

# Shoulder Electronics Limited

## Approval sheet

SPEC. NO. : Sample

D A T E : 2013-04-02

CUSTOMER	
PRODUCT TYPE	3225 VCTCXO( 3.0V -30/60°C ±1.0ppm 1.0Tmax)
NOMINAL FREQ.	15.600000 MHz
CUSTOMER P/N	N/A
SHOULDER P/N	VU010H15603TVC

[USER]

CHECK	CHECK	APPROVAL
20 . . .	20 . . .	20 . . .
EXPIRATION DATE	20 . . .	

[SHOULDER]

CHECK	CHECK	APPROVAL
20 . . .	20 . . .	20 . . .



# SHOULDER

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## SCOPE

This specification is for SMD VCTCXO(Temperature Compensated Crystal Oscillator)

## APPLICATION STANDARDS

MIL-STD-883.

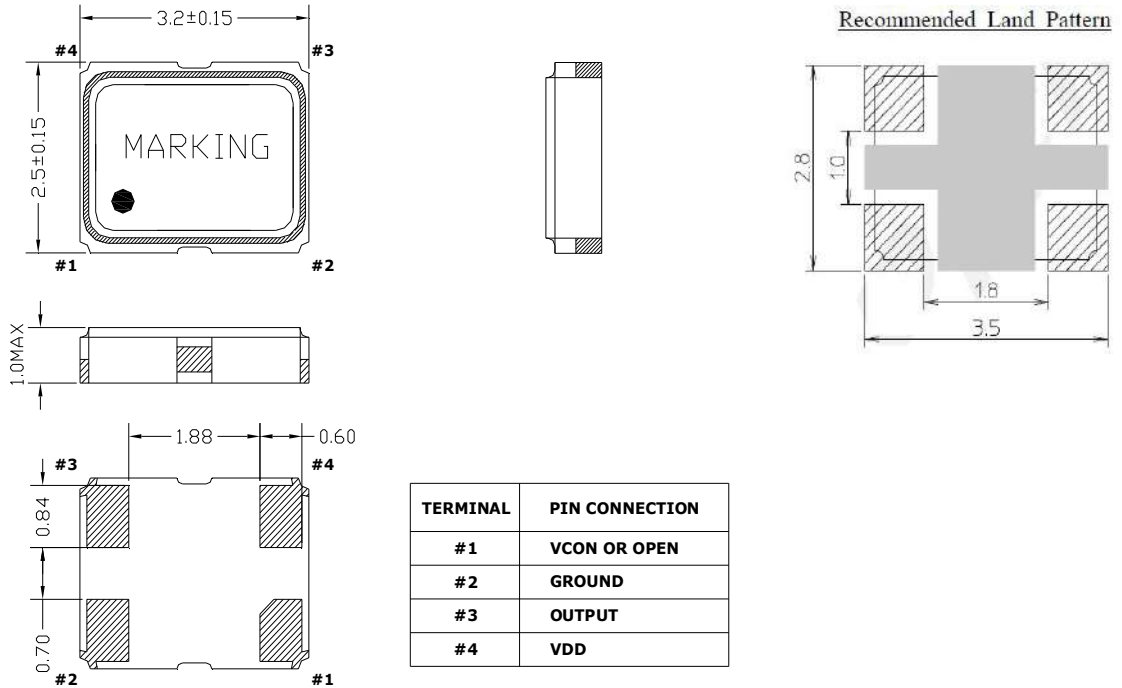
## ELECTRICAL SPECIFICATIONS

Parameters		Electrical Specifications			
		MIN	TYP	MAX	UNITS
Frequency(Fo) ref: 25°C		15.600000			MHz
Frequency Tolerance at 25°C		-1.0		+ 1.0	ppm
Frequency Stability	Vs. Temperature Range	-1.0		+ 1.0	ppm
	Vs. Supply Voltage(±5%)	-0.3		+0.3	ppm
	Vs. Load(±5%)	-0.3		+0.3	ppm
	Vs. Aging(at 25°C)	-1.0		+ 1.0	ppm
Operating Temperature Range		-30		60	°C
Storage Temperature Range		-40		85	°C
Supply Voltage			3.0		VDC
Current Consumption				1.5	mA
Output Voltage Level		0.8			Vp-p
Output Waveform		Clipped Sine			
Output Load		10kΩ//10pF			
Auto-Frequency-Control(AFC) Voltage		0.50	1.5	2.50	V
Auto-Frequency-Control(AFC) Range		±9		±15	ppm
Start-up Time(90% of Vp-p)				3.0	mS
Duty Cycle		40		60	%

