EPSON TOYOCOM

EPSON TAIWAN TECHNOLOGY & TRADING LTD.
(ETT)

REF. NO.
C-070802

APPROVAL SHEET

PROPOSAL DATE
2007/8/2

TCXO SPECIFICATION

CUSTOMER MediaTek Inc.

PREPARED BY
Sheng Weng

Model (Specification No.)	FREQUENCY / DESCRIPTION	CMR PART'S NO.
TG-5005CE-21G (TN4-22107	16.368Mhz	

YOUR SIGNATURE

DEPT.	NAME	APPROVAL DATE
R&D		
BUYER		

REMARK

1. 規格書之內容若有與封面不合者; 請參照封面; 以封面爲準.

2. 若是承蒙貴公司之承認; 請在此份封面簽名後; 傳真回敝公司即可. 謝謝.

TEL: 02-87866688
FAX: 02-87866660

登録 REGIST.		Supply Specification		名称 TITLE	仕番 SPEC NO.
版	年月日 DATE			CRYSTAL OSCILLATOR	TN4-22107
1	'07.07.30	作成部門 SECTION 49836	作成年月日 DATE '07.07.30		頁 P. 1 / 11

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SPECIFICATION

1. MODEL TG-5005CE-21G

※ This product is compliant with RoHS directive

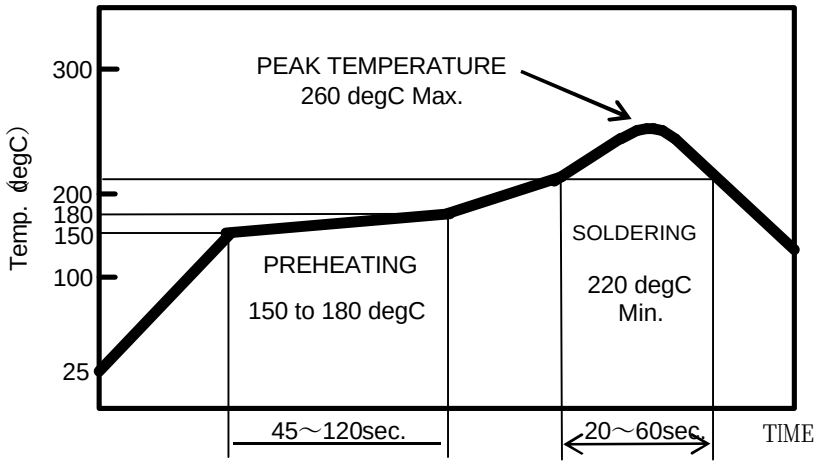
2. ELECTRICAL SPECIFICATIONS

2.1. Output frequency		16.368MHz
2.2	Supply voltage	DC +2.65V to +3.05V (+2.85V center)
2.3	Current drain	1.5mA max.
2.4	Output level	0.3Vp-p to 1.2Vp-p / Clipped sinewave (DC-coupled)
2.5	Load	10kΩ // 10pF ± 10% each
2.6	Operating temperature range	-30℃ ～ +85℃
2.7	Storage temperature range	-40℃ ～ +85℃
2.8	Frequency stability	
2.8.1	vs. Temperature	±0.5ppm max. / -30℃ to +85℃ (Referenced to +25℃)
2.8.2	vs. Supply voltage	±0.1ppm max. / DC +2.65V to +3.05V (+2.85V center)
2.8.3	vs. Load	±0.1ppm max. / 10kΩ//10pF ±10% each
2.8.4	vs. Aging	±1.0ppm max. / year
2.9	Frequency slope vs. Temp.	±0.1ppm/℃ max./ -20℃ to +70℃ ±0.2ppm/℃ max./ -30℃ to -20℃, +70℃ to +85℃
2.10	Preset frequency	±0.5 ppm max. / +25℃±2℃ before re-flow soldering
2.11	Reflow frequency drift	±1.0ppm max. / 1hour after two reflow cycle
2.12	Start-up time	2.0ms max. / within ±0.5ppm of final frequency 1.5ms max. / to 90% of final amplitude
2.13	SSB Phase Noise	-23dBc/Hz max. @0.1Hz offset -53dBc/Hz max. @1Hz offset -78dBc/Hz max. @10Hz offset -93dBc/Hz max. @100Hz offset -103dBc/Hz max. @1KHz offset -108dBc/Hz max. @10KHz offset
2.14	Drift rate	±20ppb max. / -30℃ to +85℃ constant temperature
2.15	G sensitivity	3.0ppb/g max. / Vibration frequency : 500Hz max.

