solutions

Semtech Products
Short Form Catalog

www.semtech.com

SEMTECH

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This catalog is a quick introduction to the key Semtech product families and is available from your Semtech sales representative and distribution partner. For the complete product portfolio, visit www.semtech.com

SEMTECH

AEC-Q100 Automotive Qualified

OUR EXPANDING COMMITMENT

As the electronic content in automobiles increases dramatically, so does our commitment to power, protect and connect customers with optimized IC solutions. Semtech has provided leading performance ICs for the automotive industry for many years, and our devices are used in applications ranging from protecting sensitive electronics to ADAS safety to in-cabin lighting and safeguarding touch screen interfaces. Today, we continue to work on expanding our list of AEC-Q100 certified products for future applications.

Two-wire Ethernet
ADAS, 360 Camera View, Audio

Antennas
AM/FM, DAB, GPS, Satellite, WiFi, Telematics Applications

USB 2.0
Infotainment, Phone Connectivity

USB 3.0/HDMI
Audio Video Infotainment, Back-end Display

CAN, LIN
Control Bus, Networking
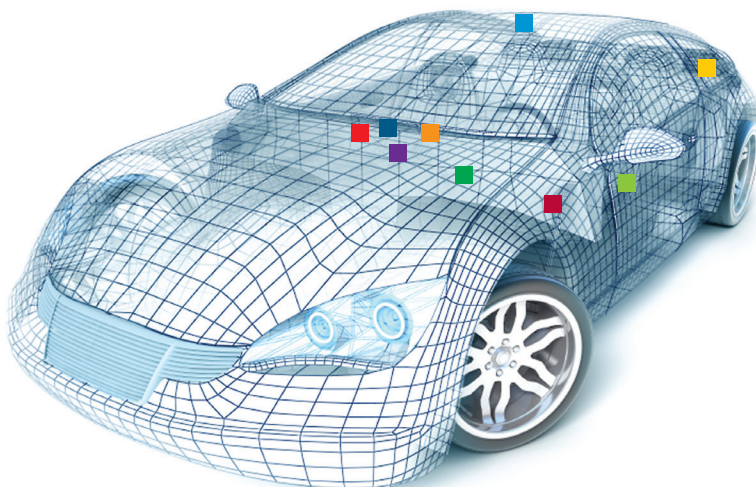
SD Card/Memory
Navigation Applications

Analog Video, LVDS
ADAS, Back-up Camera Applications

Standard Ethernet
On-board Diagnostics, Networking

Audio
Infotainment, Console Display

Transient Voltage (TVS) Protection - AEC-Q100 Qualified

Part Number	V_{RWM} (V)	Lines	ESD Rating (air/contact)	Surge (8x20µs)	Cap (pF)	Package (mm)	Interface To Protect
RClamp® 3552TQ	3.5	2	±20kV/±17kV	4A	0.4	1.0x0.6x0.5	LVDS/APIX links
RClamp® 0582BQ	5	2	±30kV/±25kV	15A	1.2	1.6x1.6x0.75	Two wire ethernet single twisted pair
RClamp® 0531TQ	5	1	±20kV/±12kV	4A	0.5	1.0x0.6x0.5	
RClamp® 2574NQ	2.5	4	±30kV/±30kV	40A	1.7	3.0x2.0x0.6	LVDS links
RClamp® 0531TQ	5	1	±20kV/±12kV	4A	0.5	1.0x0.6x0.5	USB 2.0
RClamp® 0582BQ	5	2	±30kV/±25kV	15A	1.2	1.6x1.6x0.75	USB 2.0
RClamp® 0531TQ	5	1	±20kV/±12kV	4A	0.5	1.0x0.6x0.5	Antenna interfaces
RClamp® 1521PQ	15	1	±15kV/±8kV	4A	0.3	1.0x0.6x0.5	Antenna interfaces
RClamp® 0582BQ	5	2	±30kV/±25kV	15A	1.2	1.6x1.6x0.75	Antenna interfaces
RClamp® 2431TQ	24	1	±13kV/±8kV	2A	0.35	1.0x0.6x0.5	Antenna interfaces
µClamp® 0511PQ	5	1	±30kV/±30kV	12A	75	1.0x0.6x0.5	Audio
SLVU2.8Q	2.8	2	±30kV/±25kV	24A	100	2.9x2.37x0.90	Analog video
µClamp® 3311PQ	3.3	1	±30kV/±25kV	5A	12	1.0x0.6x0.5	Keypads & Multimedia touch-points
µClamp® 0511PQ	5	1	±30kV/±30kV	12A	75	1.0x0.6x0.5	Keypads & Multimedia touch-points
RClamp® 0512TQ	5	2	±30kV/±30kV	20A	2	1.0x0.6x0.4	Ethernet, USB2.0, LVDS, antennas
µClamp® 0301PQ	3	1	±30kV/±25kV	5A	25	1.0x0.6x0.5	Keypads & Multimedia touch-points
RClamp® 0524PQ	5	4	±25kV/±15kV	5A	0.4	2.5x1.0x0.58	HDMI

AEC-Q100 Automotive Qualified

Single-line DC Bus Protection - AEC-Q100 Qualified

Part Number	V_{RWM} (V)	Lines	ESD Rating (air/contact)	Surge (8x20µs)	Cap (pF)	Package (mm)	Application
µClamp® 0571P	5	1	±30kV/±30kV	80A	675	1.6x1.0x0.57	
µClamp® 0871P	8	1	±30kV/±30kV	65A	475	1.6x1.0x0.57	
µClamp® 1071P	10	1	±30kV/±30kV	60A	350	1.6x1.0x0.57	
µClamp® 1271P	12	1	±30kV/±30kV	45A	275	1.6x1.0x0.57	
µClamp® 1571P	15	1	±30kV/±30kV	40A	220	1.6x1.0x0.57	Single-line DC Bus protection
µClamp® 1871P	18	1	±30kV/±30kV	35A	220	1.6x1.0x0.57	
µClamp® 2271P	22	1	±30kV/±30kV	25A	165	1.6x1.0x0.57	
µClamp® 2671P	26	1	±30kV/±30kV	23A	155	1.6x1.0x0.57	
µClamp® 3671P	36	1	±30kV/±30kV	18A	150	1.6x1.0x0.57	

Filter Devices (TVS+EMC Filter) Protection - AEC-Q100 Qualified

Part Number	V_{RWM} (V)	Lines	ESD Rating (air/contact)	Filter type	Cap (pF)	Package (mm)	Application
EClamp® 2410PQ	5	6	±17kV/±12kV	SD card termination	15	4.0x1.6x0.5	SD card
EClamp® 2357NQ	5	6	±20kV/±12kV	RC filter SD card termination	20	3.0x3.0x0.6	SD card
EClamp® 2374KQ	5	4	±15kV/±8kV	RC filter	10	1.7x1.3x0.5	Color LCD

Power Management - Regulators and Controllers - AEC-Q100 Qualified

Part Number	Type	V_{IN} Min	V_{IN} Max	I_{OUT} Max (A)	Power-Good flag	Enable	Soft Start	PSAVE	Package (mm)
SC183CQ	Regulator	2.9	5.5	2	No	Yes	Yes	No	MLPD-10, 3x3x1
SC508A	Controller	4.5	46	30	Yes	Yes	Programmable	Yes	MLPQ-20, 3x3
SC4501Q	Regulator	1.4	16	2	No	Yes	Programmable	No	MLPD-10, 3x3
SC284AQ	Regulator	2.75	5.5	1.72	Yes	Yes	Yes	No	MLPQ-20, 3x3
SC220Q	Regulator	2.7	5.5	0.6	No	Yes	Yes	Yes	SOIC-8

Power Management - LED Drivers - AEC-Q100 Qualified

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	V_{OUT} (V) Max	Fsw (MHz)	# LEDs per string* V_f=(3.5V)	# of Strings	String Current (mA)	Dimming Max Freq.	Package (mm)	Features
SC441A	4.5	21	36	0.7	10	4	150	up to 50kHz	TSSOP-20 EDP	Open/Short LED string disable, OCP, OTP, OVP, and FFLAG
SC445Q	4.5	27	42	0.7	12	4	150	up to 50kHz	TSSOP-20 EDP	Adj SCP level, Open/Short LED string disable, OCP, OTP, OVP, and FFLAG
SC5012/Q	4.5	45	65	0.2–2.2	18	4	150	up to 30kHz	MLPQ-24, 4x4	I²C, FSYNC, 5000:1 Phase shifted PWM dimming

TVS Protection - Key Advantages

Semtech Transient Voltage Suppressors (TVS) safeguard circuits against damage or latch-up caused by ESD, lightning and other destructive voltage transients. Our protection devices feature low clamping voltage, low capacitance and low leakage current.

LOW CAPACITANCE

Provides robust protection while preserving signal integrity in high-speed video and data interfaces
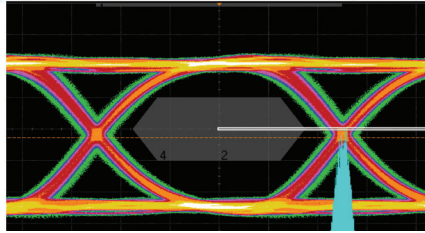
LOW LEAKAGE

Increases battery life in handheld electronic devices
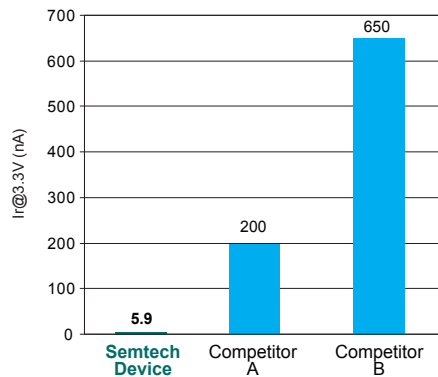
LOWER WORKING VOLTAGE

Reduces stress energy to protected IC

— *Typical 5V TVS IV Curve*
— *Semtech low V_{RWM} IV Curve*
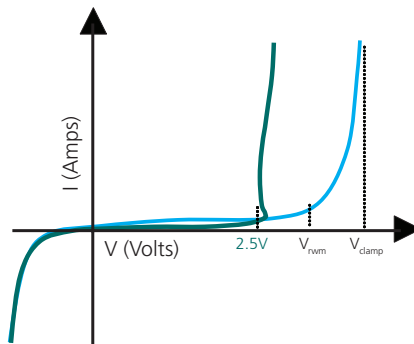
LOW CLAMPING VOLTAGE

Better protection and less stress on transceiver
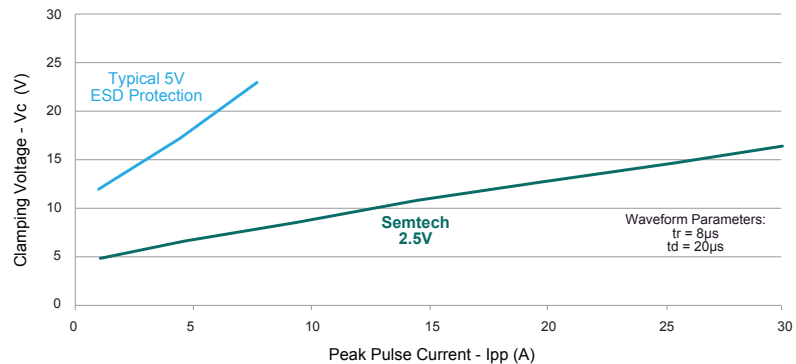
PRODUCT PLATFORMS

TClamp® = TransClamp
High surge lightning current handling capability

RClamp® = RailClamp
Low capacitance for high-speed applications

µClamp® = MicroClamp
Single TVS or TVS arrays for general purpose, standard TVS Process

EClamp® = EMIClamp
ESD and EMI protection with integrated inductor or resistor

KEY ESD PROTECTIONS

- ESD
- ESD-EMI filter
- High-current lightning
- Low capacitance ESD
- Low voltage ESD

