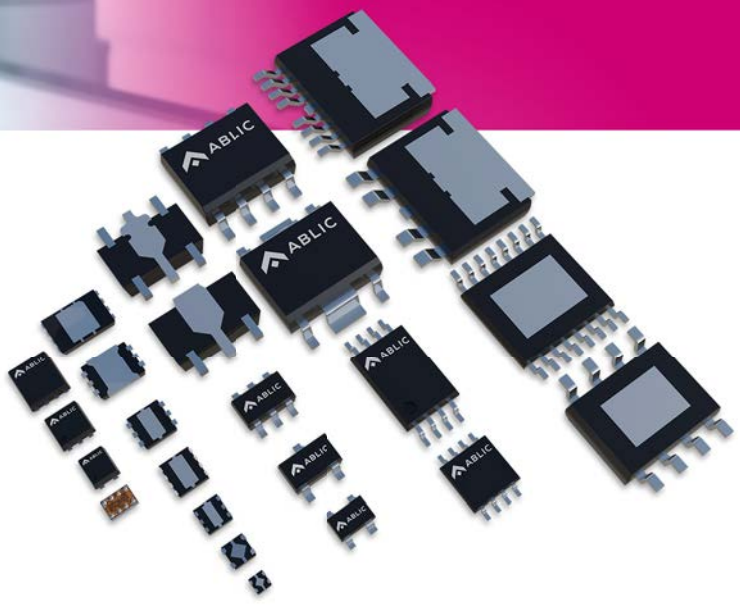
ABLIC

MinebeaMitsumi Group

Product Catalog

Timer ICs, Wireless Power ICs, Amplifiers

2025



ABLIC Inc.

Table of Contents

Real-Time Clocks (RTCs)

Real-Time Clocks (RTCs) on ablic.com

Series Name	Features	Interface	Current consumption (3.0V) [µA]	Power supply voltage that allows communication min. [V]	Power supply voltage that allows communication max. [V]	Operation temp. min. [°C]	Operation temp. max. [°C]	Package	Page
S-35190A	Super-low 0.25µA current consumption	3-wire	0.25	1.3	5.5	-40	85	8-Pin SOP, 8-Pin TSSOP, SNT-8A	1
S-35192A	Constant 32kHz output	3-wire	0.45	1.3	5.5	-40	85	SNT-8A	2
S-35390A	Super-low 0.25µA current consumption	2-wire	0.25	1.3	5.5	-40	85	8-Pin SOP, 8-Pin TSSOP, SNT-8A	3
S-35391A	A product having different device code from S-35390A	2-wire	0.25	1.3	5.5	-40	85	8-Pin SOP, SNT-8A	4
S-35392A	Constant 32kHz output	2-wire	0.45	1.3	5.5	-40	85	SNT-8A	5
S-35399A03	Alarm settable to day/month/year, 24-bit counter	2-wire	0.34	1.3	5.5	-40	85	8-Pin SOP	6

Wake-up Timer ICs

Wake-up Timer ICs on ablic.com

Series Name	Features	Time setting	Current consumption [µA]	Operation voltage min. [V]	Operation voltage max. [V]	Operation temp. min. [°C]	Operation temp. max. [°C]	Package	Page
S-35710M	Programmable Wake-up Timer IC with Built-in Quartz Crystal	Software	0.25	1.8	5.5	-40	85	HSOP-8Q	7
S-35710	Programmable Wake-up Timer IC	Software	0.20	1.8	5.5	-40	85	TMSOP-8	8
S-35720	Pin-selectable Wake-up Timer IC	Hardware	0.20	1.8	5.5	-40	85	TMSOP-8	9

Interval Timer ICs

Interval Timer ICs on ablic.com

Series Name	Features	Time setting	Current consumption [µA]	Operation voltage min. [V]	Operation voltage max. [V]	Operation temp. min. [°C]	Operation temp. max. [°C]	Package	Page
S-35730	Pin-selectable Interval Timer IC	Hardware	0.20	1.8	5.5	-40	85	TMSOP-8	10
S-35740	Programmable Interval Timer IC	Software	0.20	1.8	5.5	-40	85	TMSOP-8	11

Counter ICs

Counter ICs on ablic.com

Series Name	Features	Operation voltage min. [V]	Operation voltage max. [V]	Current consumption [nA]	Operation temp. min. [°C]	Operation temp. max. [°C]	Package	Page
S-35770	2-wire (I^2C-bus) Interface	1.5	5.5	10.0	-40	85	TMSOP-8	12

Wireless Power ICs

Wireless Power ICs on ablic.com

Series Name	Features	Purpose	Operation voltage min. [V]	Operation voltage max. [V]	Current consumption during operation typ. [µA]	Operation temp. min. [°C]	Operation temp. max. [°C]	Package	Page
S-8471	Constant voltage output	Reception control	0.95	6.5	30	-40	85	SNT-6A	13
S-8473	With charge function to a Li-ion rechargeable battery (Charge current: 33mA)	Reception control	2.20	5.0	250	-40	85	SNT-8A	14
S-8474	Continuous operation / Intermittent operation switch function	Transmission control	4.50	6.5	200	-40	85	SNT-8A	15

