

32.768 kHz TCXO

TG-3530 SA

- Built-in temperature compensated circuit
- Operating voltage 1.5 V to 5.5 V
- Temperature compensated voltage 2.2 V to 5.5 V
- Low current consumption: 4.0 μ A / 3 V (Max.)
- Small package (SA: SOP-14 pin)
- Built-in frequency adjusted 32.768kHz crystal oscillator
- CMOS output

1. Absolute Max. Rating

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Max. Supply voltage	V _{DD}	GND - 0.3		GND + 7.0	V	
Storage temperature	T _{STG}	-55		+125	°C	
Operating temperature	T _{OPR}	-40		+85	°C	

2. Operating characteristic

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V _{DD}	1.5		5.5	V	
Temp. Compensated voltage		2.2		5.5	V	
Current consumption	I _{DD}		1.7	4.0	μ A	No load, V _{DD} =3.0V
Output voltage	V _{OH}	V _{DD} - 0.4			V	I _{OH} = -0.1 mA, V _{DD} =3.0 V
	V _{OL}			0.4	V	I _{OL} = 0.1 mA, V _{DD} =3.0 V
Duty	t _w / t	40	50	60	%	V _{DD} /2 level
Rise and fall time	t _r , t _f			200	ns	20% → 80% V _{DD}

3. Frequency characteristics

Item	Symbol	Specifications	Unit	Conditions
Output frequency	f _o	32.768	kHz	
Frequency tolerance	Δ f / f _o	-3.8 to +3.8 *1	$\times 10^{-6}$	T _a = -10 °C to +60 °C , V _{DD} = 3.0 V
		-5.0 to +5.0		T _a = -20 °C to +70 °C V _{DD} = 3.0 V
Frequency voltage characteristics	Δ fV / f _o	± 1.0	$\times 10^{-6}$ / V	T _a = +25 °C , V _{DD} = 2.0 V to 5.5 V
Oscillation start up time	t _{STA}	3	s	T _a = +25 °C , V _{DD} = 3.0 V

*1. Equivalent to 10 seconds of month deviation

4. External dimension

(Unit : mm)

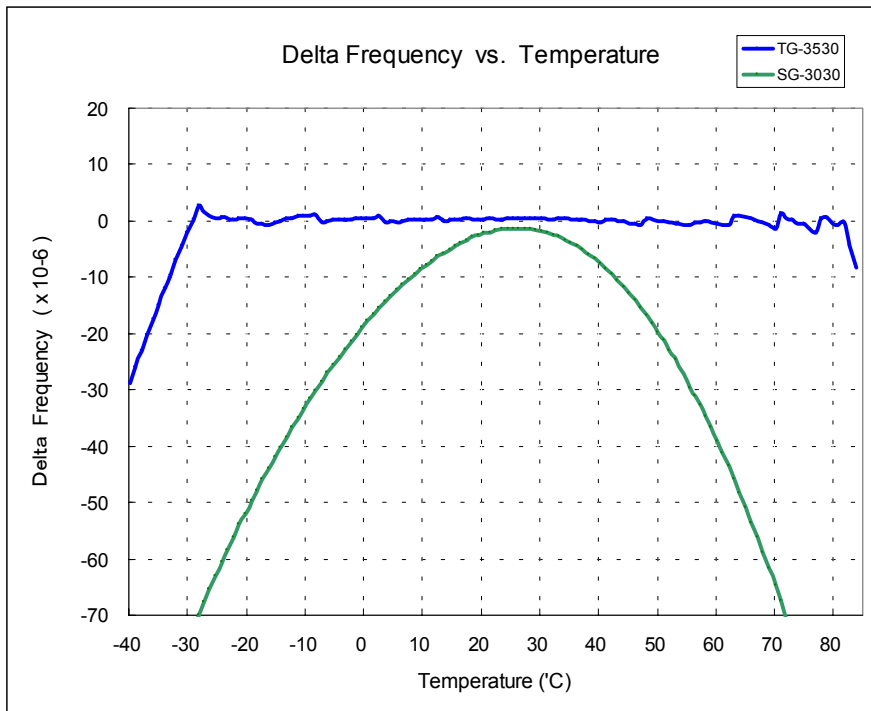
Pin Assignment

1. N.C.	14. GND
2. OUT	13. N.C.
3. N.C.	12. N.C.
4. N.C.	11. N.C.
5. N.C.	10. N.C.
6. N.C.	9. N.C.
7. N.C.	8. VDD

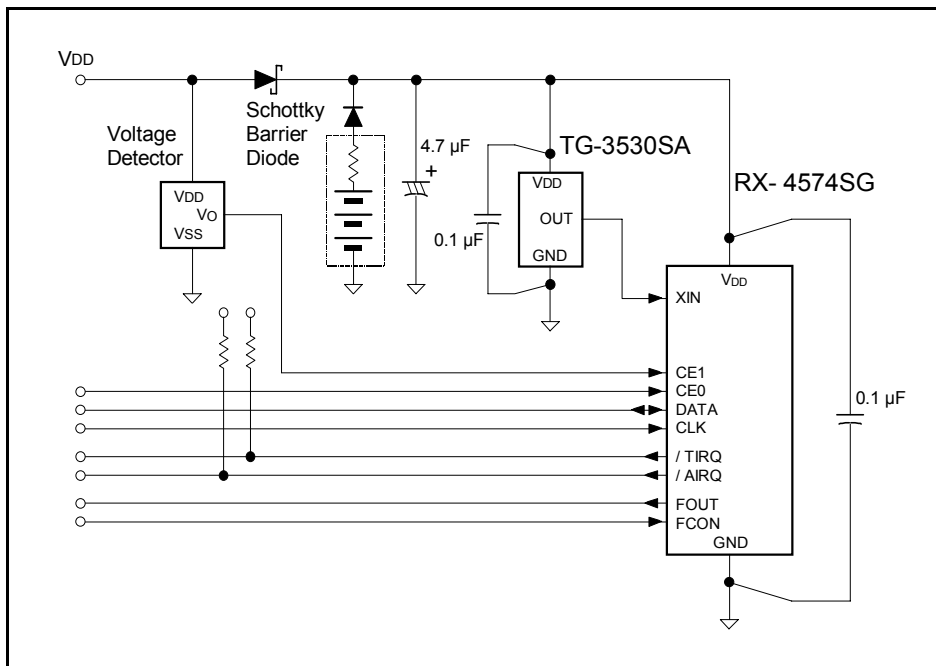
Symbol	Pin No.	Functions
OUT	2	32.768 kHz Output
VDD	8	VDD
GND	14	GND

* Please use N.C. pin Open.

5. Ex.) Delta Frequency vs. Temperature



6. Ex.) External connection



- TG-3530 Output signal is C-MOS output.
- C, R level adjustment is needed when TG-3530 Output is connected directly to LSI_crystal_unit gate. Please be careful that depends on LSI_internal oscillation circuit and power supply circuit, there could be cases that TG-3530 could not be used or increase current consumption extremely.
- Epson would recommend to use RTC-IC(Epson RX-4574SG) with TG-3530. RTC-IC(Epson RX-4574SG) can connect TG-3530 output directly.

This catalog is a preliminary version. Please be aware that specs and characteristics could possibly change without notice. And Epson would not guarantee with such changes.

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