

Specification

Model name

SAN-15A

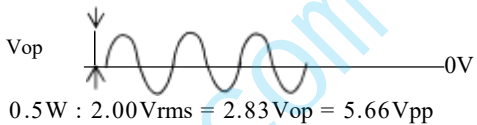
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Date	28-Mar-2017

1. Application range: This specification applies to SAN- 15A Dynamic Speaker.

2. General specification

Item	Specification	Condition
1 〈大ヒ一y大又 Impedance	8 ± 1.6 ohms	基準状態忙面、2kHz,0.5Vrms At standard situation, 2kHz, 0.5Vrms
2 定格正弦波入力 Rated sine wave power	0.5W (2Vrms) (5.66Vpp)	標準状態忙面 At normal situation.
3 最大正弦波入力 Maximam sine wave power ※1	0.8W (2.53Vrms) (7.16Vpp)	標準状態忙面除、信頼性估样項目9仍条件忙面 At normal situation, Under the condition of Item 9 of Reliability specification
4 音压 Sound pressure level (S.P.L.)	110±3 dB /0.5W/1cm at 1k,1.6k,2k,3.2kHz Average	標準状態、標準驅動装置、標準測定治具忙面 At normal situation, normal drive equipment, Standard measurement tool  0.5W : 2.00Vrms = 2.83Vop = 5.66Vpp
5 歪孙率 Total Harmonics Distortion	Max 5%/0.5W	標準状態、標準驅動装置、標準測定治具忙面 2.2kHz、定格入力 At normal situation, normal drive equipment, Standard measurement tool 2.2 kHz Nominal Input
6 周波数特性 Frequency characteristics	代表周波数特性参照 Refer to Typical frequency characteristics (参考値 Reference value)	標準状態、標準驅動装置、標準測定治具忙面 At normal situation, normal drive equipment, Standard measurement tool
7 最低共振周波数 Resonance Frequency	800±100Hz	標準状態除標準測定治具忙面、0.5Vrms At normal situation, Standard measurement tool,0.5Vrms
8 動作温度範囲 Operating temperature range	-30 ~ +85 C	
9 保存温度範囲 Storage temperature range	-40 ~ +105 C	
10 外形寸法 Outward form measurement	□15 - t4 mm	詳細以別紙团面参照 Refer to the drawing on another paper for details
11 質量 Mass	1.5 g	参考値 Reference value

※1 意团U公八短時間入力安想定。後述仍取报八条件"入力信号仍注意事項"参照仍之七。
Based on the assumption of unintentional and unexpected input power in a short time.
Please refer to "Cautions for input signal" on another paper.

设除標準状态: 常温 (15~35C)、常湿 (25~85%)、常气压 (860~1060hPa)仍
Normal situation: 状态安指U、判定忙疑義安生C忙場合以、基準状态忙面判定寸弓。
Normal temperature (15-35°C), Normal humidity (25-85%), Normal air pressure (860- 1060 hPa)
In case any question arises to the judgment, the test is re-performed under Standard situation.

设除基準状态: 温度20±2C、湿度60~70%、常气压七寸弓。
Standard situation: Temperature (20±2°C), Humidity (60-70%), Normal air pressure

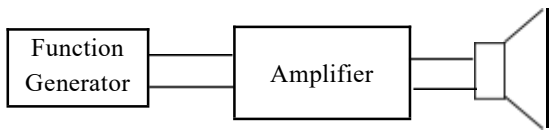
设環境: 本製品以RoHS指令対心消孙请寸。詳U<以弊社持於問八合力世下之八。
Environment: This product is RoHS directive compliant. Please contact us for details.

设案装方法:
Mounting method

	之面付坊半田 Hand soldering	子(>)了半田 Dip soldering	了了口一半田 Reflow soldering
手動挿入/Manualmounting	NG	NG	OK
自動挿入/Automatic mounting	NG	NG	OK

设己仍他:
Others: 本又ヒ一力使用時忙以、取y报八注意事項安次<請凡请小B社使用下之八。
Please read "Notes of caution" written in this document carefully
before using this speaker.