TVS Key Product Applications

Circuit Protection Products

Key Applications

Application (Port)	Part Number	# of Lines	Voltage (V)	Max Capacitance (Line-GND)	Protection level (A) (8/20µs)*
USB 2.0 (Data Lines)	RClamp® 0552T	2	5	0.4	3
USB 2.0 (Data Lines + Vbus)	RClamp® 0582N	3	5	0.5	5
USB (OTG)	RClamp® 1624T	2+1	5+12	0.8	5
USB 3.0	RClamp® 3346P	6	3.3	0.65	4.5
HDMI, DisplayPort	RClamp® 3328P	8	3.3	0.65	5
LCD Panel	RClamp® 3324T	4	3.3	0.65	5
LCD Panel (EMI filter)	EClamp® 2388P	8	5	27	5
Single Line	µClamp® 3311Z µClamp® 0541Z µClamp® 1211Z	1 1 1	3.3 5 12	9 9 25	4 2 5
Single Line High Speed	RClamp® 0531Z	1	5	0.4	3
10/100 Ethernet	RClamp® 0534N RClamp® 3354S	4 4	5 3.3	3** 5	25 25
Gigabit Ethernet	RClamp® 3374N TClamp® 3302N	4 2	3.3 3.3	1.7** 25	40 95
T1/E1	TClamp® 0602N	2	6	25	95
CAN Bus	µClamp® 3601P µClamp® 3603T	1 3	33 36	25 50	– 2
RS485	SM712 TClamp® 1202P	2 2	12/-7 12	75 12	17 100
RS232	RClamp® 1224S	4	12	3	15
Keyboard, I/O	µClamp® 0541Z	1	5	9	2
xDSL	TClamp® 1272S TClamp® 2472S	2 2	12 24	5 3.5	25 –
2.5G Ethernet	RClamp® 0512TQ	2	5	3	–

*All devices will protect at a minimum to IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact) and IEC 61000-4-4 (EFT) 40A (5/50ns)   ** I/O to I/O Capacitance

Gigabit and 10/100 Ethernet

Existing Devices	Next-Generation Improved Performance & Packaging	Pin-to-Pin Improved Performance
RClamp® 2504N	RClamp® 2574N	–
RClamp® 3304N(A)	RClamp® 3374N	–
SLVU2.8-4	RClamp® 3374N	µClamp® 2804L
SRV05-4(A)	RClamp® 0534N	RClamp® 0554S RClamp® 3354S
LC03-3.3	–	RClamp® 2502L

HDMI, Ethernet & USB 3.0 Protection

HDMI PROTECTION

- RClamp® 3328P (3.8x1.0mm)
- RClamp® 7524T (1.3x0.7mm)
- Flow-through layout
- More than 50% PCB savings
- Low capacitance (0.25 typ) to minimize signal degradation

HDMI Connector

D2+
D2
D1+
D1
D0+
D0
CLK
CLK

RClamp® 3328P

To HDMI graphics chip

CEC
SCL
SDA
HPD

RClamp® 7524T
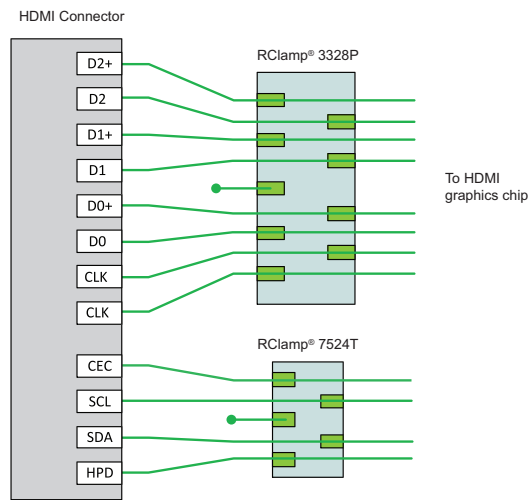
GIGABIT ETHERNET PROTECTION

- RClamp® 3374N (3x2x0.60mm)
- 3.3V working voltage
- Low capacitance: 1.7pF I/O to I/O
- Flow-through layout
- Low clamping voltage performace
- High surge rating: 40A Ipp (8x20µs)

RClamp® 3374N

Pin 1
LINE 1 In

Pin 10
LINE 1 Out

Pin 2
LINE 2 In

Pin 9
LINE 2 Out

Pin 4
LINE 3 In

Pin 7
LINE 3 Out

Pin 5
LINE 4 In

Pin 6
LINE 4 Out

Center Tabs
and Pins 3, 8
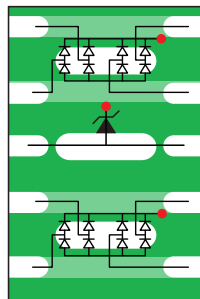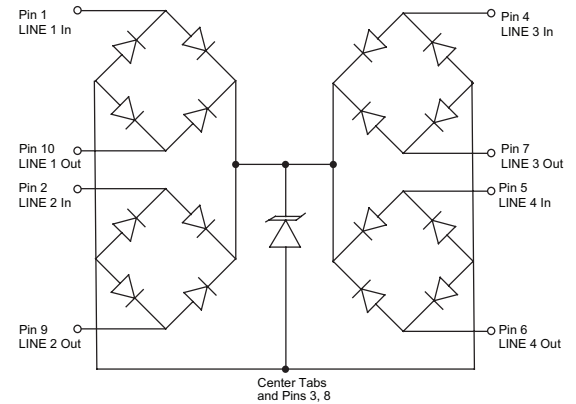
USB 3.0 PROTECTION

- RClamp® 3346P (2.7x0.8x0.50mm)
- µClamp® 0541Z (0.6x0.3x0.25mm)
- Extremely low clamp across entire ESD event
- Low capacitance to minimize signal attenuation
- Low dynamic resistance

USB 3.0 - Type B
Device Connector

SSTX-
SSTX+
D+   D-   GND
GND
SSRX-
VBus
SSRX+

RClamp® 3346P
µClamp® 0541Z

USB 3.0 - Type A
Device Connector

SSRX-
GND
SSRX+
GND   D+
SSTX-   D-
SSTX+   VBus

RClamp® 3346P
µClamp® 0541Z
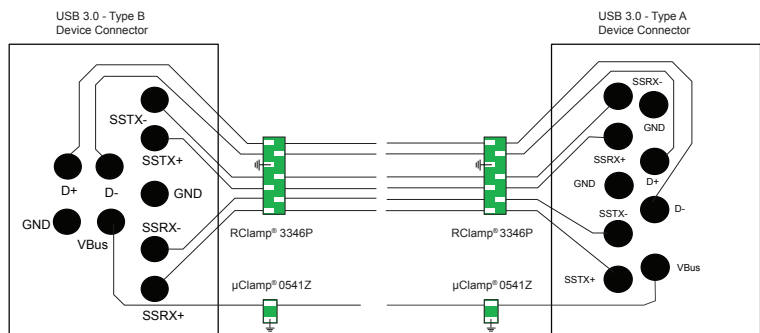
Wireless Charging Solutions

Semtech offers scalable wireless power transmitter and receiver platforms for both battery charging and power delivery in standards compliant and non-compliant systems. Semtech is a member of the Wireless Power Consortium (WPC) and is active in helping shape the future standards for wireless power.

FEATURES

- Firmware-based and programmable
  - Customizable to meet specific application requirements
  - Firmware is upgradable to support evolving standards

- Supports multiple system configurations
  - Multiple supply voltages and coil configurations with the same architecture
  - Supports custom receiver and transmitter coil sizes and inductance values

- Support for medium and high power Tx and Rx solutions
  - Up to15W for smart phones and tablets supporting Qi industry standard
  - >15W for next-generation consumer products and industrial applications
  - 40W and beyond for high power applications such as notebook computers, power tools, and other industrial applications

- Support for low power (0.1W–2W) Tx and Rx solutions
  - Proprietary based solutions
  - Support for very small coils and form-factors
  - Direct charging of batteries at <50mAh
  - Support for multi-receiver applications

EVALUATION MODULE (EVM) SERIES

- Low Power Wearables <2W
  - LinkCharge® LP Series

- Medium Power 5W-15W
  - LinkCharge® CT Series
  - LinkCharge® 10 Series
  - LinkCharge® 15 Series

- High Power >15W
  - LinkCharge® 20 Series
  - LinkCharge® 40 Series

LinkCharge® Standards Compatibility					
Power Level	Standard	LinkCharge® LP	LinkCharge® 5	LinkCharge® 20	LinkCharge® 40
2 W	Semtech Proprietary	✓	—	—	—
5 W	Qi 5 W	—	✓	✓	✓
7.5 W	Apple Fast Charge	—	—	✓	✓
9 W	Samsung Fast Charge	—	—	✓	✓
15 W	Qi 15 W	—	—	✓	✓
20 W	Semtech Proprietary	—	—	✓	✓
40 W	Semtech Proprietary	—	—	—	✓
Product Order Code Transmitter EVM's		TSWITX-G4-EVM	TSDMTX-5V2-EVM	TSDMTX-19V3-EVM	TSDMTX-40W-EVM
		TSWITX-5V-2RX-EVM			
Product Order Code Receiver EVM's		TSWIRX-5V2-EVM	TSDMRX-5-15W-EVM	TSDMRX-19V-20W-EVM	TSDMRX-40W-EVM
		TSWIRX-LI2-EVM			

Touch & Proximity Controllers

The superior sensitivity of the Semtech touch sensor platform enables sensing through a thick overlay material. Semtech's proximity detection has an extended range (>10cm). These devices all come in a tiny footprint with zero components per input.

FEATURES

- Extreme low power
- Support button, slider and wheel design
- Proximity detection (>10cm)
- Built-in LED drivers (up to 15mA)
- 256-step intensity control (Lin/Log)
- Auto lightening
- Field programmable
- Fast scan time (15ms)
- Overlay (>5mm)
- Smart auto-offset compensation
- Ultra-small footprint
  - QFN-28 (4x4mm)
  - QFN-32 (5x5mm)
  - QFN-32 (4x4mm)
  - TSSOP-24 (4.4x7.8mm)

APPLICATIONS

- Tablet eBook
- Flat panel TV
- LCD monitors
- White goods & appliances
- Printers
- Automotive audio consoles
- Personal media players
- Set Top Boxes (STBs)
- Game consoles
- Industrial systems

Touch & Proximity Controller Products																
Part Number	Sensor Inputs	LED Driver	Interface	Proximity	Button	Slider	Wheel	IR Detect	Buzzer	Overlay (mm)	Auto Comp	Intensity (256-step)	Fade-in/out	Auto Lightening	Field Prog. Memory	Package (mm)
SX8634	12	8	I²C	✓	✓	✓	–	–	–	>5	✓	Lin./Log.	✓	✓	✓	QFN (5x5)
SX8635	12	8	I²C	✓	✓	–	✓	–	–	>5	✓	Lin./Log.	✓	✓	✓	QFN (5x5)
SX8636	8	8	I²C	✓	✓	–	–	–	–	>5	✓	Lin./Log.	✓	✓	✓	QFN (4x4)
SX9510	8	8	I²C/ Analog	✓	✓	–	–	✓	✓	>5	✓	Lin./Log.	✓	✓	✓	QFN (4x4) TSSOP (4.4x7.8)
SX9511	8	8	I²C/ Analog	✓	✓	–	–	✓	✓	>5	✓	Lin./Log.	✓	✓	✓	QFN (4x4) TSSOP (4.4x7.8)
SX9512	8	8	I²C/ Analog	–	✓	–	–	–	✓	>5	✓	Lin./Log.	✓	✓	✓	QFN (4x4) TSSOP (4.4x7.8)
SX9513	8	8	I²C/ Analog	–	✓	–	–	–	✓	>5	✓	Lin./Log.	✓	✓	✓	QFN (4x4) TSSOP (4.4x7.8)

Smart Proximity Sensors

Semtech advanced capacitive sensing solutions provide best-in-class sensitivity (down to sub fF) with unique human discrimination features to enhance near range proximity detection. These products are commonly used in wireless-enabled consumer devices (i.e. smartphones, tablets, notebook) for smarter RF control.

