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DATE	2000.9.18
NO.	S-SC0006

Messrs.



SPECIFICATION

PRODUCT NAME: CRYSTAL CLOCK OSCILLATOR

TYPE: CSX-750FB? (?= B,C,F)

FREQUENCY: 2.500 ~ 32.000 MHz

PARTS NO.:

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Oscillator Technical section
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APPROVED	CHECKED	PREPARED
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1. SCOPE

This specification relates to the crystal clock oscillator to be supplied by CITIZEN WATCH CO., LTD. (following as CITIZEN) to .

NOTICE

- 1.If something that is ambiguously defined or undefined in this specification happened, customer and CITIZEN would discuss and take necessary steps by mutual consent.
- 2.Product test data can't be attached to this specification.
- 3.This product is not authorized for use as critical component in life support devices or systems.

2. SPECIFICATION

1. ABSOLUTE MAXIMUM RATING

Parameter	Conditions		Unit
Supply Voltage V_{MAX}		-0.5 ~ +7.0	V
Storage Temperature T_{STG}	See 8.	-55 ~ +125	°C
Output Current I_{OUT}		25	mA
Input Voltage V_{IN_M}		-0.5 ~ $V_{DD} + 0.5$	V
Solder Heat Resistance Of The Outer Lead T_{SOL}	{ MAX.260°C, MAX.10 seconds , 2times } or { MAX.230°C, MAX.3 minutes }		

2. OPERATING RANGE

Parameter	Conditions				Unit
		Min.	Typ.	Max.	
Supply Voltage V_{DD}		3.0	3.3	3.6	V
Temperature T_{OPR}	FBC,FBB	-20		70	°C
	FBF	-40		85	°C
Input Voltage V_{IN}		0		V_{DD}	V
Output Load CL				30	pF

3. FREQUENCY CHARACTERISTICS

Parameter	Conditions		Unit
Frequency f_0	See Section 2.	2.500 ~ 32.000	MHz
Frequency Stability df	See Section 2. FBB:±50 FBC, FBF:±100		ppm

note) Frequency Stability includes initial tolerance, temperature characteristics, voltage characteristics, load characteristics and aging(25°C , first year).

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4. ELECTRICAL CHARACTERISTICS
(V=3.3V Ta = 25°C load=30pF)

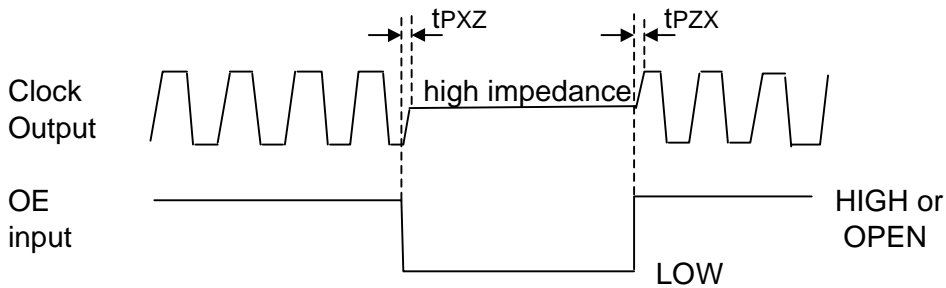
Parameter	Conditions				Unit
		Min.	Typ.	Max.	
Start Up Time t_{osc}				10	ms
Power Supply Current I_{DD}	No Load			15	mA
Disable Current I_{INH}	OE=GND			5	mA
Rise Time t_r	CMOS load : 20%V _{DD} to 80%V _{DD}			8	ns
Fall Time t_f	CMOS load : 80%V _{DD} to 20%V _{DD}			8	ns
Duty Cycle DUTY	CMOS load : 50%V _{DD}	45		55	%
Output HIGH Voltage V_{OH}	I _{OH} = -4mA	2.2			V
Output LOW Voltage V_{OL}	I _{OL} = 4mA			0.4	V
Input HIGH Voltage V_{IH}	OE	2.0			V
Input LOW Voltage V_{IL}	OE			0.4	V
Output Disable Time t_{PXZ}	See 5.			100	ns
Output Enable Time t_{PXZ}	See 5.			100	ns