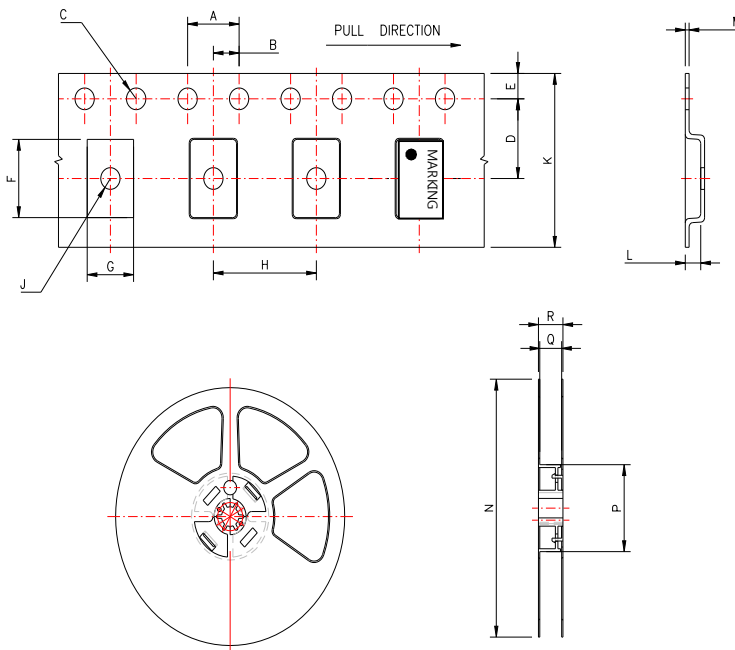
# SHOULDER

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## DIMENSIONS(UNIT: mm)



## PACKING(UNIT: mm)



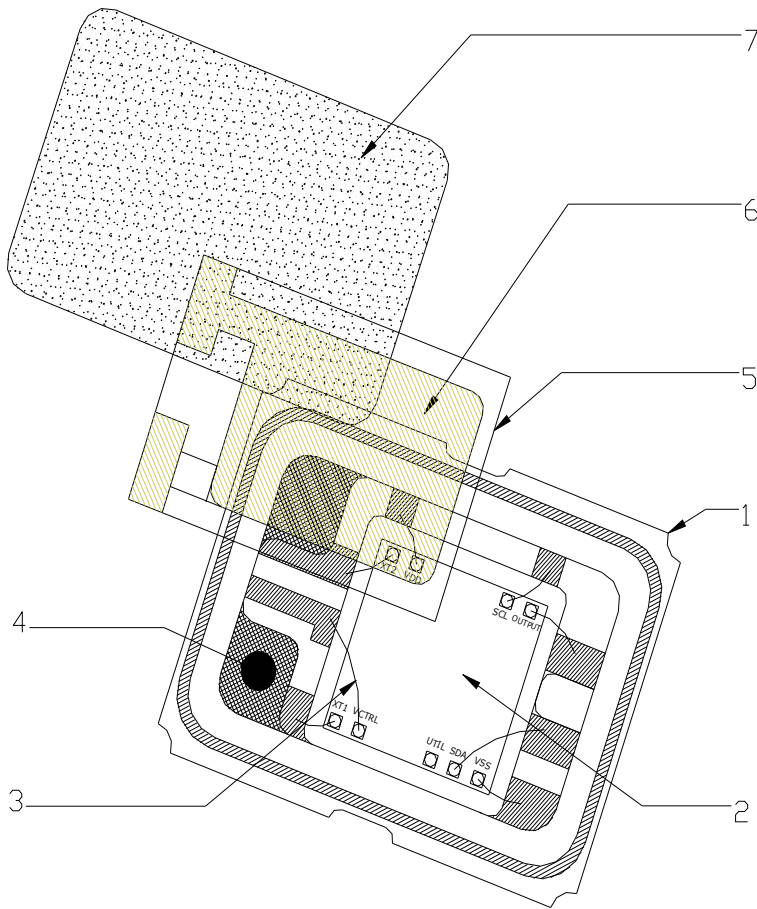
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	Q'TY
SIZE	8.00	2.00	$\phi 1.50$	5.50	1.75	5.35	3.50	8.00	$\phi 1.50$	12.0	1.50	0.29	$\phi 178$	$\phi 60$	13.00	16.00	3000

