

## Voltage-Controlled Crystal Oscillator (VCXO)

- Package size (3.2 mm × 2.5 mm × 1.05 mm)
- Fundamental mode VCXO
- Output: LV-PECL
- Reference weight Typ.26 mg

### [ 1 ] Product Number / Product Name / Marking

(1-1) Product Number / Ordering Code

**X1G0053610012xx**

Last 2 digits code(**xx**) defines Quantity.

The standard is "00", 2 000 pcs/Reel.

(1-2) Product Name / Model Name

**VG3225EFN 148.500000MHz CJGHBA**

### [ 2 ] Absolute Maximum Ratings

Parameter	Symbol	Specifications			Unit	Conditions
		Min.	Typ.	Max.		
Maximum supply voltage	V <sub>CC</sub>	-0.5	-	+5.0	V	-
Input voltage	V <sub>c</sub>	-0.5	-	V <sub>CC</sub> + 0.5	°C	V <sub>c</sub> terminal
Storage temperature range	T <sub>stg</sub>	-55	-	+125	°C	Storage as single product

### [ 3 ] Operating Range

Parameter	Symbol	Specifications			Unit	Conditions
		Min.	Typ.	Max.		
Supply voltage	V <sub>CC</sub>	3.135	3.3	3.465	V	-
	GND	0	0	0	V	-
Control voltage	V <sub>c</sub>	0	1.65	3.3	V	-
Operating temperature range	T <sub>use</sub>	-40	-	+85	°C	-
ECL load condition	L <sub>ECL</sub>	-	50	-	Ω	Terminated to V <sub>CC</sub> - 2.0 V

### [ 4 ] Frequency Characteristics

(Unless stated otherwise [ 3 ] Operating Range)

Parameter	Symbol	Specifications			Unit	Conditions
		Min.	Typ.	Max.		
Output frequency	f <sub>o</sub>	-	148.500000	-	MHz	-
Frequency tolerance *1	f <sub>tol</sub>	-50	-	+50	×10 <sup>-6</sup>	T <sub>use</sub>

\*1 Frequency tolerance includes Initial frequency tolerance, Frequency / temperature characteristics, Frequency / voltage coefficient and aging (10 years, +25 °C)

### [ 5 ] Frequency Control Characteristics

(Unless stated otherwise [ 3 ] Operating Range)

Parameter	Symbol	Specifications			Unit	Conditions
		Min.	Typ.	Max.		
Absolute pull range *1	APR	±50	-	-	×10 <sup>-6</sup>	-
Input impedance	Z <sub>in</sub>	10	-	-	MΩ	DC level
Linearity *2	FLIN	-	±5	±10	%	-
Modulation bandwidth	BW	10	15	-	kHz	±3 dB
Frequency change polarity	f <sub>cp</sub>	Positive			-	-

\*1 Absolute pull range = Frequency control range - Frequency tolerance

\*2 Deviation from best linear fit.

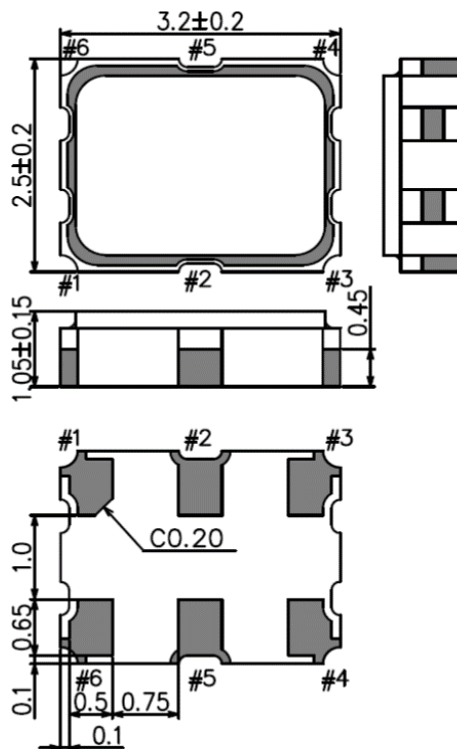
## [ 6 ] Electrical Characteristics

(Unless stated otherwise [ 3 ] Operating Range)

