

Approved by:

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APPROVAL SHEET

承认书

PRODUCT: CERAMIC RESONATOR

MODEL: T27.00MT

SMD 2.5×2.0 CASE

SHENZHEN HUAJINGDA ELECTRONICSCO.,LTD

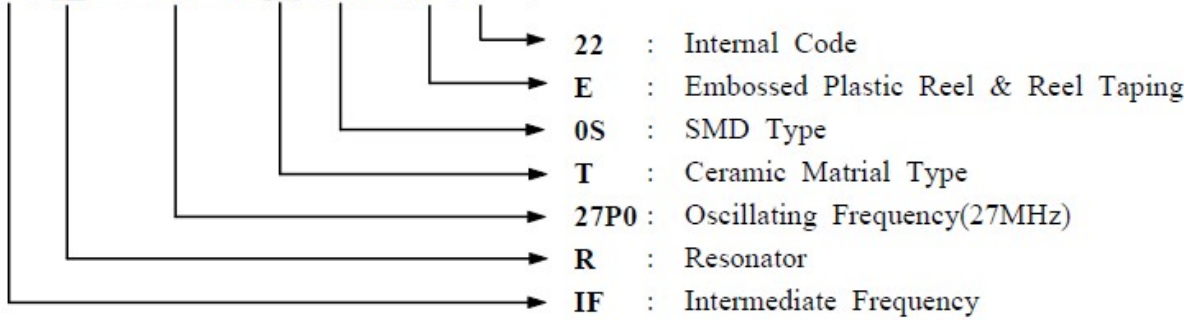
深圳市华晶达电子有限公司

1. SCOPE 使用范围

This specification is applied to the ceramic resonator in IC oscillation circuit.
此规格适用在 IC 震荡回路上的陶瓷谐振器

2. PART NUMBER 部品号

IF R 27 P 0 T 0 S E 2 2



3. ELECTRICAL CHARACTERISTICS 电路特性

The MHz ceramic resonator must meet the following performance when tested in the circuit
Indicated in figure 1 and figure 2.

在电路测试时，兆赫兹陶瓷谐振器一定得符合以下条件，图1 图2 示：

ITEM	SPECIFICATION
Oscillation Frequency 振动频率	27.00 MHz
Initial Tolerance 初级公差	within ±0.5%
Resonant Impedance 谐振阻抗	60 Ω max.
Built-in Load Capacitance 内置负载电容	12pF±20% max.
Insulation Resistance 绝缘电阻	500 MΩ min. (Applied D.C.IOV)
Withstanding Voltage 电压适应性	D.C. 100V, 5 seconds max.
Rated Working Voltage (1) D.C. Voltage 直流电压 (2) A.C. Voltage 交流电压	D.C. 6V 15Vp-p
Temperature Stability 温度稳定性 · Operating Temperature 工作温度 · Storage Temperature 贮藏温度	± 0.2 % max. (From initial value) -20℃ □ +80℃ -40℃ □ +85℃
Aging (10 years) 老化率	± 0.1 % max. (From initial value)

• **Measuring Condition : Temperature (+15 ~ 35℃), Humidity (45 ~85%RH)**

测量条件：温度(+15 ~ 35℃)，湿度 (45 ~85%RH)