Operational Amplifiers

Operational Amplifiers on ablic.com

Series Name	Number of circuits	Input Rail-to-Rail	Operating voltage min. [V]	Operating voltage max. [V]	Current consumption (per circuit) [µA]	Input offset voltage max. [mV]	Gain bandwidth product [kHz]	Slew rate [V/µs]	Operation temp. min. [°C]	Operation temp. max. [°C]	Package	Page
S-89630A	2 circuits	Yes	4.00	36.00	250	0.05	1200	0.450	-40	125	TMSOP-8	16
S-89713	2 circuits	Yes	2.65	5.50	165	0.01	240	0.160	-40	85	TMSOP-8, SNT-8A	17
S-89430/89431	1 circuit, 2 circuits	Yes	0.90	5.50	0.5	10.0, 5.0	4.8	0.005	-40	85	SC-88A, SOT-23-5, TMSOP-8, SNT-8A	18
S-89110/89120	1 circuit, 2 circuits	-	1.80	5.50	50.0, 10.0	4.0	175, 35	0.070, 0.015	-40	125	SC-88A, SOT-23-5, TMSOP-8, SNT-8A	19
S-89130/89140	2 circuits	-	2.70	5.50	1000, 270	6.0, 7.0	3000, 1000	2.000, 0.500	-40	125	TMSOP-8, SNT-8A	20

Comparators

Comparators on ablic.com

Series Name	Number of circuits	Input Rail-to-Rail	Operating voltage min. [V]	Operating voltage max. [V]	Current consumption (per circuit) [µA]	Input offset voltage max. [mV]	Rise propagation delay time [µs]	Fall propagation delay time [µs]	Output rise time [µs]	Output fall time [µs]	Operation temp. min. [°C]	Operation temp. max. [°C]	Package	Page
S-89530A/89531A	1 circuit	Yes	0.9	5.5	0.7	10, 5	110	280	10	30	-40	85	SC-88A	21
S-89210/89220	1 circuit	-	1.8	5.5	50, 10	4	30, 150	6, 30	2, 10	2, 10	-40	85	SC-88A	22
S-89230/89240	2 circuits	-	1.8	5.5	23, 5.0	4	26, 100	4, 18	2, 10	2, 10	-40	85	TMSOP-8, SNT-8A	23

S-35190A

3-WIRE REAL-TIME CLOCK

The S-35190A is a CMOS 3-wire real-time clock IC which operates with the very low current consumption in the wide range of operation voltage. The operation voltage is 1.3 V to 5.5 V so that the S-35190A can be used for various power supplies from main supply to backup battery. Due to the 0.25 μA current consumption and wide range of power supply voltage at time keeping, the S-35190A makes the battery life longer. In the system which operates with a backup battery, the included free registers can be used as the function for user's backup memory. Users always can take back the information in the registers which is stored before power-off the main power supply, after the voltage is restored.
The S-35190A has the function to correct advance / delay of the clock data speed, in the wide range, which is caused by the crystal oscillation circuit's frequency deviation. Correcting according to the temperature change by combining this function and a temperature sensor, it is possible to make a high precise clock function which is not affected by the ambient temperature.

■ Features

- Low current consumption: 0.25 μA typ. (V_{DD} = 3.0 V, Ta = +25°C)
- Wide range of operating voltage: 1.3 V to 5.5 V
- Built-in clock correction function
- Built-in free user register
- 3-wire (MICROWIRE) CPU interface
- Built-in alarm interrupter
- Built-in flag generator during detection of low power voltage or at power-on
- Auto calendar up to the year 2099, automatic leap year calculation function
- Built-in constant-voltage circuit
- Built-in 32.768 kHz crystal oscillation circuit (built-in C_d, external C_g)
- Lead-free, Sn 100%, halogen-free[*1]

***1.** Refer to "■ **Product Name Structure**" for details.

■ Applications

- Mobile game device
- Mobile AV device
- Digital still camera
- Digital video camera
- Electronic power meter
- DVD recorder
- TV, VCR
- Mobile phone, PHS

■ Packages

- 8-Pin SOP (JEDEC)
- 8-Pin TSSOP
- SNT-8A

S-35192A

3-WIRE REAL-TIME CLOCK

The S-35192A is a CMOS 3-wire real-time clock IC which operates with the very low current consumption in the wide range of operation voltage. The operation voltage is 1.3 V to 5.5 V so that the S-35192A can be used for various power supplies from main supply to backup battery. Due to the 0.45 μA current consumption and wide range of power supply voltage at time keeping, the S-35192A makes the battery life longer. In the system which operates with a backup battery, the included free registers can be used as the function for user's backup memory. Users always can take back the information in the registers which is stored before power-off the main power supply, after the voltage is restored.
The S-35192A has the function to correct advance / delay of the clock data speed, in the wide range, which is caused by the crystal oscillation circuit's frequency deviation. Correcting according to the temperature change by combining this function and a temperature sensor, it is possible to make a high precise clock function which is not affected by the ambient temperature.

■ Features

- Low current consumption: 0.45 μA typ. (V_{DD} = 3.0 V, Ta = +25°C)
- Constant output of 32.768 kHz clock pulse (Nch open-drain output)
- Wide range of operating voltage: 1.3 V to 5.5 V
- Built-in clock correction function
- Built-in free user register
- 3-wire (MICROWIRE) CPU interface
- Built-in alarm function
- Built-in flag generator during detection of low power voltage or at power-on
- Auto calendar up to the year 2099, automatic leap year calculation function
- Built-in constant voltage circuit
- Built-in 32.768 kHz crystal oscillation circuit (built-in C_d, external C_g)
- Lead-free (Sn 100%), halogen-free

■ Applications

- Mobile game device
- Mobile AV device
- Digital still camera
- Digital video camera
- Electronic power meter
- DVD recorder
- TV, VCR
- Mobile phone, PHS

■ Package

- SNT-8A

S-35390A

2-WIRE REAL-TIME CLOCK

The S-35390A is a CMOS 2-wire real-time clock IC which operates with the very low current consumption in the wide range of operation voltage. The operation voltage is 1.3 V to 5.5 V so that the S-35390A can be used for various power supplies from main supply to backup battery. Due to the 0.25 μA current consumption and wide range of power supply voltage at time keeping, the S-35390A makes the battery life longer. In the system which operates with a backup battery, the included free registers can be used as the function for user's backup memory. Users always can take back the information in the registers which is stored before power-off the main power supply, after the voltage is restored.
The S-35390A has the function to correct advance / delay of the clock data speed, in the wide range, which is caused by the crystal oscillation circuit's frequency deviation. Correcting according to the temperature change by combining this function and a temperature sensor, it is possible to make a high precise clock function which is not affected by the ambient temperature.