承認 APP.	照査 CHK'D	照査 CHK'D	作成 DRAW
S.KUROGO	H.HIRANO	H.KANNO	N.YOSHIDA

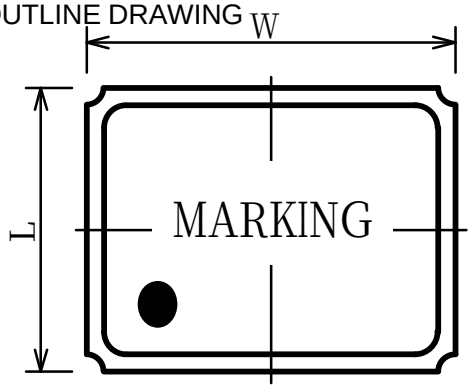
改版記事 DESCRIPTION

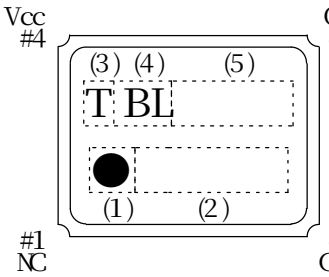
3. REFLOW SOLDERING PROFILE



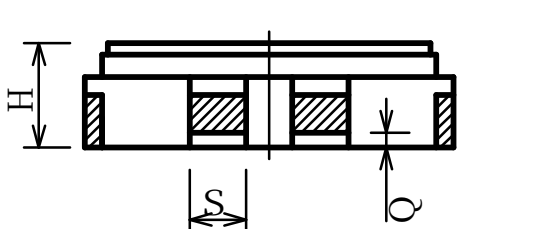
SOLDER TEMPERATURE PROFILE

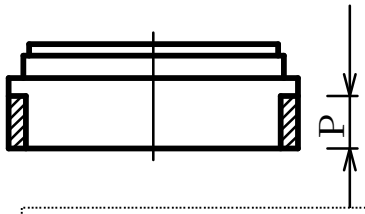
4.OUTLINE DRAWING

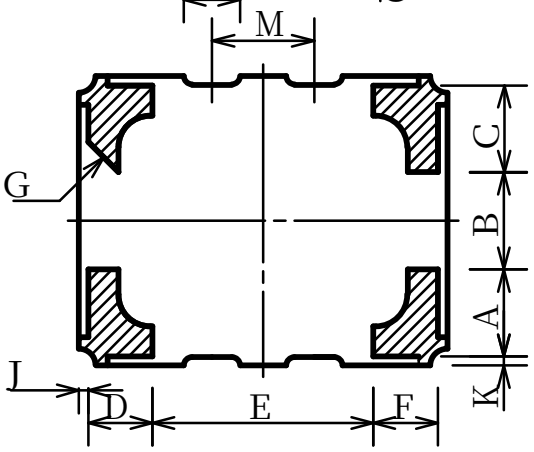




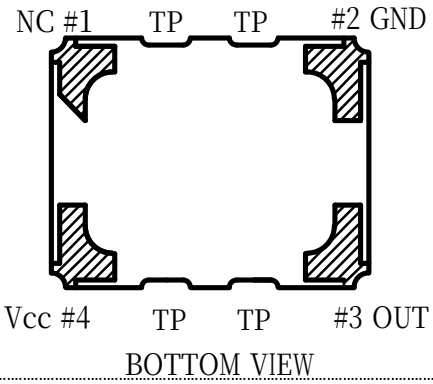
(1) 1Pin Mark
(2) Arbitrary marking area
(3) T(TOYOCOM) Mark
(4) TCXO Model ID「BL」
(5) TCXO Lot No.
(4 figure)







