

SMALL HIGH-FREQUENCY CRYSTAL OSCILLATOR

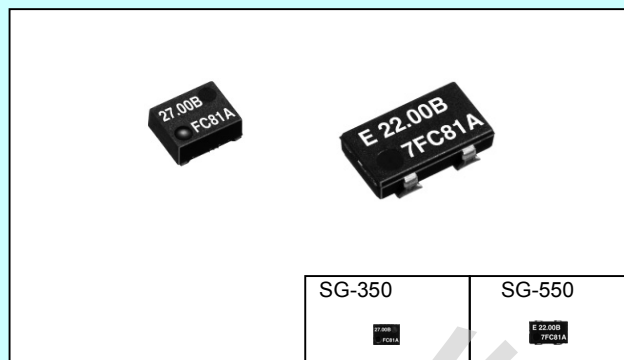
# SG - 350 / 550 series

Product number (please contact us)

SG-350 : Q33350xx0xxxx00

SG-550 : Q33550xx0xxxx00

- Frequency range : 1 MHz to 48 MHz
- Operating voltage : 1.8 V Typ. / 2.5 V Typ. / 3.3 V Typ.
- Current consumption : SEF1.8 V No load condition 48 MHz 1.5 mA Typ.
- Function : Standby( $\overline{ST}$ )
- Thickness : 1.2 mm Max.
- Lead(Pb)-free : Complies with EU RoHS directive (Lead free completely)



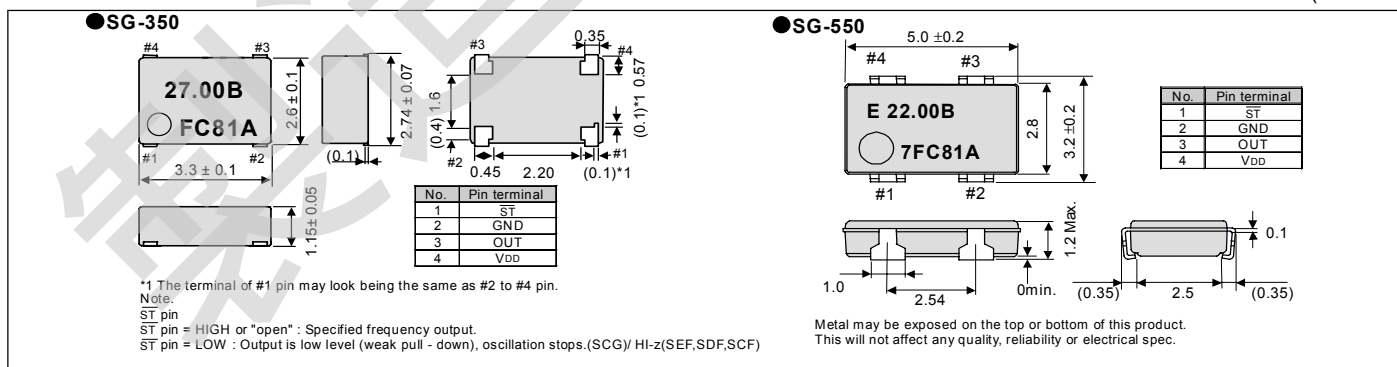
Actual size

## Specifications (characteristics)

Item	Symbol	Specifications				Remarks	
		SEF	SDF	SCF	SCG		
Output frequency range	$f_0$	2 MHz to 48 MHz			1 MHz to 48 MHz		
Power source voltage	Operating voltage	$V_{DD}$	1.8 V Typ. 1.6 V to 2.2 V	2.5 V Typ. 2.2 V to 3.0 V	3.3 V Typ. 2.7 V to 3.6 V		
		Storage temperature	$T_{STG}$ -40 °C to +125 °C				Stored as bare product after unpacking
Temperature range	Operating temperature	$T_{OPR}$ -40 °C to +85 °C					
		Frequency stability	$\Delta f/f_0$	B: $\pm 50 \times 10^{-6}$ , C: $\pm 100 \times 10^{-6}$			—
M: $\pm 100 \times 10^{-6}$				—	-40 °C to +85 °C		
—				S: $\pm 25 \times 10^{-6}$	-20 °C to +70 °C	$V_{DD} \pm 5\%$	
L: $\pm 50 \times 10^{-6}$				—	-40 °C to +85 °C		
Current consumption	$I_{OP}$	1.5 mA Max.	1.5 mA Max.	1.5 mA Max.	—	No load condition, 2 MHz $\leq f_0 \leq$ 4 MHz	
		1.5 mA Max.	1.5 mA Max.	2.0 mA Max.	—	No load condition, 4 MHz $\leq f_0 \leq$ 8 MHz	
		1.5 mA Max.	2.0 mA Max.	2.5 mA Max.	—	No load condition, 8 MHz $\leq f_0 \leq$ 16 MHz	
		2.0 mA Max.	2.0 mA Max.	2.5 mA Max.	—	No load condition, 16 MHz $\leq f_0 \leq$ 25 MHz	
		2.0 mA Max.	2.5 mA Max.	3.5 mA Max.	—	No load condition, 25 MHz $\leq f_0 \leq$ 33 MHz	
		3.0 mA Max.	3.5 mA Max.	4.5 mA Max.	—	No load condition, 33 MHz $\leq f_0 \leq$ 48 MHz	
Standby current	$I_{ST}$	—	—	—	12 mA Max.	No load condition, Max.frequency output.	
		0.7 $\mu$ A Max.	1.5 $\mu$ A Max.	2.0 $\mu$ A Max.	50 $\mu$ A Max.	$\overline{ST} = GND$	
Duty	$tw/t$	45 % to 55 %	45 % to 55 %		45 % to 55 %	1 MHz $\leq f_0 \leq$ 16 MHz	
		40 % to 60 %	40 % to 60 %			16 MHz $\leq f_0 \leq$ 33 MHz	50 % $V_{DD}$ $C_L \leq 15$ pF
			40 % to 60 %			33 MHz $\leq f_0 \leq$ 40 MHz	
High output voltage	$V_{OH}$	90 % $V_{DD}$ Min.			$V_{DD} - 0.4$ V Min.	$I_{OH} = -3$ mA(SEF, SDF, SCF), -8 mA(SCG)	
Low output voltage	$V_{OL}$	10 % $V_{DD}$ Max.			0.4 V Max.	$I_{OL} = 3$ mA(SEF, SDF, SCF), 8 mA(SCG)	
Output load condition	$C_L$	15 pF Max.					
Output enable / disable input voltage	$V_{IH}$	80 % $V_{DD}$ Min.			70 % $V_{DD}$ Min.	$\overline{ST}$ terminal	
	$V_{IL}$	20 % $V_{DD}$ Max.					
Output rise and fall time	$t_R / t_F$	4 ns Max.				20 % $V_{DD}$ level to 80 % $V_{DD}$ level. $C_L = 15$ pF	
Oscillation start up time	$t_{osc}$	SG-350:2 ms Max. / SG-550:10 ms Max.			12 ms Max.	$t = 0$ at 90% $V_{DD}$	
Aging	$f_a$	$\pm 5 \times 10^{-6}$ / year Max.			$\pm 10 \times 10^{-6}$ Max. 10 years	$T_a = +25$ °C, First year, $V_{DD} = 1.8V, 2.5V, 3.3V$	

## External dimensions

(Unit:mm)



## Recommended soldering pattern

(Unit:mm)

