECEIVERS, [-40oC, 85oC] TEMPERATURE RANGE	2	2	4.5	5.5	200	400	1.5	4	1500	-	-40	85	-	SO-16
ST232AC	VERY HIGH SPEED, ULTRA LOW POWER CONSUMPTION 5V POWERED RS-232 DRIVERS AND RECEIVERS, [0oC, 70oC] TEMPERATURE RANGE	2	2	4.5	5.5	200	400	1.5	4	1500	-	0	70	-	SO-16
ST232B	5V POWERED MULTI-CHANNEL RS-232 DRIVERS AND RECEIVERS, [-40oC, 85oC] TEMPERATURE RANGE	2	2	4.5	5.5	120	220	5	10	1500	-	-40	85	-	SO-16,TSSOP-16L
ST232C	5V POWERED MULTI-CHANNEL RS-232 DRIVERS AND RECEIVERS, [0oC, 70oC] TEMPERATURE RANGE	2	2	4.5	5.5	120	220	5	10	1500	-	0	70	-	SO-16,SO-16W,TSSOP-16L
ST232EB	15KV ESD-protected 5 V RS-232 transceiver	2	2	4.5	5.5	230	400	5	10	1500,15000	6	-40	85	-	SO-16,TSSOP-16L
ST232EC	15KV ESD PROTECTED 5V RS-232 TRANSCEIVER, [0oC, 70oC] TEMPERATURE RANGE	2	2	4.5	5.5	230	400	5	10	1500	6	0	70	-	SO-16
ST3222B	3 TO 3.6V, LOW POWER, UP TO 400 KBPS RS-232 DRIVERS AND RECEIVERS, [-40oC, 85oC] TEMPERATURE RANGE	2	2	3	3.6	240	400	0.3	1	1999	-	-40	85	-	TSSOP-20
ST3222C	3 TO 3.6V, LOW POWER, UP TO 400 KBPS RS-232 DRIVERS AND RECEIVERS, [0oC, 70oC] TEMPERATURE RANGE	2	2	3	3.6	240	400	0.3	1	1999	-	0	70	-	TSSOP-20
ST3222EB	15KV ESD protected, 3 to 5.5V low power, up to 250kbps, RS-232 drivers and receivers	2	2	3	5.5	250	-	0.3	1	15000	8	-40	85	-	SSOP 20 7.2x5.3,TSSOP-20
ST3222EC	15KV ESD protected, 3 to 5.5V low power, up to 250kbps, RS-232 drivers and receivers	2	2	3	5.5	250	-	0.3	1	15000	8	0	70	-	SSOP 20 7.2x5.3,TSSOP-20
ST3232B	3 to 5.5V, low-power, up to 400kbs RS-232 drivers and receivers	2	2	3	5.5	300	400	0.3	2	1999,2000	-	-40	85	-	SO-16,TSSOP-16L
ST3232C	3 to 5.5V, low-power, up to 400kbs RS-232 drivers and receivers	2	2	3	5.5	300	400	0.3	2	1999,2000	-	0	70	-	SO-16,TSSOP-16L
ST3232EB	±15KV ESD protection 3 to 5.5V low power, up to 250kbps, RS-232 drivers and receivers	2	2	3	5.5	250	-	0.3	1	15000,999	8	-40	85	-	SO-16,TSSOP-16L
ST3232EC	±15kv ESD protection 3 to 5.5V low power, up to 250kbps, RS-232 drivers and receivers	2	2	3	5.5	250	-	0.3	1	1500,15000	8	0	70	-	SO-16,TSSOP-16L
ST3237EB	15KV ESP PROTECTED 3 TO 5.5V 250KBPS RS-232 TRANSCEIVER WITH STAND-BY, [-40oC, 85oC] TEMPERATURE RANGE	5	3	3	5.5	1000	-	0.3	1	15000	8	-40	85	-	SSOP 28 10.2x5.3
ST3241EB	15KV ESD protected 3 to 5.5V, 400kbps, RS-232 transceiver with auto power-down	3	5	3	5.5	250	-	0.3	1	15000	8	-40	85	Auto-powerdown	SSOP 28 10.2x5.3
ST3241EC	15KV ESD protected 3 to 5.5V, 400kbps, RS-232 transceiver with auto power-down	3	5	3	5.5	250	-	0.3	1	15000	8	0	70	Auto-powerdown	SSOP 28 10.2x5.3
ST3243C	15KV ESD protected 3 to 5.5V, 400kbps, RS-232 transceiver with auto power-down	3	5	3	5.5	250	400	0.3	1	15000	8	0	70	Auto-powerdown	SSOP 28 10.2x5.3
ST3243EB	±15kv ESD protected 3 to 5.5V, 400kbps, RS-232 transceiver with auto power-down	3	5	3	5.5	250	400	0.3	1	15000	8	-40	85	Auto-powerdown	TSSOP-28
ST3243EC	±15kv ESD protected 3 to 5.5V, 400kbps, RS-232 transceiver with auto power-down	3	5	3	5.5	250	400	0.3	1	15000	8	0	70	Auto-powerdown	TSSOP-28
ST75185C	Multiple RS-232 drivers and receivers	3	5	4.5	5.5	120	-	-	-	1999	-	0	70	-	TSSOP-20