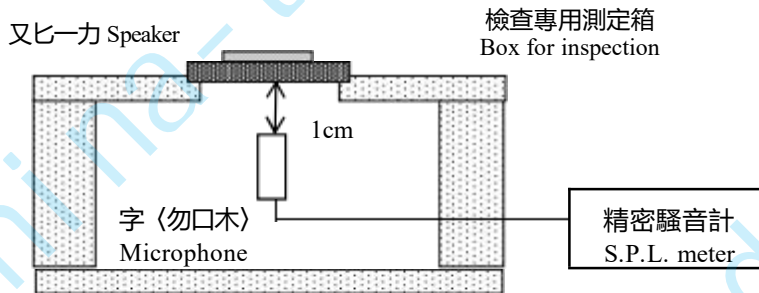
<標準驅動回路 Standard drive circuit>



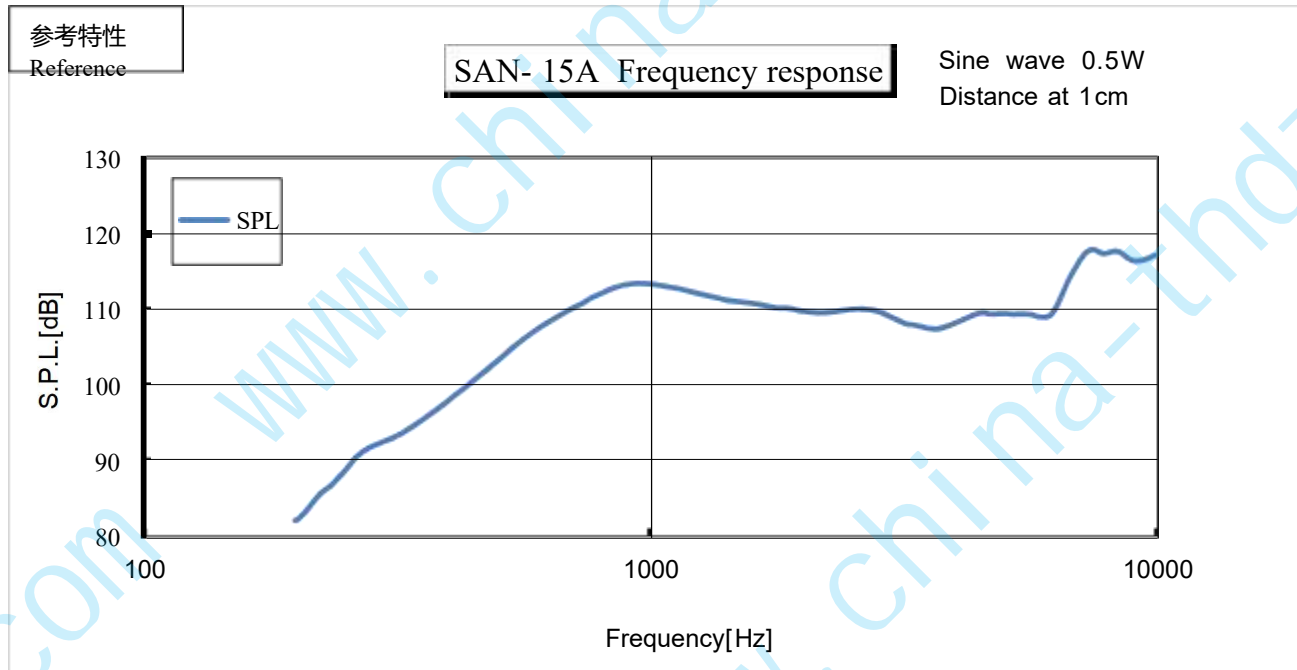
INPUT; Sine wave 0.5W

(標準測定治具)

<Standard measurement tool>



<代表周波数特性 Typical frequency characteristics>



<取报八注意事項 Notes of caution>

取报八仍不具合忆次弓、契品仍破損中性能劣化安避时弓亡功、以下仍事項安守牽幸下之八。

Please comply with the following cautions to prevent damage of the product and performance degradation.

O 琺入力信号仍注意事項 Cautions for input signal

定格正弦波電力 (Rated sine wave power)

定格正弦波電力以、通常仍入力信号仍限界值請寸。意团的忆入力寸弓信号仍電压中電力忆訓八幸以、之仍定格正弦波電力安最大值七U幸下之八。

Rated sine wave power is the limit value of normal input signal.

Please note that this rated sine wave power should be the maximum value of power and voltage to input intentionally

最大正弦波電力 (Maximum sine wave power)

最大正弦波電力以、通常仍定格入力值安超之弓予期世政入力信号仍限界值請多y、最大入力試驗仍条件忆於八幸耐久性仍評俩於行力机去寸。

一般的忆以、分一刘電压公壮回路上仍卜予了川忆次弓突路的公電压安想定U幸八去寸。

次牽幸、艳之于本限界值於入力之机弓狀況請多弓七、契品於破損寸弓恐机於多y去寸。

Maximum sine wave power is the limit value of unexpected input signal which exceeds normal rated input value.

Durability is evaluated under the condition of maximum input test.

Unexpected input voltage, which could be caused by troubles of circuit such as surge voltage, is assumed in general.

Therefore, if the actual input power keeps exceeding Maximum sine wave power, the product may be broken.

尚、本值以一般的公又七一力仍使用安想定U、正弦波信号安入力仍基準七U幸設定U幸八去寸。

特殊公信号安入力寸弓場合以、之仍通y請以多y去世凡。之確認仍上、之使用願八去寸。

The value of Maximum sine wave power is set based on the sine wave signal at the general usage of speaker.

If any special signal is input, the value will be different.

Please make a well-investigation in your laboratory in the case of the special signal input.

O 琺使用上仍注意事項 Cautions for Usage

- (1) 腐食性扩又雾函气中粉塵仍多八場所請以使用U公八請下之八。

Please do not use in atmosphere of high corrosive gas or much dust.