FEATURES

- Highest performance sensor on the market that enables longest distance/smallest area
- Strongest immunity to common RF noise (minimize interference)
- Lowest power for extended battery life (2.5uA at Sleep, <10uA at Doze)
- Capacitive resolution down to 0.04fF
- Patented on-chip smart engine for human detection
- Built-in automatic calibration
- Advanced temperature compensation
- Active sensor guard
- Programmable I²C or standalone mode
- Extremely small footprint

APPLICATIONS

- Smartphone
- Tablet
- Wearables
- Notebooks (Ultrabook, Detachable, 2-in-1)
- Hotspot
- Portable gaming devices
- Wireless-enabled devices

Smart Proximity Sensor Products

Part Number	# of Sensors	Interface	Prox.	Active Guard	Human Sensing	RF Shield	Configurable Proximity Mode	Auto Calibration	Package (mm)
SX9300	2	I²C	✓	✓	On-chip Smart Engine	–	–	✓	QFN (3x3)
SX9306	3 or 4	I²C	–	✓	On-chip Smart Engine	✓	✓	✓	WLCSP (1.2x1.6) QFN (3x3)
SX9310	3	I²C	✓	✓	On-chip Smart Engine	✓	✓	✓	WLCSP (1.3x1.3)
SX9500	4	I²C	✓	✓	–	–	–	✓	QFN (3x3)
SX9501	4	Analog	✓	✓	–	–	–	✓	QFN (3x3)
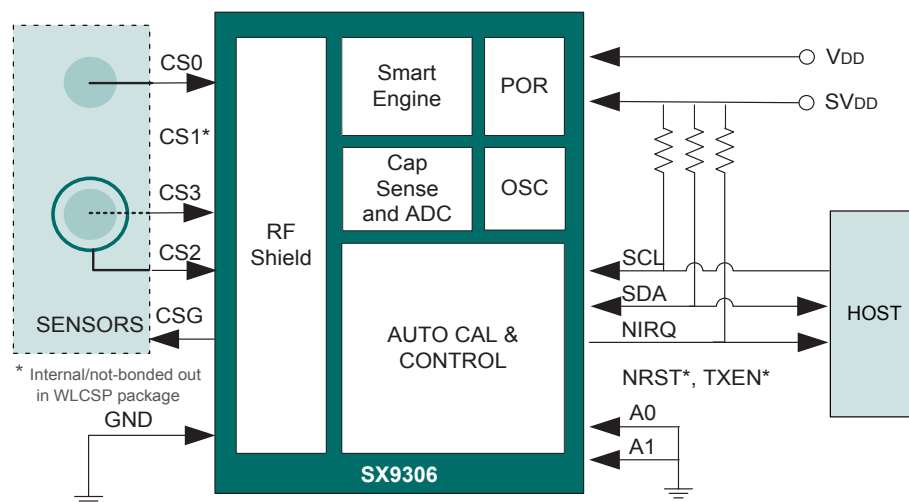
SX9306 Block Diagram

High Performance Touchscreen Solutions

Semtech offers fully integrated touch controllers in both capacitive and resistive technologies with ultra-low power consumption (as low as 0.4uA) and robust on-chip ESD protection (up to ±15kV ESD) to support different human interface designs in portable handheld applications (i.e. smartphones, wearable devices). Many of these products have the capability to sense in the X, Y and Z dimensions allowing for multi-touch and gesture control as well as providing tactile feedback to enhance the user experience.

FEATURES

- Low power (0.4μA)
- Compatible with a wide range of resistive panels
- Enables multi-touch gestures with 4-wire touch panel
- Built-in proximity detection with any panel (>5cm)
- Integrated haptic motor control (LRA & ERM)
- 12-bit resolution

APPLICATIONS

- Portable navigation devices
- Automotive center consoles
- Digital photo frames
- DSC, video cameras
- Handheld games & mobiles
- POS terminals
- Control panels

Smart Sensing IC Solutions Products					
Part Number	Interface	Multi-touch	Proximity Sensing	Haptics	Package (mm)
SX8650	I²C	–	–	–	WLCSP (1.5x2.0), QFN (3x3)
SX8651	I²C	✓	–	–	WLCSP (1.5x2.0), QFN (3x3)
SX8652	SPI	–	–	–	DFN (4x3)
SX8674	I²C	✓	✓	Generic	WLCSP (2x2), QFN (4x4)

General Purpose Parallel Input/Output (GPIO)

General Purpose Parallel Input/Output (GPIO) expanders are ideal for low power handheld battery powered equipment. Our IO expanders come in 8- and 16-channels of IOs operating with a VDD range of 1.2V to 5.5V connecting easily to today's low core voltage chipsets in battery powered handheld applications without the need for level translating circuits.

FEATURES

- 8/16 channel of I/Os
- True bi-directional style I/O
- Programmable Pull-up/Pull-down Push/Pull outputs
- 1.2V to 5.5V independent operating voltage for all supply rails (VDDM, VCC1, VCC2)
- 5.5V compatible I/Os, up to 24mA output sink (no total sink current limit)
- Fully programmable logic functions (PLD)
- 400kHz two wire I²C compatible slave interface

APPLICATIONS

- Smartphones, PDAs, MP3 players
- Digital cameras
- Portable multimedia players
- Notebooks
- GPS devices

GPIO IC Products

Part Number	I/O Chan.	I/O Volt. Range (V)	Interface	Max Current (mA)	Dual I/O Supplies	PLD Function	Lin./Log. Intensity	Blink	Breath	Keypad Scan. Engine	Polarity Inversion	Current (µA)	I²C Add.	Package (mm)
SX1502	8	1.2–5.5	I²C	12/24	✓	✓	–	–	–	–	–	1	2	3x3
SX1503	16	1.2–5.5	I²C	12/24	✓	✓	–	–	–	–	–	1	1	4x4
SX1508B	8	1.2–3.6	I²C	15	✓	–	✓	✓	✓	✓	✓	1	4	3x3
SX1509B	16	1.2–3.6	I²C	15	✓	–	✓	✓	✓	✓	✓	1	4	4x4

Ultra-low Power Solutions

ULTRA-LOW POWER MANAGEMENT SOLUTIONS

Semtech nanoSmart® ultra-low power technology enables energy savings in everyday products. nanoSmart® products support multiple energy harvesting technologies including indoor and outdoor solar. Off-active™ switching and ultra-low power design result in dissipation in the nano-ampere range, ensuring more energy delivered to the application or storage element. Implementing advanced system power management and scheduled system wake-up is possible with optional microcontroller and real-time clock based solutions making it ideal for remote sensing and control applications.

FEATURES

- Lowest standby power in the industry
  - Eliminates standby power losses
  - Quiescent current below battery self-discharge current
- Extends battery life on portable products

APPLICATIONS

- Portable standalone low-power
- Background energy scavenging
- Off-grid indoor solar energy harvesting
- Autonomous systems that run forever (i.e. wireless sensors)
- Medical and Industrial

nanoSmart® Solutions			
Part Number	Description	Features	Application
TS12001	Battery management under voltage load switch	Trigger voltage options of 1.2V–4.2V (factory set), 70nA quiescent current	Protects batteries from excessive discharge in portable devices
TS14002	Ultra-low power LDO	V_{IN} = 2.5V to 5.5V, V_{OUT} = 1.2V–4.2V @250mA (factory set), 20nA quiescent current	Portable battery-operated electronics
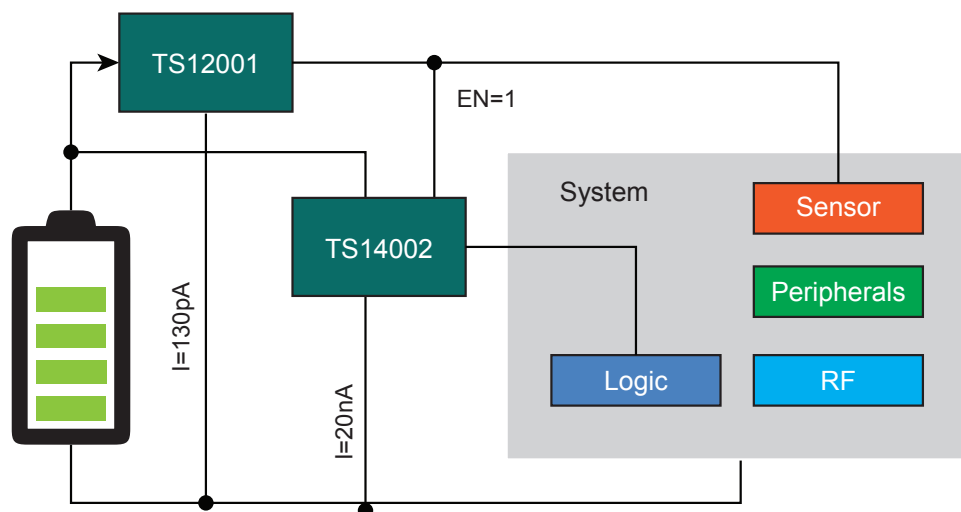
TS12001 and TS14002 Block Diagram

Neo-Iso™ Isolated Power Solutions

Neo-Iso™ ISOLATED LOAD SWITCH

Neo-Iso technology from Semtech enhances Internet of Things applications by adding higher levels of intelligence and control. Neo-Iso switches make it possible for low power microcontrollers to control high voltage loads in the system. Reporting of fault conditions from the switch to the controller enables system responses resulting in safer, more efficient operation. Low current draw allows each switch to operate on power harvested from the load eliminating the need for additional supplies. Implemented in proven, volume manufacturing processes, consistently high levels of reliability are achieved throughout the entire operating life. Semiconductor based design allows future scalability and integration options not possible with legacy technologies such as mechanical relays and opto-couplers.

Ordering Info		
Part Number	Package (mm)	Standard Reel Quantity
TS13101-QFNR	QFN-20 (4x4)	3,300
TS13102-QFNR	QFN-16 (3x3)	3,300
TS13103-QFNR	QFN-16 (3x3)	3,300
TS13401ULTRT	QFN-20 (3x3)	3,000

FEATURES

- Overcurrent protection
- Diagnostic information feedback
- Integrated protection devices
- Energy harvesting
- Energy transfer to primary side control
- Scalable galvanic from primary to secondary sides of the device
- Switch Turn-On / Turn-Off Times ~25μS
- Single control signal for on/off input (CLK) Operation Switch
- 60V switch with bi-directional blocking in OFF state
- External FET capability allows scalable switching voltages to 120/240V
- Low profile allows thin and compact end products
- Silent operation improves user experience

APPLICATIONS

- Internet of Things (IoT)
- HVAC / Thermostats
- Home Automation / Smart Home
- Security
- Smart Metering
- Industrial Control
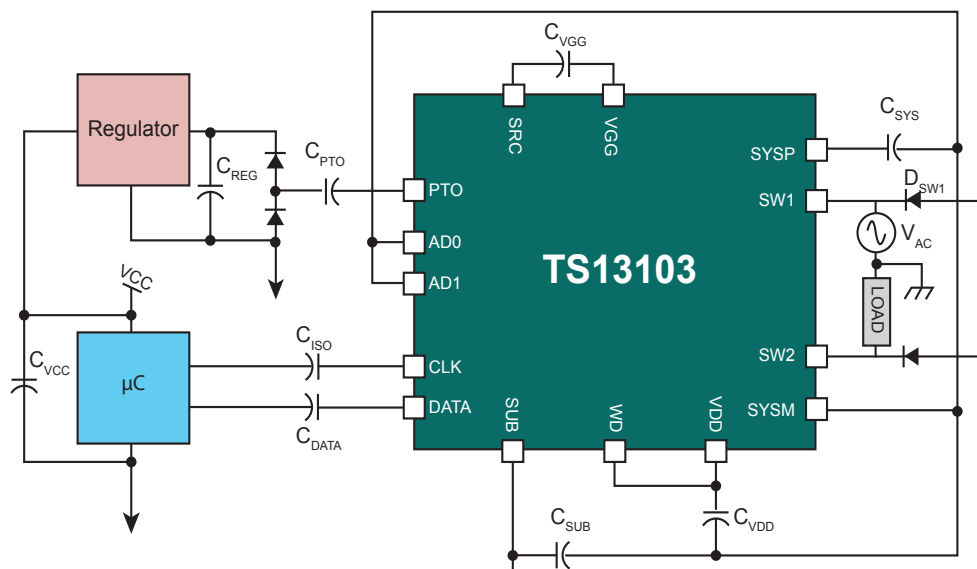
TS13103 single channel with energy harvesting and Power Take Out (PTO)

Power Management Solutions

Semtech supplies a wide range of power management ICs used in telecommunications and industrial equipment, portable devices, computers, and networks. Products include feature rich, highly-integrated solutions for the telecom industry and low power, small-package, high-efficiency products for smartphones, handsets, notebook PCs and other portable devices. An established leader in power management ICs across networking and industrial power, handheld power and LED lighting applications, Semtech is pushing performance to higher levels to enable a totally new class of greener, smarter and smaller end products.

