

SMALL SOJ HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-636 series

- A small SMD that enables high-density mounting.
- A general-purpose device with builtin heat-resisting cylindrical AT-cut crystal and allowing almost the same temperature condition for soldering as SMD IC.
- Low current consumption.
- Provided with output enable function.
- 3.3 V operation, stand-by function available.

Specifications (characteristics)

Item		Symbol	SG-636PTF	SG-636PTJ	SG-636PH	SG-636SCE/PCE	Remarks
			Specifications				
Output frequency range		f ₀	2.21675 MHz to 41.0000 MHz	41.0001 MHz to 70.0000 MHz		2.21675 MHz to 41.0000 MHz	
Power source voltage	Max. supply voltage	V _{DD-GND}	-0.5 V to +7.0 V	-0.3 V to +7.0 V	-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 +100 °C				Stored as bare product after unpacking
	Operating temperature	T _{OPR}	-20 °C to +70 °C				
Soldering condition		T _{SOL}		Twice at under +260 °C within 10 s or under +230 °C within 3 min.			
Frequency stability		Δf/f ₀	C: ±100 x 10 ⁻⁶				
Current consumption		I _{OP}	17 mA Max.	35 mA Max.		9 mA Max.	No load condition
Duty	C-MOS level	t _{w/t}	40 % to 60 %	—	40 % to 60 %	45 % to 55 %	C-MOS load: 1/2 V _{DD} level
	TTL level		45 % to 55 %		—		TTL load: 1.4 V level
Output voltage		V _{OH}	V _{DD} -0.4 V Min.	2.4 V Min.	V _{DD} -0.4 V Min.		
		(I _{OH})	-8 mA	-400 μA	-4 mA		
		V _{OL}		0.4 V Max.			
		(I _{OL})	16 mA	8 mA	4 mA		
Output load condition (fan out)	C-MOS	C _L	50 pF Max.	15 pF	20 pF Max.(≤ 55 MHz) 15 pF Max.(> 55 MHz)	30 pF Max.	
	TTL	N	10 TTL Max.	5 TTL Max.	5 LSTTL Max.	—	C _L ≤15 pF
Output enable/disable input voltage		V _{IH}	2.0 V Min.	3.5 V Min.	2.0 V Min.	0.8 V _{DD} Min.	I _{IH} =1 μA Max.(OE=V _{DD})PTF,PTJ,PH I _{IL} =-100 μA Min.(OE=GND) PTF,PH -500 μA Min.(OE=GND) PTJ
		V _{IL}	0.8 V Max.	1.5 Max.	0.8 V Max.	0.2 V _{DD} Max.	
Output disable current		I _{OE}	10 mA Max.	28 mA Max.	20 mA Max.	5 mA Max.	OE=GND, ST=GND 2 μA Max.(SCE)
Output rise time	C-MOS level	t _{TLH}	7 ns Max.	—	5 ns Max.		C-MOS load: 20 %→80 % V _{DD}
	TTL level		5 ns Max.		—		TTL load: 0.4 V→2.4 V
Output fall time	C-MOS level	t _{THL}	7 ns Max.	—	5 ns Max.		C-MOS 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.		4 ms Max.	Time at 4.5 V to be 0 s
Aging		f _a	±5 x 10 ⁻⁶ /year Max.				T _a =+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 ml/s ² x 0.3 ms x 1/2 sine wave in 3 directions

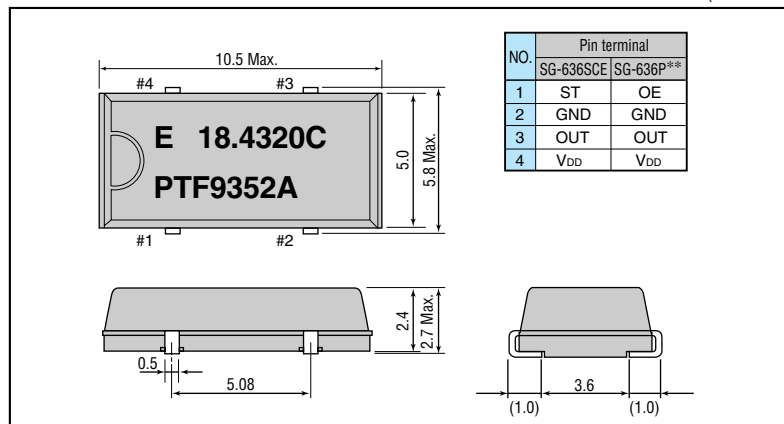
Note: • Unless otherwise stated, characteristics (specifications) shown in the above table are based on the rated operating temperature and voltage condition.

