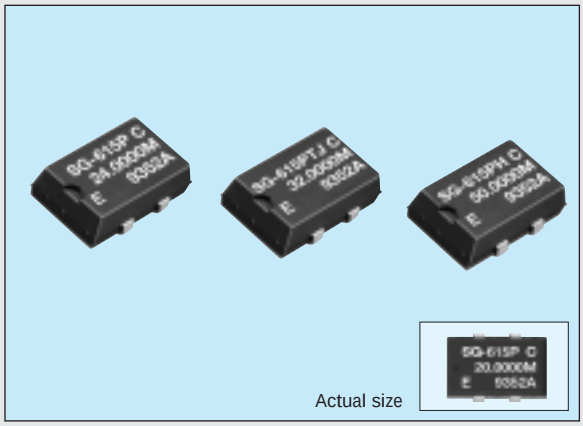
SOJ HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-615 series

Product number

Q33615xxxxxxx00

- High-density mounting-type SMD.
- A general-purpose SMD with heat-resisting cylindrical AT-cut crystal unit and allowing almost the same soldering temperature as SMD IC.
- Cylindrical AT crystal unit builtin, thus assuring high reliability.
- Low current consumption by output enable function(OE) or standby function(ST).



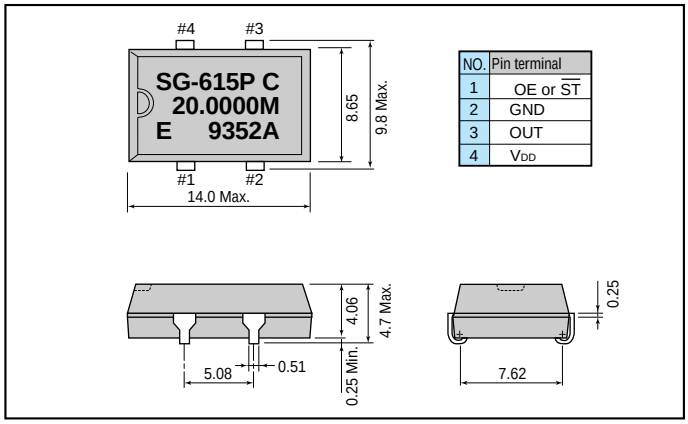
Specifications (characteristics)

Item		Symbol	SG-615P	SG-615PTJ	SG-615PH	Remarks
			Specifications			
Output frequency range		f_0	1.0250 MHz to 26.0000 MHz	26.0001 MHz to 66.6667 MHz		
Power source voltage	Max. supply voltage	V_{DD}-GND		-0.3 V to +7.0 V		
	Operating voltage	V_{DD}		5.0 V±0.5 V		
Temperature range	Storage temperature	T_{STG}		-55 °C to +125 °C		Stored as bare product after unpacking
	Operating temperature	T_{OPR}	-20 °C to +70 °C (-40 °C to +85 °C)			55 MHz Max.(-40 °C to +85 °C)
Frequency stability		$\Delta f/f_0$		B: ±50 x 10^{-6} C: ±100 x 10^{-6}		B type is possible up to 55 MHz
Current consumption		Iop	23 mA Max.	35 mA Max.		No load condition
Output disable current		I_{OE}	12 mA Max.	28 mA Max.	20 mA Max.	OE=GND
Duty	CMOS level	t_w/t	40 % to 60 %	—	40 % to 60 %	CMOS load: 1/2V_{DD}
	TTL level		45 % to 55 %		—	TTL load: 1.4 V
Output voltage		V_{OH}	V_{DD} -0.4 V Min.	2.4 V Min.	V_{DD} -0.4 V Min.	I_{OH} = -400 µA (P,PTJ) /-4 mA (PH)
		V_{OL}		0.4 V Max.		I_{OL} = 16 mA (P) /8mA (PTJ) /4 mA (PH)
Output load condition (fan out)	CMOS	C_L	50 pF Max.	—	50 pF Max.	
	TTL	N	10 TTL Max.	5 TTL Max.	—	C_L≤15 pF
Output enable/disable input voltage		V_{IH}	2.0 V Min.	3.5 V Min.	2.0 V Min.	I_{IH}=1 µA Max.(OE=V_{DD})
		V_{IL}	0.8 V Max.	1.5 V Max.	0.8 V Max.	I_{IL}=-100 µA Min.(OE=GND) I_{IL}=-500 µA Min.(OE=GND) PTJ
Output rise time	CMOS level	t_{TLH}	8 ns Max.	—	7 ns Max.	CMOS load: 20 %→80 % V_{DD}
	TTL level			5 ns Max.	—	TTL load: 0.4 V→2.4 V
Output fall time	CMOS level	t_{THL}	8 ns Max.	—	7 ns Max.	CMOS load: 80 %→20 % V_{DD}
	TTL level			5 ns Max.	—	TTL load: 2.4 V→0.4 V
Oscillation start up time		t_{OSC}	4 ms Max.	10 ms Max.		Time at 4.5 V to be 0 s
Aging		fa		±5 x 10^{-6}/year Max.		Ta= +25 °C, V_{DD} = 5 V, first year
Shock resistance		S.R.		±20 x 10^{-6} Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s² x 0.3 ms x 1/2sine wave in 3 directions

Note: • Unless otherwise stated, characteristics (specifications) shown in the above table are based on the rated operating temperature and voltage condition.
• External by-pass capacitor is recommended.