BUCK REGULATORS

With a broad selection of buck converters, Semtech offers some of the world's smallest, high-performance point-of-load (POL) regulators. These include our family of EcoSpeed® converters that set a new standard for efficiency, speed, size and simplicity in emerging green energy applications.

BOOST REGULATORS

Semtech's expanded line of boost converters now includes the world's smallest low-voltage regulators, as well as a growing line of single- and multi-string boost LED drivers for demanding, rugged backlighting applications.

LDOS

A wide range of ultra-low dropout regulators offers ideal solutions for systems where V_{OUT} is very close to V_{IN}.

LED DRIVERS

Semtech manufactures an extensive line of LED driver ICs for LCD display, automotive, backlight, and LED camera flash applications. They include inductor-based boost LED drivers for series-connected LEDs and charge pump LED drivers, and low-dropout current sinks for parallel-connected LEDs. Each LED driver topology is designed for optimal high efficiency in the smallest footprint with accurate current regulation, low noise and a wide dimming range.

CHARGE PUMPS

Semtech's high-performance, charge pump-based converters and LED backlight drivers build on a strong history of charge pump experience providing very high efficiency in the smallest footprint with accurate current regulation, low noise and a wide dimming range.

FEMTOBUCK™ LOAD SWITCHES

Semtech's new load switch products focus on lowest RDS(ON) in class for highest system efficiency and extremely robust protection to withstand the harshest circuit conditions.

Wide Input Voltage Regulators & Controllers

EcoSpeed® Wide Input Synchronous Buck Regulators / Controllers

Part Number	Input Voltage	Output Current (A)	Package (mm)	Features
SC3303	5.5V–28V	3	MLPD-10 (3x3)	0.75V–7.5V, Int. LDO, Ultrasonic PSAVE
SC401B	3V–17V	15	MLPQ-32 (5x5)	0.6V–85%V_{IN}, Programmable Soft Start, Prog. LDO, Selectable PSAVE
SC402B	3V–28V	10	MLPQ-32 (5x5)	0.6V–85%V_{IN}, Programmable Soft Start, Prog. LDO, Selectable PSAVE
SC403B	3V–28V	6	MLPQ-32 (5x5)	0.6V–85%V_{IN}, Programmable Soft Start, Prog. LDO, Selectable PSAVE
SC414/424	3V–28V	6	MLPQ-28 (4x4)	0.75V–85%V_{IN}, 5V LDO, Ultrasonic/Regular PSAVE
SC417/427	3V–28V	10	MLPQ-32 (5x5)	0.5V–85%V_{IN}, Prog. LDO, Ultrasonic/Regular PSAVE
SC418/9	3V–28V	30	MLPQ-20 (3x3)	Ext. FETs, 0.5V–85%V_{IN}, Prog. LDO, Ultrasonic/Regular PSAVE
SC461	3V–28V	30	MLPQ-20 (3x3)	Ext. FETs, Hiccup, 0.6V–85%V_{IN}, 5V LDO, Selectable PSAVE
🚗 SC508(A)	4.5V–46V	30	MLPQ-20 (3x3)	Ext. FETs, Hiccup, 0.6V–85%V_{IN}, 5V LDO, Ultrasonic/Regular PSAVE
SC9301	3V–28V	10	MLPQ-32 (5x5)	Hiccup, 0.6V–5.5V, 5V LDO

High Efficiency Wide Input Synchronous Buck Regulators

Part Number	Input Voltage	Output Current (A)	Package (mm)	Features
TS30011	4.5V–24V	1	QFN-16 (3x3)	
TS30012	4.5V–24V	2	QFN-16 (3x3)	
TS30013	4.5V–18V	3	QFN-16 (3x3)	
TS30041	4.5V–40V	1	QFN-16 (3x3)	1 MHz Converters, Fixed V_{OUT} options (1.5V, 1.8V, 2.5V, 3.3V, 5.0V) or adjustable V_{OUT} (0.9V to VCC-1V)
TS30042	4.5V–40V	2	QFN-16 (3x3)	
🚗 TS30041Q	4.5V–40V	1	QFN-16 (3x3)	
🚗 TS30042Q	4.5V–40V	2	QFN-16 (3x3)	

NEW

Wide Input Asynchronous Buck Regulators

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	V_{OUT} (V) Min	V_{OUT} (V) Max (% V_{IN})	I_{OUT} Max (A)	Isw Limit (A)	Shutdown Current (µA)	Fsw (kHz)	Package (mm)	Features
SC4530	3	30	1.23	90	0.3	0.39	0.1	–	MLPD-8 (3x2)	Light load idle mode
SC4518H	4.4	24	0.8	85	1.4	2.0	100	600	SO-8 EDP	External synch
SC4519	3	16	1.2	85	2.7	3.0 typ.	5	600	SO-8 EDP	External synch
SC4519H	4.4	24	0.8	85	3.0	3.5	100	600	SO-8 EDP	External synch
SC4520	4.4	24	0.8	85	2.7	3.0	250	100-600	SO-8 EDP	Programmable frequency
SC4521	4.4	24	0.8	85	3.0	3.5	250	600	SO-8 EDP	Programmable Soft Start
SC4524E	3	28	1	96	2.0	2.6	40	200-2000	SO-8 EDP	Programmable Soft Start, hiccup overload protection with frequency foldback
SC4524F	3	18	1	96	2.0	2.6	40	200-2000	SO-8 EDP	Programmable Soft Start, hiccup overload protection with frequency foldback
SC4525E	3	28	1	96	3.0	3.9	40	200-2000	SO-8 EDP	Programmable Soft Start, hiccup overload protection with frequency foldback
SC4525F	3	18	1	96	3.0	3.9	40	200-2000	SO-8 EDP	Programmable Soft Start, hiccup overload protection with frequency foldback

EcoSpeed® is a registered trademark of Semtech Corporation.   🚗 *Automotive AEC-Q100 Qualified*

Point of Load (POL) Solutions

Low Dropout Regulators

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	V_{OUT} (V) Min	I_{OUT} (A) Max	$V_{DROPOUT}$ (V) Max O.T.	$V_{DROPOUT}$ @ Full Load (V) Typ	Package (mm) *Exposed die pad
TS31023	5	16	1.25	0.06	0.55	0.45	MLPD-8 (2x2)
TS31223	5	36	1.25	0.06	0.55	0.45	MLPD-8 (2x2)
SC4213H	1.4	6	0.5	0.5	0.15	0.075	SOIC-8
SC4211	1.4	6	0.5	1	0.5	0.2	SOIC-8 EDP
SC4212B	1.6	6	0.5	1	0.175	0.09	MLPD-8 (3x3)
SC4215J*	1.4	6	0.5	2	0.6	0.3	SOIC-8 EDP
SC4216H	1.45	5.5	0.5	3	0.7	0.45	SOIC-8 EDP
SC4217	1.8	5.5	1.24	3	0.6	0.3	TO-263-5

* SC4215J has 1ms internal Soft Start

Low Current, Low Voltage LDO Regulators

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	V_{OUT} (V) Min	I_{OUT} (A) Max	$V_{DROPOUT}$ (V) Max O.T.	Output options	Package (mm)
SC560	2.5	5.5	1.2	0.3	0.215	Many dual fixed outputs available	MLPQ-UT8 (1.5x1.5)
SC563	2.3	5.5	1.0	0.3	0.540	Dual fixed outputs	MLPD-UT8 (1.6x1.2)
TS14002	2.5	5.5	1.2	0.25	0.160	Ultra-low Iq, Fixed output	VDFN (2x2)

Buck Regulators

Part Number	Output Current (A)	Package (mm)	Features
SC195/B	0.5	MLPQ-8 (1.5x1.5) CSP-8 (0.8x0.8)	Low BOM 4 bit VID
SC197	2x0.5	MLPQ-18 (2x3)	Low BOM 4 bit VID
SC202A	0.5	MLPQ-13 (2.5x3)	Integrated inductor
SC220	0.65	SOIC 8	PCB trace inductor
SC4626	1	SOT23-5	Fixed V_{OUT} Low BOM
SC189	1.5	MLPD-6 (2x2)	Small size fixed V_{OUT} Low BOM
SC283 SC284 SC284P	2x1.8 2x1.8 2x2	MLPQ-18 (2x3) MLPQ-20 (3x3) MLPQ-20 (3x3)	Low BOM 4 bit VID Low BOM 4 bit VID 3 bit VID, PSAVE, PGOOD
🚗 SC183C/Q	2	MLPQ-16 (3x3)	Low BOM 4 bit VID
SC3102	2	MLPQ-16 (3x3)	Fixed V_{OUT} selectable forced PSAVE
SC185	4	MLPQ-16 (3x3)	Fixed V_{OUT} Low BOM
SC186	4	MLPQ-16 (3x3)	Low BOM 4 bit VID
SC286	2x4	MLPQ-28 (4x4)	Low BOM 4 bit VID

DDR1 to DDR4 Memory Termination LDO Regulators

Part Number	V_{CC} (V) Min	V_{CC} (V) Max	V_{DDQ} (V)	V_{TT} (V)	IV_{TT} (A) Max	DDR Type	Package	Features
SC2598	2.35	3.6	1–3.6	0.5–1.8	±3	1,2,3,4	SOIC-8 EDP	Integrated DDR VTT LDO with on-board buffered reference, remote sense
SC2599	2.35	3.6	1–3.6	0.5–1.8	±3	1,2,3,4	SOIC-8 EDP MLPD-UT8 (2x2)	Integrated DDR VTT LDO with on-board buffered reference, remote sense

Boost Regulators

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	V_{OUT} (V) Min	V_{OUT} (V) Max	I_{OUT}/ I_{SW}(A) Max	Shutdown Current (μA)	Iq (mA)	Switching Freq (MHz)	Package (mm)	Features
TS32101	1.8	5.5	1.8	5.5	/1.5	5	0.05	2	MLPQ-16 (3x3)	Synchronous, Power Save mode, bypass mode
SC120	0.7	4.5	1.8	5	/1.2	0.1	0.05	1.2	MLPD, SOT-23 (1.5x2)	Power Save mode for light load efficiency
SC121	0.7	4.5	1.8	5	/1.2	0.1	3.5	1.2	MLPD-UT-6 (1.5x2)	No Power Save
🚗 SC4501Q	1.4	16	1.4	30	/2	<18	<1.6	Up to 2	MSOP-8 EDP, MLPD-10 (3x3)	Programmable Soft Start, SEPIC configurable
SC4502(H)	1.4	16	1.4	32(40)	/1.4	<18	<1.6	Up to 2	MLPD-10 (3x3)	Programmable Soft Start, SEPIC configurable
SC630A	2.95	5.5	–	3.3	0.3/	0.1	2.5	1	MLPD-8 (2x2)	Buck-Boost 33mV ripple, Soft Start small caps
SC632	2.9	5.5	–	5	0.275/	0.1	1.5	0.2	MLPD-8 (2x2)	Buck-Boost <30mV ripple, Soft Start
SC632A	2.95	5.5	–	5	0.275/	0.1	2.5	1	MLPD-8 (2x2)	Buck-Boost 50mV ripple, Soft Start, small caps
SC633	2.9	5.5	–	5.3	0.4/	0.1	1.5	0.2	MLPD-8 (2x2)	Buck-Boost <30mV ripple, Soft Start

🚗 *Automotive AEC-Q100 Qualified*

LED Drivers & Load Switches

LED Inductor Based

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	V_{OUT} (V) Max	F_{sw} (MHz)	# LEDs per string* V_f=(3.5V)	# of Strings	String Current (mA)	Dimming Max Freq.	Package (mm)	Features
🚗 SC441A	4.5	21	36	0.7	10	4	150	up to 50kHz	TSSOP-20 EDP	Open/Short LED string disable, OCP, OTP, OVP, and FFLAG
SC442	4.5	21	42	0.2–1.0	12	10	30	up to 50kHz	MLPQ-UT-28 (4x4x0.6)	Adj freq, adj SCP level, Open/Short LED string disable, OCP, OTP, and OVP
SC443	4.5	27	42	0.2–.2	12	3	30	up to 50kHz	MLPQ-UT-16 (3x3x0.6)	Adj freq, Open LED string disable, OCP, OTP, and OVP
🚗 SC445Q	4.5	27	42	0.7	12	4	150	up to 50kHz	TSSOP-20 EDP	Adj SCP level, Open/Short LED string disable, OCP, OTP, OVP and FFLAG
SC446	4.5	27	42	0.7	12	3	100	up to 50kHz	TSSOP-16 EDP	Open/Short LED string disable, OCP, OTP, and OVP
SC4541	2.9	22	25	2	7 (Boost) 5 (Buck)	1	100 (max) Boost 200 (max) Buck	up to 1kHz	SOT23-6, MLPD-UT-6	High-side sensing integrated Schottky rectifier, no external compensation
SC5010/H	4.5	27	50	0.2–2.2	14	8	30 50(H)	up to 30kHz	MLPQ-UT-28 (4x4)	Phase shifted, PWM/I²C dimming, extensive protection
NEW 🚗 SC5012/BQ	4.5	45	65	0.2–2.2	18	4	150	up to 30kHz	MLPQ-24 (4x4)	I²C, FSYNC, 5000:1 phase shifted PWM Dimming
SC5014	4.5	27	50	0.2–2.2	14	4	120	up to 30kHz	MLPQ-20 (4x4)	Phase shifted, PWM/I²C dimming, extensive protection
SC5014A	4.5	27	50	0.2–2.2	14	2	240	up to 30kHz	MLPQ-20 (4x4)	Advanced high efficiency