■ Features

- Low current consumption: 0.25 μA typ. (V_{DD} = 3.0 V, Ta = +25°C)
- Wide range of operating voltage: 1.3 V to 5.5 V
- Built-in clock correction function
- Built-in free user register
- 2-wire (I^2C-bus) CPU interface
- Built-in alarm interrupter
- Built-in flag generator during detection of low power voltage or at power-on
- Auto calendar up to the year 2099, automatic leap year calculation function
- Built-in constant voltage circuit
- Built-in 32.768 kHz crystal oscillation circuit (built-in C_d, external C_g)
- Lead-free, Sn 100%, halogen-free[*1]

***1.** Refer to "■ **Product Name Structure**" for details.

■ Applications

- Mobile game device
- Mobile AV device
- Digital still camera
- Digital video camera
- Electronic power meter
- DVD recorder
- TV, VCR
- Mobile phone, PHS

■ Packages

- 8-Pin SOP (JEDEC)
- 8-Pin TSSOP
- SNT-8A

S-35391A

2-WIRE REAL-TIME CLOCK

The S-35391A is a CMOS 2-wire real-time clock IC which operates with the very low current consumption in the wide range of operation voltage. The operation voltage is 1.3 V to 5.5 V so that the S-35391A can be used for various power supplies from main supply to backup battery. Due to the 0.25 μA current consumption and wide range of power supply voltage at time keeping, the S-35391A makes the battery life longer. In the system which operates with a backup battery, the included free registers can be used as the function for user's backup memory. Users always can take back the information in the registers which is stored before power-off the main power supply, after the voltage is restored.
The S-35391A has the function to correct advance / delay of the clock data speed, in the wide range, which is caused by the crystal oscillation circuit's frequency deviation. Correcting according to the temperature change by combining this function and a temperature sensor, it is possible to make a high precise clock function which is not affected by the ambient temperature.

■ Features

- Low current consumption: 0.25 μA typ. (V_{DD} = 3.0 V, Ta = +25°C)
- Wide range of operating voltage: 1.3 V to 5.5 V
- Built-in clock correction function
- Built-in free user register
- 2-wire (I^2C-bus) CPU interface
- Built-in alarm interrupter
- Built-in flag generator during detection of low power voltage or at power-on
- Auto calendar up to the year 2099, automatic leap year calculation function
- Built-in constant voltage circuit
- Built-in 32.768 kHz crystal oscillation circuit (built-in C_d, external C_g)
- Lead-free, Sn 100%, halogen-free[*1]

***1.** Refer to "■ **Product Name Structure**" for details.

■ Applications

- Mobile game device
- Mobile AV device
- Digital still camera
- Digital video camera
- Electronic power meter
- DVD recorder
- TV, VCR
- Mobile phone, PHS

■ Packages

- 8-Pin SOP (JEDEC)
- SNT-8A

S-35392A

2-WIRE REAL-TIME CLOCK

The S-35392A is a CMOS 2-wire real-time clock IC which operates with the very low current consumption in the wide range of operation voltage. The operation voltage is 1.3 V to 5.5 V so that the S-35392A can be used for various power supplies from main supply to backup battery. Due to the 0.45 μA current consumption and wide range of power supply voltage at time keeping, the S-35392A makes the battery life longer. In the system which operates with a backup battery, the included free registers can be used as the function for user's backup memory. Users always can take back the information in the registers which is stored before power-off the main power supply, after the voltage is restored.
The S-35392A has the function to correct advance / delay of the clock data speed, in the wide range, which is caused by the crystal oscillation circuit's frequency deviation. Correcting according to the temperature change by combining this function and a temperature sensor, it is possible to make a high precise clock function which is not affected by the ambient temperature.

■ Features

- Low current consumption: 0.45 μA typ. (V_{DD} = 3.0 V, Ta = +25°C)
- Constant output of 32.768 kHz clock pulse (Nch open-drain output)
- Wide range of operating voltage: 1.3 V to 5.5 V
- Built-in clock correction function
- Built-in free user register
- 2-wire (I^2C-bus) CPU interface
- Built-in alarm interrupter
- Built-in flag generator during detection of low power voltage or at power-on
- Auto calendar up to the year 2099, automatic leap year calculation function
- Built-in constant voltage circuit
- Built-in 32.768 kHz crystal oscillation circuit (built-in C_d, external C_g)
- Lead-free (Sn 100%), halogen-free

■ Applications

- Mobile game device
- Mobile AV device
- Digital still camera
- Digital video camera
- Electronic power meter
- DVD recorder
- TV, VCR
- Mobile phone, PHS

■ Package

- SNT-8A

S-35399A03

2-WIRE REAL-TIME CLOCK

The S-35399A03 is a CMOS 2-wire real-time clock IC which operates with the very low current consumption in the wide range of operation voltage. The operation voltage is 1.3 V to 5.5 V so that the S-35399A03 can be used for various power supplies from main supply to backup battery. Due to the 0.34 µA current consumption and wide range of power supply voltage at time keeping, The S-35399A03 makes the battery life longer. In the system which operates with a backup battery, the included free registers can be used as the function for user's backup memory. Users always can take back the information in the registers which is stored before power-off the main power supply, after the voltage is restored.
The S-35399A03 has the function to correct advance / delay of the clock data speed, in the wide range, which is caused by the crystal oscillation circuit's frequency deviation. Correcting according to the temperature change by combining this function and a temperature sensor, it is possible to make a high precise clock function which is not affected by the ambient temperature.
Moreover, the S-35399A03 has a 24-bit binary up counter. This counter counts up every 60 seconds from power-on so that users are able to grasp the elapsed time from power-on up to 30 years.