Overview

The low-power, **high-speed transceivers** of this family are designed for **RS-485, RS-422 and RS-423** communication applications. They usually contain one driver and one receiver in half duplex configuration. Each driver output and receiver input is protected against electrostatic discharge up to ± 15 kV and has no latch-up. These **transceivers** operate with a 5 V supply and draw a very low supply current when unloaded or fully loaded but with disabled drivers.

A interface controller for industrial control systems enables **real-time communication** via optical fiber rings, RS-485 rings and RS-485 buses.



Low-power RS-485 transceiver with selectable data rate and compatible with 1.8 V I/Os

A 3.3 V differential line transceiver for RS-485 data transmissions in half-duplex mode, the STR485LV includes an external slew rate select pin able to switch between a fast data rate up to 20 Mbps or a slow data rate up to 250 kbps for longer cables.

Able to interface directly with voltage logic from 1.8 to 3.3 V, this differential driver/receiver is robust over fast transient burst IEC61000-4-4 Class B conditions and the bus pins withstand over ± 8 kV contact discharge and ± 16 kV air discharge conditions without latch-up, exceeding IEC 61000-4-2 specifications.

Available in a small (3 x3 mm) DFN10 package with a temperature range from -40 up to $+105$ °C, the **STR485LV** is a perfect fit for a wide range of applications including telecom infrastructure, high-speed data links, and low-voltage microcontroller communications.