FemtoSwitch™ Load Switches

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	IO_{UT} Max (A)	RDS ON (mΩ)	Shutdown Current (µA)	Quiescent Current (µA)	Reverse Current Blocking	Auto Discharge	ESD (kV HBM)	Package (mm)
SC704	1.1	3.6	0.5	90	0.1	2	–	–	5	CSP-4 (0.76x0.76)
SC705	1.1	3.6	0.5	90	0.1	2	–	✓	5	CSP-4 (0.76x0.76)
TS12001	1.2	5.5	1.0	175	0.0001	0.07	–	✓	2	DFN 8-L (2x2)
SC724	1.1	3.6	2.0	36	0.2	0.81	–	–	3	CSP-4 (0.76x0.76)
SC725	1.1	3.6	2.0	36	0.2	0.81	–	✓	3	CSP-4 (0.76x0.76)
SC33020H	1.6	5.5	2.0	32	0.3	1	✓	–	4	CSP-4 (0.9x0.9)
NEW 🚗 SC33020HQ	1.6	5.5	2.0	32	0.3	1	✓	–	4	CSP-4 (0.9x0.9)
SC33021	1.6	5.5	2	32	0.3	0.8	✓	✓	5	CSP-4 (0.9x0.9)
SC33001A	1.7	5.5	3	9	0.04	150	–	✓	Class 1C	CSP-6 (0.9x1.4)
SC700	0.75	5.25	4.0	17	0.5	150	–	✓	Class 1C	MLPD-6 (2x2)
SC700H	0.75	5.25	4.0	17	0.5	150	–	–	Class 1C	MLPD-6 (2x2)
SC701	1.7	5.5	4.0	8	3.5	125	–	✓	Class 1C	CSP-6 (0.9x1.4)
SC701H	1.7	5.5	4.0	8	3.5	125	–	–	Class 1C	CSP-6 (0.9x1.4)

Current Sense Amplifier

Part Number	V_{IN} (V) Min	V_{IN} (V) Max	Gain Temp Coefficient (ppm/°C)	Signal Input Voltage (V) Min	Signal Input Voltage (V) Max	Quiescent Current (µA)	Input Bias Current (µA)	ESD (kV HBM)	Package (mm)
TS94033	4.0	42	-20	V_{dd}-5.5	V_{dd}+0.04	140	2.1	2	SOT23-8

*Maximum number of LEDs depends on LED forward voltage   🚗 Automotive AEC-Q100 Qualified

Optical & Networking Solutions

BUILDING THE FUTURE TOGETHER

As networking requirements continue to evolve, Semtech will work with customers to continue providing solutions for tomorrow's networking challenges. One thing that won't change, however, is Semtech's commitment to being a reliable partner and providing innovative approaches that deliver unrivaled performance for the most sophisticated applications.

ENABLING HIGH PERFORMANCE AND SPEED

- Class leading IC solutions for 25G, 100G and 400G applications, including SFP28, QSFP28, CFPx, FRx,DRx SRx and AOCs
- Receive Optical Sub-Assembly (ROSA) based on Semtech's Rchip technology
- Full portfolio of integrated solutions to address all SFP+ and XFP modules
- Dual-lane Clock and Data Recovery (CDRs) (Tx/Rx) with integrated VCSEL, DML or EML driver
- Low power, reference-free
- Limiting amplifiers (LA) that provide wideband, low noise post-amplification
- Transimpedance amplifiers (TIAs) that exceed IEEE 10GbE and 100GbE Stressed Receiver Sensitivity (SRS) specifications
- High performance, low power laser drivers
- Full portfolio of integrated solutions for all PON applications including complete reference designs
- Industry's first single-chip 10G PON transceivers for symmetric and asymmetric applications
- Industry's first quad 10Gbps CDR, enabling long reach Infiniband® QDR, 40GbE and 100GbE applications
- Protocol-independent repeaters/redrivers
- Reference design kits for optical modules to decrease design time

MARKETS

56GBD & 28GBD PAM4 ETHERNET

- Complete solutions for 400G FR4/DR4 and 100G DR1, 200G and 400G as well as AOCs & SRx modules

100G ETHERNET

- Solutions for QSFP28, CFPx modules

25G ETHERNET

- Market leading module IC and ROSA solutions for SFP28

16G FIBRE CHANNEL

- Industry's first complete integrated IC solution for 16G Fibre Channel

10G

- Complete portfolio of module IC and backplane solutions
- Solutions for XFP, SFP+, QSFP+ modules

PON/FTTH

- Industry's first fully integrated 10G PON solutions
- Highly integrated chipset solutions for EPON & GPON ONU/OLT

TECHNOLOGY

CLEAREDGE® CDRs

- Market leader
- Reference-free operation
- Integrated solutions enable best performance and lowest power

ROSAS

- Best-in-class sensitivity, based on our patented Rchip technology

TIAS

- Industry leading performance and proved reliability with over 300 million sold

LASER DRIVERS & TRANSCEIVER ICS

- High performance integrated solutions for single and multi-channel applications

Optical Solutions

Optical Module CDRs

Part Number	Data Rate (Gbps)	Lanes	Laser Driver	TIA	Slice Level Adjust	Pin Compatibility	Package	Applications
GN2042	9.95–11.3	2 (1Rx + 1Tx)	DML	–	Yes	GN2044	QFN-32	XFP & SFP+ 10GbE & OC-192 Enables 1W Retimed SFP+ 10km
GN2044	9.95–11.3	2 (1Rx + 1Tx)	EML	–	Yes	GN1444, GN2042	QFN-32	XFP & SFP+ 10GbE, OC-192 & DWDM Enables 1.5W Retimed SFP+ 40/80km
GN2044S	9.95–11.3	2 (1Rx + 1Tx)	EML	–	Yes	GN1444S	QFN-32	Tunable SFP+, OC-192 & DWDM Enables 1.5W Retimed TSFP+
GN2040	9.95–11.3	2 (1Rx + 1Tx)	DML	–	Yes	GN204x	QFN-32	XFP and SFP+ 10GbE, OC-192 and DWDM
GN2017A	9.95–11.7 14.025	2 (1Rx + 1Tx)	VCSEL	–	No	GN2010X	QFN-32	16G FC, 10G FCoE
GN2104S	24-28	4	–	–	Yes	–	FC-CSP	100Gbps Ethernet, Wireless, CPRI
GN2104SC	24-26.5	4	–	–	Yes	–	FC-CSP	100Gbps Ethernet, Wireless, CPRI
GN2106S	24-28	4	EML	–	Yes	–	BGA	100Gbps Ethernet/OTN, Infiniband EDR
GN2108B	24-28	4	VCSEL	–	Yes	–	Die	100Gbps Ethernet SR4, 100G Active Optical Cable
GN2109S	24-28	4	–	Yes	Yes	GN2110S	Die	100Gbps Ethernet SR4, 100G Active Optical Cable
GN2108S	24-28	4	VCSEL	–	Yes	–	Die	100Gbps Ethernet SR4, 100G Active Optical Cable
GN2110B	24-28	4	–	Yes	Yes	GN2109, GN2110	Die	100Gbps Ethernet SR4, PSM4, 100G Active Optical Cable
GN2110S	24-28	4	–	Yes	Yes	GN2109S	Die	100Gbps Ethernet/OTN, CWDM4, CLR4, LR4
GN2105B	24–28	4	DML	–	Yes	–	FC-BGA	100Gbps Ethernet, PSM4, CWDM4, CLR4
GN2147	24–28	2 (1Rx+1Tx)	VCSEL	Yes	Yes	–	Die	25Gbs AOC, 25GBs SR
GN2148	24–28	1	VCSEL	–	–	–	Die	25Gbs AOC, 25GBs SR
GN2149	24–28	1	–	Yes	Yes	–	Die	25Gbs AOC, 25GBs SR

NEW (GN2147, GN2148, GN2149)

Laser Drivers

Part Number	Overview	Data Rate (Gbps)	Max Mod / Bias Current (mA)	Supply (V)	Package	Applications
NT20042	300Mbps LED Driver	0.3	100	3.3/5.0	QSOP-16	OC-3, Fast Ethernet
NT22L33	1.25Gbps FP/DFB Laser Driver	1.25	70/80	3.3/5.0	QFN-24 (4mm)	OC-3, OC-12, GbE
GN1163	DFB Driver	to 11.9	90/120	3.3 (Opt. 2.8)	QFN-24	QSFP+ 10GBASE-LR
GN1190	Quad VCSEL Driver	to 14.3	12/12	3.3	Bare Die	40Gbps Ethernet, Infiniband, QSFP+
GN1185	Quad DFB Driver	25–28	55/70	2.3/3.3	Bare Die	100GbE Ethernet active TOSA

Limiting Amplifiers

Part Number	Overview	Data Rate (Gbps)	Gain (dB)	BW	Supply (V)	Noise Figure (uV)	Applications
NT20045	200Mbps Limiting Amp	0.2	60	0.125	3.3/5.0	80	OC-3, Fast Ethernet

Optical Solutions

Transceiver IC (LD&LA)

Part Number	Overview	Data Rate (Gbps)	Max Mod/Bias Current (mA)	Supply (V)	Package	Applications
GN25L95C	SFP Burst Mode DFB + Receive LA	3.1G to 125M	90/100	3.3	QFN-28	Single and multi rate SFP
GN1412B	EML Laser Driver + Receive LA	to 11.3	2.5Vpp/120mA	3.3	QFN-32	10GbE, OC-192
GN1444S	EML Laser Driver + Receive LA	to 11.3	2.5Vpp/120mA	1.8 & 3.3	QFN-32	10GbE, OC-192
GN1157	DML Laser Driver + Receive LA	to 11.3	90/120	3.3 (Optional 2.8)	QFN-28	10GbE LR SFP+, CPRI
GN1157B	DML Laser Driver + Receive LA	to 12.5	90/120	2.4 & 3.3	QFN-28	10GbE LR SFP+, CPRI
GN1158	VCSEL Laser Driver + Receive LA	to 11.3	20/15	3.3 (Optional 2.8)	QFN-28	10GbE SR SFP+
NEW GN1159	DML Laser Driver + Receive LA with Digital Diagnostics	to 12.5	90/120	2.35 & 3.3	QFN-32	10GbE LR SRP+, CPRI

Combo Transceiver IC (LD&LA) for PON

Part Number	Overview	Data Rate (Gbps)	Max Mod/Bias Current (mA)	Supply (V)	Package	Applications
GN25L95	Burst Mode DFB + Receive LA	to 2.5	90/100	3.3	QFN-28	EPON, GPON, BOSA-on-Board
GN25L96	Programmable Burst Mode DFB + Receive LA	to 2.5	90/100	3.3	QFN-28	EPON, GPON, BOSA-on-Board, SFP
GN25L98	Burst Mode DFB + Receive LA + APD Controller	to 2.5	90/100	3.3	QFN-28	EPON, GPON, BOSA-on-Board
GN28L95	2.5Gbps Burst Mode DFB + 10 Gbps Receive LA	Rx 10.3 Tx 2.5	100/85	3.3	QFN-28	10G EPON, XG-PON1 (Asymmetric)
GN7354	Burst Mode DFB + Receive LA & CDR	Rx 10.3 Tx to 2.5	90/90	3.3 (3.3 or 5 output stage)	QFN-32	10G EPON, XG-PON (Asymmetric)
GN7355	Burst Mode DFB + Receive LA & CDR	10.3	90/90	3.3 + 5 output stage (optional 3.3 V)	QFN-32	10G EPON, XG-PON (Symmetric)

TIAs

Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	BW (GHz)	Supply (V)	Noise	Applications
NT20R67	155Mbps AGC TIA	0.155	63	0.165	3.3/5.0	11 nA	OC-3, Fast Ethernet
NT20067	155Mbps AGC TIA	0.155	23	0.165	3.3/5.0	11 nA	OC-3, Fast Ethernet
GN1056	10G Linear	to 11.3	500/1	12	3.3	1µA	OC-192
GN1058	10G Linear AGC	to 11.3	4	12	3.3	1µA	10GBASE-LRM & DWDM
GN1068	14G Limiting	to 14.3	6.75	12	3.3	1.2µA	CPRI, 10GBASE-SR/LR/ER & 16G FC
GN1090	Quad 10G limiting	to 14.3	*	*	3.3	0.9µA	40Gbps Ethernet; Infiniband, QSFP+
NEW GN1069	12.5G Limiting	to 12.5	10	11.5	3.3	0.86uA	CPRI, 10GBASE-SR/LR/ER
GN1081	28G Limiting	28	6	22	3.3	1.78µA	25Gbps and 100Gbps Ethernet/OTN, Infiniband EDR

Optical Solutions

TIAs (Conti.)

Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	BW (GHz)	Supply (V)	Noise	Applications
GN1084	25G Limiting	25	6	22	3.3	2.3µA	25Gbps and 100Gbps Ethernet
GN1085	Quad 28G Limiting	28	6	22	3.3	1.78µA	100Gbps Ethernet / OTN, Infiniband EDR
GN1088 NEW	Quad 28G Limiting	28	5	23	3.3	1.25uA	100Gbps Ethernet / OTN, Infiniband EDR

TIAs for PON

| Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	BW (GHz)	Supply (V)	Noise	Applications
NT23L50	622Mbps AGC TIA	0.622	50	0.32	3.3	60 nA	OC-12, BPON
NT24L50	1.25Gbps AGC TIA	1.25	25	0.75	3.3	92 nA	GbE, EPON
NT24L55	1.25Gbps High Sensitivity AGC TIA	1.25	46	0.75	3.3	74 nA	EPON
NT25L51	2.5Gbps AGC TIA	2.5	8	1.7	3.3	230 nA	OC-48, GPON (APD)
GN25L53	3.1Gbps AGC TIA	3.1	5.5	1.9	3.3	335 nA	CPRI, GPON, OC-48 (APD)
NT25L55	2.5Gbps High Sensitivity AGC TIA	2.5	21	1.4	3.3	87 nA	GPON (PD)
NT28L52	10G Limiting	to 10.3	2.35	7	3.3	1.2 µA	PON, 10GBASE-SR
GN7068	10G Limiting	to 11.3	3	12	3.3	1µA	APD ROSAs for 10G PON ONU & 10GBASE-ZR
GN7050	1.25G Burst Mode Limiting	1.25	13	1.0	3.3	*	1G EPON OLT
GN7052	Tri-rate PON TIA	1.25/ 2.5/ 10.3	13/ 1.2/ 2.3	1.1/ 2.5/ 8.7	3.3	*	1.25G EPON/ 2.5G XG-PON/ 10G EPON OLT
GN7053	1G GPON Burst Mode Limiting	1.25	1.25	1.5	3.3	*	1G GPON OLT

ROSAs & Super High Gain ROSAs

| Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	Supply	RSSI	Unstressed Sensitivity	Comments	ORL
GN3155	SR Super High Gain Rchip	to 11.3	35	+3.3V ±10%	Yes	-15dBm OMA	Eliminates LA in SFP+	-14dB
GN3055	10km Super High Gain Rchip	to 11.3	35	+3.3V ±10%	Yes	-21dBm	Eliminates LA in SFP+	-14dB
GN3255	40km Super High Gain Rchip	to 11.3	35	+3.3V ±10%	Yes	-21dBm	EliminatesLA in SFP+	-27dB
GN3068	10km Low Power Limiting	to 11.3	7	+3.3V ±10%	Yes	-21dBm	94 mW power dissipation	-14dB
GN3268	40km Low Power Limiting	to 11.3	7	+3.3V ±10%	Yes	-21dBm	94mW power dissipation	-27dB
GN3257	PIN with AGC	to 11.3	8.5	+3.3V ±10%	Yes	-19dBm	–	-27dB
GN3352	APD with AGC	to 11.3	4	+3.3V ±10%	VAPD	-27dBm	–	-27dB
GN3357	High Gain APD with AGC	to 11.3	8.5	+3.3V ±10%	VAPD	-27dBm	–	-27dB
GN3358	High Gain APD Rchip	to 11.3	13	+3.3V ± 10%	VAPD	-27dBm	Ideal for Non-Retimed SFP+	-27dB
GN3368	Limiting APD RChip	to 11.3	4	+3.3V ±10%	VAPD	-27dBm	–	-27dB
GN3270	25G Limiting PIN ROSA	28	6	+3.3V ±10%	Yes	-14dBm	SFP28 LR applications	-27dB

Networking Solutions

Multi-Lane Signal Conditioners

Part Number	Data Rate (Gbps)	Lanes	CDR	Ref Clock	Input Stage	De-emphasis	Supply (V)	Pkg	Applications
GN2504	25.6–28.1	4	Yes	Not Req.	Adaptive Equalizer	Yes	1.8	QFN-54	25G/50G/100G Linecards, nx28G Backplanes, 25G/50G/100G Active Copper Cables
GT1706 family	1.25–14.5	6	Yes	Req.	Adaptive Equalizer	Yes	0.9 1.8	BGA-144	HD/3G/4K/8K Video Broadcast testing Fibre Channel/Infiniband/ Ethernet Link Testing BERT Developments
GN2412 family	1.25–12.8	12	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	BGA-144	> nx10G Backplanes,10G/40G/100G Linecards, 10G-KR, 40G-KR4, 40G-CR4, Crosspoint Switching, CPRI
GN2408 family	1.25–12.8	8	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	BGA-144	>nx10G Backplanes,10G/40G Linecards, 10G-KR, Crosspoint Switching, CPRI
GN2404 family	1.25–12.8	4	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	BGA-144	>nx10G Backplanes,10G/40G Linecards, 10G-KR, 40G-KR4, 40G-CR4, Crosspoint Switching, CPRI
GN2402	10.3125	4	Yes	Not Req.	Equalizer	Yes	3.3	QFN-44	nx10G Backplanes, 10G/40G Linecards, 10G/40G Active cables
GX4002	9.9–11.3, 14.025	2	Yes	Not Req.	Equalizer	Yes	3.3	QFN-32	nx10G Backplanes,10G/40G Linecards, Infiniband FDR, 16G Fibre Channel, Crosspoint Switching
GN2405A/5S	9.95–11.3	4	Yes	Not Req.	Equalizer	Yes	3.3	QFN-48	nx10G Backplanes 10G/40G Linecards 10G/40G Active cables
GN2406/6S	9.95–10.95	4	Yes	Not Req.	Limiting Amp	Yes	3.3	QFN-48	10G/40G Linecards
GN1407	1–8	4	No	Not Req.	Equalizer	No	1.2 1.8	QFN-56	PCIe Gen 1/2/3, SNAP-12, POP-4/LX-4/CX-4/KX-4, XAUI/RXAUI and Rapid I/O
GN1406	2.5 3.125 5.0, 6.25	4	Yes	Req.	Equalizer	Yes	1.2 1.8	QFN-56	PCIe Gen 1/2, SNAP-12, POP-4/LX-4/CX-4/KX-4, XAUI/RXAUI and Rapid I/O

HIGH-SPEED BACKPLANES
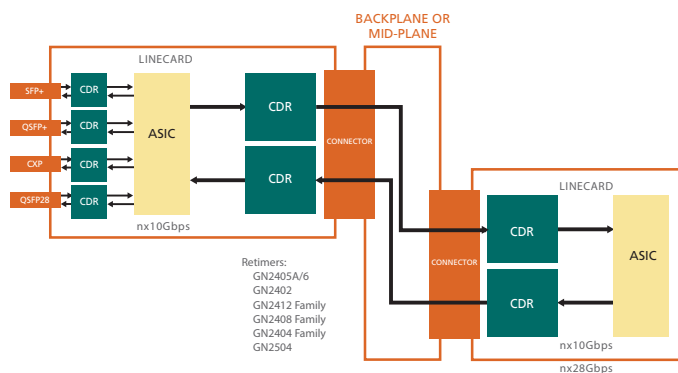

RETIMED CROSSPOINTS
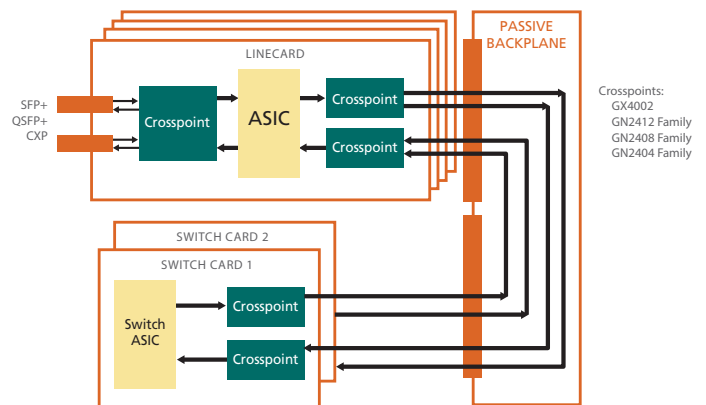
LoRa® – The Ultimate Long-Range Solution

Ideal for eliminating repeaters, reducing infrastructure cost, extending battery lifetime, and improving network capacity

LoRa® PRODUCTS

- Long range of up to 30 miles outdoor line of sight
- Deep indoor coverage for hard to reach areas
- Available for any environment
- Bi-directional communication link with adaptive data rates
- Low power sensors with extended battery lifetime of up to 20 years
  - 100nA sleep mode
  - 4.2mA active receive mode

- LoRa, LoRaWAN™ and FSK compliant
- GFSK modes supported by a single radio
- Scalable, multi-channel, high-capacity gateways powered by SX1301/SX1308
- LoRa modulation offers 30dB improvement over FSK for co-channel interference rejection
- Programmable registers for maximum flexibility

- Footprint-compatible ICs for global coverage
- Supported by over 500 members of LoRa Alliance™ that defines the open LoRaWAN protocol
- Dedicated developer forum for LoRa-based products in the LoRa Community
- Public, semi-private and private networks available worldwide

SX126X BLOCK DIAGRAM
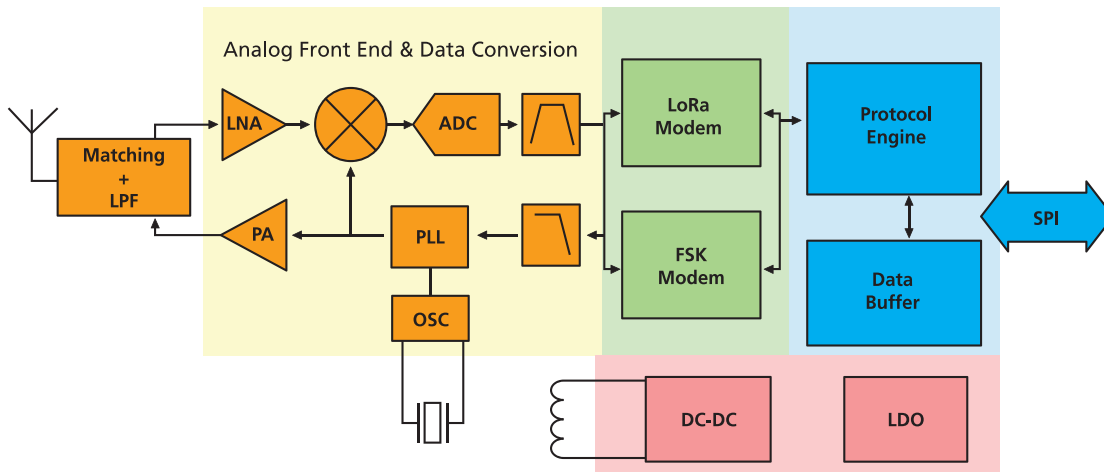
LoRa® Products							
Part Number	Frequency Range (MHz)	Link Budget (dB)	RXCurrent (mA)	FSK Max DR (kbps)	LoRa DR (kbps)	Max Sensitivity (dBm)	TX Power (dBm)
SX1261	150-960	163	4.2	300	0.018–62.5	-148	+ 15
SX1262	150-960	170	4.2	300	0.018–62.5	-148	+ 22
SX1268	410-810	170	4.2	300	0.018–62.5	-148	+ 22
SX1272	860–1020	158	10	300	0.3–40	-138	+ 20
SX1276	137–1020	168	11	300	0.018–40	-148	+ 20
SX1278	137–525	168	11	300	0.018–40	-148	+ 20

