



TCXO
32.768 kHz

TG-3530 SA

- 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 : 15 pF



Product Number
Q3721SA01000100



Actual size

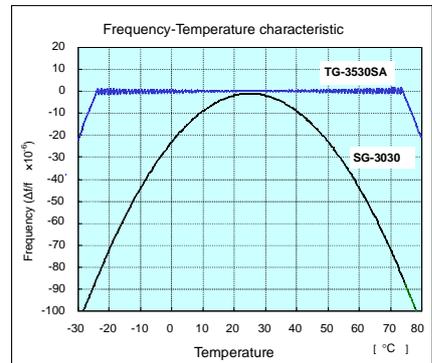


Specifications (characteristics)

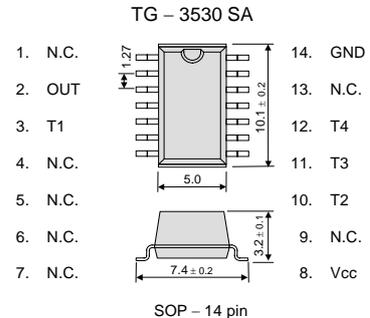
Item	Symbol	Specifications	Condition
Output frequency	f _o	32.768 kHz	
Oscillation output voltage	V _{cc}	1.5 V to 5.5 V	
Temperature compensated voltage	V _{cc}	2.2 V to 5.5 V	
Storage temperature	T _{stg}	-55 °C to +125 °C	Store as bare product after unpacking
Operating temperature	T _{use}	-40 °C to +85 °C	
Frequency temperature characteristic	fo-Tc	± 3.8 × 10 ⁻⁶ * Equivalent to 10 seconds of monthly deviation	-10 °C to +60 °C V _{cc} = 3.0 V
		± 5.0 × 10 ⁻⁶ * Equivalent to 13 seconds of monthly deviation	-20 °C to +70 °C V _{cc} = 3.0 V
Frequency voltage coefficient	fo-Vcc	± 1.0 × 10 ⁻⁶ / V Max.	+25 °C V _{cc} = 2.2 V to 5.5 V
Current consumption	I _{cc}	6.0 μA (Max.) 3.0 μA (Typ.)	V _{cc} = 5.0 V , No load condition
		4.0 μA (Max.) 1.7 μA (Typ.)	V _{cc} = 3.0 V , No load condition
Output voltage ("H" level)	V _{OH}	V _{cc} - 0.4 V Min.	I _{OH} = -0.1 mA V _{cc} = 3.0 V
Output voltage ("L" level)	V _{OL}	0.4 V Max.	I _{OL} = 0.1 mA V _{cc} = 3.0 V
Output load condition	L _{CMOS}	15 pF Max.	CMOS load
Symmetry	SYM	40 % to 60 %	V _{cc} = 1.5 V to 5.5 V 1 / 2 V _{cc} level
Rise time	t _r	200 ns Max.	CMOS load 20 % V _{cc} → 80 % V _{cc}
Fall time	t _f	200 ns Max.	CMOS load 80 % V _{cc} → 20 % V _{cc}
Start-up time	t _{str}	1.0 s Max. *1)	+25 °C V _{cc} = 3.0 V
		3.0 s Max. *1)	-40 °C to +85 °C V _{cc} = 3.0 V
Frequency aging	f _{age}	± 3.0 × 10 ⁻⁶ / year	+25 °C V _{cc} = 3.0 V , first year

*1) V_{cc} rise time < 10ms (10 % V_{cc} - 90 % V_{cc})
 *2) If not specifically indicated, -40 °C to +85 °C.

Frequency temperature coefficient (Ex.)



Terminal connection



Signal Name	Input / Output	Function
V _{cc}	—	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.)

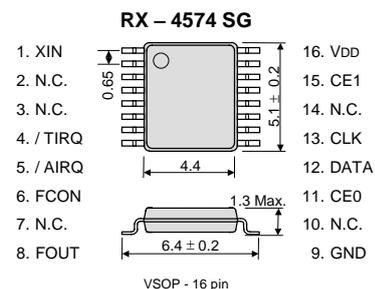
REAL TIME CLOCK IC. For TG-3530SA

RX-4574 SG

- By combining TG-3530SA with RX-4574SG (real-time clock IC), it is possible to achieve a very 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 (CMOS) of 32.768 kHz are necessary.
 Please input it from the XIN terminal.

Pin map



“QMEMS” EPSON TOYOCOM

In order to meet customer needs in a rapidly advancing digital, broadband and ubiquitous society, we are committed to offering products that are one step ahead of the market and a rank above the rest in quality. To achieve our goals, we follow a “3D (three device) strategy” designed to drive both horizontal and vertical growth. We will to grow our three device categories of “Timing Devices”, “Sensing Devices” and “Optical Devices”, and expand vertical growth through a combination of products from these categories.

A Quartz MEMS is any high added value quartz device that exploits the characteristics of quartz crystal material but that is produced using MEMS (micro-electro-mechanical system) processing technology.

Market needs are advancing faster than previously imagined toward smaller, more stable crystal products, but we will stay ahead of the curve by rolling out products that exceed market speed and quality requirements. We want to further accelerate the 3D strategy by QMEMS.

Quartz devices have become crucial in the network environment where products are increasingly intended for broadband, ubiquitous applications

and where various types of terminals can transfer information almost immediately via LAN and WAN on a global scale. Epson Toyocom Corporation addresses every single aspect within a network environment. The new corporation offers “Digital Convergence” solutions to problems arising with products for consumer use, such as, core network systems and automotive systems.



QMEMS

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PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Epson Toyocom, 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.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

ISO 14000 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

In order provide high quality and reliable products and services than meet customer needs,

Epson Toyocom made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

► Explanation of the mark that are using it for the catalog

	► Pb free.
	► Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
	► The products have been designed for high reliability applications such as Automotive.

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