5. THREE STATE OUTPUT OPERATION

OE Input	Clock Output	Internal quartz oscillator
HIGH or OPEN	Active : enable	Active
LOW	High impedance : disable	Active

Propagation delay time between
 t_{PXZ} : OE(HIGH to LOW) and
OUTPUT(active level
to high impedance)

t_{PXZ} : OE(LOW to HIGH) and
OUTPUT(high impedance
to active level)

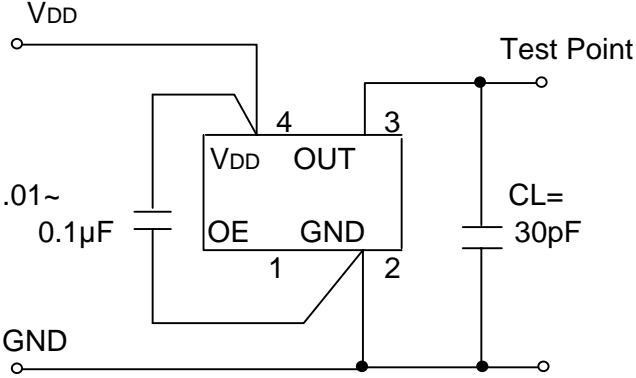


NOTE: The phase of clock output does not synchronize with OE signal edges.

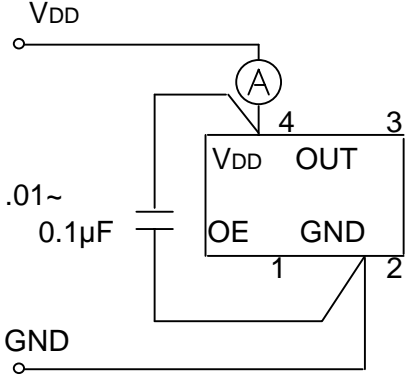
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6. TEST CIRCUIT

[CMOS LOAD] (30pF)



[SUPPLY CURRENT]

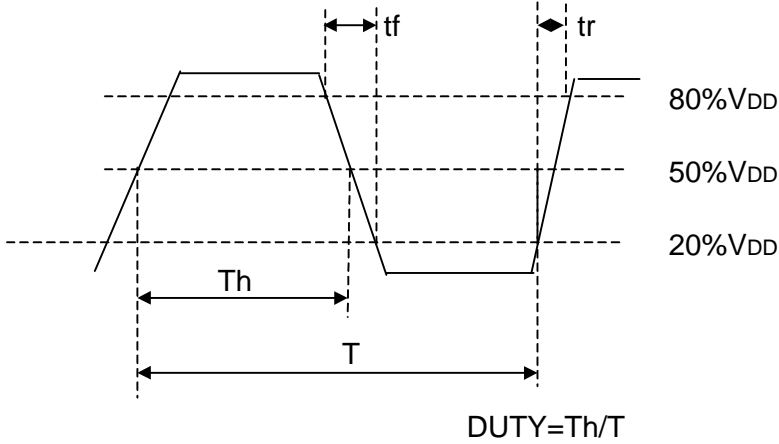


[MEASUREMENT CONDITION]

1. Oscilloscope
 Impedance: No less than 1M ohm
 Capacitance: No more than 5pF
 Band width: No less than 500MHz
 The length of GND lead of the probe should be as short as possible.
2. The CL includes the probe capacitance.
3. Grounding should be single point grounding.
4. Supply impedance should be as low as possible.
 0V to 90%VDD rise time is no less than 150µs
5. Use the ammeter that internal impedance is small.

7. OUTPUT WAVEFORM

[CMOS LOAD] (30pF)



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8. ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS

The following are our reliability test conditions.