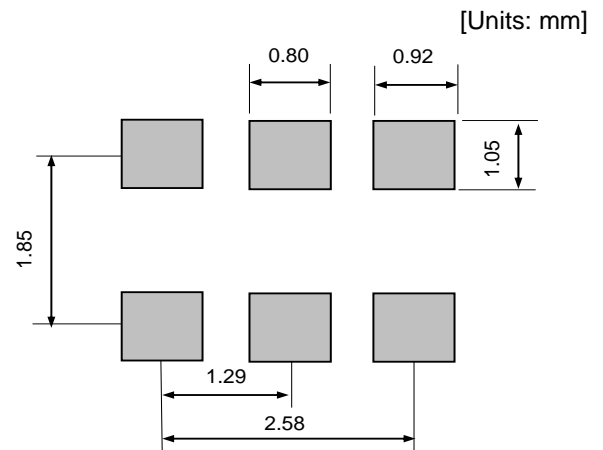
Parameter	Symbol	Specifications			Unit	Conditions
		Min.	Typ.	Max.		
Start-up time	$t_{str}$	-	-	10	ms	$t = 0$ at $V_{CC}$ Min.
Current consumption	$I_{CC}$	-	-	60	mA	$OE = V_{CC}$ , $L\_ECL = 50 \Omega$
Disable current	$I_{dis}$	-	-	25	mA	$OE = GND$
Output voltage	$V_{OH}$	$V_{CC} - 1.1$	-	-	V	DC characteristics
	$V_{OL}$	-	-	$V_{CC} - 1.5$	V	DC characteristics
Differential swing	$V_{SW}$	800	-	2 000	mV	Differential output peak to peak voltage
Rise time	$t_r$	-	-	0.5	ns	20 % $\rightarrow$ 80 % of $(V_{OH}-V_{OL})$
Fall time	$t_f$	-	-	0.5	ns	80 % $\rightarrow$ 20 % of $(V_{OH}-V_{OL})$
Symmetry	SYM	45	50	55	%	at output crossing point
Input voltage	$V_{IH}$	70 % $V_{CC}$	-	-	V	OE terminal
	$V_{IL}$	-	-	30 % $V_{CC}$	V	OE terminal
Output disable time (OE)	$t_{stp\_oe}$	-	-	100	ns	OE terminal HIGH $\rightarrow$ LOW
Output enable time (OE)	$t_{sta\_oe}$	-	-	200	ns	OE terminal LOW $\rightarrow$ HIGH
Phase jitter	$t_{PJ}$	-	-	120	fs	Offset frequency: 12 kHz to 20 MHz

## [ 7 ] External Dimensions / Footprint / Pin Map

## (7-1) External Dimensions



## (7-2) Footprint



For stable operation, it is recommended that 0.01  $\mu$ F to 0.1  $\mu$ F bypass capacitors should be connected between  $V_{CC}$  and GND and placed as close to the  $V_{CC}$  pin as possible.

## (7-3) Pin Map

Pin #	Connection	Function		
#1	$V_c$	Vc terminal		
#2	OE	OE terminal / active high		
		OE function	Osc. circuit	Output
		"H" or OPEN	Oscillation	Specified frequency: Enable
		"L"	Oscillation	High impedance: Disable
#3	GND	GND terminal		
#4	OUT	Output terminal (Positive)		
#5	$\bar{O}UT$	Output terminal (Negative)		
#6	$V_{CC}$	$V_{CC}$ terminal		

**[ 8 ] Packing Information****(8-1) Packing Quantity**

The last two digits of the Product Number (X1G005361xxxxxx) are a code that defines the packing quantity. The standard is "00" for a 2 000 pcs/Reel.