CONNECTION



BOTTOM VIEW

(unit : mm)

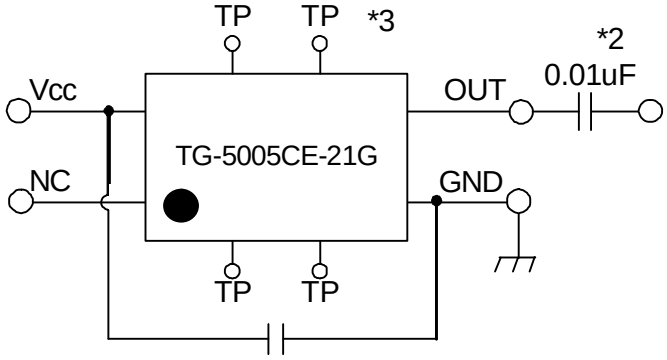
DIM.	MIN.	TYP.	MAX.	DIM.	MIN.	TYP.	MAX.
W	3.00	3.20	3.40	F	—	0.57	—
L	2.30	2.50	2.70	G	—	C 0.27	—
H	0.80	0.90	1.00	J	—	0.08	—
A	—	0.765	—	K	—	0.08	—
B	0.76	0.86	0.96	M	0.80	0.90	1.00
C	—	0.765	—	P	0.41	0.46	0.51
D	—	0.57	—	Q	—	0.13	—
E	1.85	1.95	2.05	S	0.40	0.50	0.60

Material
Base : Ceramics
Terminal : W-Ni-Au
Lid : Fe-Ni-Co

承認 APP.	照査 CHK'D	照査 CHK'D	作成 DRAW
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改版記事 DESCRIPTION

5.CONNECTION



Cby : 0.01u F *1

Cby: bypass capacitor

*1 Please connect capacitor (recommendation:0.01 μF) between “Vcc” and “GND” terminal.

*2 Please connect capacitor (recommendation:0.01 μF) between “OUT” terminal and load.

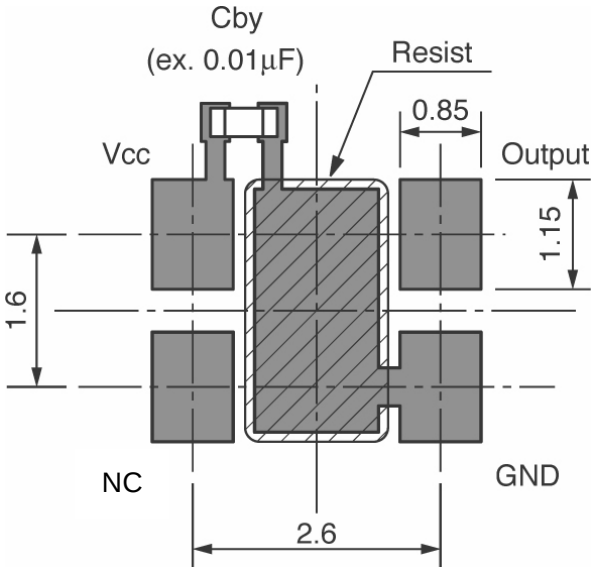
*3 Do not connect ”TP” terminal.

*4 This product has one chip LSI. Do not supply over +6V or negative voltage under -0.3V to ”Vcc” terminal. Do not supply over Vcc+0.3V or negative voltage under -0.3V to ”NC” terminal. Do not supply any voltages to ”OUT” terminal.

*5 Do not supply any voltages in any way which differs from the above connection figure.