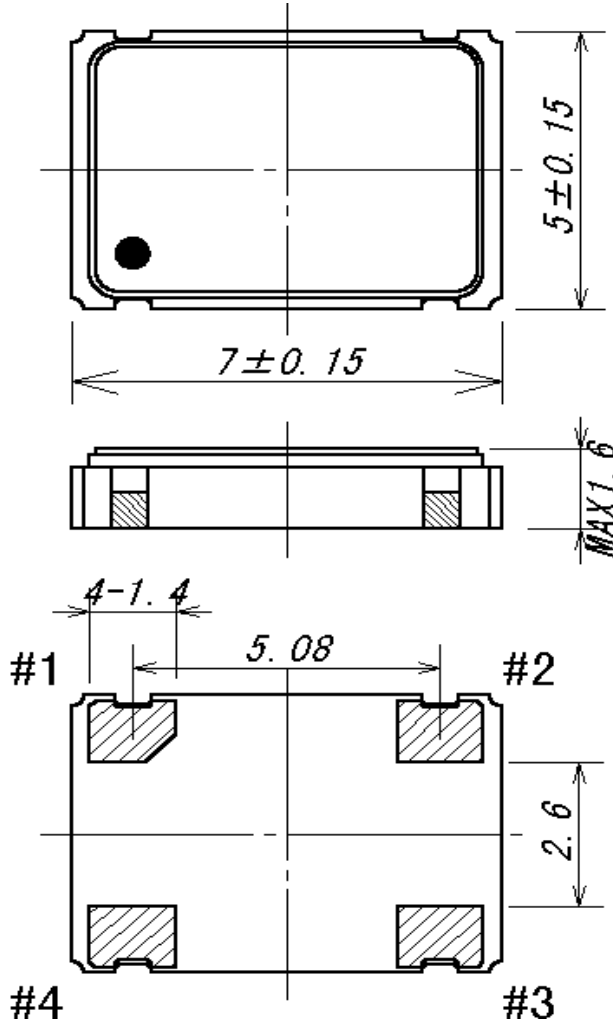
Item	Test Method	Frequency *1 Shift after Test	Electrical
Temperature Cycle	-55 ~ 125°C(NO BIAS) (15min. , 100cycles)	±20 ppm	Electrical Characteristics satisfy the spec.4.
High Temp. Storage	+125°C , NO BIAS , 1000hours	±50 ppm	
Low Temp. Storage	-55°C , NO BIAS , 1000hours	±20 ppm	
Vibration	20Hz ~ 2000Hz, 1.5mm p-p or 196m/s ² 20Hz ~ 2000Hz ~ 20Hz 4 min./cycle 3 direction , 4 cycles for each direction	±10 ppm	
Drop	Free drop from 75cm height on a hard wooden board for 3 times.	±20 ppm	
Resistance to Soldering Heat	Into solder bath +260°C±5°C for 20 sec.	±10 ppm	
Solderability	Dip into solder bath +230°C for 5 sec.	90% of the dipped terminal is soldered.	
Seal	Helium leak detector	1E-9 Pa m ³ /s max.	

Each test is independently examined.

*1 The value of after test is measured after putting in room temperature for 2 ~ 24hours.

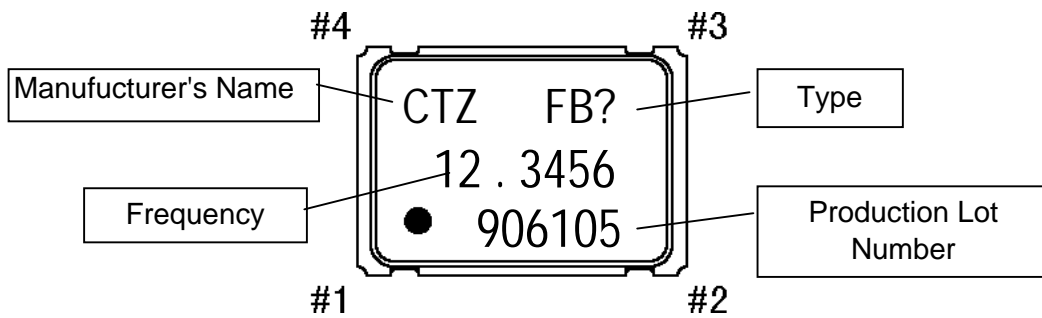
3. DIMENSIONS AND MARKING

[Dimensions] (UNIT mm)



