SPECIFICATION FOR CRYSTAL OSCILLATOR

KYUSHU DENTSU Co.,Ltd.

◎	Parts Number	
◎	TEW Ordering Number	120-18658
◎	TEW Package Code	TTS18NSH
◎	Center Frequency	26.000000 MHz
◎	Application	GPS
◎	RoHS compliant	Applied
◎	Packing form	Tape and Reel
◎	Other	No attached test data

CUSTOMER SIGNATURE DATE

(1)Tokyo Denpa Co., Ltd. requires one copy returned with signature and title of authorized individual that signifies acceptance of the attached specifications.

(2)Any orders received and accepted by Tokyo Denpa Co., Ltd. prior to return of signed copy of specification will be produced per these specifications.

(3)Any changes to these specifications must be agreed upon in writing prior to acceptance by Tokyo Denpa Co., Ltd. for any orders.

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This specification is applied for the TCXO. MOUNTING TYPE S.M.D (for IR Reflow)

1. Absolute maximum value

	Parameter	Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
1	Supply Voltage	Vcc	-0.6	---	+6.0	V	
2	Storage Temperature Range	T_{STG}	-40	---	+85	℃	

2. Operating range

	Parameter	Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
1	Supply Voltage	Vcc	+2.65	+2.85	+3.05	V	DC+2.85V±0.2V
2	Operating temperature range	$T_{_use}$	-30	---	+85	℃	
3	Load impedance	Load_R	9	10	11	kΩ	
	Load capacitance	Load_C	9	10	11	pF	

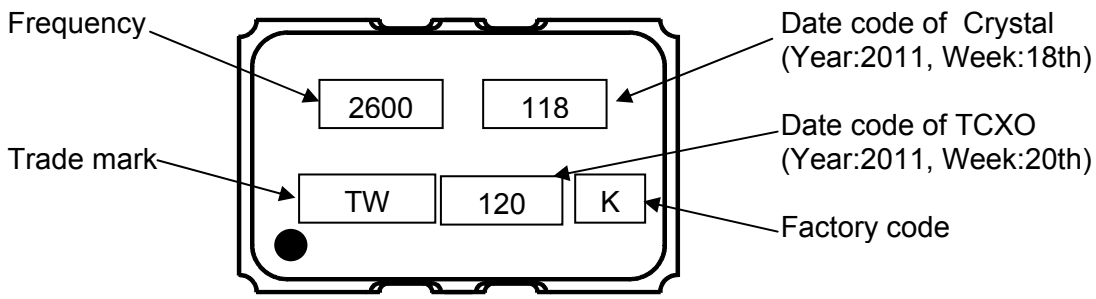
3. Electrical specification

	Parameter	Test Condition	Value			Unit	Note
			Min.	Typ.	Max.		
1	Current Consumption		---	---	1.5	mA	
2	Output Level	Load R//C = 10kΩ//10pF	0.3	---	1.2	Vp-p	1
3	Frequency Stability						
	1. Frequency Tolerance	25± 2℃	---	---	±0.5	ppm	2
	2. Frequency - Temperature	$T_{_use}$ = -30℃ to +85℃ (referred to the value 25±2℃)	---	---	±0.5	ppm	3
	3. Frequency - Voltage Coefficient	Vcc=+2.85V-0.2V/+0.2V	---	---	±0.1	ppm	
	4. Frequency - Load Coefficient	Load = (10kΩ//10pF)± 10%	---	---	±0.1	ppm	
	5. Frequency - Aging	1 year, (25± 2℃)	---	---	±1.0	ppm/year	
	6. Frequency - After Reflow-soldering	2 times	---	---	±1.0	ppm	4
4	Start up time	@ for 90% Vp-p min.	---	---	1.5	ms	
		@within ±0.5× 10^{-6} of final frq.	---	---	2.0	ms	
5	Frequency Slope	over-20℃～+70℃	---	---	±0.1	ppm/℃	5
		over-30℃～-20℃	---	---	±0.2	ppm/℃	
		over+70℃～+85℃	---	---	±0.2	ppm/℃	
6	Phase Noise (at 25±2℃)	Offset 0.1Hz	---	---	-20	dBc/Hz	
		Offset 1Hz	---	---	-50	dBc/Hz	
		Offset 10Hz	---	---	-75	dBc/Hz	
		Offset 100Hz	---	---	-90	dBc/Hz	
		Offset 1kHz	---	---	-100	dBc/Hz	
		Offset 10kHz	---	---	-105	dBc/Hz	