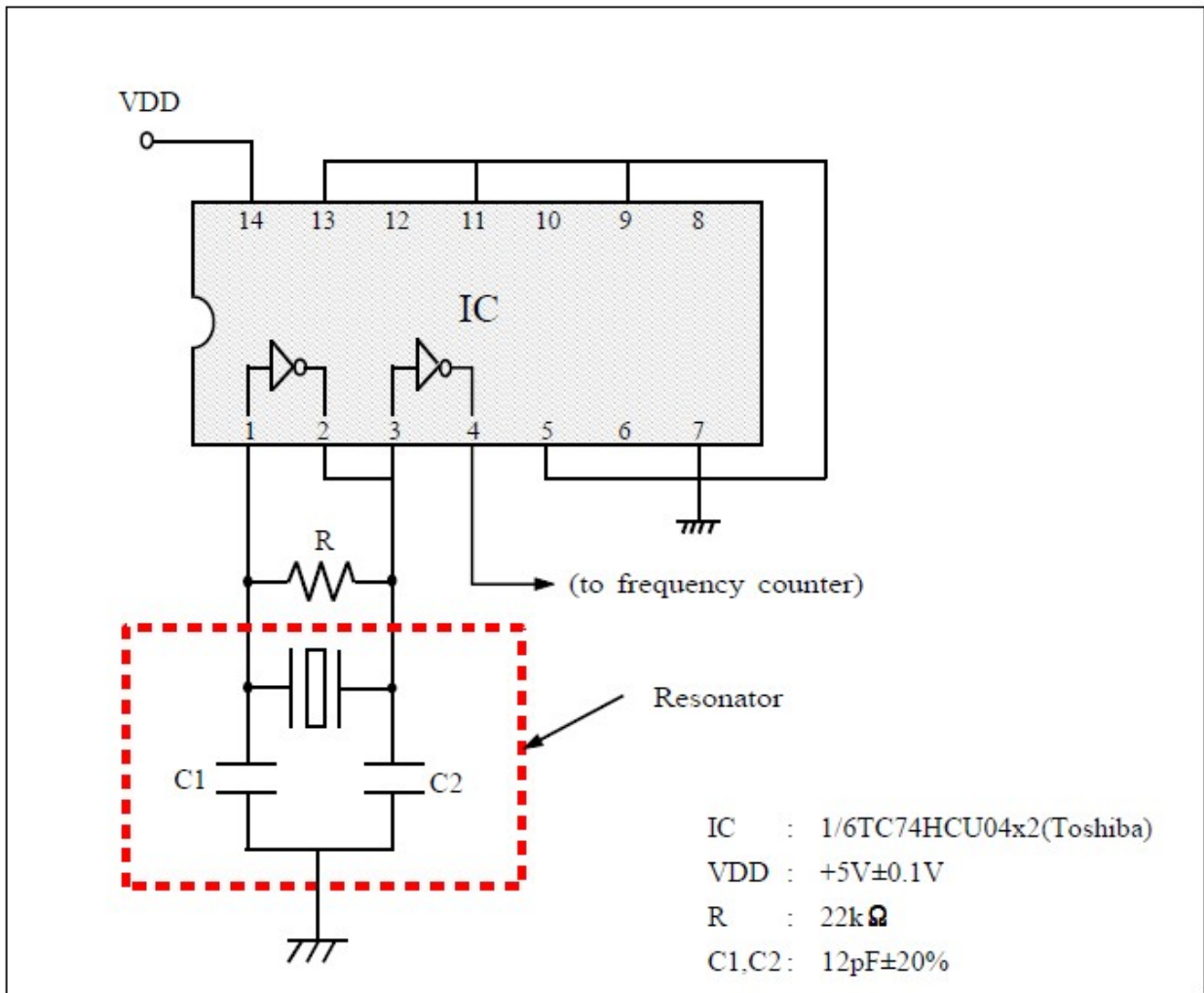


Figure1. Test circuit for oscillating frequency

图 1. 振动频率的测试电路

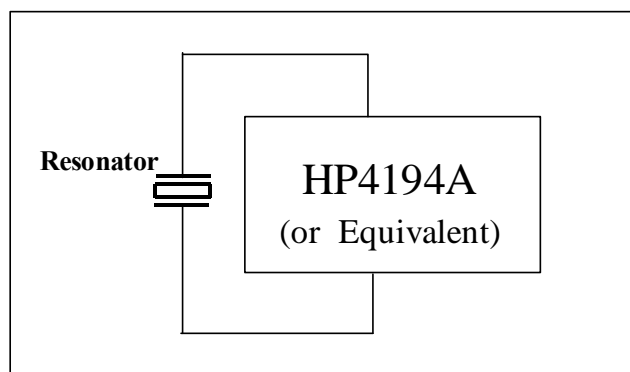
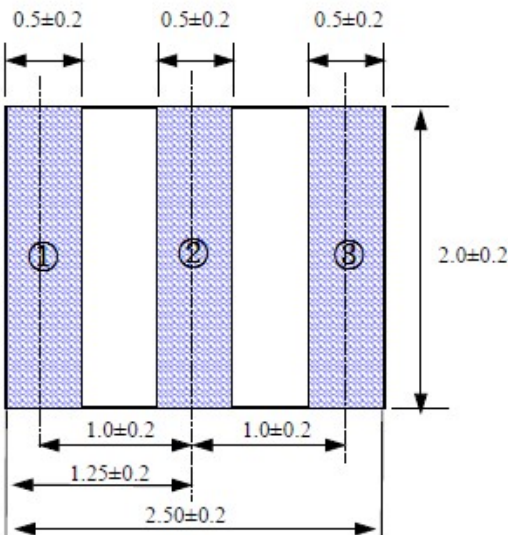
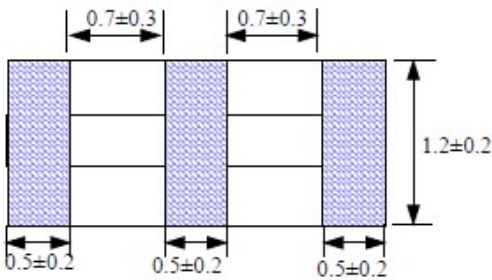
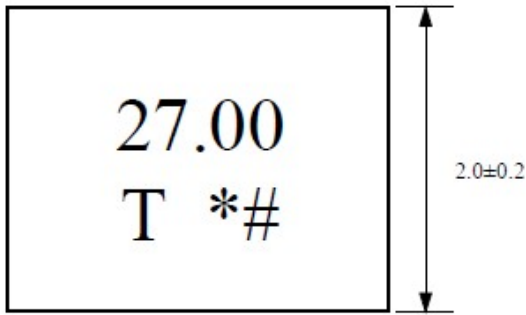


Figure2. Measurement for resonant Impedance