6. RECOMMENDATION FOOT PATTERN

< TOP VIEW >



※ Please connect Cby(bypass capacitor) quite near by ”Vcc” terminal.

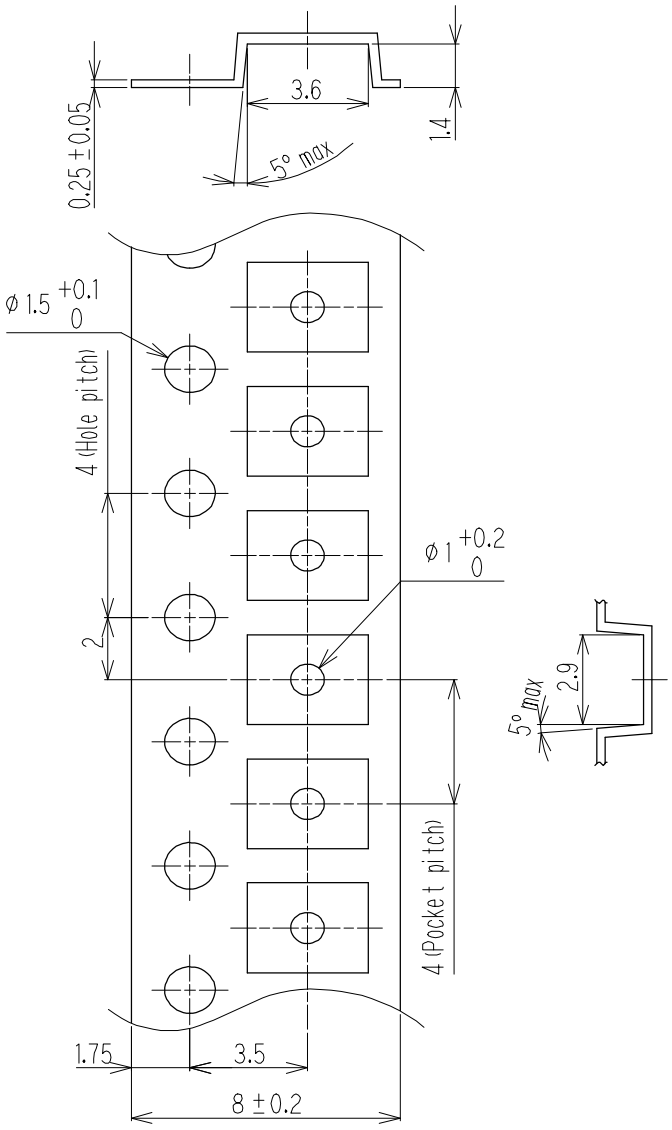
※ It is desirable to draw GND pattern under TCXO.

承認 APP.	照査 CHK'D	照査 CHK'D	作成 DRAW
S.KUROGO	H.HIRANO	H.KANNO	N.YOSHIDA

改版記事 DESCRIPTION

7.TAPE & REEL PACKAGING SPECIFICATION

7.1.Embossed tape dimension & Outline drawings



[Size in mm]