■ Features

- Low current consumption: 0.34 µA typ. (V_{DD} = 3.0 V, Ta = +25°C)
- Wide range of operating voltage: 1.3 V to 5.5 V
- Built-in clock correction function
- Built-in 24-bit binary up counter
- Built-in free user register
- 2-wire (I^2C-bus) CPU interface
- Built-in alarm interrupter
- Built-in flag generator during detection of low power voltage or at power-on
- Auto calendar up to the year 2099, automatic leap year calculation function
- Built-in constant voltage circuit
- Built-in 32.768 kHz crystal oscillation circuit (built-in C_d, external C_g)
- Lead-free (Sn 100%), halogen-free

■ Applications

- Mobile game device
- Mobile AV device
- Digital still camera
- Digital video camera
- Electronic power meter
- DVD recorder
- TV, VCR
- Mobile phone, PHS

■ Package

- 8-Pin SOP (JEDEC)

S-35710M

WAKE-UP TIMER IC

PROGRAMMABLE WAKE-UP TIMER IC WITH BUILT-IN QUARTZ CRYSTAL

The wake-up timer IC allows for intermittent system operation by periodically waking up the system.
The S-35710M compares the timer value and the value written to the internal register, and outputs a wake-up signal (interrupt signal) when the values match each other.
The timer of the S-35710M is a 24-bit binary-up counter.
The internal register data can be set freely by users via a 2-wire serial interface. Consequently, the time before the occurrence of a wake-up signal (interrupt signal) can be set freely.
Since the S-35710M has a built-in quartz crystal, a matching assessment of the IC and the quartz crystal is unnecessary. Moreover, the number of external parts can also be reduced.

■ Features

- Built-in 32.768 kHz quartz crystal
- Wake-up function (Alarm interrupt function): Settable on the second time scale from 1 second to 194 days (Approximately half a year)
- Low current consumption: 0.25 µA typ. (V_{DD} = 3.0 V, Ta = +25°C)
- Wide range of operation voltage: 1.8 V to 5.5 V
- 2-wire (I^2C-bus) CPU interface
- Operation temperature range: Ta = –40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- IoT communications device
- Monitoring device
- Security device
- Battery system
- Energy harvesting system

■ Package

- HSOP-8Q

S-35710 Series

WAKE-UP TIMER IC

PROGRAMMABLE WAKE-UP TIMER IC

The wake-up timer IC allows for intermittent system operation by periodically waking up the system.
The S-35710 Series compares the timer value and the value written to the internal register, and outputs a wake-up signal (interrupt signal) when the values match each other.
The timer of the S-35710 Series is a 24-bit binary-up counter.
The internal register data can be set freely by users via a 2-wire serial interface. Consequently, the time before the occurrence of a wake-up signal (interrupt signal) can be set freely.

■ Features

- Wake-up function (Alarm interrupt function): Settable on the second time scale from 1 second to 194 days (Approximately half a year)
- Low current consumption: 0.2 μA typ. (Quartz crystal: C_L = 6.0 pF, V_{DD} = 3.0 V, Ta = +25°C)
- Wide range of operation voltage: 1.8 V to 5.5 V
- 2-wire (I^2C-bus) CPU interface
- Built-in 32.768 kHz crystal oscillation circuit
- Operation temperature range: Ta = –40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- IoT communications device
- Monitoring device
- Security device
- Battery system
- Energy harvesting system

■ Package

- TMSOP-8

S-35720 Series

WAKE-UP TIMER IC

PIN-SELECTABLE WAKE-UP TIMER IC

The wake-up timer IC allows for intermittent system operation by periodically waking up the system.
The S-35720 Series compares the timer value and the value set to the SET0 pin and the SET1 pin, and outputs a wake-up signal (interrupt signal) when the values match each other.
The timer of the S-35720 is a 24-bit binary-up counter.
4 types of wake-up time (interrupt time) can be selected depending on the SET0 pin and the SET1 pin settings.

■ Features

- Wake-up function (Alarm interrupt function): Settable wake-up time (interrupt time). Selectable as the option on the second time scale from 1 second to 194 days (Approximately half a year)
- Low current consumption: 0.2 µA typ. (Quartz crystal: C_L = 6.0 pF, V_{DD} = 3.0 V, Ta = +25°C)
- Wide range of operation voltage: 1.8 V to 5.5 V
- Built-in 32.768 kHz crystal oscillation circuit
- Operation temperature range: Ta = –40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- IoT communications device
- Monitoring device
- Security device
- Battery system
- Energy harvesting system

■ Package

- TMSOP-8

S-35730

INTERVAL TIMER IC

PIN-SELECTABLE INTERVAL TIMER IC

The interval timer IC allows for intermittent system operation by inputting a signal to the system at fixed periods of time.
The S-35730 outputs the interval signal (clock pulse).
One interval signal (clock pulse frequency) can be selected from "32.768 kHz", "32 Hz", "1.024 kHz", and "1 Hz" according to the SET0 pin and the SET1 pin settings.

