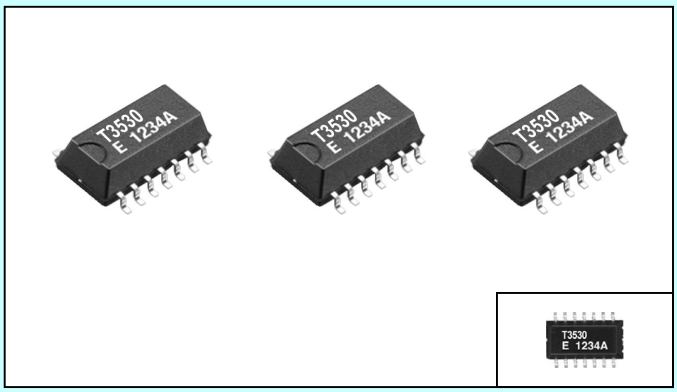
32 kHz TCXO

TG - 3530 SA

Product Number (please contact us)
TG-3530 SA : Q3721SA01xxxx00

- Built-in 32.768 kHz crystal oscillator with high accuracy. (adjustment-free efficient operation)
- Temperature compensated circuit : Stabilized frequency tolerance at any operating temperature.
- Oscillation output voltage : 1.5 V to 5.5 V
- Temperature Compensated Voltage : 2.2 V to 5.5 V
- 32.768 kHz output : C-MOS output, output load : CL = 15 pF
- Complies with EU RoHS directive



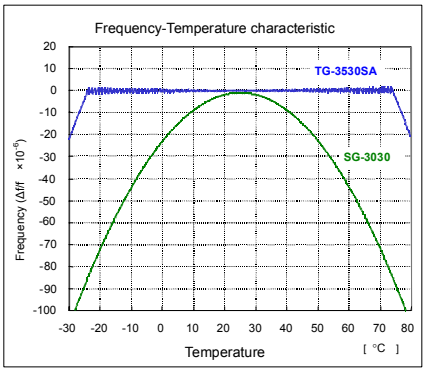
Actual size

■ Specifications (characteristics)

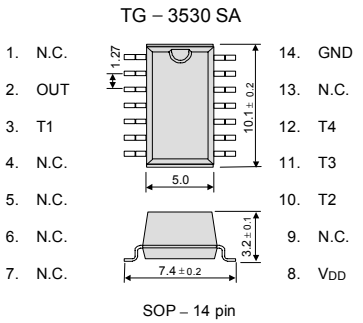
Item	Symbol	Specifications	Condition
Output frequency	f_O	32.768 kHz	
Max.supply voltage	V_{DD} - GND	-0.3 V to +7.0 V	
Oscillation output voltage	V_{DD}	1.5 V to 5.5 V	
Temperature compensated voltage	V_{DD}	2.2 V to 5.5 V	
Storage temperature	T_{STG}	–55 °C to +125 °C	Stored as bare product after unpacking
Operating temperature	T_{OPR}	–40 °C to +85 °C	Operating temperature
Frequency tolerance	Δ f / f	$\pm 3.8 \times 10^{-6}$ ∗ Equivalent to 10 seconds of monthly deviation	T_a = -10 °C to +60 °C, V_{DD} = 3.0 V
		$\pm 5.0 \times 10^{-6}$ ∗ Equivalent to 13 seconds of monthly deviation	T_a = –20 °C to +70 °C, V_{DD} = 3.0 V
Frequency voltage characteristics	f / V	$\pm 1.0 \times 10^{-6}$ / V Max.	T_a = +25 °C, V_{DD} = 2.2 V to 5.5 V
Current consumption	I_{DD}	6.0 µA (Max.) 3.0 µA (Typ.)	V_{DD} = 5.0 V , No load condition
		4.0 µA (Max.) 1.7 µA (Typ.)	V_{DD} = 3.0 V , No load condition
Output voltage (“H” level)	V_{OH}	V_{DD} - 0.4 V Min.	I_{OH} = –0.1 mA, V_{DD} = 3.0 V
Output voltage (“L” level)	V_{OL}	0.4 V Max.	I_{OL} = 0.1 mA, V_{DD} = 3.0 V
Output load condition	C_L	15 pF Max.	CMOS load
Duty	tw / t	40 % to 60 %	V_{DD} = 1.5 V to 5.5 V, 1 / 2 V_{DD} level
Output rise time	t_{TLH}	200 ns Max.	CMOS load, 20 % V_{DD} → 80 % V_{DD}
Output fall time	t_{THL}	200 ns Max.	CMOS load, 80 % V_{DD} → 20 % V_{DD}
Oscillation start-up time	t_{OSC}	1.0 s Max. ∗1)	T_a = +25 °C, V_{DD} = 3.0 V
		3.0 s Max. ∗1)	T_a = –40 °C to +85 °C, V_{DD} = 3.0 V
Aging	fa	$\pm 3.0 \times 10^{-6}$ / year	T_a = +25 °C, V_{DD} = 3.0 V , first year

∗1) V_{DD} rise time< 10ms (10 % V_{DD} – 90 % V_{DD})
∗2) If not specifically indicated, Ta = –40 °C to +85 °C.