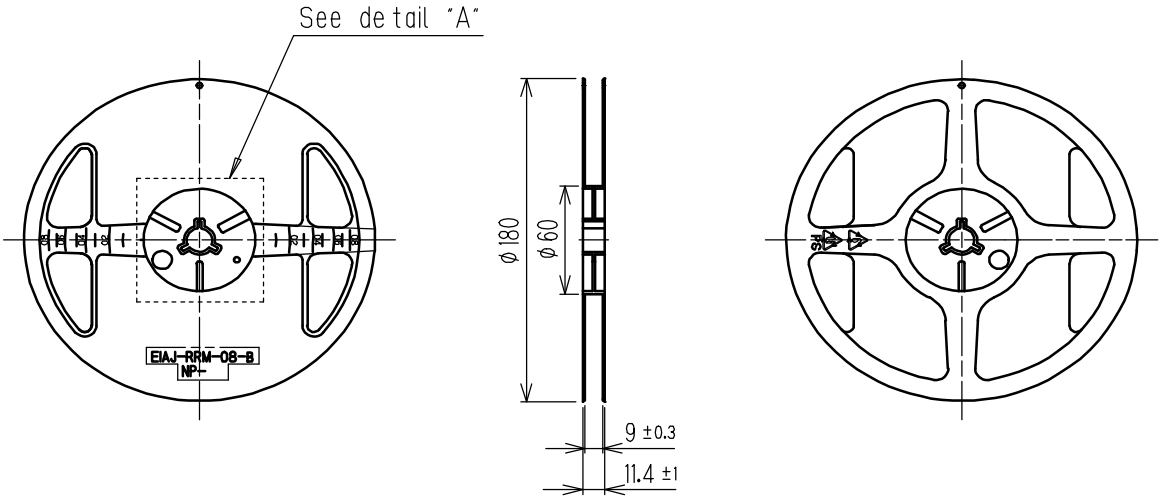
※ The radius of each corner is 0.3mm max.

※ 10 feeding hole pitches cumulative tolerance on tape is ±0.2mm max.

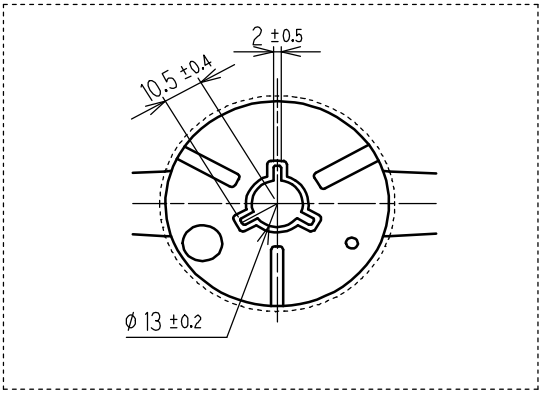
※ The material is polystyrene.

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7.2.Reel dimension & Outline drawing



Detail "A"



Material

PS(REEL)

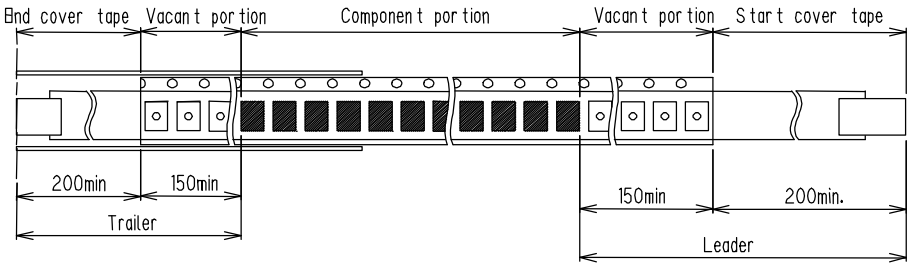
[Size in mm]

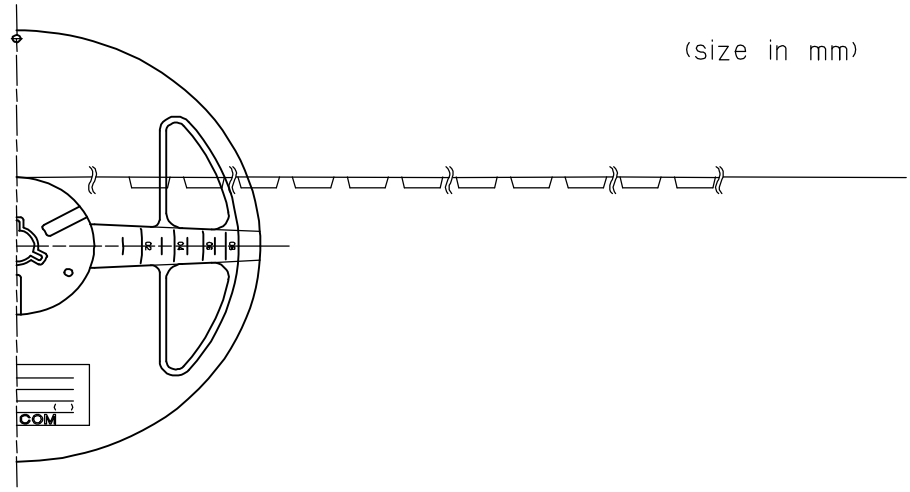
承認 APP.	照査 CHK'D	照査 CHK'D	作成 DRAW
S.KUROGO	H.HIRANO	H.KANNO	N.YOSHIDA