Note

1 Output Wave : Clipped Sine wave（DC coupling)
DC-cut capacitor of output is not put in TCXO.
Please add DC-cut capacitor(1,000pF) in oscillators output line.
2 Reference : Nominal Frequency
3 Reference : Frequency
4 Reference : 7.Reflow-Soldering Profile(Please refer to 5/8 page)
5 1 frequency reading every 2℃ step

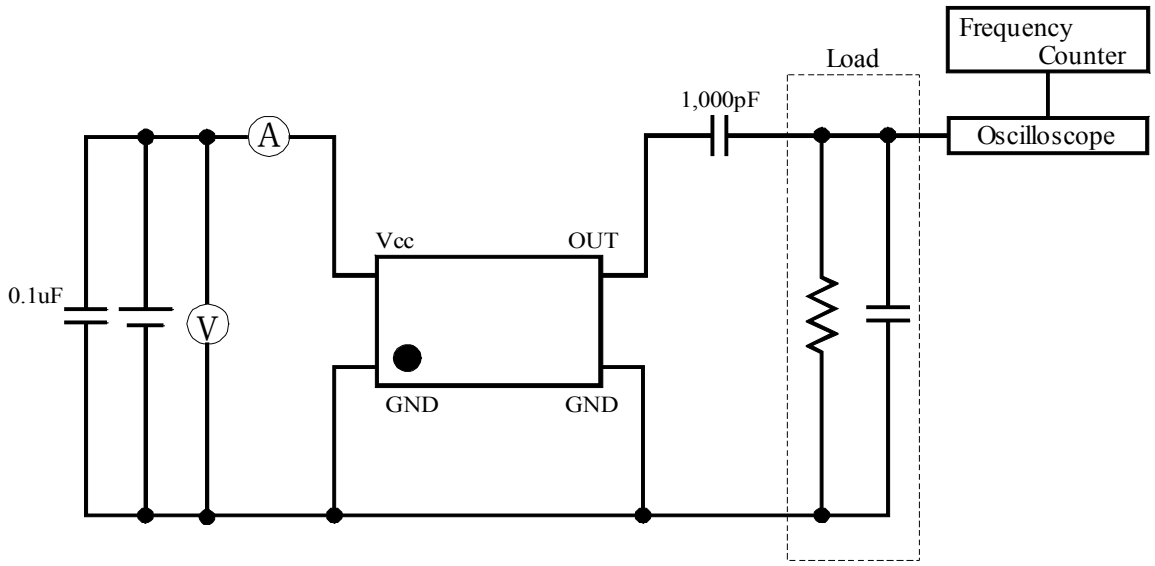
4. Marking （Product marking）



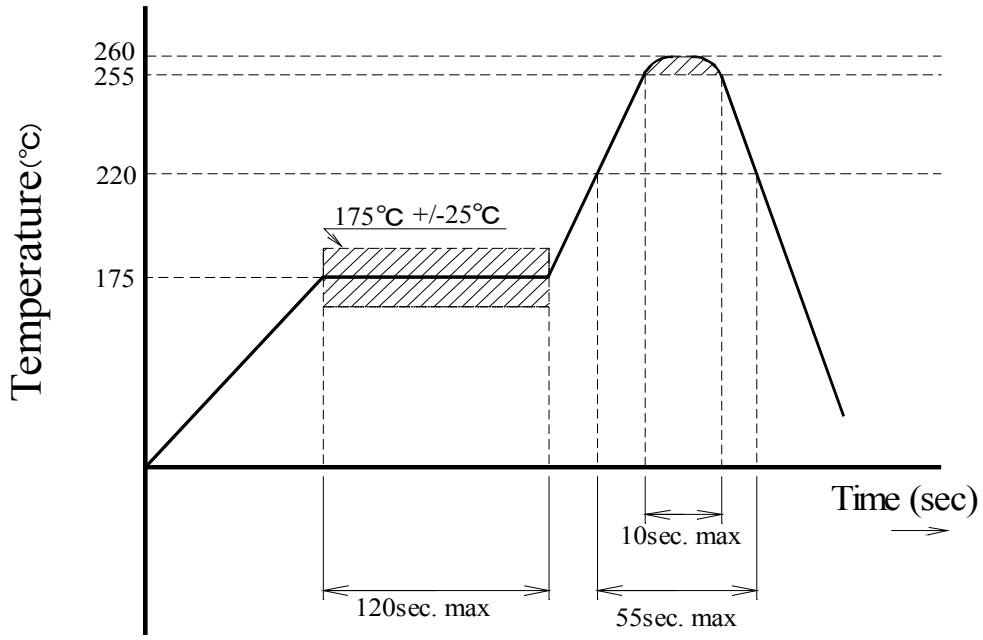
Factory code：1 character