External dimensions

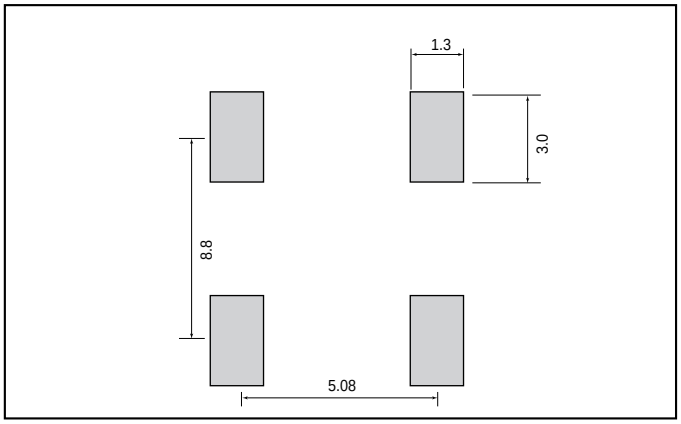
(Unit: mm)



NO.	Pin terminal
1	OE or $\overline{ST}$
2	GND
3	OUT
4	V_{DD}

Recommended soldering pattern

(Unit: mm)



Specifications (characteristics)

Item		Symbol	SG-615PTW/STW	SG-615PHW/SHW	SG-615PCW/SCW	Remarks
			Specifications			
Output frequency range		f_0	55.0001 MHz to 135.0000 MHz		26.0001 MHz to 135.0000 MHz	
Power source voltage	Max. supply voltage	V_{DD}-GND	-0.5 V to +7.0 V			
	Operating voltage	V_{DD}	5.0 V±0.5 V		3.3 V±0.3 V	
Temperature range	Storage temperature	T_{STG}	-55 °C to +125 °C			Stored as bare product after unpacking
	Operating temperature	T_{OPR}	-20 °C to +70 °C		-40 °C to +85 °C	
Frequency stability		$\Delta f/f_0$	B: ±50 x 10^{-6} C: ±100 x 10^{-6}		M: ±100 x 10^{-6}	B , C : -20 °C to +70 °C M : 40 °C to +85 °C
Current consumption		Iop	45 mA Max.		28 mA Max.	No load condition
Output disable current		I_{OE}	30 mA Max.		16 mA Max.	OE=GND
Standby current		I_{ST}	50 µA Max.			$\overline{ST}$=GND
Duty	CMOS level	tw/t	—	40 % to 60 %		CMOS load: 1/2V_{DD}
	TTL level		40 % to 60 %	—		TTL load: 1.4 V
Output voltage		V_{OH}	V_{DD}-0.4 V Min.			I_{OH}= -16 mA (*TW/HW)/-8 mA(*CW)
		V_{OL}	0.4 V Max.			I_{OL}= -16 mA (*TW/HW)/8 mA(*CW)
Output load condition (fan out)		C_L	15 pF Max.			
Output enable disable input voltage		V_{IH}	2.0 V Min.		0.7 V_{DD} Min.	OE,$\overline{ST}$
		V_{IL}	0.8 V Max.		0.2 V_{DD} Min.	OE,$\overline{ST}$
Output rise time	CMOS level	t_{TLH}	—	4 ns Max.	4 ns Max.	CMOS load: 20 %→80 % V_{DD}
	TTL level		4 ns Max.	—	—	TTL load: 0.4 V→2.4 V
Output fall time	CMOS level	t_{THL}	—	4 ns Max.	4 ns Max.	CMOS load: 80 %→20 % V_{DD}
	TTL level		4 ns Max.	—	—	TTL load: 2.4 V→0.4 V
Oscillation start up time		t_{OSC}		10 ms Max.		Time at minimum operating voltage to be 0 s
Aging		fa		±5 x 10^{-6}/year Max.		Ta=+25 °C, V_{DD} =5 V
Shock resistance		S.R.		±20 x 10^{-6} Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s² x 0.3 ms x 1/2 sine wave in 3 directions

Operating condition and Frequency band

Operating condition		1 MHz	50 MHz	100 MHz	150 MHz
5 V±0.5 V	Frequency stability:B (-20 °C to +70 °C)	1.025	26	55	135
		SG-615P	SG-615PTJ/PH	SG-615PTW/STW/PHW/SHW	
	Frequency stability:C (-20 °C to +70 °C)	1.025	26	66.667	135
		SG-615P	SG-615PTJ/PH	SG-615PTW/STW/PHW/SHW	
3.3 V±0.3 V	Frequency stability:B (-20 °C to +70 °C)	26			135
		SG-615PCW/SCW			
	Frequency stability:C (-20 °C to +70 °C)	26			135
		SG-615PCW/SCW			
	Frequency stability:M (-40 °C to +85 °C)	26			135
		SG-615PCW/SCW			