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7.3.Taping package





※ Direction of taking up reel is clock-wise as above. There are sprocket holes on the right hand side of the tape when it is pulled out as shown above.

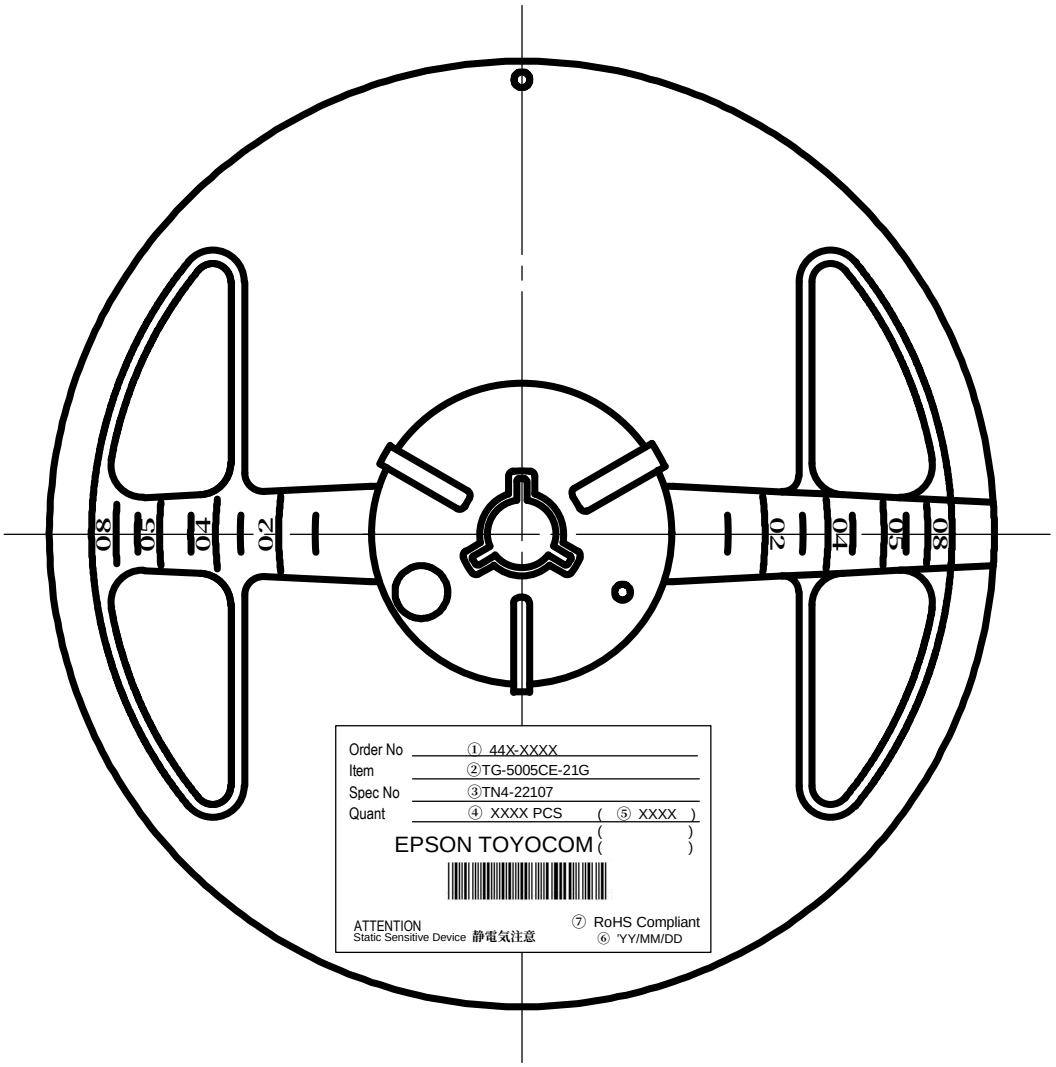
※ The end of leader is fixed on the tape with adhesive tape as shown above.