H:Head office, Z:KITAMI factory,S:MORIOKA factory, K:KUJI factory

5.Requirement of detaching TCXO from circuit board.
When detaching TCXO from circuit board, the heat has to be reached equally on each terminal pad, and strong shock must not be added on TCXO.

6. Frequency measurement circuit

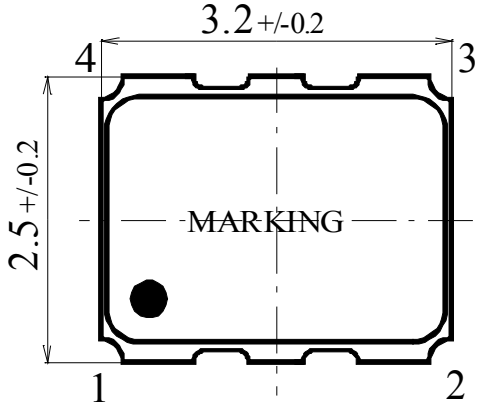


7.Reflow-soldering profile



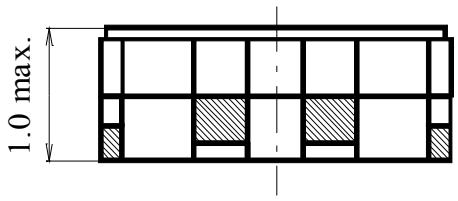
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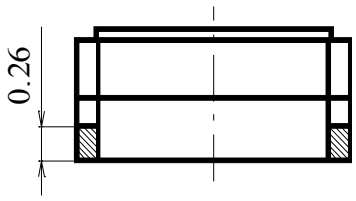
8.Dimensions



