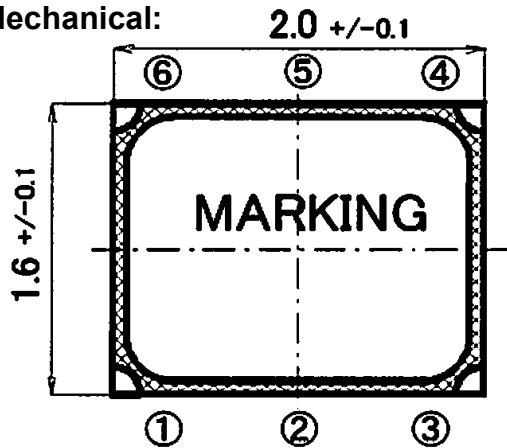


- Pletronics TCG4 Series is an precision temperature compensated crystal oscillator.
- The TCG4 has a clipped-sine output.
- Frequencies available from 15MHz to 52 MHz
- Supply voltages from 1.8V to 3.3V

- 1.6 X 2.0 mm Ceramic LCC Package
- Very Low Power consumption
- Optional Voltage Control function
- Low phase noise and jitter

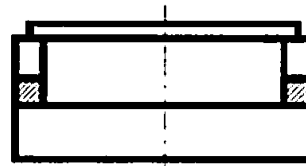
**Mechanical:**



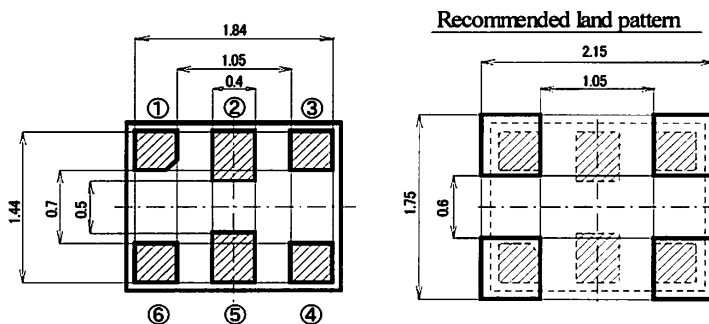
**Pin Connections**

- ①: VC
- ②: NC
- ③: GND
- ④: OUTPUT
- ⑤: NC
- ⑥: Vcc

NC= no external connection allowed



Contacts: gold 11.8 to 39.4  $\mu$ -inches (0.3 to 1.0  $\mu$ m) over Nickel 50 to 350  $\mu$ -inches (1.27 to 8.89  $\mu$ m).



**Layout and Application Information**

For optimum jitter performance, Pletronics recommends:

- A ground plane under the device
- No large transient signals (both voltage and current) should be routed under the device.
- Do not layout near large magnetic fields such as high frequency switching power supplies.
- Do not place near piezoelectric buzzers or mechanical fans.

**Electrical Specification for specified Vcc over the specified temperature range**

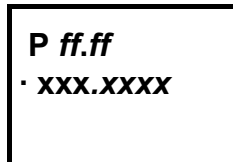
Item	Min	TYP	Max	Unit	Condition
Frequency Range	15		52	MHz	See table of available frequencies.
Frequency Tolerance (Calibration)	-1.0		+1.0	ppm	Vcontrol =(1.50 or 0.9) volts at 25±2°C, reference to nominal frequency Vcontrol = 0.9 volts for VCC below 2.5 Volts
Frequency Stability vs. Temp. <sup>1</sup>	-0.5		+0.5	ppm	Over operating range referenced to value at 25±2°C
Frequency Stability vs. Supply	-0.2		+0.2	ppm	Load: 10K ohm // 10 pF & Vcc ±5%
Frequency Stability vs. Load	-0.2		+0.2	ppm	Load 10K ohm    10 pF ±5%
Aging	-1.0		+1.0	ppm	Per year at 25°C
Output Waveform	Clipped Sinewave				DC Coupled
Output Level	0.8			V <sub>p-p</sub>	Load: 10K ohm ±10% // 10 pF ±10%
Phase Noise	10 Hz	-	-85	-	dBc/Hz
	100Hz	-	-110	-	
	1 KHz	-	-130	-	
	10 KHz	-	-145	-	
	100KHz	-	-145	-	
V Supply Range V <sub>CC</sub>	1.7	-	3.3	Volts	Specified by part number.
Supply Current I <sub>CC</sub>		2.5		mA	
Vcontrol Range	0.5 0.3		2.5 1.5	Volts	1.50 volts nominal for V <sub>CC</sub> ≥ 2.5V 0.90 volts nominal for V <sub>CC</sub> ≤ 2.5V
Frequency Pullability <sup>1</sup>		±8		ppm	
Linearity	-	0.05	2.0	%	In accordance with MIL-PRF-55310
Operating Temperature Range <sup>1</sup>	-30		+85	°C	
Storage Temperature Range	-40		+85	°C	