承認 APP.
S.KUROGO
照査 CHK'D
H.HIRANO
照査 CHK'D
H.KANNO
作成 DRAW
N.YOSHIDA

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7.4.Marking



Marking label

Order No ① 44X-XXXX
Item ②TG-5005CE-21G
Spec No ③TN4-22107
Quant ④ XXXX PCS (⑤ XXXX)
EPSON TOYOCOM

ATTENTION
Static Sensitive Device 静電気注意
⑦ RoHS Compliant
⑥ 'YY/MM/DD

① Order No.
② Model Name + TCXO Model ID
③ Spec. No.
④ Quantity
⑤ Lot No.
⑥ Date
⑦ RoHS Compliant

承認 APP.
S.KUROGO
照査 CHK'D
H.HIRANO
照査 CHK'D
H.KANNO
作成 DRAW
N.YOSHIDA

改版記事 DESCRIPTION

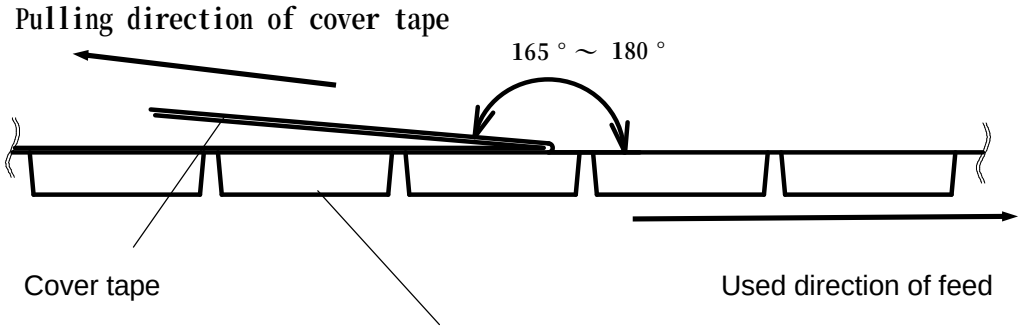
7.5. Cover tape peeling-off strength

※ Angle :165 ° ～180 ° from feeding direction

※ Speed :5mm/sec.

※ Force :0.2N～0.7N

※ Others :There shall be no split or breakage of the carrier tape and the cover tape when peeling away the fixing tape.

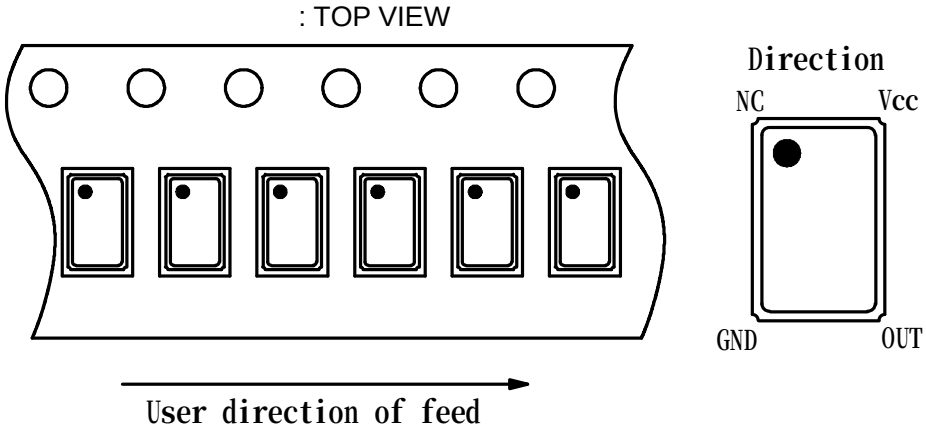


7.6.Quantity of components

2000pcs／reel(MAX.)
500pcs／reel(MIN.)