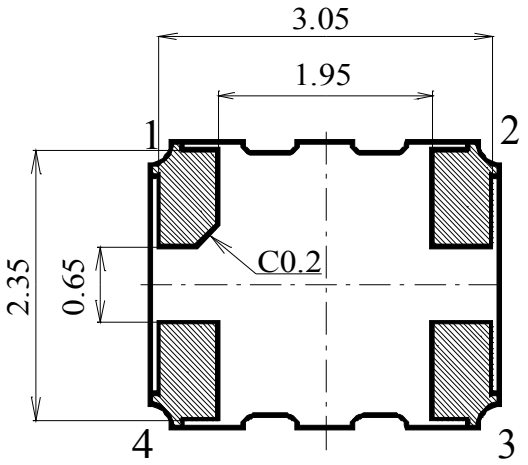
Pin Connections

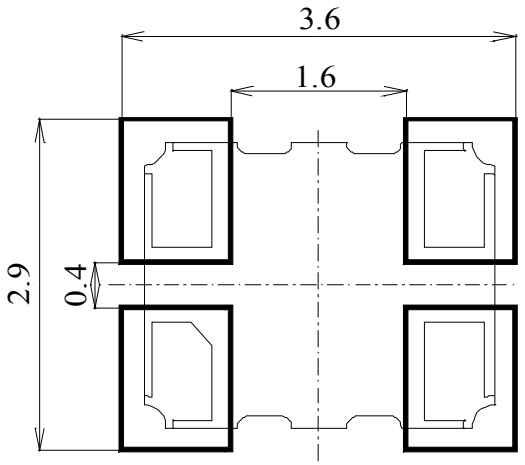
1. GND
2. GND
3. OUTPUT
4. Vcc





Recommended land pattern (Top View)



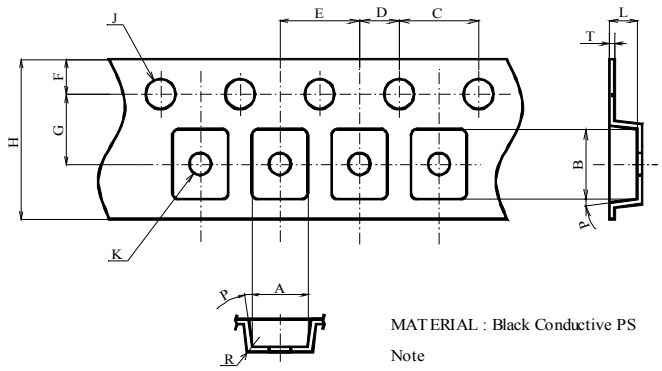


unit : mm

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9.Tape & Reel specifications

9.1 Embossed Tape



MATERIAL : Black Conductive PS

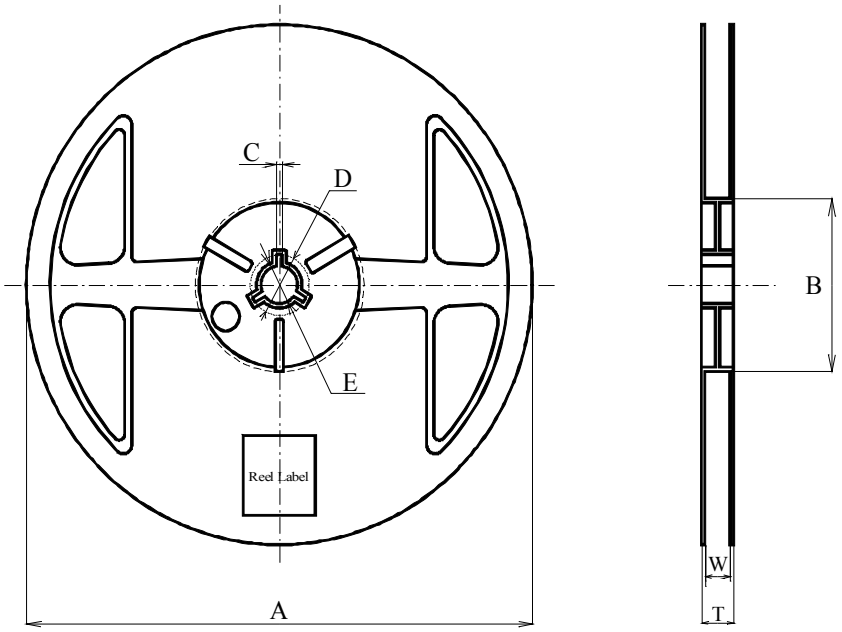
Note

1) Cumulative tolerance of 10 pitches of the sprocket hole is +/-0.2mm

Symbol	A	B	C	D	E	F	G
Dimension	2.8+/-0.1	3.5+/-0.1	4.0+/-0.1	2.0+/-0.05	4.0+/-0.1	1.75+/-0.1	3.5+/-0.05
Symbol	H	J	K	L	P	T	R
Dimension	8.0+/-0.3	Φ 1.5+0.1/-0	Φ 1.1+/-0.1	1.4+/-0.1	3° max	0.25+/-0.05	R0.3 max