<sup>1</sup> Specified by Part Number

## Part Number:

<b>TCG4</b>	<b>017</b>	<b>019</b>	<b>G</b>	<b>H</b>	<b>010</b>	<b>008</b>	<b>-20.0M</b>	<b>-XX</b>	
									Internal code or blank
									Nominal Frequency in MHz
									<b>Pullability in ppm (Vcontrol)(in ppm)</b> <b>000</b> = TCXO only <b>005</b> = ±5 ppm minimum <b>008</b> = ±8 ppm minimum
									<b>Stability in ppm</b> <b>010</b> = ± 1.0 ppm, <b>005</b> = ±0.5 ppm
									<b>Highest Specified Operating Temperature</b> <b>A</b> = +40°C <b>E</b> = +60°C <b>J</b> = +80°C <b>B</b> = +45°C <b>F</b> = +65°C <b>K</b> = +85°C <b>C</b> = +50°C <b>G</b> = +70°C <b>D</b> = +55°C <b>H</b> = +75°C
									<b>Lowest Specified Operating Temperature</b> <b>A</b> = +10°C <b>E</b> = -10°C <b>J</b> = -30°C <b>B</b> = +5°C <b>F</b> = -15°C <b>C</b> = +0°C <b>G</b> = -20°C <b>D</b> = -5°C <b>H</b> = -25°C
									<b>Highest Supply Voltage</b> <sup>1</sup> (voltage * 10) <b>035</b> = 3.3 volts <b>030</b> = 3.0 volts      (typical examples shown)
									<b>Lowest Supply Voltage</b> <sup>1</sup> (voltage * 10) <b>017</b> = 1.7 volts <b>028</b> = 2.8 volts      (typical examples shown)
									Series (Part Type, Logic & Package)

## Part Marking:



P = Pletronics  
ff.ff = frequency in MHz  
xxx.xxxx = internal code

## Package Labeling:

Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Courier New  
Bar code is 39-Full ASCII

Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Arial



**Pletronics Inc. certifies this device is in accordance with the RoHS 6/6 (2002/95/EC) and WEEE (2002/96/EC) directives.**

- Pletronics Inc. guarantees the device does not contain the following:  
Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
- Weight of the Device: 0.64 grams
- Moisture Sensitivity Level: 1 As defined in J-STD-020D.
- Second Level Interconnect code: e4

**Absolute Maximum Ratings:**

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +6.0V
V <sub>i</sub> Input Voltage	-0.5V to V <sub>CC</sub> + 0.5V
V <sub>o</sub> Output Voltage	-0.5V to V <sub>CC</sub> + 0.5V

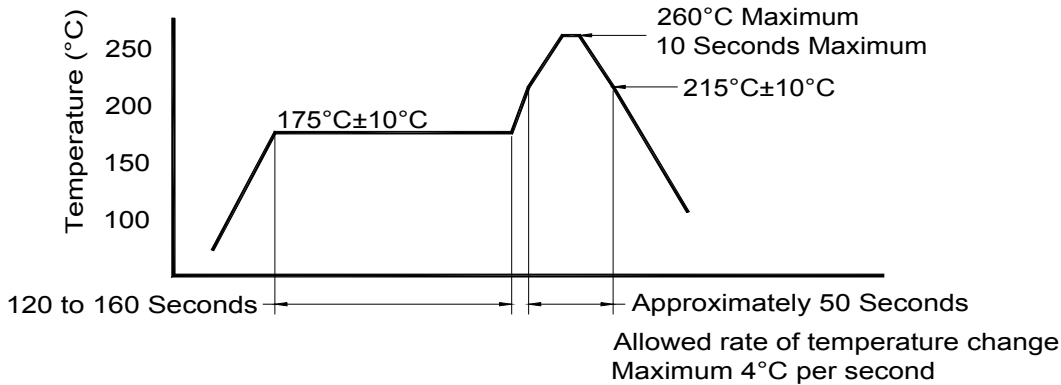
**ESD Rating**

Model	Minimum Voltage	Conditions
Human Body Model	1500	MIL-STD-883 Method 3115
Charged Device Model	1000	JESD 22-C101