■ Features

- Interval signal output function (Clock pulse output function): Selectable interval signal (clock pulse frequency), with an output control pin
- Low current consumption: 4.0 μA typ. (Quartz crystal: C_L = 6.0 pF, V_{DD} = 3.0 V, ENBL pin = "H", Ta = +25°C, FOUT pin output = 32.768 kHz)
- Wide range of operation voltage: 1.8 V to 5.5 V
- Built-in 32.768 kHz crystal oscillation circuit
- Operation temperature range: Ta = −40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- IoT communications device
- Monitoring device
- Security device
- Battery system
- Energy harvesting system

■ Package

- TMSOP-8

S-35740

INTERVAL TIMER IC

PROGRAMMABLE INTERVAL TIMER IC

The interval timer IC allows for intermittent system operation by inputting a signal to the system at fixed periods of time.
The S-35740 outputs an interval signal (fixed-cycle interrupt signal). The frequency and duty ratio of the interval signal (fixed-cycle interrupt signal) can be set freely by users via a 2-wire serial interface.
The S-35740 has a 24-bit timer. For example, users can obtain the cumulative energization time of the system since the timer performs a count-up action every second.

■ Features

- Interval signal output function: Settable interval signal frequency and duty ratio, with an output control pin
  (Fixed-cycle interrupt signal output function)
- Low current consumption: 0.2 μA typ.
  (Quartz crystal: C_L = 6.0 pF, V_{DD} = 3.0 V, ENBL pin = "H", Ta = +25°C)
- Wide range of operation voltage: 1.8 V to 5.5 V
- 2-wire (I^2C-bus) CPU interface
- Built-in 32.768 kHz crystal oscillation circuit
- Operation temperature range: Ta = −40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- IoT communications device
- Monitoring device
- Security device
- Battery system
- Energy harvesting system

■ Package

- TMSOP-8

S-35770

COUNTER IC

COUNTER IC WITH 2-WIRE (I^2C-bus) INTERFACE

The counter IC allows for counting externally input clocks.
The counter of the S-35770 is a 24-bit binary-up counter. The counter data can be read via a 2-wire serial interface.

■ Features

- External clock signal count function: Countable from 0 to 16,777,215, with output pin for counter loop flag
- Low current consumption: 0.01 µA typ. (V_{DD} = 3.0 V, Ta = +25°C, out of communication (CLKIN pin = 0 V))
- Wide range of operation voltage: 1.5 V to 5.5 V
- 2-wire (I^2C-bus) CPU interface
- Operation temperature range: Ta = –40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- Various measurement equipment
- Infrastructure-related meter
- Amusement equipment
- Life counter

■ Package

- TMSOP-8

S-8471 Series

WIRELESS POWER RECEIVER CONTROL IC

The S-8471 Series is Wireless Power Receiver Control IC, which is configured with an overvoltage detection circuit, a high temperature detection circuit, an ON / OFF circuit, etc.

■ Features

- Current consumption: During operation: I_{SS1} = 30 µA typ.
  During power-off: I_{SS2} = 1.0 µA max.
- Overvoltage detection voltage range: 4.00 V to 5.50 V, selectable in 50 mV step
- Overvoltage detection accuracy: ±2.0%
- ON / OFF pin control logic is selectable: Active "H", active "L"
- ON / OFF pin internal resistor connection is selectable: Unavailable, pull-up, pull-down
- Built-in ON / OFF circuit
- Over temperature protection function: Available by connecting a thermistor to the TH pin.
- Operation temperature range: Ta = –40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- Device for wireless power
- Small-sized wireless charging system

■ Package

- SNT-6A

S-8473 Series

WIRELESS POWER RECEIVER CONTROL IC WITH CHARGE FUNCTION

The S-8473 Series is Wireless Power Receiver Control IC, which is configured with an overvoltage detection circuit, a charge current control circuit, a VBAT voltage detection circuit, a UVLO circuit, high temperature / low temperature detection circuit, etc. This IC has a charge function to a small lithium-ion rechargeable battery.

■ Features

- Power supply voltage: V_{DD} = 2.2 V to 5.0 V
- Current consumption during charge operation: I_{SS1} = 250 µA typ.
- VBAT pin current consumption during power-down: I_{PDN} = 1.0 µA max.
- UVLO detection voltage: V_{UVLO-} = 2.0 V typ.
- Charge function to a small lithium-ion rechargeable battery
  - Charge current: I_{LIM} = 33 mA typ.
  - Precharge current: I_{PRE} = 3.3 mA typ.
  - Precharge completion voltage: 2.4 V to 3.4 V (50 mV step)
  - Charge completion voltage: 4.0 V to 4.5 V (50 mV step)
  - Recharge start voltage: 3.6 V to 4.45 V*1
  - Short-circuit detection voltage: 1.5 V to 2.0 V (50 mV step)
  - Charge timer function: The charge operation stops after the elapse of 4.0 hours. (C_{CT} = 4.7 nF)
    The time is settable by connecting an external capacitor to the CT pin.
- High temperature / low temperature protection function: Available by connecting a thermistor to the TH pin.
- Status display function: Available by connecting an external LED to the STATUS pin.
  - During charge operation: Lighting
  - During charge operation stop: Lights-out
  - During error detection: Blinking
- Operation temperature range: Ta = –40°C to +85°C
- Lead-free (Sn 100%), halogen-free

***1.** Recharge start voltage = charge completion voltage – charge hysteresis voltage
(The charge hysteresis voltage can be selected from a range of 0.05 V to 0. 40 V in 50 mV step.)

■ Applications

- Device for wireless power
- Small-sized wireless charge system

■ Package

- SNT-8A

S-8474 Series

WIRELESS POWER TRANSMITTER CONTROL IC

The S-8474 Series is Wireless Power Transmitter Control IC, which is configured with an ON time control circuit, an OFF time control circuit, a reception detection circuit, a UVLO circuit, a high temperature detection circuit, etc.