图 2. 谐振阻抗的测试

4. DIMENSIONS & STRUCTURE 尺寸与结构

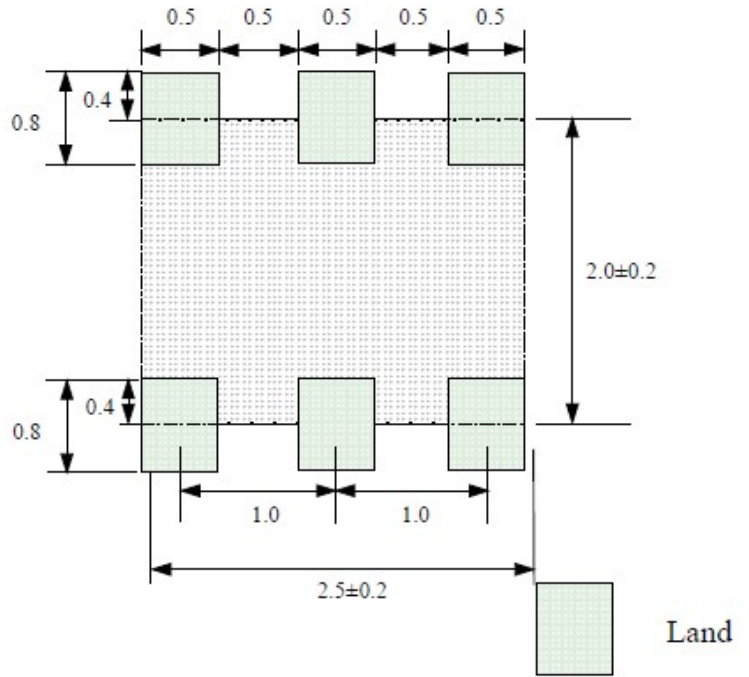
● Marking



①,③ : Input, OutPut ② : Ground

● PCB Soldering Land Dimensions

(Unit : mm)



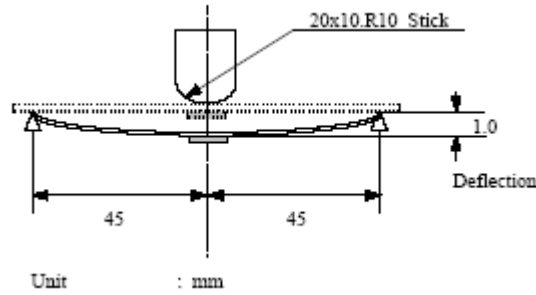
*# Internal Management Code
* : Monthly Code, # : Weekly Code

