

## Crystal Oscillator

**SG – 645\*\*G Series**

Products number

Q33645Gxxxxxx00

- Reflowable and high density mounting type SMD package
- Operable 3.3 V or 5.0 V
- Out put frequencies from 2.500 MHz to 33.000 MHz
- Output enable(OE : P type) or Standby(ST : S type) function allow more low current consumption.

**Specifications****1. Absolute Maximum Ratings**

Item	Symbol	PT/PH	PC/SC	Remarks
Storage Temperature	TSTG	-55 °C ~ +125 °C		Stored as bare product
Maximum supply voltage	VDD	-0.5 V ~ 7.0 V		
Maximum input voltage	VIN	-0.5 V ~ VDD+0.5 V		

**2. Operating Conditions**

Item	Symbol	PT/PH	PC/SC	Remarks
Operating Temperature	TOPR	-40 °C ~ +85 °C		
Operating voltage	VDD	4.5 V ~ 5.5 V	2.7 V ~ 3.6 V	
Input voltage	VIN	GND ~ VDD		
Output load condition	CL	25 pF		

**3. Frequency Characteristics**

Item	Symbol	PT/PH	PC/SC	Remarks
Output frequency range*	f <sub>0</sub>	2.500 MHz ~ 33.000 MHz		VDD=2.7 V ~ 3.6 V
Frequency stability	f / f <sub>0</sub>	B: $\pm 50 \times 10^{-6}$ , C: $\pm 100 \times 10^{-6}$		-20 °C ~ +70 °C
		M: $\pm 100 \times 10^{-6}$		-40 °C ~ +85 °C
Aging	f <sub>a</sub>	$\pm 5 \times 10^{-6}$ Max.		+25 °C, VDD=3.3V First year

\*Note :

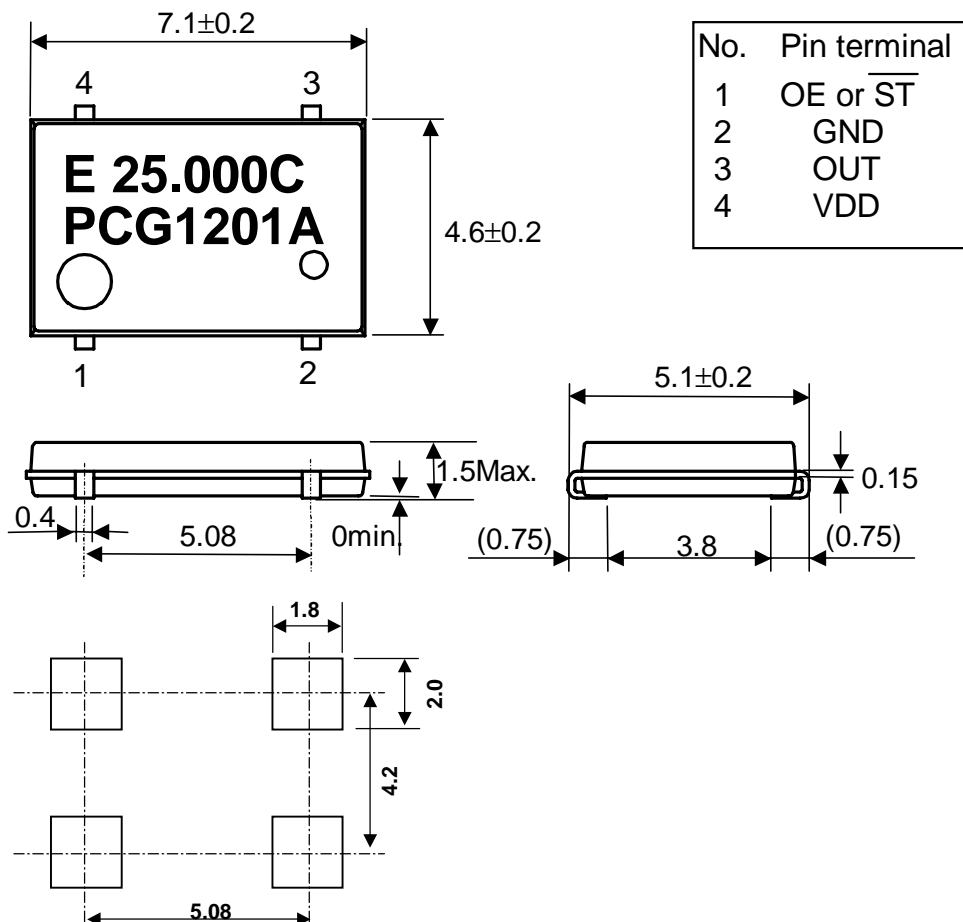
Standard Frequencies (MHz)

2.5	3.6864	5.0	7.3728	10.0	14.7456	20.0	29.4912
2.8125	3.6873625	5.625	7.374725	11.25	14.74945	22.5	29.4989
3.072	3.75	6.144	7.5	12.288	15.0	24.576	30.0
3.125	3.84	6.25	7.68	12.5	15.36	25.0	30.72
3.375	4.0	6.75	8.0	13.5	16.0	27.0	32.0
3.579545	4.096	7.15909	8.192	14.31818	16.384	28.63636	32.768

4. Characteristics

Item	Symbol	PT	PH	PC/SC	Remarks
Current consumption	IOP	25 mA Max.		12 mA Max.	No Load
Disable current	IOE	20 mA Max.		10 mA Max.	OE =GND
Standby current	IST	-		50 $\mu$ A Max.	ST =GND
OE or ST input voltage	V <sub>IH</sub>	2.0 V Min.		70 %V <sub>DD</sub> Min.	
	V <sub>IL</sub>	0.8 V Max.		20 %V <sub>DD</sub> Max.	
OE or ST input current	I <sub>IH</sub>	5 $\mu$ A Max.			OE or ST = V <sub>DD</sub>
	I <sub>IL</sub>	10 $\mu$ A Max.			OE or ST =GND
Duty	T <sub>w</sub> / T	-	45 %~ 55 %		50%V <sub>DD</sub> , CL= 25 pF
		40 %~ 60 %	-		1.4V Level, CL=25pF
Output voltage	V <sub>OH</sub>	2.4 V Min.	-	V <sub>DD</sub> -0.4 V Min.	I <sub>OH</sub> =- 8 mA
		-	V <sub>DD</sub> -0.4 V Min.	-	I <sub>OL</sub> = - 16mA
	V <sub>OL</sub>	-	0.4 V Max.		I <sub>OL</sub> = 8 mA
		0.4 V Max	-		I <sub>OL</sub> = 16mA
Output rise time	t <sub>r</sub>	-	3.4 ns Max.	4.0 ns Max.	20 % ~ 80 %V <sub>DD</sub> , CL $\leq$ 25 pF
		1.2 ns Max.	-		0.8 V ~ 2.0 V, CL $\leq$ 25 pF
		2.4 ns Max.	-		0.4 V ~ 2.4V, CL $\leq$ 25 pF
Output fall time	t <sub>f</sub>	-	3.4 ns Max.	4.0 ns Max.	80 % ~ 20 %V <sub>DD</sub> , CL $\leq$ 25 pF
		1.2 ns Max.	-		2.0 V ~ 0.8 V, CL $\leq$ 25 pF
		2.4 ns Max.	-		0.4 V ~ 2.4V, CL $\leq$ 25 pF
Oscillation start up time	tOSC	12 ms Max.			Time at minimum operating voltage to be o s

5. External Dimensions & Recommended soldering pattern ( Unit : mm )



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