■ Features

- Power supply voltage: V_{DD} = 4.5 V to 6.5 V
- Current consumption: During operation: I_{SS1} = 200 μA typ.
  During standby: I_{STB} = 3.0 μA max.
- UVLO detection voltage: V_{UVLO-} = 4.1 V typ.
- t_{ON} time is settable by connecting an external resistor to the RTON pin.
- Power saving is possible by intermittent operation during standby time of a receiver module.
  Active time: t_{ACT} = 5.0 ms typ.
  Sleep time: t_{SLEEP} = 25.0 ms typ.
- TH pin detection voltage is selectable: 0.667 V, 0.577 V, 0.500 V, 0.429 V, 0.370 V
- Built-in reception detection circuit
- Status display function: Available by connecting an external LED to the STATUS pin.
  Continuous operation mode: Lighting
  Intermittent operation mode: Lights-out
  High temperature protection mode: Blinking
- Over temperature protection function: Available by connecting a thermistor to the TH pin.
- Operation temperature range: Ta = −40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- Device for wireless power
- Small-sized wireless charging system

■ Package

- SNT-8A

S-89630A

125°C OPERATION, LOW INPUT OFFSET VOLTAGE CMOS OPERATIONAL AMPLIFIER

This IC incorporates a general purpose analog circuit in a small package. This is a zero-drift operational amplifier with Rail-to-Rail input and output, which uses chopper-stabilizing techniques to provide low input offset voltage.
The S-89630AB is a dual operational amplifier (2 circuits), which is suitable for applications requiring less offset voltage.

■ Features

- Low input offset voltage: V_{IO} = +50 µV max. (Ta = –40°C to +125°C)
- Low input offset voltage drift: $\frac{\Delta V_{IO}}{\Delta Ta}$ = ±25 nV/°C typ. (V_{DD} = 30.0 V, Ta = –40°C to +125°C)
- Operation power supply voltage range: V_{DD} = 4.0 V to 36.0 V (Single supply)
  V_{DD} = ±2.0 V to ±18.0 V (Dual supply)
- Low current consumption (Per circuit): I_{DD} = 250 µA typ.
- Low input noise voltage: V_{NOISE_pp} = 0.8 µVpp typ. (f = 0.1 Hz to 10 Hz)
- Low input noise voltage density: V_{NOISE} = 25 nV/√Hz typ. (f = 1 kHz)
- Built-in output current limit circuit: Overcurrent limit when output pin is short-circuited
- Internal phase compensation: No external parts required
- Rail-to-Rail input and output
- Operation temperature range: Ta = –40°C to +125°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- High-accuracy current detection
- Various sensor interfaces
- Strain gauge amplifier

■ Package

- TMSOP-8

S-89713 Series

LOW INPUT OFFSET VOLTAGE CMOS OPERATIONAL AMPLIFIER

This IC incorporates a general purpose analog circuit in a small package.
The S-89713 Series is an auto-zero operation, zero-drift operational amplifier that has input and output of low input offset voltage and Rail-to-Rail. The S-89713 Series is suitable for applications requiring less offset voltage.
The S-89713 Series is a dual operational amplifier (with 2 circuits).

■ Features

- Low input offset voltage: V_{IO} = 10 µV max. (Ta = +25°C)
- Operation power supply voltage range: V_{DD} = 2.65 V to 5.50 V
- Low current consumption: I_{DD} = 165 µA typ. (Per circuit, Ta = +25°C)
  I_{DD} = 330 µA typ. (2 circuits, Ta = +25°C)
- Internal phase compensation: No external parts required
- Rail-to-Rail input and output
- Operation temperature range: Ta = –40°C to +85°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- Various sensor interfaces
- High-accuracy current detection
- Strain gauge amplifier
- Game
- Various electric devices

■ Packages

- TMSOP-8
- SNT-8A

S-89430/89431 Series

MINI ANALOG SERIES
0.5 μA Rail-to-Rail CMOS OPERATIONAL AMPLIFIER

The mini-analog series is a group of ICs that incorporate a general purpose analog circuit in a small package.
The S-89430/89431 Series is a CMOS type operational amplifier that feature Rail-to-Rail*1 I/O and an internal phase compensation circuit, and operates at a lower voltage with lower current consumption. These features make this product the ideal solution for small battery-powered portable equipment.
These features enable driving at a lower voltage (from 0.9 V) and with lower current consumption (0.5 μA).
The S-89430A/89431A Series is a single operational amplifier (one circuit).
The S-89430B/89431B Series is a dual operational amplifier (two circuits).

***1.** Rail-to-Rail is a trademark of Motorola, Inc.

■ Features

- Lower operating voltage than the conventional general-purpose: V_{DD} = 0.9 V to 5.5 V
- Low current consumption (per circuit): I_{DD} = 0.5 μA Typ.
- Wide I/O voltage range (Rail-to-Rail): V_{CMR} = V_{SS} to V_{DD}
- Low input offset voltage: V_{IO} = 10.0 mV Max. (S-89430 Series)
  V_{IO} = 5.0 mV Max. (S-89431 Series)
- No external capacitors required for internal phase compensation
- Lead-free, Sn 100%, halogen-free*1

***1.** Refer to "■ **Product Name Structure**" for details.

■ Applications

- Mobile phone
- Notebook PC
- Digital camera
- Digital video camera

■ Packages

- SC-88A
- SOT-23-5
- SNT-8A
- TMSOP-8

S-89110/89120 Series

MINI ANALOG SERIES
CMOS OPERATIONAL AMPLIFIER

The mini-analog series is a group of ICs that incorporate a general purpose analog circuit in a small package.
The S-89110/89120 Series is a CMOS type operational amplifier that has a phase compensation circuit, and operates at a low voltage with low current consumption. These features make this product the ideal solution for small battery-powered portable equipment.
The S-89110A/89120A Series is a single operational amplifier (one circuit).
The S-89110B/89120B Series is a dual operational amplifier (two circuits).