• External by-pass capacitor is required.

• Metal may be exposed on the top of this product. This won't affect any quality, reliability or electrical spec.

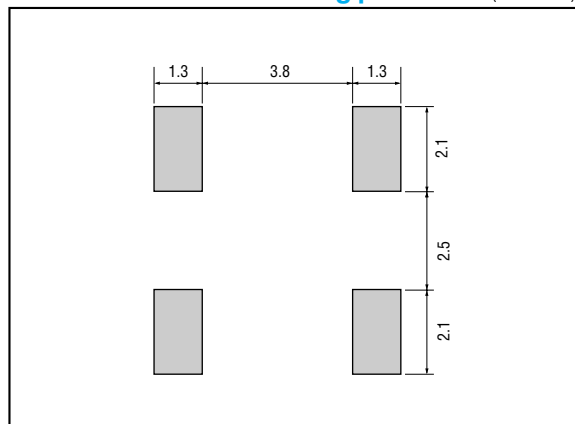
External dimensions

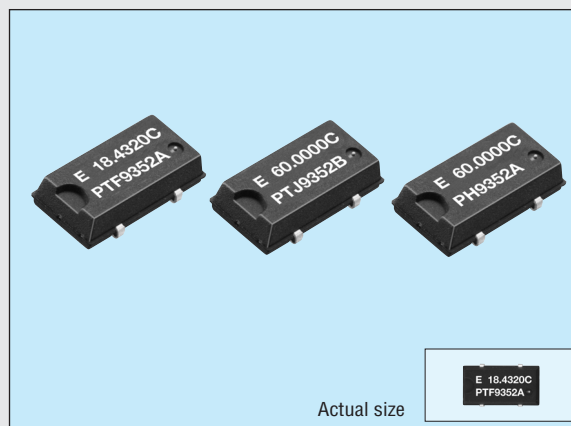
(Unit: mm)



Recommended soldering pattern

(Unit: mm)





Specifications (characteristics)

Item		Symbol	SG-636PTW/STW	SG-636PHW/SHW	SG-636PCW/SCW	Remarks
Specifications						
Output frequency range		f_0	32.0001 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 $\pm$ 0.5 V			3.3 V $\pm$ 0.3 V
Temperature range	Storage temperature	T_{STG}	-55 °C to +100 °C			
	Operating temperature	T_{OPR}	-20 °C to +70 °C			
Soldering condition (lead part)		T_{SOL}	Twice at under 260 °C within 10 s or under 230 °C within 3 min.			
Frequency stability		$\Delta f/f_0$	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$			
Current consumption		I_{OP}	45 mA Max.			No load condition
Output disable current		I_{OE}	30 mA Max.			OE=GND(P*W)
Output disable current		I_{ST}	50 μ A Max.			ST=GND(S*W)
Duty	C-MOS level	tw/t	—			C-MOS load: 1/2 V_{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		V_{IH}	2.0 V Min.			OE,ST
disable input voltage		V_{IL}	0.8 V Max.			OE,ST
Output rise time	C-MOS level	t_{TLH}	—			C-MOS load: 20 % $\rightarrow$ 80 % V_{DD}
	TTL level		4 ns Max.			TTL load: 0.4 V $\rightarrow$ 2.4 V
Output fall time	C-MOS level	t_{THL}	—			C-MOS load: 80 % $\rightarrow$ 20 % V_{DD}
	TTL level		4 ns Max.			TTL load: 2.4 V $\rightarrow$ 0.4 V
Oscillation start up time		t_{OSC}	10 ms Max.			Time at 4.5 V to be 0 s
Aging		f_a	$\pm 5 \times 10^{-6}$ /year Max.			T_a =+25 °C, V_{DD} =5 V
Shock resistance		S.R.	$\pm 20 \times 10^{-6}$ Max.			Three drops on a hard board from 750 mm or excitation test with 29400 m/s ² 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 $\pm$ 0.5 V	Frequency stability:B (-20 to +70 °C)	32 135 SG-636PTW/STW/PHW/SHW			
	Frequency stability:C (-20 to +70 °C)	2.21675 41 70 135 SG-636PTF SG-636PTJ/PH SG-636PTW/STW/PHW/SHW			
3.3 V $\pm$ 0.3 V	Frequency stability:B (-20 to +70 °C)	32 135 SG-636PCW/SCW			
	Frequency stability:C (-20 to +70 °C)	2.21675 41 135 SG-636PCE/SCE SG-636PCW/SCW			