NEW

LoRa® Gateway/Concentrator Solutions

The ultimate long-range, high-capacity solution for IoT and M2M networks
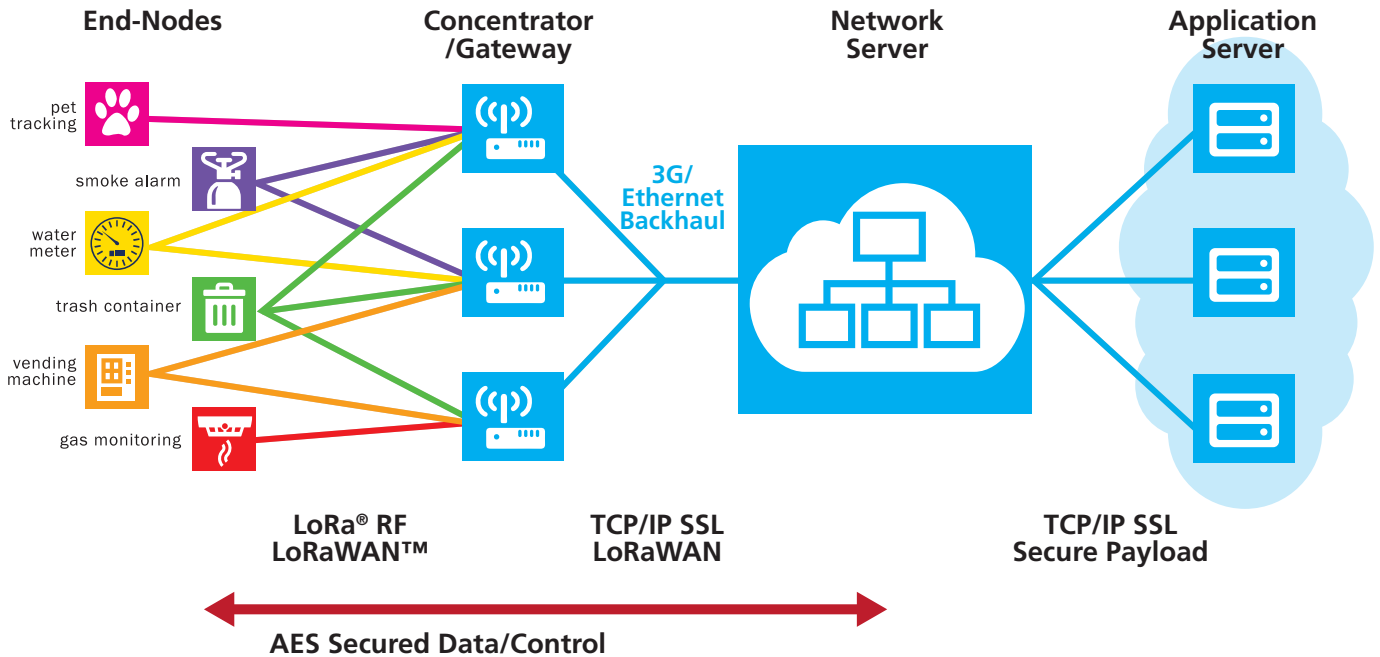
FEATURES OF SEMTECH'S LoRa WIRELESS RF TECHNOLOGY

Long Range   Penetrates in dense urban and deep indoor environments, connecting to sensors up to 30 miles away in rural areas

Low Power   Designed specifically for low power consumption extending battery lifetime up to 20 years

High Capacity   Supports millions of messages per base station

Geolocation   Enables GPS-free, low power tracking applications

Standardized   LoRaWAN specification ensures global interoperability among applications, IoT solution providers and telecom operators

Secure   Embedded end-to-end AES-128 encryption of data for optimal privacy and protection

Low Cost   Reduces costs three ways: infrastructure investment, operating expenses and end-node sensors

PICOCELL SOLUTIONS

- LoRa Picocell platforms are designed for a variety of indoor applications such as home, small business and buildings.
- SX1308 picocell IC is coupled with a SX1255 or SX1257 LoRa RF transceiver, and helps bring low cost LoRaWAN networks to market for consumers and private enterprises.

GATEWAY SOLUTIONS

- Multi-channel, multi-modem receiver including LoRa and FSK modems.
- Inherent two-way communication.
- Simultaneously receives different data rates on same channel.

RF ICs for Gateways and Picocells					
Part Number	Tx/Rx	Operating Temp. Range	LoRa Modem	FSK Modem	Capacity
SX1301	Tx/Rx	-40–85°C	9	1	Varies by application
SX1308	Tx/Rx	0–70°C	9	1	Varies by application

RF Transceivers				
Part Number	Tx/Rx	Band (MHz)	Tx Power	NF
SX1257	Tx/Rx	860–1000	-20–8	7
SX1255	Tx/Rx	400–510	-20–8	7

LoRa®-based Smart Sensors

With over 20 years of experience providing RF communications and sensing ICs for battery-operated sensors, Semtech offers the widest range of RF ICs for ultra long range M2M communications.

Use Case Example: LoRa-based Smart Water Flow Monitoring System
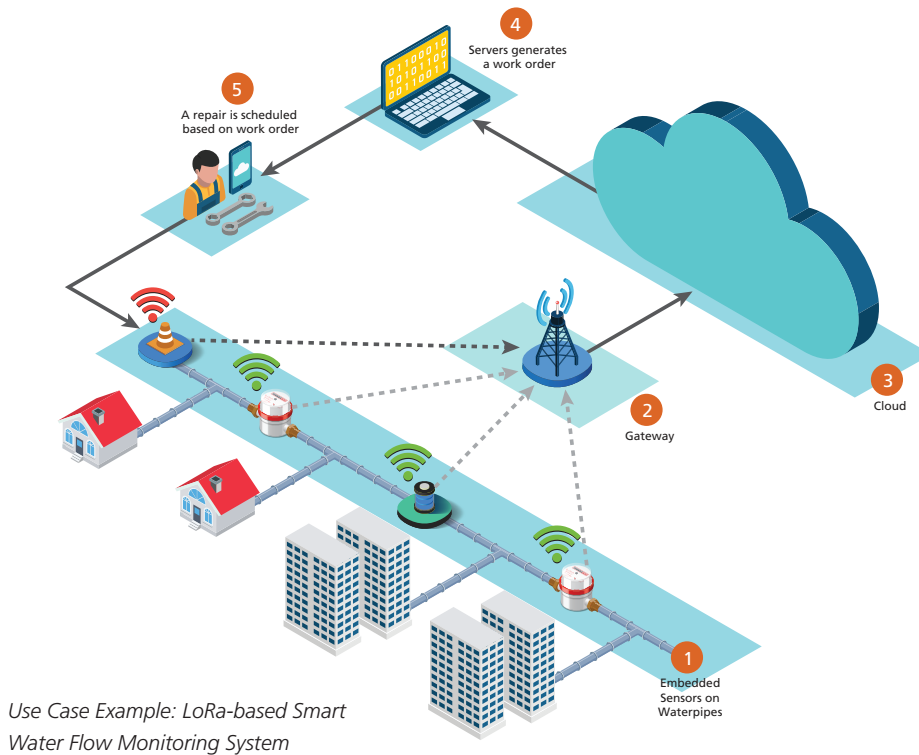
HIGH-LINK BUDGET
- 30dB higher than competing devices when using a low-cost BOM

HIGH RX SENSITIVITY SOLUTIONS
- Up to -148dBm of sensitivity

7X LOWER POWER CONSUMPTION
- 100nA sleep
- 4.2mA Rx
- 25mA @ +14dBm Tx

SUPPORT FOR MAJOR WIRELESS COMMUNICATIONS PROTOCOLS
- LoRaWAN™
- IEEE 802.15.4g
- Wireless M-Bus
- 6LoWPAN

RF ICs for Smart Sensors

	Part Number	Description	Link Budget (dB)	Rx Current (mA)	Evaluation Kit
NEW	SX1261	150-960MHz Long Range LoRa G/FSK	163	4.2	SX1261DVK1BAS
	SX1262	150-960MHz Long Range LoRa G/FSK	170	4.2	SX1262DVK1CAS
	SX1268	410-810MHz Long Range LoRa G/FSK	170	4.2	SX1268DVK1GAS
	SX1272	860–1020MHz Long Range LoRa G/FSK Transceiver	158	10	SX1272DVK1BAS (868MHz) SX1272DVK1CAS (915MHz)
	SX1276	138–1020MHz Long Range LoRa G/FSK Transceiver	168	9.9	SX1276DVK1IAS (169/868MHz) SX1276DVK1IAS (433/868MHz) SX1276DVK1IAS (490/915MHz)
	SX1278	138–1510MHz Long Range LoRa G/FSK Transceiver	168	9.9	SX1276DVK

Broadcast Video

Semtech's broadcast video products extend its 20+ year leadership in SDI technology with a complete line of advanced UHD-SDI solutions. Semtech's multi-rate device lineup enables customer roadmaps, facilitating the creation of differentiated and advanced UHD-SDI products. We offer the world's most advanced solutions designed specifically for real world broadcast challenges, including the latest innovations that help push the boundaries of performance, reach, power, and signal integrity while reducing time to market and design risks.

COMPREHENSIVE PORTFOLIO

Semtech offers the most comprehensive, end-to-end portfolio of UHD-SDI video solutions available, including our new family of long-reach, dual-input, multi-rate 12G retiming equalizers and cable drivers, low-power 3G equalizers, cable drivers and reclockers, integrated adaptive cable equalizers and cable drivers, and innovative UHD-SDI gearbox solutions.

UHD-SDI: THE NEXT GENERATION

New UHD-SDI solutions are needed to enable next-generation broadcast television and D-Cinema applications. UHD-SDI is the only fully-standardized interface for next-generation broadcast television production for high definition television (HDTV), ultra-high definition television (UHDTV),

high dynamic range (HDR), high frame rate (HFR), and wide color gamut (WCG) services.

