Temperature Compensated Crystal Oscillator SAMSUNG ELECTRO-MECHANICS

TCXO is abbreviation of Temperature Compensated Crystal Oscillator. TCXO is a reference oscillator in frequency synthesizers required highly accurate frequency stabilization, such as PLL in mobile phone and various telecommunication system. Generally, TCXO is divided into two types : discrete type and 1 chip IC type. discrete type TCXO is consisted of crystal, MLCC, oscillation IC, resistor, thermistor and PCB. 1 chip IC type TCXO is consisted of crystal, 1 chip IC, ceramic package.

■ FEATURE AND APPLICATION

• Feature

- Various products
- SMD type(leadless)
- Industry Standard Size
- AFC(Auto Function Control) function is available
- Highly accurate frequency stability
- Low power consumption
- Tape & Reel for Surface Mount Assembly

Application

- GSM / GPRS / UMTS / W-CDMA : 13MHz, 26MHz
- PCS / CDMA / 1xEVDO : 19.2MHz, 19.68MHz
- PCS / CDMA (include GPS function) : 19.2MHz



STRUCTURE

• Discrete type (7x5, 5x3.2)





• 1 chip IC type (5x3.2, 4x2.5, 3.2x2.5)





■ APPEARANCE AND DIMENSION

• 7x5 Discrete type



• 5x3.2 Discrete type



• 5x3.2 1 chip IC type





• 4x2.5 1 chip IC type



• 3.2x2.5 1 chip IC type





PART NUMBERING



1 Product Abbreviation

2 Size

- **3** Nominal Frequency
- 4 Additional Function
- **6** Operating Voltage
- **6** Operating Temperature
- Pin Number
- 8 Country Code
- 9 User Serial Number

1 Product Abbreviation

Abbreviation of Temperature Compensated Crystal Oscillator

Ø Size

Symbol	Size	
U	11.4x9.6x2.6 mm	
S	9.0x7.0x2.0 mm	
Α	7.0x5.2x2.0 mm / 7.0x5.0x2.0 mm	
В	5.0x3.2x1.5 mm	
F	4.0x2.5x1.5 mm	
С	User Spec	

8 Nominal Frequency

EX) 1920 : 19.200000 MHz

4 Additional Function

Symbol	Additional Function
Ν	No Additional Function
V	Voltage Controlled Method
D	Digital Temperature Compensation



6 Operating Voltage

Symbol	Operating Voltage
Α	3.0V
В	3.3V
С	4.0V
D	5.0V
Р	2.8V

6 Operating Temperature

Symbol	Operating Temperature
н	-30 ℃ ~ 80'C
I	-30 ℃ ~ 75'C
J	-30℃ ~ 70'C
К	-20℃ ~ 70'C
L	0℃ ~ 50'C
Μ	User Spec

7 Pin Number

Symbol	Pin Number
4	4
6	6

8 Country Code

Symbol	Country
KR	Korea
US	United States of America
FR	France
DK	Denmark
DE	Germany

9 User Serial Number

Give a character from A to Z in order of User Serial Number



PACKAGING

• 7x5 Discrete type



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• 5x3.2 1 chip IC type, Discrete type





• 4x2.5 1 chip IC type



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■ RELIABILITY TEST DATA

NO	ITEM	TEST CONDITION
1	High Temp. Storage	85+/-2'C, 96+/-2Hr
2	Low Temp. Storage	-40+/-2'C, 96+/-2Hr
3	High Temp. & High Humidity Storage	40'C, 90~95%RH, 96+/-2Hr
4	Thermal shock	-40'C/30min ~ 85'C/30min, 15cycles
5	Vibration	Frequency : 20~2000Hz Acceleration : 5G XYZ each direction × 30min
6	Drop	150cm, 120g Jig, onto concrete, each side(6), corner(1), total 7times
7	Solderability	230 $^\circ\!\!\mathbb{C}$ +/-5 $^\circ\!\!\mathbb{C}$ for 10sec, more than 90% must be covered
8	Solder heat resistance	260+/-5℃ for 10sec

<u>Note</u>

1. Must be measured after 4~12hours at room temperature, humidity.

2. Frequency must be within initial value +/-2ppm.



CHARACTERISTIC GRAPH

• ELECTRICAL CHARACTERISTICS

► TEMPERATURE CHARACTERISTICS CURVE





▶ PUSHING CHARACTERISTICS (SUPPLY VOLTAGE VARIATION)



▶ PHASE NOISE (7x5 discrete type)

▶ PHASE NOISE (5x3.2 1 chip IC type)





BLOCK DIAGRAM

• Discrete type (7x5, 5x3.2)



• 1 chip IC type (5x3.2, 4x2.5, 3.2x2.5)





• Caution to handle / Storage

1. Storage

Keep products at the room temperature ($20\pm15^{\circ}$ C), normal humidity (below 60% RH), recommend to use products within 6months after manufacturing, and in case of opening the product box, recommend to use products within 24 hours.

2. Static Electricity

While handling, prevent to occur static electricity, and while moving, move products under doing - no static electricity.

3. Reflow Recommend to soldering according to recommended reflow condition.

4. Be cautious of products pin connection