■Frequency temperature characteristics (Ex.)



■Terminal connection



SOP – 14 pin

Signal Name	Input / Output	Function
V_{DD}	—	Connected to a positive power supply.
OUT	OUTPUT	32.768 kHz clock output pin (C-MOS).
GND	—	Connected to a ground.
T1, T2 T3, T4	—	∗ Used by the manufacture for testing. (Do not connect externally.)

REAL TIME CLOCK IC. For TG - 3530SA

RX - 4574 SG

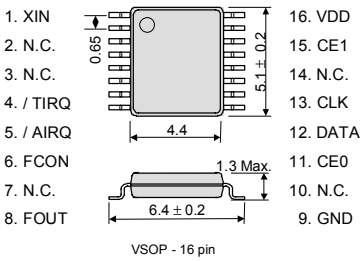
Product Number (please refer to Application guide)
RX - 4574 SG : Q414574Bxxxxx00

- By combining TG-3530SA with RX-4574SG (real-time clock IC), it is possible to achieve a ver high accuracy clock system.
- Functions are compatible with RX - 4574 LC and RTC - 4574 series (except 32 kHz oscillation function).
- Complies with EU RoHS directive

Note) RX-4574SG does not include the crystal unit.
The external clock resources (C-MOS) of 32.768 kHz are necessary.
Please input it from the XIN terminal.

■Terminal connection

RX – 4574 SG



VSOP - 16 pin

ENERGY SAVING EPSON

EPSON offers effective savings to its customers through a wide range of electronic devices, such as semiconductors, liquid crystal display (LCD) modules, and crystal devices. These savings are achieved through a sophisticated melding of three different efficiency technologies.

Power saving technology provides low power consumption at low voltages.

Space saving technology provides further reductions in product size and weight through super-precise processing and high-density assembly technology.

Time saving technology shortens the time required for design and development on the customer side and shortens delivery times.

Our concept of Energy Saving technology conserves resources by blending the essence of these three efficiency technologies. The essence of these technologies is represented in each of the products that we provide to our customers.

In the industrial sector, leading priorities include measures to counter greenhouse effect by reducing CO_2,measures to preserve the global environment, and the development of energy-efficient products. Environmental problems are of global concern, and although the contribution of energy-saving products by our customers through the utilization of our electronic devices. EPSON is committed to the conservation of energy, both for the sake of people and of the planet on which we live.

WORKING WITH ENVIRONMENTAL ISSUES

In 1988, Seiko Epson led in working to abolish CFCs, and perfect abolition of those ozone layer-destroying substances was achieved in 1992. In 1998, the 10th year of start of the CFC-free activity,Seiko Epson set this year as the "Second Environmental Benchmark Year" And established a new corporate General Environment Policy. Seiko Epson is tackling with environmental issues comprehensively.

At the end of Fiscal 1988,Seiko Epson succeeded in abolishing chloric solvents doubted to be harmful to human body. In fiscal 1999, Seiko Epson started the activity with a goal of abolishing lead solder Pointed out possibility of environmental pollutant.

Co-existence Mark

The environmental mark symbolizing Epson's basic stance of "Co-existence With Nature". The design incorporates a fish,flower,and water,representing mutually supportive co-existence.

PROMOTION OF ENVIRONMENT MANAGEMENT SYSTEM CONFORMING INTERNATIONAL STANDARD

At Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements.
The environmental management system (EMS) operates under the ISO 14001 environmental management standard.
In May 2001, all of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.
In the future, new Group companies will be expected to acquire the certification around the third year of operations.

ISO14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

WORKING FOR HIGH QUALITY

Seiko-Epson quickly began working to aquire company-wide ISO9000 series certification, and has acquired ISO9001 or ISO 9002 certification with all targeted products manufactured in Japanese and overseas plants.

The Quarts Device Operations Division (Ina Japan,EPM and SZE) have acquired QS-9000 certification, which are of higher Level.

QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S.automobile manufacturers based on the international ISO 9000 series.

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