■ Features

- Lower operating voltage than the conventional general-purpose: V_{DD} = 1.8 V to 5.5 V
- Low current consumption (per circuit): I_{DD} = 50 µA (S-89110 Series), I_{DD} = 10 µA (S-89120 Series)
- Low input offset voltage: 4.0 mV max.
- No external capacitors required for internal phase compensation
- Output full swing
- Lead-free, Sn 100%, halogen-free[*1]

***1.** Refer to "■ **Product Name Structure**" for details.

■ Applications

- Mobile phone
- Notebook PC
- Digital camera
- Digital video camera

■ Packages

- SC-88A
- SOT-23-5
- SNT-8A
- TMSOP-8

S-89130/89140 Series

MINI ANALOG SERIES
CMOS OPERATIONAL AMPLIFIER

The mini-analog series is a group of ICs that incorporate a general purpose analog circuit in a small package.
S-89130/89140 Series is a CMOS type operational amplifier that has a phase compensation circuit, and operates at a low voltage with low current consumption. S-89130/89140 Series can operate within a wide temperature range of −40°C to +125°C.
This product is a dual operational amplifier (two circuits).

■ Features

- Lower operating voltage : V_{DD} = 2.7 V to 5.5 V
- Low current consumption (per circuit) : I_{DD} = 1.00 mA typ. (S-89130 Series, V_{DD} = 5.0 V)
  I_{DD} = 0.27 mA typ. (S-89140 Series, V_{DD} = 5.0 V)
- Low input offset voltage : V_{IO} = 6.0 mV max. (S-89130 Series)
  V_{IO} = 7.0 mV max. (S-89140 Series)
- Operational temperature range : −40°C to +125°C
- No external capacitors required for internal phase compensation
- Lead-free (Sn 100%), halogen-free *1

***1.** Refer to "■ **Product Name Structure**" for details.

■ Applications

- Current sensing
- Signal amplification
- Buffer
- Active filter
- Electronics devices

■ Packages

- SNT-8A
- TMSOP-8

Caution **This product is intended to use in general electronic devices such as consumer electronics, office equipment, and communications devices. Before using the product in medical equipment or automobile equipment including car audio, keyless entry and engine control unit, contact to ABLIC Inc. is indispensable.**

S-89530A/89531A Series

MINI ANALOG SERIES
0.7 µA Rail-to-Rail CMOS COMPARATOR

The mini analog series is a group of ICs that incorporate a general-purpose analog circuit in an ultra-small package.
The S-89530A/89531A Series are CMOS type comparators that feature Rail-to-Rail*1 I/O and can be driven at a lower voltage and lower current consumpsion than existing comparators, making the S-89530A/89531A for use in battery-powered compact portable devices.

***1.** Rail-to-Rail is a registered trademark of Motorola Inc.

■ Features

- Can be driven lower voltage than existing general-purpose comparators: V_{DD} = 0.9 V to 5.5 V
- Low current consumption: I_{DD} = 0.7 µA (Typ.)
- Rail-to-Rail wide input and output voltage range: $V_{CMR} = V_{SS}$ to V_{DD}
- Low input offset voltage: 5.0 mV max.
- Lead-free, Sn100%, halogen-free*1

***1.** Refer to "■ **Product Code List**" for details.

■ Applications

- Cellular phones
- PDAs
- Notebook PCs
- Digital cameras
- Digital video cameras

■ Package

Package Name	Drawing Code		
	Package	Tape	Reel
SC-88A	NP005-B-P-SD	NP005-B-C-SD	NP005-B-R-SD

■ Product Code List

Table 1

Input Offset Voltage	Product Name (Single)
V_{IO} = 10 mV max.	S-89530ACNC-HCBTF□
V_{IO} = 5 mV max.	S-89531ACNC-HCCTF□

Remark □: G, S or U

S-89210/89220 Series

MINI ANALOG SERIES
CMOS COMPARATOR

The mini-analog series is a group of ICs that incorporate a general purpose analog circuit in a small package.
The S-89210/89220 Series is a CMOS type comparator works on a lower voltage and lower current consumption. These features make this product the ideal solution for small battery-powered portable equipment.
This product is a single comparator (with 1 circuit).

■ Features

- Lower operating voltage than the conventional general-purpose: V_{DD} = 1.8 V to 5.5 V
- Low current consumption: I_{DD} = 50 μA Typ. (S-89210 Series)
  I_{DD} = 10 μA Typ. (S-89220 Series)
- Low input offset voltage: 4.0 mV Max.
- Lead-free, halogen-free*1

***1.** Refer to "■ **Product Name Structure**" for details.

■ Application

- Mobile phones
- Notebook PCs
- Digital cameras
- Digital video cameras

■ Package

- SC-88A

S-89230/89240 Series

MINI ANALOG SERIES
CMOS COMPARATOR

The mini-analog series is a group of ICs that incorporate a general purpose analog circuit in a small package.
The S-89230/89240 Series is a CMOS type comparator works on a lower voltage and lower current consumption. These features make this product the ideal solution for small battery-powered portable equipment.
This product is a dual comparator (with 2 circuits).