Interfaces and Transceivers/RS-422 RS-423 RS-485

Part Number	General Description	Supply Voltage (V) typ	Number of Drivers typ	Number of Receivers typ	Data Rate (Mb/s) min	Half-duplex	Number of nodes	ESD: HBM Minimum (V) nom	Current Consumption (Icc) (mA) max	Current Consumption (Icc) (µA) (Stand By) typ	Common Mode Input Voltage (V) min	Common Mode Input Voltage (V) max	Fault protection voltage	Fail safe circuit	Grade	Operating Temperature (°C) min	Operating Temperature (°C) max	Package
SERC816	SERCOS Interface controller	-	1	1	16	full duplex	-	2000	-	-	-	-	-	-	Industrial	-40	85	POFP 100 14x20x2.7
ST1480AB	3.3V POWERED, 15kV ESD PROTECTED TRANSMIT AT UP TO 12MBPS TRUE RS-485/RS422 TRANSCEIVER, [-40oC, 85oC] TEMPERATURE RANGE	3.3	1	1	12	half duplex	64	15000	2.2	5.0E-4	-7	12	-14.0 to 14.0	Open	Industrial	-40	85	SO-8
ST1480AC	3.3V powered, 15kV ESD protected, up to 12Mbps true RS-485/RS-422 transceiver	3.3	1	1	12	half duplex	64	15000	2.2	5.0E-4	-7	12	-14.0 to 14.0	Open	Industrial	0	70	SO-8
ST1480US	3.3V powered, 15kV ESD protected, up to 12Mbps true RS-485/RS-422 transceiver	5	1	1	12	half duplex	64	15000	2.2	5.0E-4	-7	12	-14.0 to 14.0	Open	Industrial	0	70	SO-8
ST26C31B	CMOS quad 3-state differential line driver	5	0	4	10	-	-	1500,1999	0.5	-	-	-	-	-	Industrial	-40	85	SO-16,TSSOP-16L
ST26C32AB	CMOS quad 3-state differential line receiver	5	4	0	10	-	16	1999,999	23	-	-7	7	-	Open	Industrial	-40	85	SO-16,TSSOP-16L
ST3485EB	3.3 V Powered, 15 kV ESD protected, up to 12 Mbps RS-485/RS-422 transceiver, [-40oC, 85oC] temperature range	3.3	1	1	12	half duplex	64	15000	2.2	0.002	-7	12	-14.0 to 14.0	Open	Industrial	-40	85	SO-8
ST3485EC	3.3 V Powered, 15 kV ESD protected, up to 12 Mbps RS-485/RS-422 transceiver, [0oC, 70oC] temperature range	3.3	1	1	12	half duplex	64	15000	2.2	0.002	-7	12	-14.0 to 14.0	Open	Industrial	0	70	SO-8
ST3485EI	3.3 V Powered, 15 kV ESD protected, up to 12 Mbps RS-485/RS-422 transceiver, [-40oC, 125oC] temperature range	3.3	1	1	12	half duplex	64	15000	2.2	0.002	-7	12	-14.0 to 14.0	Open	Industrial	-40	125	SO-8
ST3485EII	3.3 V Powered, 15 kV ESD protected, up to 12 Mbps RS-485/RS-422 transceiver, automotive grade	3.3	1	1	12	half duplex	64	15000	2.2	0.002	-7	12	-14.0 to 14.0	Open	Automotive	-40	125	SO-8
ST4485EB	3.3 V Powered, 15 kV ESD protected, up to 20 Mbps RS-485/RS-422 transceiver, [-40oC, 105oC] temperature range	3.3	1	1	20	half duplex	64	15000	2.2	0.002	-7	12	-14.0 to 14.0	Open	Industrial	-40	105	SO-8
ST485AB	Very high speed low power RS-485/RS-422 transceiver	5	1	1	30	half duplex	32	4000	2.6	-	-7	12	-7.5 to 12.0	Open	Industrial	-40	85	SO-8
ST485B	Low power RS-485/RS-422 transceiver	5	1	1	2.5	half duplex	64	2000	0.4	-	-7	12	-14.0 to 14.0	Open	Industrial	-40	85	SO-8
ST485C	Low power RS-485/RS-422 transceiver	5	1	1	2.5	half duplex	64	2000	0.4	-	-7	12	-14.0 to 14.0	Open	Industrial	0	70	SO-8
ST485EB	15 kV ESD protected, low power RS-485/RS-422 transceiver	5	1	1	5	half duplex	256	1500	0.4	-	-7	12	-14.0 to 14.0	Open	Industrial	-40	85	SO-8
ST485EC	15 kV ESD protected, low power RS-485/RS-422 transceiver	5	1	1	5	half duplex	256	1500	0.4	-	-7	12	-14.0 to 14.0	Open	Industrial	0	70	SO-8
ST485ERB	15 kV ESD protected, low-power RS-485/RS-422 transceiver	5	1	1	2.5	half duplex	64	1500	0.4	-	-7	12	-14.0 to 14.0	Open	Industrial	-40	85	SO-8
ST485EX	15 kV ESD protected, low-power RS-485/RS-422 transceiver	5	1	1	5	half duplex	256	1500	0.4	-	-7	12	-14.0 to 14.0	Open	Industrial	-55	125	SO-8
ST490AB	Low power high speed RS-485/RS-422 transceiver	5	1	1	25	full duplex	32	3500	5	-	-7	12	-7.5 to 12.0	Open	Industrial	-40	85	SO-8
STR485	3.3V RS485 compatible with 1.8V I/Os and selectable speed 20Mbps or 250kbps	3.3	1	1	20	half duplex	256	8000	0.9	0.5	-7	12	-7.5 to 12.0	Open	Industrial	-40	105	VDFPN 10 3x3x1.0
STR485E	3.3V RS485 compatible with 1.8V I/Os and selectable speed 20Mbps or 250kbps	3.3	1	1	20	half duplex	128	8000	0.9	0.5	-7	12	-7.5 to 12.0	Open	Industrial	-40	125	VDFPN 10 3x3x1.0

Smartcard Interfaces

Overview

ST offers complete **analog interfaces** for asynchronous 1.8 V, 3 V and 5 V **smartcards**. They can be placed between the card and the microcontroller with only a few external components to perform all supply protection and control functions. Main targeted applications are **smartcard readers for set-top boxes**, IC card readers for banking, identification and pay TV.

They comply with several standards including ISO 7816, EMV and GSM, and are also certified by NDS for STBs.