DEDICATED TO CUSTOMER SUCCESS

Our commitment to customer success is the driver for everything we do. That's why we are unique in providing:

- Comprehensive test for each component in production, assuring high-yield on assembled boards
- Complimentary design support, including review and feedback to shorten development cycles, reduce risks and optimize performance
- Dedicated field applications engineering support throughout the product's life cycle

Adaptive Equalizers

Part Number	Application	Data Rate (Mbps)	Power (mW)	Inputs	Outputs	Cable Length (m)
GS12141	12G, 6G, 3G, HD, SD, MADI, low power, long reach	1–11880	320**	1	2	12G(70), 6G(90), 3G(190), HD(260), SD(450)
GS3140	3G, HD, SD, MADI, low power, long reach	1–2970	83mW	1	1	3G(200), HD(280), SD(500)
GS6042	6G, 3G, HD, SD, MADI, long reach	125–5940	180	1	1	6G(80), 3G(210), HD(300), SD(550)
GS3440 GS3441	3G, HD, SD, MADI, long reach	125–2970	180 212	1	1 2	3G(210), HD(300), SD(550)
GS12241	12G, 6G, 3G, HD, SD, MADI, low power, long reach	1-11880	385**	1	2	12G(80), 6G(100), 3G(190), HD(260), SD(450)
NEW GS12142*	12G, 6G, 3G, HD, SD, MADI, low power, long reach	1-11880	385**	2	2	12G(80), 6G(100), 3G(190), HD(260), SD(450)
GS3241	3G, HD, SD, MADI, long reach	1-2970	385**	1	2	3G(190), HD(260), SD(450)

Cable Drivers

Part Number	Application	Data Rate (Mbps)	Power (mW)	Input Trace EQ	Inputs	Outputs	Max Output Swing (mV)
GS12181	12G, 6G, 3G, HD, SD, MADI, dual output cable driver	1–11880	310**	Yes	1	2	1000
GS6080 GS6081	6G, 3G, HD, SD, single or dual output cable driver	143–5940	135 205	Yes	1	2 4	1800
GS12281 GS12081	12G, 6G, 3G, HD, SD, MADI, dual output cable driver	1–11880	360** 170	Yes	1	2	1000
NEW GS12182*	12G, 6G, 3G, HD, SD, MADI, dual output cable driver	1–11880	360**	Yes	2	2	1000
GS3281	3G, HD, SD, single or dual output cable driver	1-2970	360**	Yes	1	2	1000

Specifications are preliminary and subject to change

Broadcast Video

Reclockers

Part Number	Application	Data Rate (Mbps)	Input MUX	Input Trace EQ	Output De-emphasis	Package (mm)
GS6151	6G, 3G, HD, SD, MADI, reclocking with eye monitoring, low power, high density	270, 1485, 2970, 5940	2:1	Yes	Yes	4x4
GS6152	6G, 3G, HD, SD, MADI, reclocking with eye monitoring, low power	270, 1485, 2970, 5940	4:1	Yes	Yes	6x6
GS12150*	12G, 6G, 3G, HD, SD, MADI, reclocking with eye monitoring, low power	270, 1485, 2970, 5940, 11880	2:1	Yes	Yes	6x4

NEW

* Specifications are preliminary and subject to change

Configurable SDI Input/Output - Equalizer/Cable Driver

Part Number	Application	Data Rate (Mbps)	Power (mW)	Outputs	Cable Reach (m, Belden 1694A)	Package (mm)
GS12090	12G, 6G, 3G, HD, SD, MADI Configurable EQ/CD (BiDi)	1–11880	EQ: 430** CD: 375**	EQ:1, CD:1	12G(60), 6G(65), 3G(160), HD(240), SD(300)	6x4
GS3490	3G, HD, SD, MADI Configurable EQ/CD (BiDi)	125-2970	EQ: 202 CD: 215	EQ:1, CD:1	3G(140), HD(260), SD(500)	5x5
GS3590	3G, HD, SD, MADI Configurable EQ/CD (BiDi)	1-2970	EQ: 430** CD: 375**	EQ:1, CD:1	3G(160), HD(240), SD(300)	6x4

** Power specifications includes power consumed by integrated retimer

Gearbox

Part Number	SDI Rates	Error and Format detection	SMPTE 352M Handling	Input SKEW adjustment	Per Lane output delay adjustment	Temp Range	Package
GS12070	HD, 3G, 6G, 12G, (270 Bypass)	YES	YES	YES	YES	-40 to +85	BGA196

Transmitters

Part Number	Data Rate (Mb/s)	Audio Embedded	Output Jitter (ps)	Video Processing	Parallel Bus Width	Power (mW)
GS2972	270, 1485, 2970	Yes	3G(40), HD(50), SD(200)	Yes	10 or 20	400
GS2962	270, 1485, 2970	No	3G(40), HD(50), SD(200)	Yes	10 or 20	350
GS1672	270, 1485	Yes	HD(50), SD(200)	Yes	10 or 20	350
GS1662	270, 1485	No	HD(50), SD(200)	Yes	10 or 20	330

Receivers

Part Number	Data Rate (Mbps)	Equalizer	Audio De-embed	Audio Clock Generator	Package (mm)	Power (mW)
GS3471	270, 1485, 2970	Yes	Yes	Yes	100 BGA (9x9)	300
GS3470	270, 1485, 2970	No	Yes	Yes	100 BGA (9x9)	220
GS2971A	270, 1485, 2970	Yes	Yes	Yes	100 BGA (11x11)	525
GS2961A	270, 1485, 2970	Yes	No	No	100 BGA (11x11)	500
GS2970A	270, 1485, 2970	No	Yes	Yes	100 BGA (11x11)	350
GS2960A	270, 1485, 2970	No	No	No	100 BGA (11x11)	320
GS1661A	270, 1485	Yes	No	No	100 BGA (11x11)	460
GS1660A	270, 1485	No	No	No	100 BGA (11x11)	250

NEW

Crosspoint

Part Number	Data Rate (Gbps)	Inputs	Outputs	Power (W)	Input Trace EQ	Output De-emphasis
GX3290	3.5	290	290	34	Yes	Yes
GX3190	3.5	146	290	25	Yes	Yes
GX3246	3.5	290	146	18	Yes	Yes
GX3202	3.5	202	202	24	Yes	Yes
GX3146	3.5	146	146	18	Yes	Yes

HD-VLC™ The Future of HD Surveillance

Semtech's next-generation of high-performance, all-digital HD video connectivity solutions for surveillance with integrated HD-VLC provide unprecedented levels of cable reach performance and enable long-distance transmission of high-quality HD digital video.

The High-Definition Visually Lossless CODEC (HD-VLC) has been specifically developed to allow both 720p and 1080p high-definition video to be transmitted at lower data rates over conventional CCTV coaxial cables. Combined with Semtech's industry-leading cable equalizer and CDR technology, cable distances can be extended up to four times the reach of existing HD-SDI and HDcctv 1.0 products, and up to two times the reach of other VLC-based products.
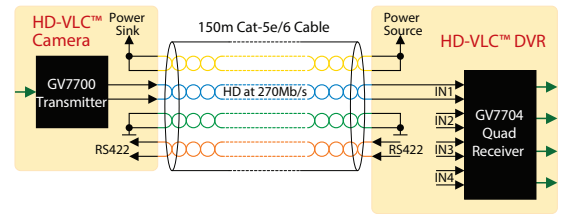
HD VLC™

CABLE REACH COMPARISON

Cable Type	HD-VLC™ 270Mbps	HD-SDI 1.485Gbps
Belden 1694A	700m	230m
Belden 543945	550m	150m
KW-Link SYV 75-5	500m	140m
Canare L-3C2V	300m	100m
KW-Link SYV 75-3	300m	80m
Cat-5e/6 UTP	150m	–

COAXIAL CABLE APPLICATION: 500M CABLE REACH
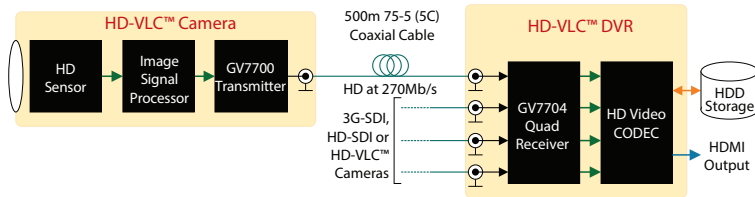
UTP CABLE APPLICATION: 150M CABLE REACH

GV7700 HD-VLC Transmitter

Data Rate (Mbps)	Downstream Data Insert	Downstream Audio Insert	Max Output Jitter (ps)	BT.1120 Bus Width	HD-VLC Encoder	I/O Voltage (V)	Temp Range (°C)	Power (mW)	Package (mm)
270, 540, 1485, 2970	Yes	4 channels	77	8/10 or 16/20 bit	Yes	1.8 or 3.3	-20 to +85	180	Dual Row QFN-84 (7x7)

GV7704 Quad HD-VLC Receiver

Data Rate (Mbps)	Integrated Equalizer	Downstream Data Extract	Downstream Audio Extract	IJT (UI)	Serial Loop Through	BT.1120 Bus Width	HD-VLC Decoder	Temp Range (°C)	Power (mW)	Package (mm)
270, 540, 1485, 2970	Yes	Yes	4 channels	0.06 (@270) 0.11 (@1485)	Yes	8/10 bit	Yes	-20 to +85	810*	BGA-169 (11x11)

* All four channels active

GV8601 Adaptive Cable Equalizer

Data Rate (Mbps)	Cable Reach with Belden 543945			Output Jitter (UI)	Output Coupling	Temp Range (ºC)	Power (mW)	Package
	3G	HD	SD					
270, 1485, 2970	100m	150m	330m	0.2	2.5/3.3V	-40 to +85	195	QFN-16

GV8500 Cable Driver

Data Rate (Mbps)	Single Ended Outputs	Output Jitter (ps)	Adjustable Slew Rate	Output Amplitude Adjust	Temp Range (°C)	Power (mW)	Package
270, 1485, 2970	2	<22	Yes	Yes	0 to +70*	168	QFN-16

* The GV8500 been characterized to meet typical conditions over the -40°C to +85°C extended temperature range.

High Reliability Products
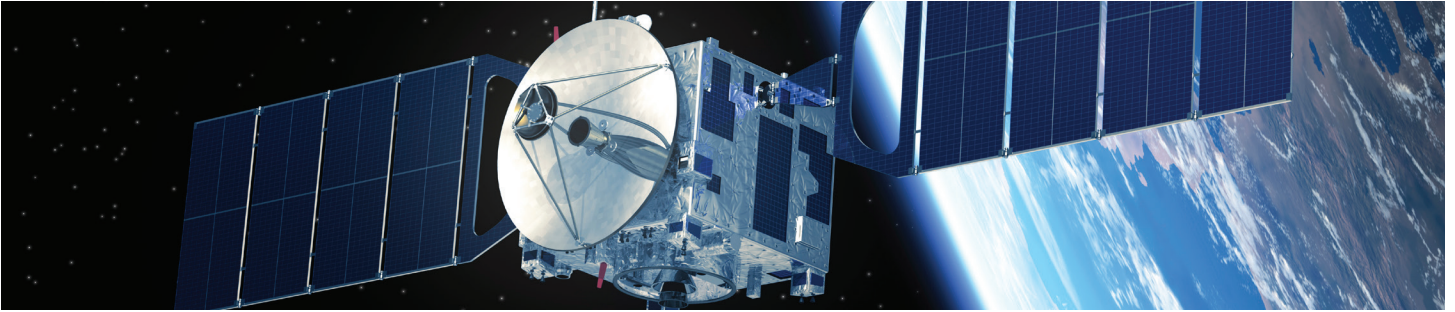
Designed to operate across a wide temperature range in unforgiving environments from the ocean floor to space, Semtech's high reliability products are ideal for Aerospace, Industrial and Military applications.

MODULES

- Epoxy encapsulated rectifier assemblies
- mA to 130A+ and 50V to 225kV+
- Catalog and custom products to source control drawings available

ISOPAC™

- High power density, rugged and reliable high current rectifier assemblies
- Fully hermetic open-frame construction
- 15A to 100A+
- Zero lead length connections for optimal thermal resistance
- Catalog and custom products to source control drawings available

15A Ministud Rectifier

45A Three Phase Full Wave Bridge

QPL DEVICES

- Rectifiers, TVS and Zener diodes qualified up to JANS grade on the Defense Logistics Agency Qualified Product List
- Axial and surface mount package options available

SPACE GRADE DEVICES

- QPL Space grade rectifiers, TVS and Zener diodes in axial and surface mount packaging
- Up-screening available for QPL devices where JANS grade is not defined
- Up-screening available for JANS-equivalent products and also for ISOPACs

COMMERCIAL OFF-THE-SHELF (COTS)

- COTS Diodes - extended temperature range industrial grade products for designs where more expensive QPL devices are not required by the end application. Offerings include popular discrete rectifiers
- COTS Power - extended temperature range industrial grade power management devices. Offerings include DCDC regulators, synchronous rectifiers, LDOs, references, and Neo-Iso™ solid state relay devices

SEMTECH CORPORATION

Semtech Corporation is a leading supplier of high performance analog, mixed-signal semiconductors and advanced algorithms for high-end consumer, enterprise computing, communications, and industrial equipment. Semtech, publicly traded since 1967, is listed on the Global Select Market under the symbol SMTC and has more than 32 sales and application support offices in 14 countries as well as representatives and distribution support locations in more than 30 countries.

Semtech is dedicated to providing proprietary platforms, differentiated by innovation, size, efficiency, performance, and reach. Our solutions are used in some of the most innovative systems and products in the fastest growing markets today.

These markets include smartphones, LCD TVs, notebooks, tablets, smart grid, automotive, automatic meter reading, medical, wireless infrastructure, PON, Internet of Things, optical transport, and datacenters. More than 5,000 customers worldwide rely on our diverse product portfolio and world class technology roadmap for solutions in low-power wireless communications, optical data transport, video broadcasting, power management, circuit protection, touch sensing, and more, making Semtech one of the most balanced semiconductor companies in the industry.

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