■ Features

- Lower operating voltage than the conventional general-purpose: V_{DD} = 1.8 V to 5.5 V
- Low current consumption (per circuit): I_{DD} = 23 μA Typ. (S-89230 Series), I_{DD} = 5 μA Typ. (S-89240 Series)
- Low input offset voltage: 4.0 mV Max.
- Output full swing
- A dual comparator (with 2 circuits)
- Lead-free, Sn 100%, halogen-free*1

***1.** Refer to "■ **Product Name Structure**" for details.

■ Applications

- Mobile phones
- Notebook PCs
- Digital cameras
- Digital video cameras

■ Packages

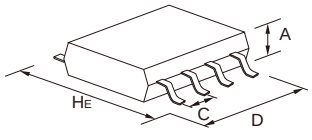
- SNT-8A
- TMSOP-8

Package List

Package Type	Pin Count	Package Name	Package Size (mm)			Pitch (mm)
			H_E	D	A (max.)	C
Lead insertion type	3	TO-92	14.5	5.2	4.2	2.5/1.27
Flat-lead type	3	SOT-89-3	4.0	4.5	1.6	1.5
	5	SOT-89-5	4.5	4.5	1.6	1.5
Gull-wing type	4	SC-82AB	2.1	2.0	1.1	1.3
	5	SC-88A	2.1	2.0	1.1	0.65
	3	SOT-23-3	2.8	2.9	1.3	1.9
	3	SOT-23-3S	2.8	2.9	1.2	1.9
	3	TSOT-23-3S	2.85	2.9	0.8	1.9
	5	SOT-23-5	2.8	2.9	1.3	0.95
	6	SOT-23-6	2.8	2.9	1.35	0.95
	6	SOT-23-6W	2.8	2.9	1.3	0.95
	8	8-Pin SOP (JEDEC)	6.0	5.02	1.75	1.27
	8	8-Pin TSSOP	6.4	3.0	1.1	0.65
	16	16-Pin TSSOP	6.4	5.1	1.1	0.65
	20	20-Pin TSSOP	6.4	6.5	1.2	0.65
	24	24-Pin SSOP	7.6	7.9	1.4	0.65
	8	TMSOP-8	4.0	2.9	0.8	0.65
	8	HTMSOP-8	4.0	2.9	0.8	0.65
	16	HTSSOP-16	6.4	5.12	1.1	0.65
	6	HSOP-6	6.0	5.02	1.75	1.91
	8	HSOP-8A	6.0	5.02	1.68	1.27
	8	HSOP-8Q	6.0	5.02	1.68	1.27
	5	TO-252-5S(A)	6.5	6.5	1.4	1.27
	9	TO-252-9S	6.5	6.5	1.4	0.65
Non-lead type	6	6-Pin HSON(A)	3.0	2.9	0.9	0.95
	4	SNT-4A	1.6	1.2	0.5	0.65
	6	SNT-6A	1.8	1.57	0.5	0.5
	6	SNT-6A(H)	1.8	1.57	0.5	0.5
	8	SNT-8A	2.46	1.97	0.5	0.5
	4	HSNT-4(0808)	0.8	0.8	0.4	0.4
	4	HSNT-4(0808)B	0.8	0.8	0.41	0.4
	4	HSNT-4(1010)	1.0	1.0	0.4	0.65
	4	HSNT-4(1010)B	1.0	1.0	0.41	0.65
	6	HSNT-6A	2.46	1.96	0.5	0.5
	6	HSNT-6(1212)	1.2	1.2	0.4	0.4
	6	HSNT-6D (HSNT-6(1618))	1.8	1.6	0.4	0.5
	6	HSNT-6(2025)	2.46	1.96	0.5	0.5
	8	HSNT-8(1616)	1.6	1.6	0.4	0.4
	8	HSNT-8(1616)B	1.6	1.6	0.41	0.4
	8	HSNT-8(2030)	3.0	2.0	0.5	0.5
	6	DFN-6(1414)A	1.4	1.4	0.6	0.5
	6	DFN-6(1518)A	1.8	1.5	0.33	0.5
	8	DFN-8(1616)A	1.6	1.6	0.6	0.4
	8	DFN-8(2020)A	2.0	2.0	0.6	0.5
	8	DFN-8(2030)	3.0	2.0	0.5	0.5
	8	DFN-8(2030)A	3.0	2.0	0.6	0.5
	8	DFN-8(2030)B	3.0	2.0	0.8	0.5

Remarks 1. For more details, please refer to our website. Package List on ablic.com

2. Please contact our sales representatives regarding WLP package products.



Notes

- The information herein is subject to change without notice.
- Neither reproduction, duplication nor unauthorized use of this catalog in whole or part is allowed without the prior written approval of ABLIC Inc.
- The colors of the products reproduced herein ("Products") may be different from the actual colors. Check colors on actual products before using the Products.
- Circuits and respective application methods described herein are for reference only. ABLIC Inc. shall not be liable for any damages or losses resulting from any claim by third parties that any Products or application methods described herein infringe any right intellectual property right. All intellectual property rights with respect to the Products belong exclusively to ABLIC Inc.
  ABLIC Inc. does not grant users of the Products any right or license to the Products hereunder.
- When Products include Strategic Products (or Services) stipulated in the Foreign Exchange and Trade Control Law, they shall not be exported without permission of governmental authorities.
- The Products cannot be used as part of any device or equipment which influences the human body or requires a significantly high reliability, such as physical exercise equipment, medical equipment, disaster prevention equipment, gas related equipment, vehicles, in-vehicle equipment, aviation equipment, aerospace equipment, and nuclear-related equipment.
- The products described herein are not designed to be radiation-proof.
- Although ABLIC Inc. exerts the greatest possible effort to ensure high quality and reliability, the failure or malfunction of semiconductor products may occur. The user of these products should therefore give thorough consideration to safety design, including redundancy, fire-prevention measures, and malfunction prevention, to prevent any accidents, fires, or community damage that may ensue.

Released in March 2025