**(8-2) Taping Specification**

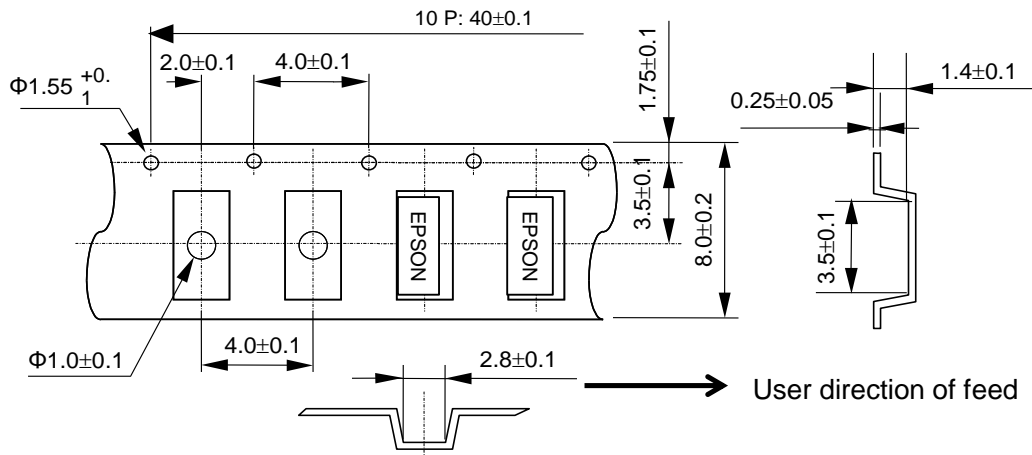
Subject to EIA-481, IEC-60286 and JIS C0806

**(1) Tape Dimensions**

Carrier Tape Material: PS (Polystyrene)

Top Tape Material: PET (Polyethylene Terephthalate) + PE (Polyethylene)

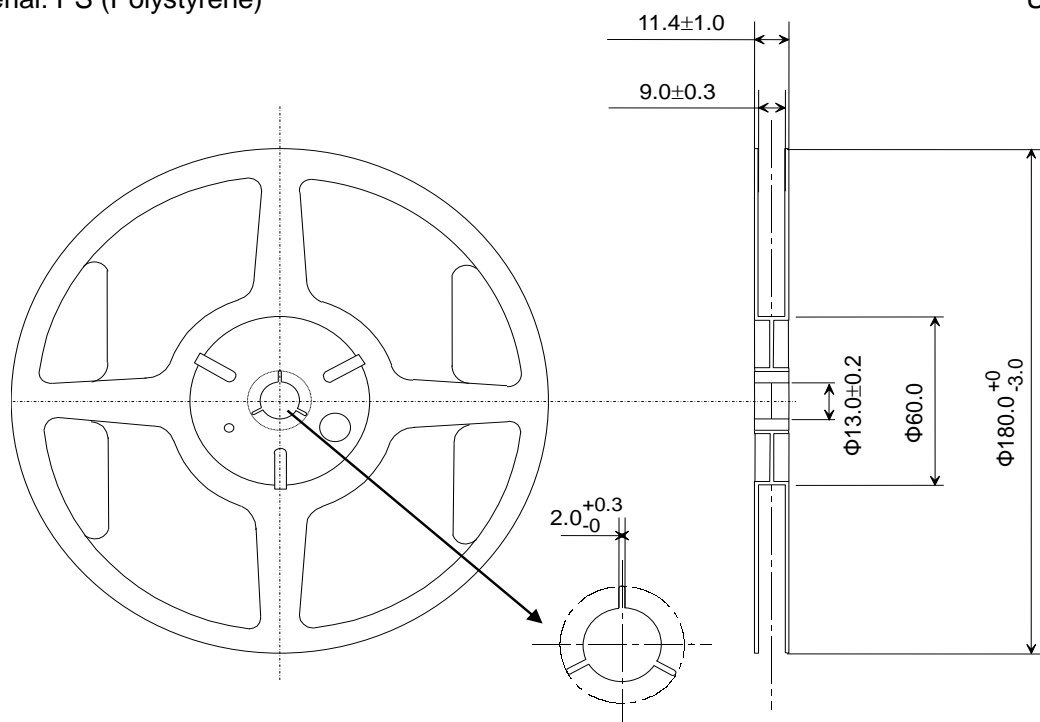
Units: mm

**(2) Reel Dimensions**

Center Material: PS (Polystyrene)

Reel Material: PS (Polystyrene)

Units: mm

**(3) Storage Environment**

We recommend to keep at normal temperature and normal humidity in a packed condition.

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