		Monthly Code											
Year	Month	1	2	3	4	5	6	7	8	9	10	11	12
2008		n	p	q	r	s	t	u	v	w	x	y	z
2009		A	B	C	D	E	F	G	H	J	K	L	M
2010		N	P	Q	R	S	T	U	V	W	X	Y	Z
2011		a	b	c	d	e	f	g	h	j	k	l	m

Weekly Code	
Weekly	Code
1	1
2	2
3	3
4	4
5	5

5. ENVIRONMENTAL & PHYSICAL CHARACTERISTICS 环境及物理特性

ITEM 项目	CONDITION & REQUIREMENT 条件和要求
5-1. Storage in High Temp. 高温下储存	After being placed in a chamber with $+85 \pm 2 \text{ }^\circ\text{C}$ for 500 hours and then being placed in Natural condition for 2 hour, then measure. 放在 $+85 \pm 2 \text{ }^\circ\text{C}$ 的烘箱内500小时, 之后放在室温条件下2小时, 再测试。 <input type="checkbox"/> <i>To be satisfied Table 1.</i>
5-2. Storage in Low Temp. 低温下储存	After being placed in a chamber with $-55 \pm 2 \text{ }^\circ\text{C}$ for 500 hours and then being placed in natural condition for 2 hour, then measure. 放在 $-55 \pm 2 \text{ }^\circ\text{C}$ 的冷冻箱内500小时, 之后放在室温条件下2小时, 再测试。 <input type="checkbox"/> <i>To be satisfied Table 1.</i>
5-3. Humidity 湿度	After being placed in a chamber within $+90$ to 95% R. H. At $+60 \pm 2 \text{ }^\circ\text{C}$ for 500 hours and then being placed in natural condition for 2 hour, then measure 放在湿度 $(90 \sim 95)\%$ R. H. 温度 $+60 \pm 2 \text{ }^\circ\text{C}$ 的室内500小时, 之后放在室温条件下2小时, 再测试。 <input type="checkbox"/> <i>To be satisfied Table 1.</i>
5-4. Heat Shock 热冲击	After being kept at room temperature, the resonator shall be placed at temperature of $-55 \text{ }^\circ\text{C}$. After 30 minutes at this temperature resonator shall be immediately placed at temperature of $+85 \text{ }^\circ\text{C}$. After 30 minutes at this temperature resonator shall be returned to $-55 \text{ }^\circ\text{C}$ again. After five above cycles, the resonator shall be returned to room temperature for at least 2 hour, then measure. 将谐振器在室温条件下拿到 $-55 \text{ }^\circ\text{C}$ 的条件下放置30分钟, 然后立即放在 $+85 \text{ }^\circ\text{C}$ 的高温内放置30分钟, 再放回 $-55 \text{ }^\circ\text{C}$ 的条件中.如此循环5次之后将谐振器放到室温条件下存放至少两小时再进行测试。 <input type="checkbox"/> <i>To be satisfied Table 1.</i>
5-5. Random Drop 撞击	Resonator shall be measured after 3 times random drops from the height of 1 m on wooden floor. 将谐振器在1米高的地方任意扔到木地板上3次之后测试。 <input type="checkbox"/> <i>No visible damage and the measured values shall meet Table 1.</i>
5-6. Vibration Test 振动检验	Resonator shall be measured after being applied vibration of amplitude to 1.5mm with 10 to 55Hz band of vibration frequency to each of a perpendicular directions for 2 hours. 谐振器在10-55HZ的振动频率带上以1.5mm的振幅垂直振动2小时之后再测量。 <input type="checkbox"/> <i>No visible damage and the measured values shall meet Table 1.</i>
5-7. Bending Strength PCB PCB板弯曲强度 检验	Resonator is soldered onto the center of PCB which is laid on the 2 small supporters spaced 90mm. PCB deflected to 1mm below from horizontal level by the pressing force with 20x10.R10 stick. The force is supplied for 1 second, 5 times repeatedly. Velocity of pole for press: 0.5mm/sec. 将谐振器焊接到PCB板的中心位置,然后将PCB板放置在距离为90mm的2个小支撑物上,用20*10.R10的小棍压PCB板, 使之偏离水平线下1mm, 时间持续1秒, 重复5次。压板速度: 0.5mm/秒