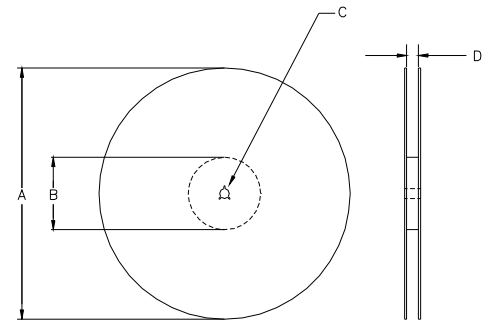
**Reliability: Environmental Compliance**

Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

## Reflow Cycle (typical for lead free processing)



Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5 -0.0 +1.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	-	0.6	-
12mm		1.5						
16mm		1.5						
24mm		1.5			2.0 ±0.1			

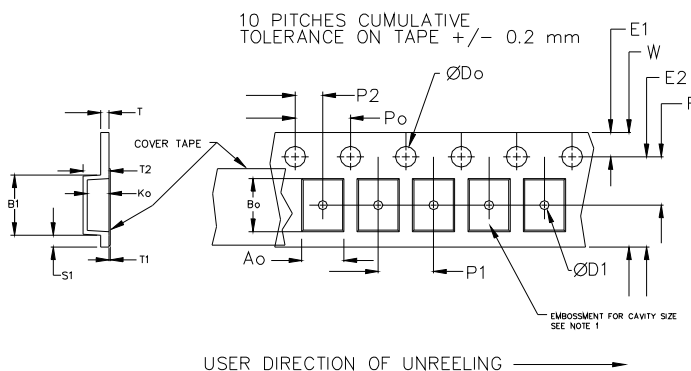


Variable Dimensions Table 2						
Tape Size	B1 Max	F	P1	T2 Max	W Max	Ao, Bo & Ko
8mm	2.2	3.5 ± 0.1	4.0 ± 0.1	1.2	8.0	Note 1

Note 1: Embossed Cavity to conform to EIA-481-B. Dimensions in mm Not to Scale

Reel Dimensions					
A	Inches	7.0	10.0	13.0	Tape Width
	mm	177.8	254.0	330.2	
B	Inches	2.50	4.00	3.75	Tape Width
	mm	63.5	101.6	95.3	
C	mm	13.0 +0.5 / -0.2			Tape Width
D	mm	16.4 +2.0 -0.0			

Reel Dimensions may vary from the above.



### **IMPORTANT NOTICE**

Pletronics Incorporated (PLE) reserves the right to make corrections, improvements, modifications and other changes to this product at anytime. PLE reserves the right to discontinue any product or service without notice. Customers are responsible for obtaining the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to PLE's terms and conditions of sale supplied at the time of order acknowledgment.

PLE warrants performance of this product to the specifications applicable at the time of sale in accordance with PLE's limited warranty. Testing and other quality control techniques are used to the extent PLE deems necessary to support this warranty. Except where mandated by specific contractual documents, testing of all parameters of each product is not necessarily performed.

PLE assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using PLE components. To minimize the risks associated with the customer products and applications, customers should provide adequate design and operating safeguards.

PLE products are not designed, intended, authorized or warranted to be suitable for use in life support applications, devices or systems or other critical applications that may involve potential risks of death, personal injury or severe property or environmental damage. Inclusion of PLE products in such applications is understood to be fully at the risk of the customer. Use of PLE products in such applications requires the written approval of an appropriate PLE officer. Questions concerning potential risk applications should be directed to PLE.

PLE does not warrant or represent that any license, either express or implied, is granted under any PLE patent right, copyright, artwork or other intellectual property right relating to any combination, machine or process which PLE product or services are used. Information published by PLE regarding third-party products or services does not constitute a license from PLE to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from PLE under the patents or other intellectual property of PLE.

Reproduction of information in PLE data sheets or web site is permissible only if the reproduction is without alteration and is accompanied by associated warranties, conditions, limitations and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. PLE is not responsible or liable for such altered documents.

Resale of PLE products or services with statements different from or beyond the parameters stated by PLE for that product or service voids all express and implied warranties for the associated PLE product or service and is an unfair or deceptive business practice. PLE is not responsible for any such statements.

### **Contacting Pletronics Inc.**

Pletronics Inc.  
19013 36<sup>th</sup> Ave. West  
Lynnwood, WA 98036-5761 USA

Tel: 425-776-1880  
Fax: 425-776-2760  
E-mail: ple-sales@pletronics.com  
URL: www.pletronics.com

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А