※ The above quantity is our standard packing size.
In case of an odd sum as per the purchased quantity, the packing quantity might be below our standard minimum packing size.

7.7.Oscillator orientation



承認 APP. S.KUROGO
照査 CHK'D H.HIRANO
照査 CHK'D H.KANNO
作成 DRAW N.YOSHIDA

改版記事 DESCRIPTION

8. Application

8.1. This document is applicable to the temperature compensated crystal oscillator (TCXO) that are delivered to Mediatek Co., Ltd. from Epson Toyocom Corp.

8.2. This product is compliant with RoHS Directive.

8.3. This Product supplied (and any technical information furnished, if any) by Epson Toyocom Corporation shall not be used for the development and manufacture of weapon of mass destruction or for other military purposes.
Making available such products and technology to any third party who may use such products or technologies for the said purposes are also prohibited.

8.4. This product listed here is designed as components or parts for electronics equipment in general consumer use.
We do not expect that any of these products would be incorporated or otherwise used as a component or part for the equipment, which requires an extra high reliability, such as satellite, rocket and other space systems, and medical equipment, the functional purpose of which is to keep life.

9.Attention

9.1. Static discharge
This device is made with CMOS IC. Please take precautions to prevent damage against electrical static discharge.

9.2. Power fluctuations
We recommend placing a 0.1 μF capacitor between V_{CC} and GND to obtain stable operation and protect against power line ripple.
V_{CC} and GND pattern shall be biggest as possible.

9.3. Power supply line
We cannot recommend to put filtering element into power line so as to reduce noise. Oscillator might be unstable oscillation because high frequency impedance of power line become higher. When use filtering element, please verify electrical construction and or element's spec.

9.4. Power on
We doesn 't recommend to power on from intermediate electric voltage or extreme fast power on.
Those powering conditions may cause no oscillation or abnormal oscillation.

9.5. Power line ripple
Power line ripple level must be kept less than 200 mVp-p.

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

9.7. Layout of TCXO in P.C.B.
Please keep distance in TCXO from Another High Level signal line.

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9.8. Shock reliability

This device contains a quartz crystal, so please do not give too much shock or vibration. We recommend storing of devices under normal temperature and humidity to keep the specification.

9.9. Automatic insertion

An automatic insertion 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 conditioning in advance.

9.10. Ultrasonic cleaning

Ultrasonic cleaners can be used on the TCXO Series, however, since the oscillator must be damaged under some conditions, please exercise in advance.

9.11. Storage

We recommend storing products at normal temperature and normal humidity (+15 °C to +35 °C and 45 %RH to 75 %RH.)

9.12. Vibration

When some vibration or periodic mechanical shock will be added from piezoelectric sounder, piezoelectric buzzer and from like that to the oscillator, the phenomena such as a frequency drift or swing level change may exist during the time facing such vibration. Of cause our oscillator has designed to minimize such problems, however please take care to design the layout as follows to avoid such problems.

(1) To mount a sounder or vibrator on the separated circuit board.
(2) When mounted on a same circuit board, to keep the distance as far as possible between a oscillator and vibrator to put some cushion between a vibrator and a circuit board to put some slit on the portion between a vibrator and a oscillator.
(3) When you want to process electrical tests, it is advised that the circuit should be enclosed in a enclosure because the vibration affects will be changed from the result of a circuit board itself.

9.13. Attention in use

Please don 't scratch IC with tweezers etc. because there is a possibility of breakdown .

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