1. TOP TAPE START 250mm MINIMUM LEADER AND 160mm EMPTY POCKETS
2. END TAPE 250mm MINIMUM EMPTY POCKETS

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## CONSTRUCTION



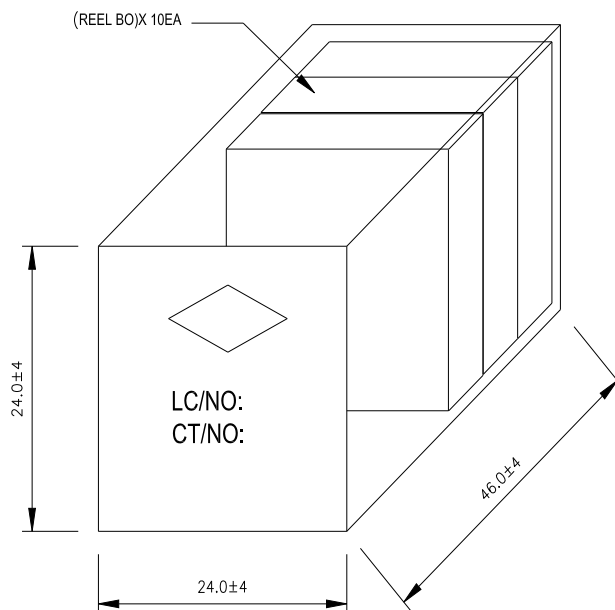
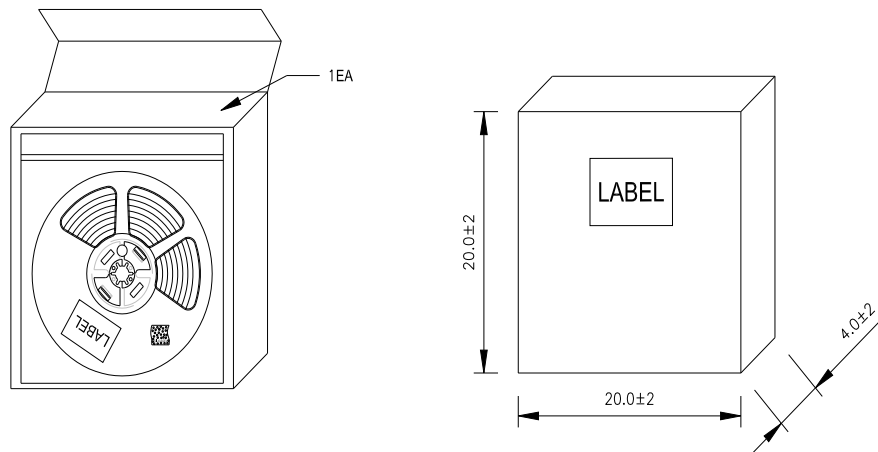
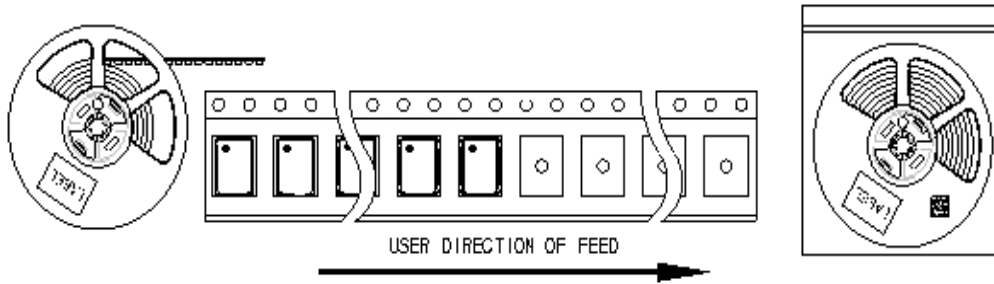
## MATERIAL

NO	NAME	MATERIAL	REMARK
1	PACKAGE	CERAMIC	LEAD FREE
2	IC	SiO <sub>2</sub>	LEAD FREE
3	GOLD WIRE	GOLD(99.999%)	LEAD FREE
4	CONDUCTIVE EPOXY	SILVER	LEAD FREE
5	BLANK	CRYSTAL	LEAD FREE
6	ELECTRODE	GOLD(99.999%)	LEAD FREE
7	LID	KOVAR	LEAD FREE