No.	PIN
#1	OE
#2	GND
#3	OUT
#4	VDD

[Marking]



4. TAPE AND REEL PACKAGING

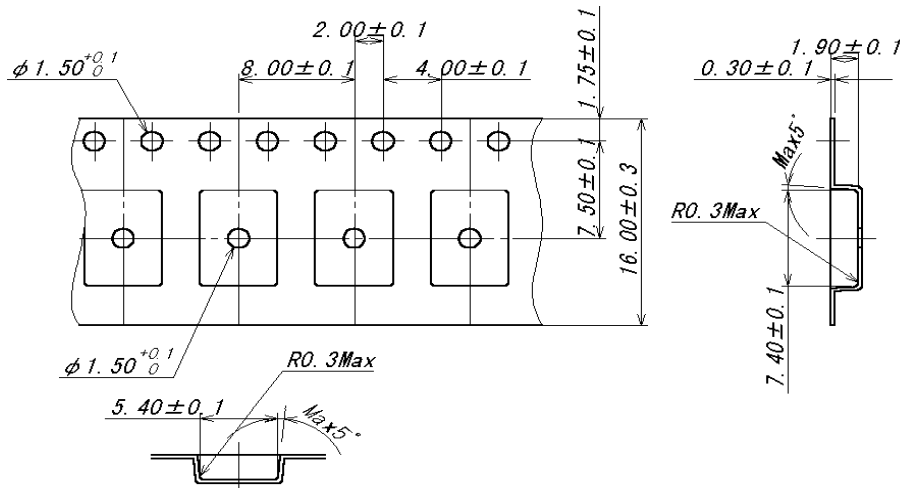
1. TAPING SPECIFICATION

Subject to EIA 481A & JIS C 0806

(1) Tape Dimensions

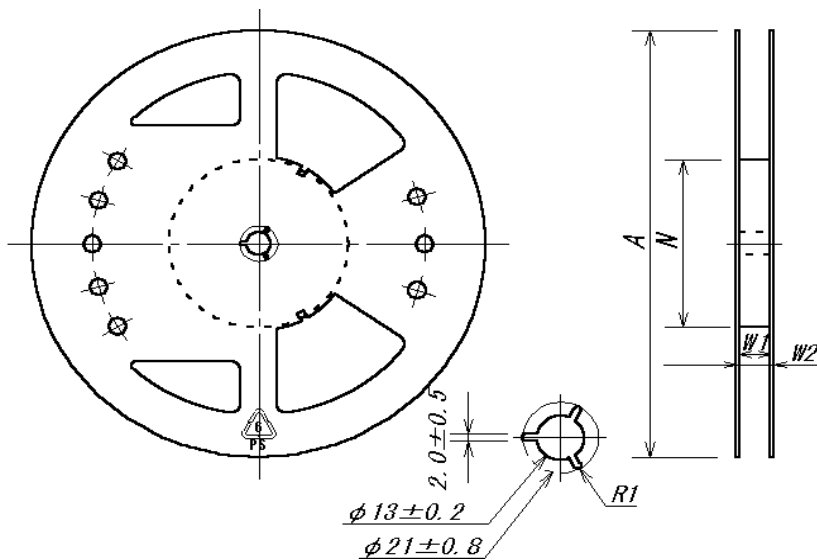
Material of the Carrier Tape : PA-PET conductive coat