Interfaces and Transceivers/Smartcard Interfaces

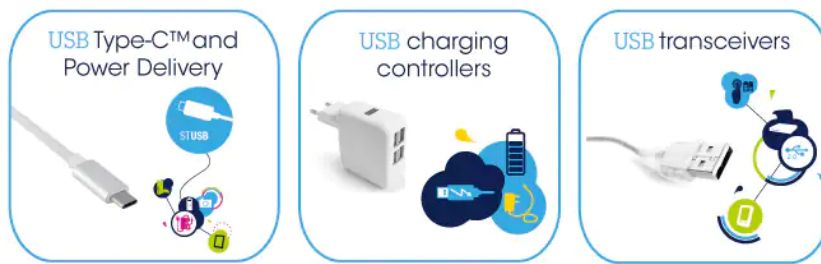
Part Number	General Description	Supply Voltage (V) min	Supply Voltage (V) max	ESD protection (kV) (Contact) min	Clock Frequency (MHz) max	Communication standards supported (ISO7816)	Communication standards supported	Communication standards supported (EMV compatible)	Security Certification	Package	Operating Temperature (°C) min	Operating Temperature (°C) max
ST8024	Smartcard interface	2.7	6.5	6	26	ISO7816	GSM11.11	EMV	-	SO-28,TSSOP-28	-25	85
ST8024L	Smart card interface	2.7	6.5	6	26	ISO7816	GSM11.11	EMV4.2	NDS	SO-28,TSSOP-20,TSSOP-28	-25	85
ST8034AT	16-pin smartcard interfaces	2.7	5.5	6	26	ISO7816	-	EMV 4.3	no	SO-16	-25	85
ST8034C	16-pin smartcard interfaces	2.7	5.5	6	26	ISO7816	-	EMV 4.3	NO	VFQFPN 16 3x3x0.8	-25	85
ST8034HC	24-pin smartcard interfaces	2.7	5.5	6	26	ISO7816	-	EMV 4.3	yes	HVQFN24 4x4x0-85	-25	85
ST8034HN	24-pin smartcard interfaces	2.7	5.5	6	26	ISO7816	-	EMV 4.3	yes	HVQFN24 4x4x0-85	-25	85
ST8034P	16-pin smartcard interfaces	2.7	5.5	6	26	ISO7816	-	EMV 4.3	yes	VFQFPN 16 3x3x0.8	-25	85
ST8034T	16-pin smartcard interfaces	2.7	5.5	6	26	ISO7816	-	EMV 4.3	no	SO-16	-25	85

USB

Overview

Universal serial bus, or USB, is an industry standard that defines the cables, connectors and communication protocols used to connect computers and peripherals. ST's portfolio covers a wide range of products designed for **USB** data (transceivers) and/or power applications (battery chargers and charger detection systems).

With the recent introduction of the **USB Type-C™** cable and connector specifications and USB power delivery standards, ST has developed new product families that help you develop innovative products and applications and re-invent the connectivity of tomorrow.



Interfaces and Transceivers / USB/USB Charging Controllers

Part Number	General Description	Package	Operating Temperature (°C) min	Operating Temperature (°C) max	Supply Voltage (V) min	Supply Voltage (V) max
STCC2540	USB charging controller with integrated power switch	VFQFPN 16 3x3x0.8	-40	85	4.5	5.5
STUSBCD01B	USB charger detection interface	CSP P 0.4 mm	-40	85	2.2	4.5

Interfaces and Transceivers / USB/USB Transceivers

Part Number	General Description	Package	Operating Temperature (°C) min	Operating Temperature (°C) max	Supply Voltage (V) min	Supply Voltage (V) max	Short Circuit Protection
STOTG04E	USB-OTG Full-speed Transceiver with USB, UART, Audio and I2C Operating Modes	QFN-24L	-40	85	2.7	5.5	false
STOTG04ES	USB-OTG Full-speed Transceiver with USB, UART, Audio Operating Modes	QFN-24L	-40	85	2.7	5.5	false
STULPI01A	High speed USB On-The-Go ULPI transceiver	TFBGA 36 3.6x3.6	-40	85	3	4.5	true
STULPI01B	High speed USB On-The-Go ULPI transceiver	TFBGA 36 3.6x3.6	-40	85	3	4.5	true
STUSB03E	USB Transceiver	QFN-16L	-40	85	4	5.5	false

Interfaces and Transceivers / USB/USB Type-C and Power Delivery Controllers

Part Number	General Description	Package	Operating Temperature (°C) min	Operating Temperature (°C) max	Supply Voltage (V) min	Supply Voltage (V) max	Power Role	Vconn (mA) max
STUSB1600	USB Type-C controller (with short-to-VBUS protection)	QFN-24L	-40	105	3	22	Consumer,Dual Role Port (DRP),Provider	600
STUSB1602	USB Type-C controller (with Tx/Rx line driver and BMC)	QFN-24L	-40	105	3	22	Consumer,Dual Role Port (DRP),Provider	600
STUSB1700	USB Type-C controller (with short-to-VBUS protection)	VFQFPN 4X4X1 24L WF	-40	105	3	22	Provider	600
STUSB1702	USB Type-C controller (with Tx/Rx line driver and BMC)	VFQFPN 4X4X1 24L WF	-40	105	3	22	Provider	600
STUSB4500	Standalone USB PD controller for power sinking devices	QFN-24L,WLCSP MSL1	-40	105	3	22	Consumer	-
STUSB4500L	Standalone USB Type-C port controller for power sinking devices	QFN-24L,WLCSP MSL1	-40	105	3	22	Consumer	-
STUSB4700	Stand-alone USB PD controller (with short-to-VBUS protection)	QFN-24L,VFQFPN 4X4X1 24L WF	-40	105	3	22	Provider	600
STUSB4710	Stand-alone USB PD controller (with short-to-VBUS protection)	QFN-16L,QFN-24L	-40	105	3	22	Provider	-
STUSB4761	Stand-alone USB PD controller (with integrated CC/CV)	QFN-16L	-40	105	4.1	22	Provider	50

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