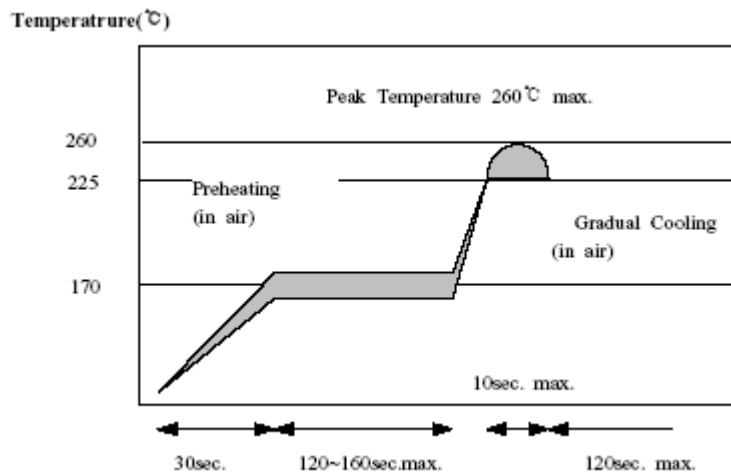


□ **No visible damage and the measured values shall meet Table 1.**

5-8. Solder ability
可焊性
End terminals are immersed in rosin for 5 seconds and then immersed in soldering bath of $230\pm 5^{\circ}\text{C}$ for 3 ± 0.5 seconds.
终端浸在松香里5秒，然后浸在 $230\pm 5^{\circ}\text{C}$ 的焊锡槽里 3 ± 0.5 秒
□ **75% min. End terminals shall be wet with solder.** 至少75%的终端浸在焊锡里。

5-9. Resistance to Soldering Heat
耐(焊接)热性
Following profile of heat stress is applied to resonator, and then being place in natural condition for 1 hour, resonator shall be measured.
下图为热应力检测条件.将谐振器经过此热应力,然后在自然条件下放置1小时,之后测量,(测量结果应为合格产品).

(1) Reflow
回流焊



1. Preheating conditions shall be 150 to 170°C for 120 to 160 seconds. Ascending time up to 170°C shall be longer than 30 seconds.
预热条件: $150^{\circ}\text{C}\sim 170^{\circ}\text{C}$ 时间:120sec.~160sec.上升至 170°C 的时间必须超过30sec.
2. Heating conditions shall be within 10 seconds at 245°C min., but peak temperature shall be lower than 260°C .
加热条件: 至少 245°C 的温度下加热不超过10秒。最高温度低于 260°C .

(2) Soldering Iron
电烙铁

Soldering iron of $300\pm 5^{\circ}\text{C}$ shall be placed 0.5mm above from electrode of resonator.
Melting solder through soldering iron shall be applied to electrode for 3 ± 1 seconds,
then being place in natural condition for 24 hour, resonator shall be measured.
 $300\pm 5^{\circ}\text{C}$ 的电烙铁放在谐振器的电极上方0.5mm处，熔化的焊锡通过电烙铁与电极接触,时间为 3 ± 1 秒，然后将谐振器在自然条件下放置24小时之后再测量。

□ **The measured values shall meet Table 1.** 测量值适用于表1

TABLE 1

MEASUREMENTS 测试项目	REQUIREMENTS 必要条件
Resonant Frequency 谐振频率	± 0.3 % max.(From initial value)

6. PACKAGING STANDARD

The products should be packaged for protecting from the accident which could be caused during transportation or preservation, and part name, quantity and inspection lot No. shall be given to the each minimum packing unit.

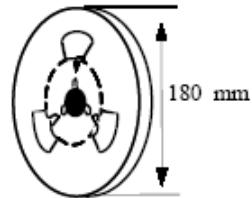
Note) 1 Tray contains 3,000 pcs Resonator.