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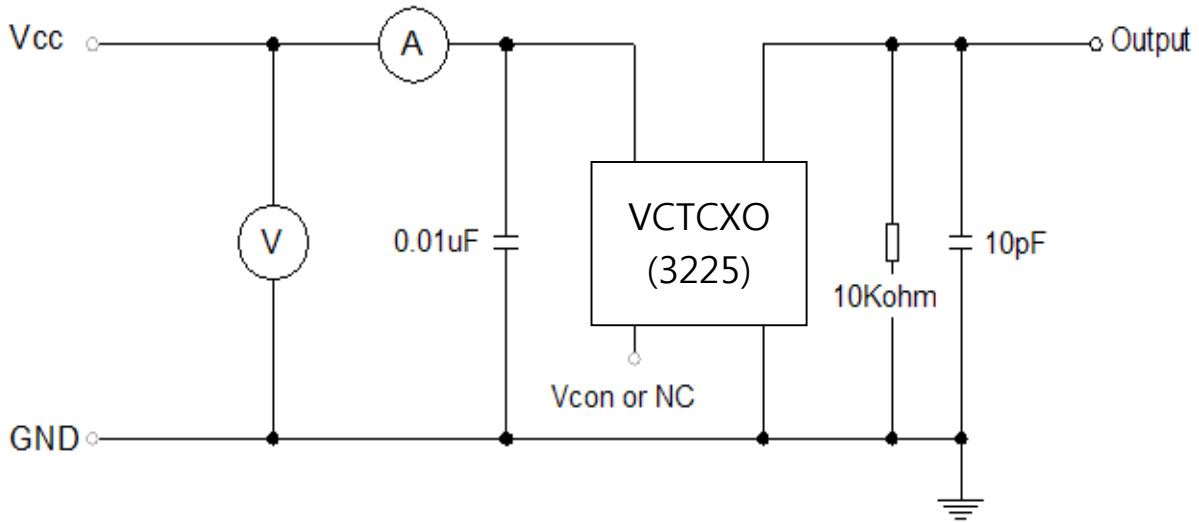
## OUTBOX DIMENSIONS(CM)



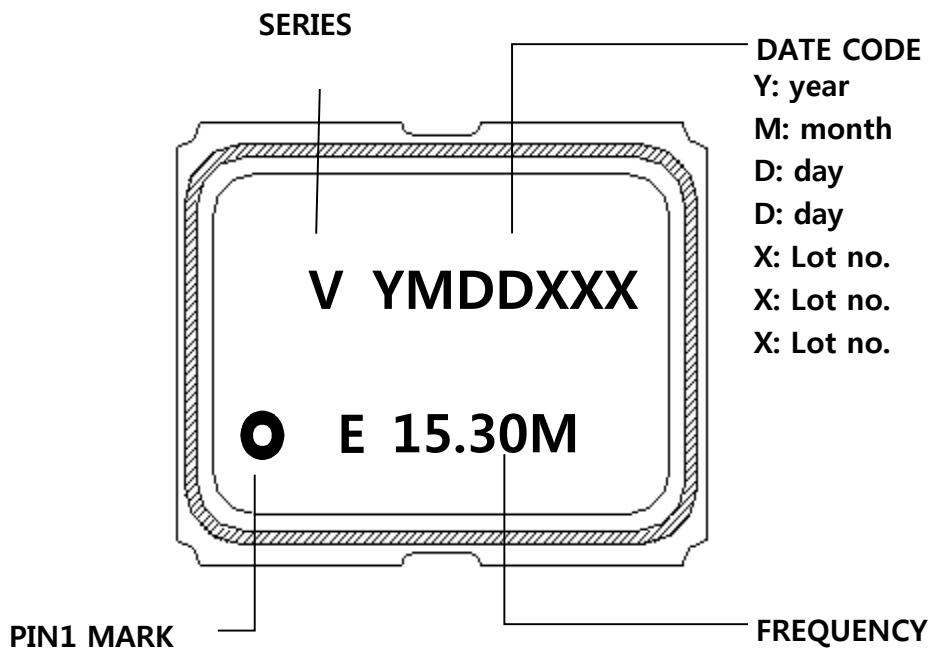
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## TEST DIAGRAM