Material of the Cover Tape : PE A-PET conductive coat



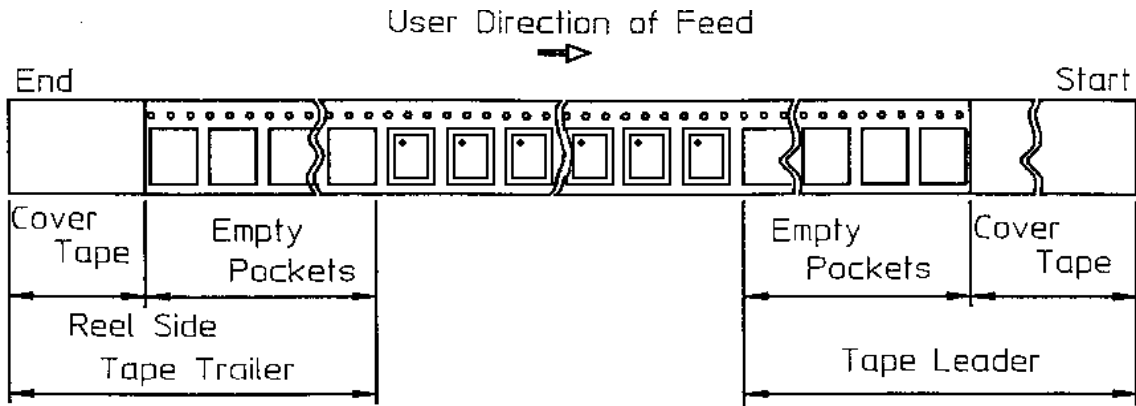
(2) Reel Dimensions

Material of the Reel : PS



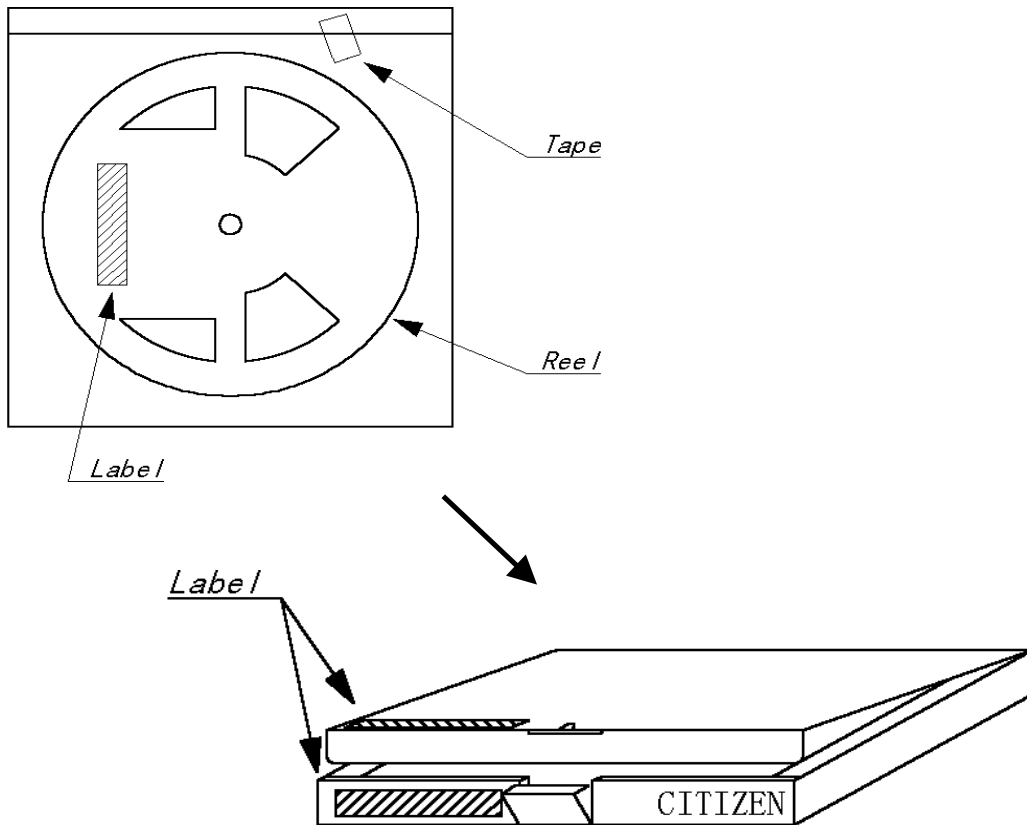
Symbol	A	N	W1	W2
Dimension(mm)	254±2	100±1	17.5±1.0	21.5±1.0