WEIGHT : 0.04 g/pcs

◎ Reel

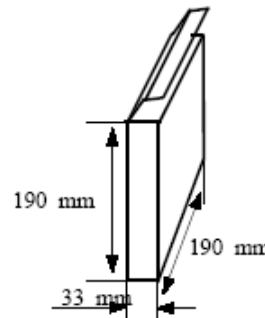
P/N _____ : (Part number)
Lot No. _____
Quantity: 3,000 pcs
Date _____

LOT No.: \diamond \diamond \diamond \diamond \diamond \diamond
 type \swarrow Freq.(MHz) Materials Year&Month



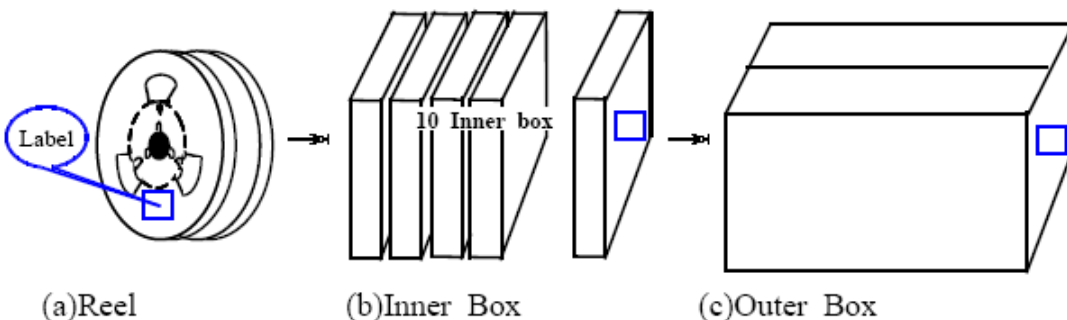
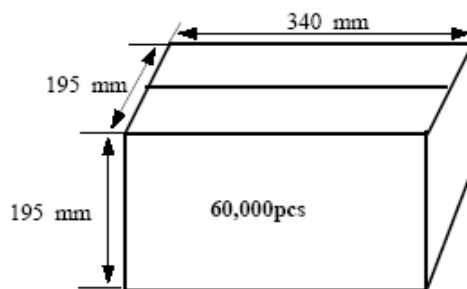
◎ Inner Box

P/N _____ : (Part number)
Quantity: 6,000(2 reel)
Date _____



◎ Outer Box

Talk No. _____
Talk P/N: (Part Name) _____
P/O No. _____
Vendor _____
Quantity: 60,000 pcs



7. CAUTIONS FOR USE 注意事项

7-1. Resonator might be damaged when an excess stress is applied. 压力过大会损坏谐振器。

7-2. Cleaning or washing of the component is not acceptable due to non-sealed construction.

Cleaning conditions, such as kinds of cleaning solvents, immersion time and temperature etc, after soldering shall be checked by experiments before production.

由于没有密封设备, 所以部品是不可以清洗的。

如果一定要清洗,清洗条件诸如各种清洗剂, 浸泡时间及温度等必须在焊接之后生产之前先做实验检测确认。

7-3. Conformal coating of the component is acceptable.

However, the resin material, curing temperature, and other process conditions should be evaluated to confirm stable electrical characteristics are maintained.

部件的外壳设计合理。

要评估产品的电性能的稳定性能可以从树脂的材料,加工温度和其他的工序条件来确认。

7-4. Irregular or stop oscillation may occur under unmatched circuit conditions. And it shall be noted that oscillating frequencies of the Ceramics Resonator may drift depending on IC applied (the type names, the manufacturer) and capacitance of external capacitors (C1, C2) and the circuit design in figure 1.

在不匹配电路条件下会发生不规则振动或停振。所以一定要注意陶瓷谐振器的振动频率变化是由所提供的IC类型, 厂商) 和外部电容 (C1,C2) 的电容量来决定的.设计电路如图1。

8. LIMITATION FOR USAGE 使用局限

8-1. The component is manufactured and promoted to be used in general electronic of AV, home appliance, communication, measurement equipments and machine tools.

进一步加工的产品用于普通的AV电路, 家电, 通讯, 测量设备及电动玩具。

8-2. Contact us before using our products for the following applications.

