

TBA4 Series TCVCXO Oscillator

February 2009

Lead Free 

- Pletronics' TBA4 Series is a temperature compensated voltage controlled crystal oscillator with a clipped sinewave output.
- The package is designed for high density surface mount designs.
- Tape and Reel packaging is available.
- 8 to 52 MHz
- Stabilities to less than 0.2ppm available
- 5 x 7 mm LCC Ceramic Package
- Optional Voltage Control Function

Pletronics Inc. certifies this device is in accordance with the RoHS (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: 0.3 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020C
Second Level Interconnect code: e4

Absolute Maximum Ratings:

Parameter	Unit
V _{CC} Supply Voltage	-0.5V to +6.5V
V _i Input Voltage	-0.5V to V _{CC} + 0.5V
V _o Output Voltage	-0.5V to V _{CC} + 0.5V

Thermal Characteristics

The maximum die or junction temperature is 155°C
The thermal resistance junction to board is 30 to 50°C/Watt depending on the solder pads, ground plane and construction of the PCB.

Part Number:

TBA4	031	035	G	H	015	008	-40.0M	-XX	
Internal code or blank									
Nominal Frequency in MHZ									
Pullability in ppm (Vcontrol) 000 = TCXO only 008 = ± 8 ppm minimum 015 = ± 15 ppm minimum									
Stability in ppm 001 = ± 0.1 ppm 010 = ± 1 ppm 002 = ± 0.2 ppm 015 = ± 1.5 ppm 005 = ± 0.5 ppm 025 = ± 2.5 ppm 007 = ± 0.7 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 K = -35°C C = +0°C G = -20°C L = -40°C D = -5°C H = -25°C M = -45°C									
Highest Supply Voltage* 055 = 5.5 volts 035 = 3.5 volts 036 = 3.6 volts 030 = 3.0 volts									
Lowest Supply Voltage * 045 = 4.5 volts 031 = 3.1 volts 030 = 3.0 volts 027 = 2.7 volts									
Series (Part Type, Logic & Package)									

* Supply Voltage: Select range between 2.7V and 5.5V with ratio of Highest / Lowest ≤ 1.20
 For Example: the part number for 3.3V nominal could be TBA4030036.....

ESD Rating

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

Electrical Specification for specified V_{CC} over the specified temperature range

Item	Min	Max	Unit	Condition
Frequency Range	10	52	MHZ	
Frequency Accuracy ¹	-2.5 -0.1	+2.8 +0.1	ppm	Vcontrol 1.50 volts if used ²
Frequency Stability versus Supply	-0.2	+0.2	ppm	Load: 10K ohm // 10 pF & V _{CC} ± 5%
Output Waveform	Clipped Sinewave			
Output Amplitude	<=40 MHZ >40 MHZ	1.0 0.8	- -	V P-P Load: 10K ohm // 10 pF
Phase Noise	1 Hz 10 Hz 100 Hz 1 KHz 10 KHz >10 KHz	-	-62 -91 -116 -137 -145 -145	dBc/Hz
V Supply Range ¹ V _{CC}	2.7	5.5	Volts	
Supply Current	I _{CC} at 13 MHZ I _{CC} at 26 MHZ I _{CC} at 52 MHZ	- 2.0 2.7 4.4	mA	10K ohm // 10 pF
Start-up time	-	10	mS	to be within ±3 ppm of the final frequency
Aging	-1.0 -0.5	+1.5 +0.5	ppm	Per year at 25°C for the first year For any year thereafter
Vcontrol Range	0.5	2.50	Volts	1.50 volts nominal
Vcontrol Input Current	-50	+50	uA	
Frequency Pullability ¹	-15	+15	ppm	
Operating Temperature Range ¹	-45	+85	°C	
Storage Temperature Range	-55	+95	°C	

¹ Specified by part number

² For all supply voltages, load changes, aging for 1 year, shock, vibration and temperatures

Reliability: Environmental Compliance

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

Part Marking:

TBymda
fff.fff M
PLHXXX

Where: *ymd* = Date code
fff.fff = frequency in MHZ
P = Pletronics
LH = Lowest Temp, Highest Temp
XXX = Stability

Due to part size limitations, marking cannot identify complete specifications.

Codes for Date Code YMD

Code	6	7	8	9	0	1	2
Year	2006	2007	2008	2009	2010	2011	2012

Code	A	B	C	D	E	F	G	H	J	K	L	M
Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Package Labeling