(3) Packing

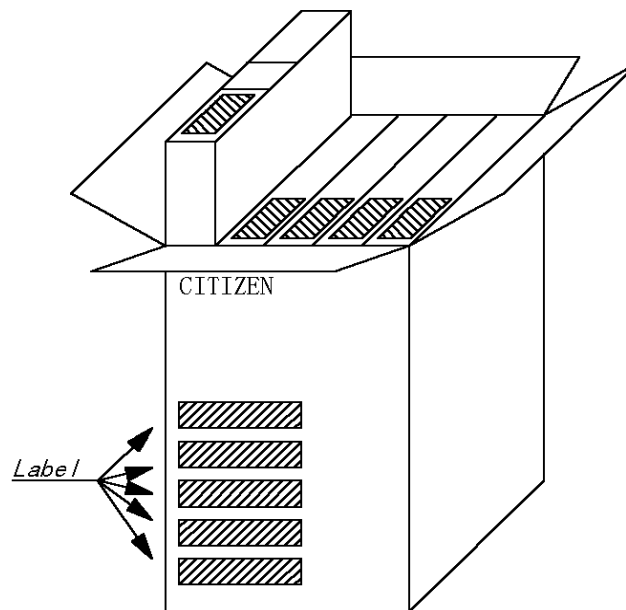


Item		Empty Space
Tape Leader	Cover Tape	Min. 500 mm
	Empty Pockets	Min. 20 Pockets
Tape Trailer	Cover Tape	Min. 0 mm
	Empty Pockets	Min. 40 mm

2. INNER CARTON



3. OUTER CARTON



4. MARKING

(1) Marking Labels are affixed to reel , inner carton and outer carton.

Reel Marking is consist of:

(2) Each label contains the following information.

- * Parts name or type
- * Frequency
- * Quantity
- * Manufacturing Date or symbol
- * Manufacturer's name or symbol
- * Others(if necessary)

5. QUANTITY

2000 pcs/reel

6. STORAGE ENVIRONMENT

- * Storage the reel at normal temperature and humidity
- * Open the packing just before using.
- * Do not expose the sun.
- * Do not storage with some erosive chemicals.
- * Nothing is allowed to put on the reel or carton to prevent mechanical damage.

7. HANDLING

- * Handle with care to prevent the damage of tape, reel and products.

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5. NOTES

1. HANDLING

(ELECTROSTATIC DISCHARGES)

This device is made with CMOS circuitry. Please take precautions to prevent damage due to electrical static discharge.

(SHOCK RELIABILITY)

This device contains a quartz crystal, so please do not give too much shock or vibration. An automatic inserion is available, however, the internal quartz crystal might be damaged in case that too much shock or vibration is given by machine condition. Be sure to check your machine condition in advance.

(CLEANING)

Since, depending on the cleaning conditions, there is a possibility of damage being caused to the Crystal Osillator, do not fail to test and confirm the results beforehand, using your company's cleaning conditions.

(TEMPERATURE AND HUMIDITY)

We recommend to store and use device under normal temperature and humidity. When this device is used in high humidity applications, there is a potential problem with condensation. As with other IC's, please take precautions to prevent condensation.

2. CIRCUIT DESIGNS

(POWER LINES)

We recommend placing a 0.01 ~ 0.1 μ F capacitor between VDD and GND to obtain stable operation and protect against power line ripple . VDD and GND pattern should be as wide as possible.

(OE INPUT LINE)

When OE pin is not used, please connect it to VDD.

(OUTPUT LINE)

As a long output line may cause irregular output, please take care to design that output line is as short as possible, and also keep high level signal source away from this device.