应用在下列场合时请提前联系我们

1) Aircraft equipment 飞行设备

2) Aerospace equipment 航空航天设备

3) Undersea equipment 海底设备

4) Medical equipment 医疗设备

5) Transportation equipment 交通运输设备

6) Traffic signal equipment 通讯信号设备

7) Disaster prevention/Crime prevention equipment 安全保护设备

8) Data-processing equipment 数据处理设备

9) Applications of similar complexity or with reliability requirements comparable to the applications

listed in the above.

微小复杂事物以及可以和上述设备相提并论的高精度,高稳定度要求的使用场合

These applications require especially high reliability in order to prevent defects, which might directly cause damage to other party's life, body or property.

为了避免可能对其他方面造成的危害或损失, 以上的这些应用场合尤其需要精度高, 品质好的产品。

9. NOTICE 注意

9-1. This specification mentions the quality of the component as a single unit. Insure the component is thoroughly evaluated in your application circuit.

本规格书只说明了部件本身的规格,产品的性能只有在您的使用过程中被认可才是真的确认.

9-2. Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by an abnormality or failure related to our product.

为了预防意外发生,请确认您的设备有相配的自动防止危害发生功能,从而避免因违规或错误操作而引起的不必要的损失.

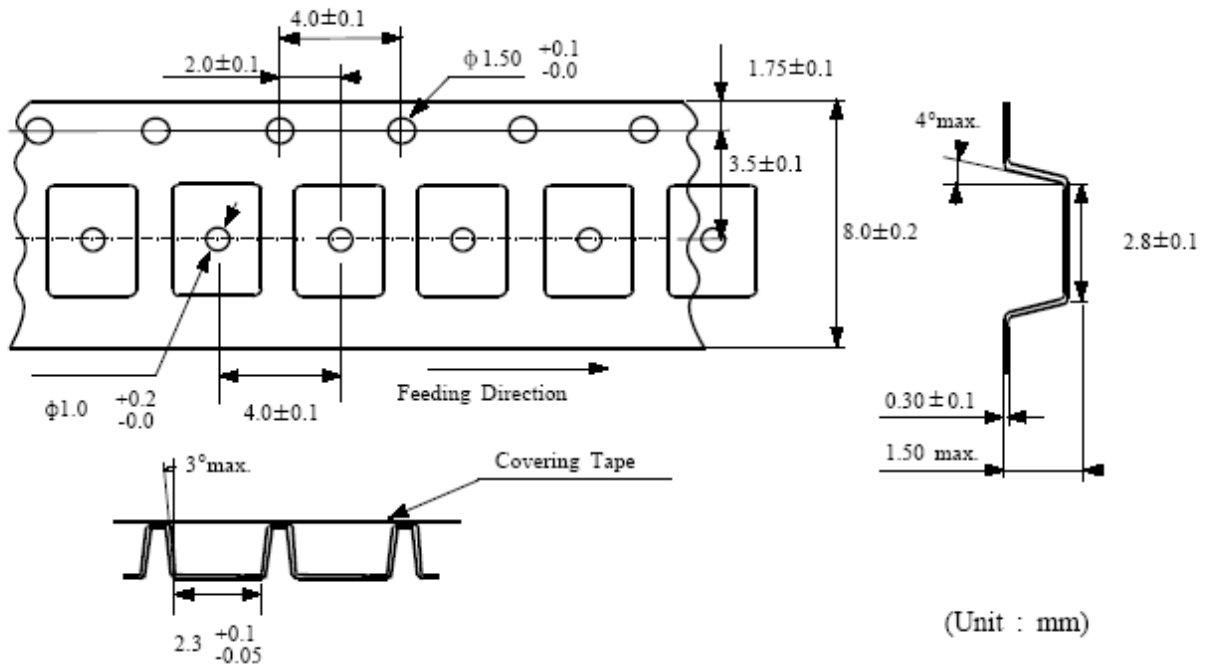
9-3. Please does not use this component in any application that deviates from its intended use as noted within the specification.

不要在规格书所提到的注意事项外任何场合都使用本产品.

9-4. Return one of this specification after your signature of acceptance. In case of no return within three months from submission date, this specification should be treated as accepted.

确认后请在规格书上签字并返还,如果在3个月之内没有返还,则视为自动接受.

■ DIMENSIONS OF CARRIER TAPE



■ DIMENSIONS OF TAPING REEL

