

# CRYSTAL OSCILLATOR

## VC-TCXO/ TCXO

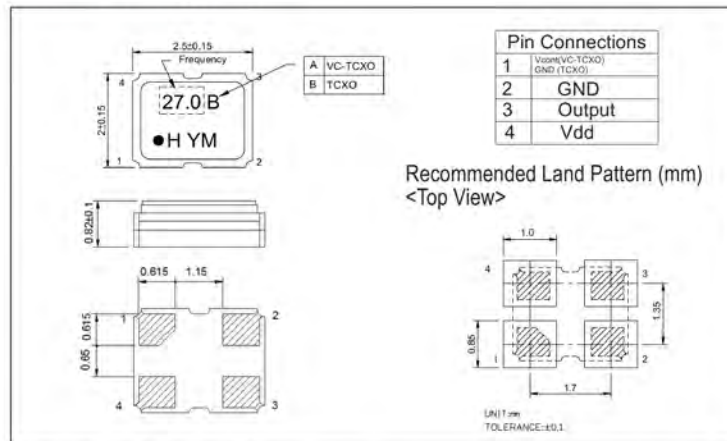
### HSA221S/HSB221S Series



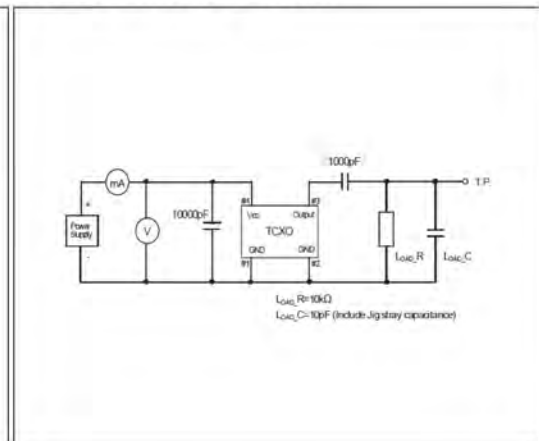
#### Features:

- 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 Vp-p min	
Output Load		10KΩ// 10pF	
Frequency Stability	Tolerance	$\pm 2.0 \text{ ppm max. (After 2 times reflow)}$	
	vs Temperature	$\pm 0.5 \text{ ppm max.} / -30 \sim +85^\circ\text{C}$	
	vs Slope	$\pm 2.0 \text{ ppm max.} / -30 \sim +85^\circ\text{C}$	
	vs Supply Voltage	$\pm 0.2 \text{ ppm}/^\circ\text{C max.} (-30 \sim +85^\circ\text{C})$	
	vs Load Variation	$\pm 0.2 \text{ ppm max. (vdd}\pm 5\%)$	
Frequency Control	vs Aging	$\pm 0.2 \text{ ppm max. (10K}\Omega/10\text{pF}\pm 10\%)$	
	Control sensitivity	+/- 1ppm. / year	
		$\pm 9.0 \sim \pm 15 \text{ ppm} /$ $V_{\text{cont}} = +1.4\text{V} \pm 1\text{V} @ V_{\text{dd}} = 2.8\text{V}$	
Start Up		5.0 ms max.	
Phase Noise	offset 1kHz	- 130 dBc / Hz	

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