unit : mm

9.2 Reel

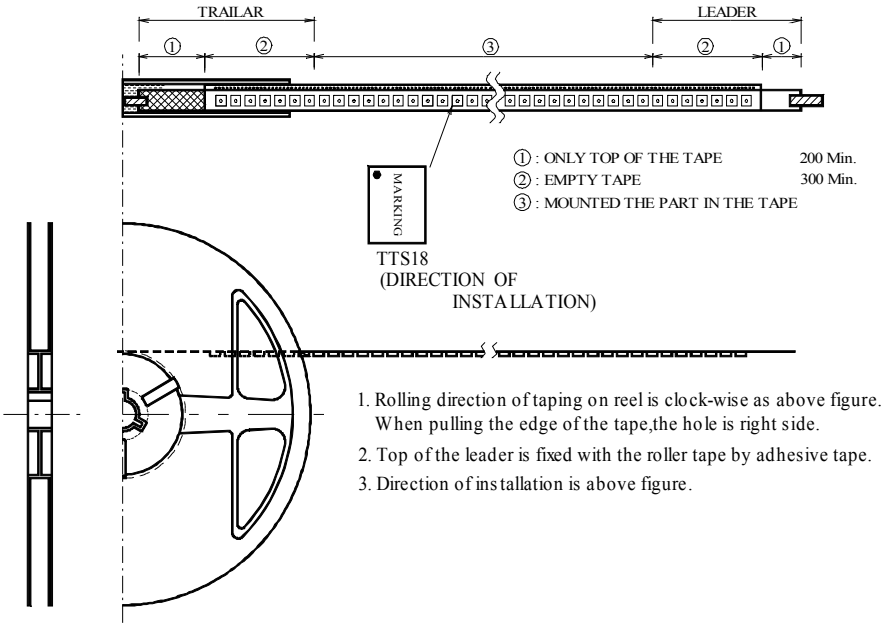


Symbol	A	B	C	D	E	W	T
Dimension	Φ 180 +0/-3	Φ 60 +1/-0	2.0+/-0.5	Φ 21.0+/-0.8	Φ 13 +/-0.2	9.0+/-0.3	11.4+/-1.0

unit : mm

SPECIFICATION FOR CRYSTAL OSCILLATOR

9.3 Taping Specification



1. Rolling direction of taping on reel is clock-wise as above figure. When pulling the edge of the tape,the hole is right side.
2. Top of the leader is fixed with the roller tape by adhesive tape.
3. Direction of installation is above figure.

9.4 Reel Label
(2D bar code Label)

CUSTOMER	OOOOOOO←①
PART No.	OOOOOOO←②
SPEC No.	OOOOOOO←③
TYPE	OOOOOOO←④
FREQ.	OOOOOOO←⑤
QTY	O,OOOpcs ←⑥
LOT No.	OOOOOOO←⑦
CONTROL No.	OOOOOOO←⑧
REMARKS	OOOOOOO←⑨

RoHS compliant

TOKYO DENPA

MADE IN JAPAN

	Description	Example
①	Customer Name	****
②	Customer part number	---
③	Specification	120-18658
④	Type	TTS18NSH
⑤	Frequency	26.000000MHz
⑥	Quantity	*,***pcs
⑦	Lot number	****
⑧	Customer number	***-****
⑨	Remarks	---

3,000pcs Max./1Reel