## MARKING



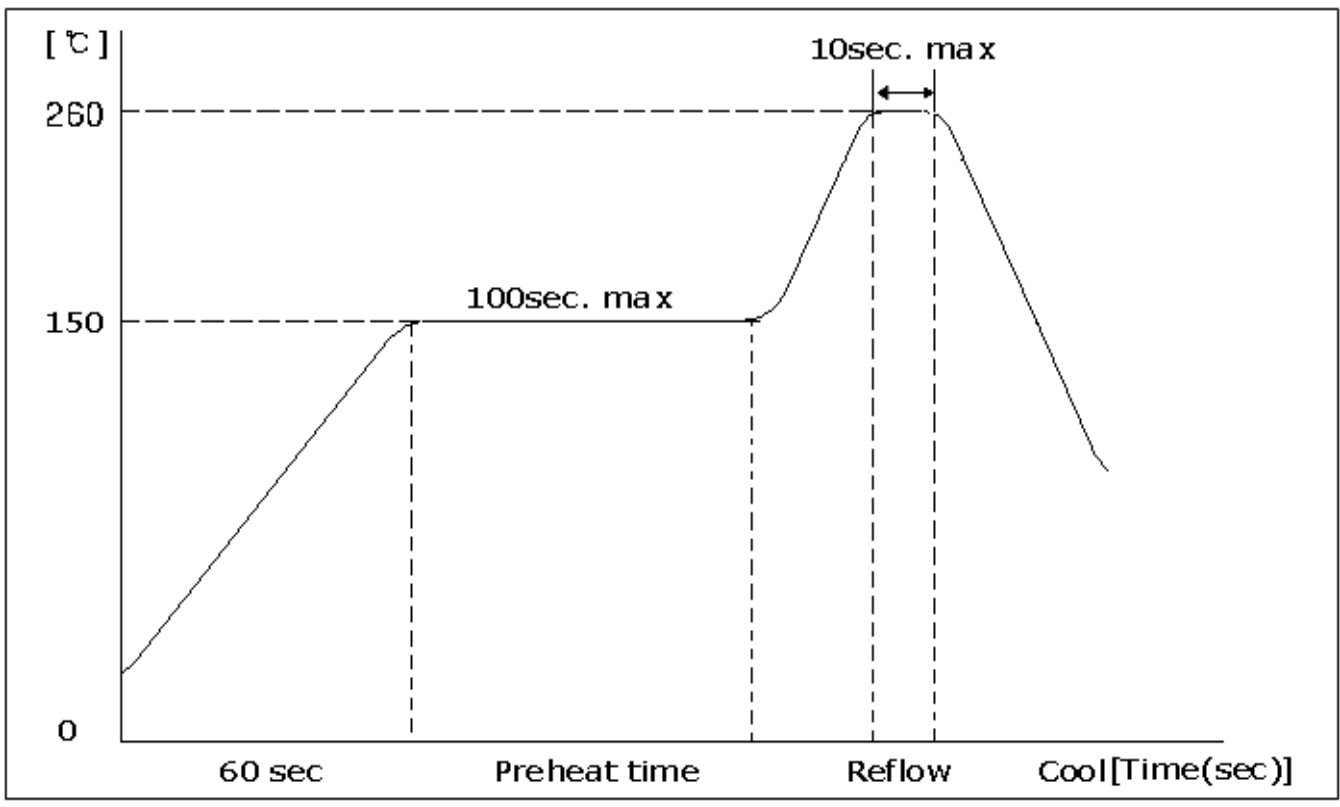
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## RELIABILITY SPECIFICATION

NO	ITEMS	CONDITIONS
1	Solderability	Solder dip at 260°C for 5 seconds
2	Vibration	20 - 2000-20Hz , 1.55mm total amplitude, each directions(X,Y,Z)/3times, 4min
3	Drop	3 times drop onto hard wooden board from 75cm
4	High Temp. High Humidity	+45°C±2°C, RH=90%±5% 96 hours minimum
5	High Tempe. Storage	+100°C±5°C, 100 hours minimum
6	Low Tempe. Storage	-55°C±5°C, 100 hours minimum
7	Thermal Shock	-25°C±5°C, +85°C±5°C, 15 minutes each 10 cycles
8	Aging	+125°C±5°C, 24 hours minimum
9	Reflow	+260°C max, 10sec max

## REFLOW SPECIFICATION





# SHOULDER

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## APPLICATION GUIDELINES

Correct application and strict adherence to the important information listed below, will be ensure optimum performance of the crystal oscillator.