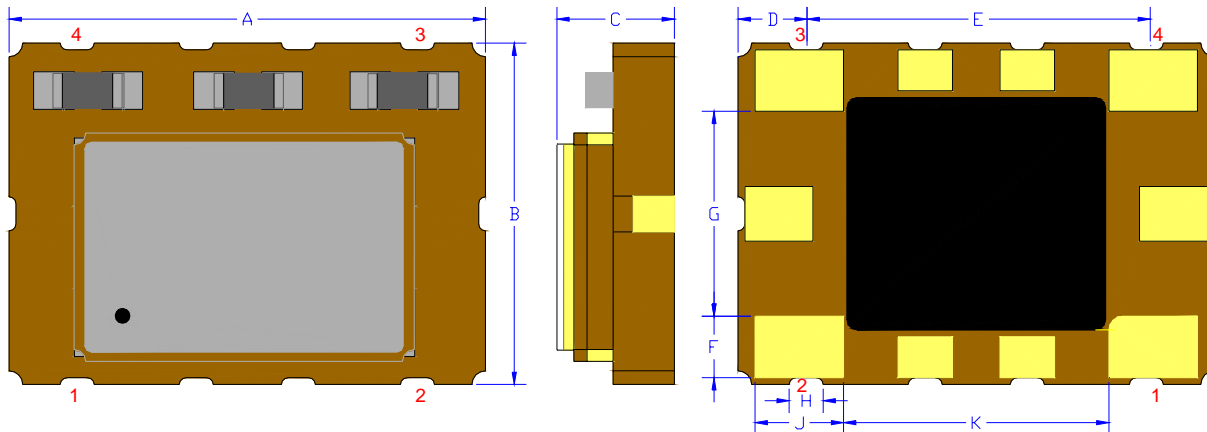
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

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

 TCA4027050GH015008-12.75M	
Customer P/N:	 12345678
Qty:	 1000
	D/C  TC512SA

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

Mechanical:



Not to Scale

Pad	Function	Note
1	Vcontrol Input	If this function is not specified, recommend connecting this pad to ground.
2	Ground (GND)	
3	Output	
4	Supply Voltage (V_{CC})	Recommend connecting appropriate power supply bypass capacitors as close as possible.

	Inches	mm
A	0.276 ±0.006	7.00 ±0.15
B	0.197 ±0.006	5.00 ±0.15
C	0.074 ±0.006	1.88 ±0.15
D ¹	0.039	1.00
E ¹	0.197	5.00
F ¹	0.025	0.90
G ¹	0.118	3.00
H ¹	0.020	0.50
J ¹	0.051	1.30
K ¹	0.154	3.90

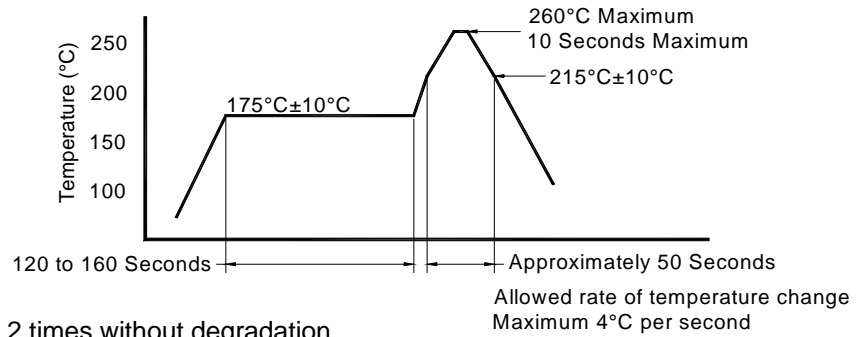
¹ Typic dimensions

Contacts :

Gold 11.8 μinches 0.3 μm minimum over Nickel 50 to 350 μinches 1.27 to 8.89 μm

There are additional pads on the package bottom, these are **not to be connected to any traces** on the PCB, solder masking on the PCB should be used to make sure no contact is made.

Reflow Cycle (typical for lead free processing)

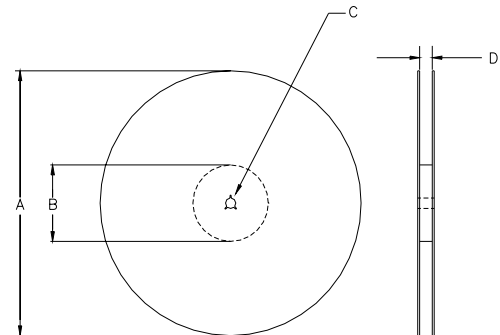


The part may be reflowed 2 times without degradation.

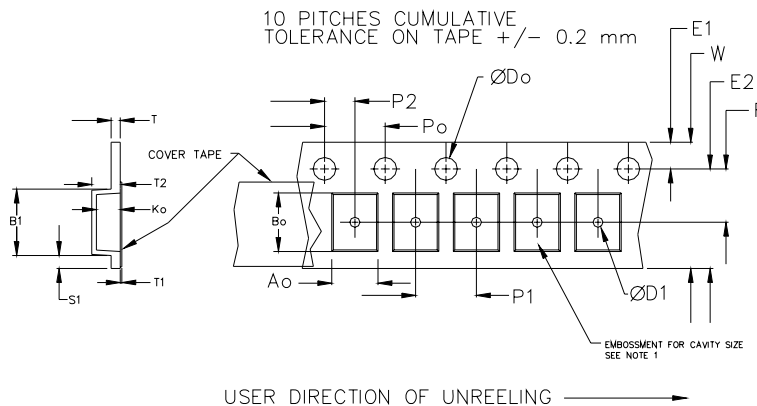
Tape and Reel: available for quantities of 250 to 1000 per reel

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

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
16 mm	12.1	14.25	7.5 ± 0.1	8.0 ± 0.1	8.0	16.3	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	16.4 +2.0 -0.0	16.4 +2.0 -0.0	
	mm	---	---	24.4 +2.0 -0.0	24.0
	mm	---	---	32.4 +2.0 -0.0	32.0

Reel dimensions may vary

from the above

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