

# CRYSTAL OSCILLATOR

## VC-TCXO/ TCXO

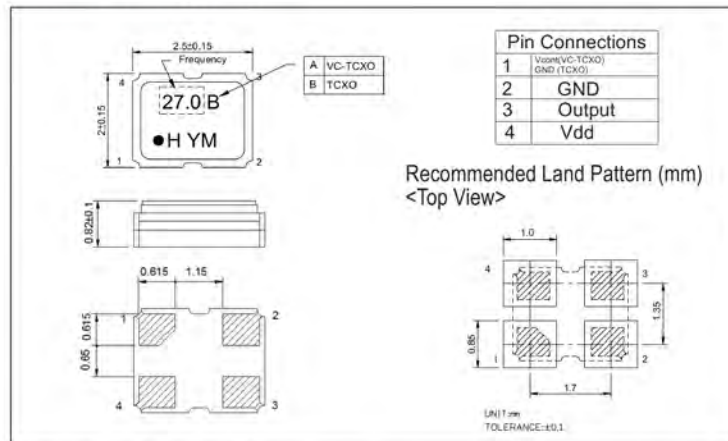
### HSA221S/HSB221S Series



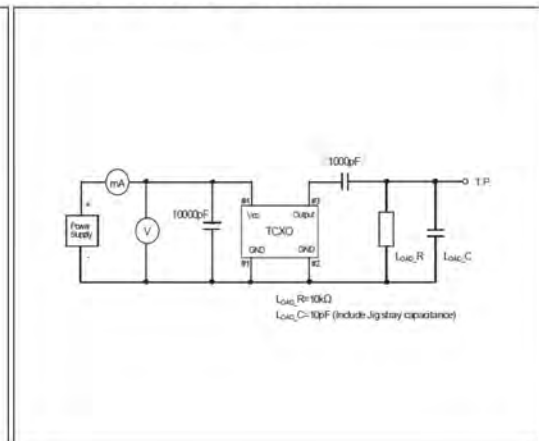
#### Features:

- High precision and high reliability at wide range of operating temperature ( $\pm 0.5 \text{ ppm} \sim \pm 2.0 \text{ ppm} / -30^\circ\text{C} \sim 85^\circ\text{C}$ ).
- Low voltage operation (1.8 V ~ 3.3 V.)
- Voltage Control Function available.
- Applications for GPS, Femtocell, RF module, smartphone and wireless communications.

#### Dimension (mm):



#### Measurement Circuit:



#### Standard Specification:

ITEM	TYPE	VC-TCXO	TCXO
		HSA221S	HSB221S
Frequency Range		13 ~ 52MHz	
Supply Voltage		1.8 ~ 3.3 V	
Current Consumption		+2.0mA max.	
Harmonics		- 5 dBc Max.	
Output Level		0.8 V <sub>p-p</sub> min	
Output Load		10KΩ// 10pF	
Frequency Stability	Tolerance	± 2.0 ppm max. (After 2 times reflow )	
	vs Temperature	± 0.5 ppm max. / -30 ~ +85°C	
	vs Slope	± 2.0 ppm max. / -30 ~ +85°C	
	vs Supply Voltage	± 0.2 ppm/°C max. (-30 ~ +85°C )	
	vs Load Variation	± 0.2 ppm max. (vdd±5%)	
Frequency Control	vs Aging	± 0.2 ppm max. (10KΩ/10pF±10%)	
	Control sensitivity	+/- 1ppm. / year	
		±9.0 ~ ±15ppm / V <sub>cont</sub> =+1.4V±1V@V <sub>dd</sub> =2.8V	
Start Up		5.0 ms max.	
Phase Noise	offset 1kHz	- 130 dBc / Hz	

\*Packing Unit: 3,000pcs/Reel.