## SHOCK RESISTANCE

SHOULDER's all products are designed to endure physical shocks.

(Drop test consist of three drops onto a hard wooden board from a height of 75cm)

Nevertheless, under some condition, crystal products may be damaged by drops or Shocks during mounting.

It is important, therefore, to run mounting machines as smoothly as possible to

Prevent under shocks. Please review conditions prior to using a mounting machine.

## VIBRATION RESISTANCE

Mechanical vibration of a piezo buzzer could cause frequency and amplitude

Change to the output frequency. It is advisable to use cushion or cutting PCB, if

You mount on same PCB.

## SOLDERING CONDITION

Please keep the conditions of "Reflow diagram"

## STORAGE

We recommend storing products at +15°C to +35°C and 25% R.H to 75% R.H

## RoHS

SHOULDER's all products are complies with all relevant international regulations concerning he ~~substance~~ environmental impacts.

# SHOULDER

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## PART NUMBERING GUID

V	C	0	2	0	K	1	9	2	0	3	T	V	0	0	0
①	②	③	④					⑤		⑥	⑦	⑧	⑨		⑩

### ① SERIES

<b>T</b>	CERAMIC SMD TCXO	<b>C</b>	CERAMIC SMD CRYSTAL
<b>V</b>	CERAMIC SMD VCTCXO	<b>H</b>	HR TYPE
<b>X</b>	CERAMIC SMD OSCILLATOR		

### ② TEMPERATURE

<b>A</b>	0 ~ 70°C	<b>D</b>	-30 ~ 80°C	<b>G</b>		<b>J</b>	
<b>B</b>	-10 ~ 60°C	<b>E</b>	-30 ~ 85°C	<b>H</b>		<b>K</b>	
<b>C</b>	-20 ~ 70°C	<b>F</b>	-40 ~ 85°C	<b>I</b>		<b>U</b>	User spec.

### ③ FREQUENCY STABILITY

<b>000</b>	±100ppm	<b>200</b>	±20ppm	<b>100</b>	±10ppm	<b>025</b>	±2.5ppm
<b>500</b>	±50ppm	<b>150</b>	±15ppm	<b>050</b>	±5.0ppm	<b>020</b>	±2.0ppm
<b>250</b>	±25ppm	<b>120</b>	±12ppm	<b>030</b>	±3.0ppm	<b>015</b>	±1.5ppm

### ④ SUPPLY VOLTAGE

<b>F</b>	5.0V	<b>I</b>	2.9V	<b>L</b>	2.6V	<b>X</b>	CRYSTAL
<b>G</b>	3.3V	<b>J</b>	2.8V	<b>M</b>	2.4V		
<b>H</b>	3.0V	<b>K</b>	2.7V	<b>N</b>	1.8V		

### ⑤ FREQUENCY

<b>1300</b>	13.000MHz	<b>1968</b>	19.680MHz	<b>2284</b>	22.848MHz		
<b>1920</b>	19.200MHz	<b>1980</b>	19.800MHz	<b>2600</b>	26.000MHz		

### ⑥ SIZE

<b>9</b>	49/S SIZE	<b>7</b>	7050SIZE	<b>5</b>	5032SIZE	<b>3</b>	3225SIZE
<b>2</b>	2520SIZE						

### ⑦ PACKING

<b>T</b>	TAPE & REEL	<b>B</b>	BULK
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### ⑧ PIN CONTROL

<b>E</b>	TRI-STATE	<b>J</b>	20pF(xtal)	<b>P</b>	12pF(xtal)	<b>U</b>	8pF(xtal)
<b>O</b>	OPEN	<b>K</b>	18pF(xtal)	<b>Q</b>	10.6pF(xtal)	<b>W</b>	6.6pF(xtal)
<b>V</b>	Vcont	<b>L</b>	15pF(xtal)	<b>R</b>	10pF(xtal)	<b>Y</b>	6pF(xtal)
<b>X</b>	SERIES(xtal)	<b>M</b>	16pF(xtal)	<b>S</b>	9pF(xtal)	<b>Z</b>	Other
<b>I</b>	24pF(xtal)	<b>N</b>	14pF(xtal)	<b>T</b>	8.5pF(xtal)		

### ⑨ OUTPUT WAVEFORM

<b>Clipped Sine</b>	C	<b>HCMOS</b>	H	<b>TTL</b>	T	<b>OTHER</b>	0
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### ⑩ OPTION