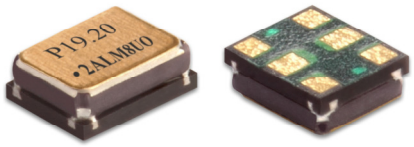
PLETRONICS
www.pletronics.com 425-776-1880

Preliminary

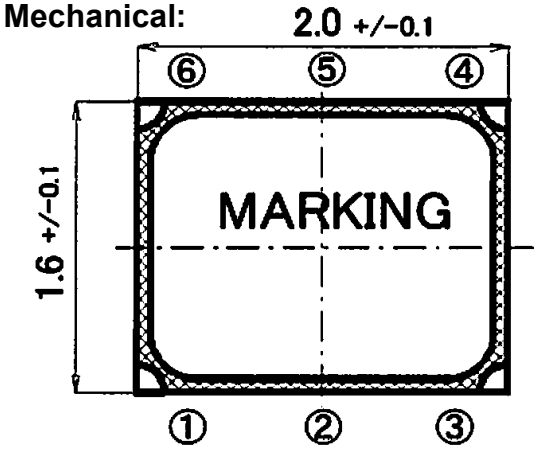
TCG4 Series
TCVCXO Oscillator
November 2012

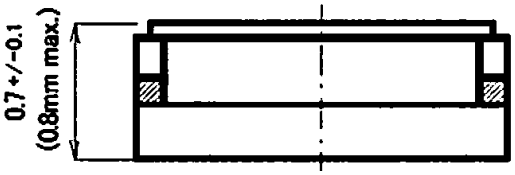


Lead Free

- 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:



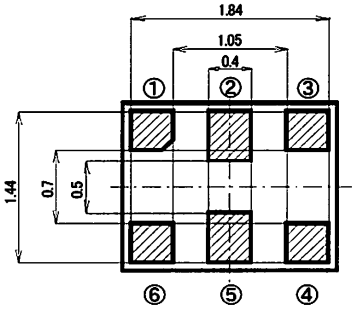


Contacts: gold 11.8 to 39.4 µ-inches (0.3 to 1.0 µm) over Nickel 50 to 350 µ-inches (1.27 to 8.89 µm).

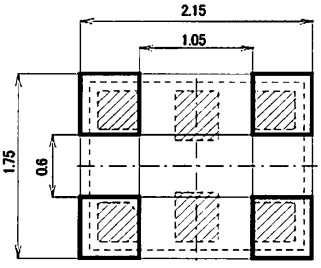
Pin Connections

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

NC= no external connection allowed



Recommended land pattern



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.[1]	-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_{p-p}	Load: 10K ohm ±10% // 10 pF ±10%
Phase Noise 10 Hz 100Hz 1 KHz 10 KHz 100KHz	- - - -	-85 -110 -130 -145 -145	- - - -	dBc/Hz	
V Supply Range V_{CC}	1.7	-	3.3	Volts	Specified by part number.
Supply Current I_{CC}		2.5		mA	
Vcontrol Range	0.5 0.3		2.5 1.5	Volts	1.50 volts nominal for $V_{CC} \geq 2.5V$ 0.90 volts nominal for $V_{CC} \leq 2.5V$
Frequency Pullability [1]		±8		ppm	
Linearity	-	0.05	2.0	%	In accordance with MIL-PRF-55310
Operating Temperature Range [1]	-30		+85	°C	
Storage Temperature Range	-40		+85	°C	

[1] Specified by Part Number

Part Number:

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

Part Marking:

P *ff.ff*
· xxx.*xxxx*

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

P/N: TCG4017019GH500008-20.0M
Customer P/N: 12345678
Qty: 1000 D/C TC512SA
MSL: 1

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

RoHS Compliant
2nd LvL Interconnect
Category=e4
Max Safe Temp=260C for 10s 2X Max

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_{CC} Supply Voltage	-0.5V to +6.0V
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo Output Voltage	-0.5V to V_{CC} + 0.5V

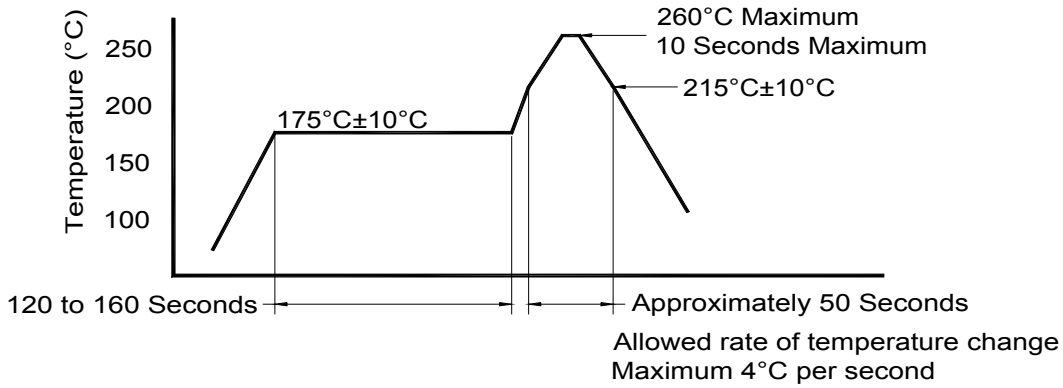
ESD Rating

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

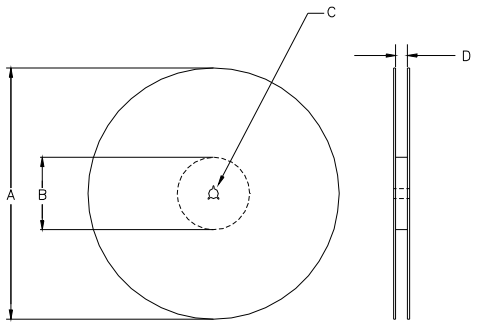
Reliability: Environmental Compliance

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			2.0 ±0.1			
24mm		1.5						

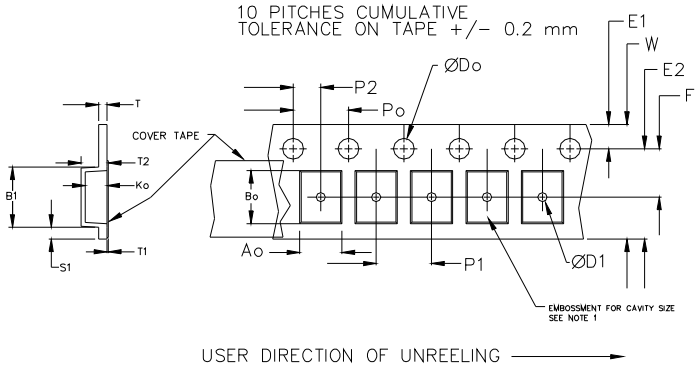


Variable Dimensions Table 2						
Tape Size	B1 Max	F	P1	T2 Max	W Max	Ao, Bo & Ko
8mm	2.2	3.5 ±0.1	4.0 ±0.1	1.2	8.0	Note 1

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	
	mm	177.8	254.0	330.2	
B	Inches	2.50	4.00	3.75	
	mm	63.5	101.6	95.3	Tape Width
C	mm	13.0 +0.5 / -0.2			
D	mm	16.4 +2.0 –0.0			16.0

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 36th 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

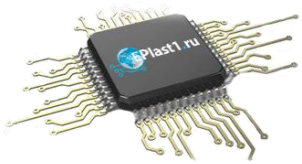
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.