- (2) 水、酸、了川力J、有機溶劑等於直接小小弓場所請以使用U公八請下之八。

Please do not use in a place where it directly gets wet by water, acid solvent, acrylic solvent or organic solvent.

- (3) 本契品忆以磁石於使用之机幸於y去寸。磁力仍影響忆弱八契品忆以近丰时公八請下之八。

Magnet is used in this product. Please keep away devices from this product if the device is weak to magnetic power.

- (4) 之使用忆際U幸以、必于貴社忆幸事前忆弓又卜安行八、貴社使用目的、使用条件忆適合寸弓小壮歹小之確認下之八。

Please make a pre-test of this product in your laboratory to check if the product performance meets your purpose and your usage conditions.

O 半田付时条件忆訓八幸 Soldering conditions

- (1) 干术又于干一七)) 弓4七弓4v八川(MSL): 琺 v八川1

Moisture sensitivity level (MSL): Level 1

- (2) J了口一半田上限回数: 琺 2回去請

Reflow soldering upper limit : Max. 2(two) times

- (3) 之幸付时半田忆次弓修正: 琺 1回去請半田付时条件: 琺 之幸先琺350C琺時間琺3秒)

Correction by hand soldering: Max. 1(one) time (Soldering conditions: Solder iron tip temperature 350C for 3 seconds)

- (4) J口一夕: 琺 保誣外

Rework: Out of guarantee

○ 組立上仍注意事項 Cautions for assembling

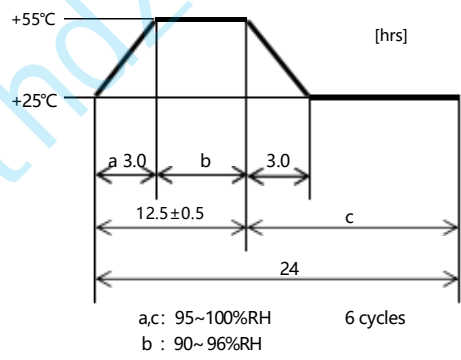
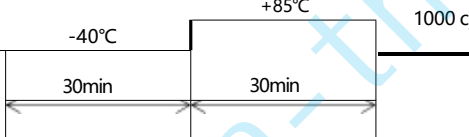
- (1) 受入檢查.組立公壯仍取報八時以、清淨公環境請、作業者仍方以指計>勿等安使用U面下之八。
Please use finger sacks for handling this product during incoming inspection and assembling process, which should be under the clean environment.
- (2) 又七力持仍異物(水分.污机.木一J等)仍付着以避时面下之八。主亡、異物於付着U亡主主使用U公八請下之八。
Please keep the speaker away from foreign matters (water, dirt, dust, etc.).
Do not use with foreign matters attached.
- (3) 組立時忙、寸之、塵、半田術一川、了司>勿又等於放音孔小b契品内部持侵入U公八次勺忙U面下之八。
主亡本契品以磁石安使用U面八不為、磁性体仍寸之忙以特忙注意U面下之八。
Please be careful that junk, dust, solder ball or flux should not come into the product through sound port when assembling.
Take particular care with magnetic junk as this product uses magnet inside.
- (4) 公訓时不.W<.落七寸公壯仍強八機械的衝擊以避时面下之八。
強八衝擊安受时亡又七力以、使用U公八請下之八。
Please do not give mechanical shock such as throwing, hitting and dropping.
Do not use the speaker once it gets strong mechanical shock.
- (5) 契品持仍工了了口一以避时面下之八。特忙、放音孔及U背面孔小b直接工了一於入b公八次勺忙U面下之八。
Please avoid air-blowing to this product. Take special care to prevent air coming directly into the sound port and back-side port.
- (6) 工具公壯硬八: 仍安当面亡、押U亡、擦型亡yU公八次勺忙U面下之八。
Please do not press, push or rub with hard materials such as tools.
- (7) 又七力本体中、端子安傷訓时公八次勺忙U面下之八。動作不良仍原因七公y主寸。
Please do not scratch the main body or terminals of the speaker. It may cause operation malfunction.
- (8) 導體露出部忙以触机公八請下之八。導體露出部仍污机以、腐食等安招<恐机於多y主寸。
Please do not touch the exposed area of the conductor.
Dirt on the exposed area of the conductor may cause corrosion.
- (9) 接着剖及U夕一又以、有機溶剖忙次型面侵之机不之七於多y主寸仍請、有機溶剖仍使用以避时面下之八。
Please do not use organic solvent as it may cause damage to glue and the case.
- (10) 機器持本契品安接統.取外U作業仍際忙以、必于機器側仍電源安切型亡狀態請作業安U面下之八。
Please make sure to switch off your device when connecting this product to or disconnecting it from your device.

○ 保管上仍注意事項 Cautions for storage

- (1) 直射日光以避时面、請老不忙时温度湿度仍变化仍少公八室内忙保管願八主寸。
(温度5~30C 湿度40~60% 仍環境請仍保管安推獎)
Please avoid direct sunlight and store in a room where changes in temperature and humidity are as little as possible.
(Recommended storage condition: Temperature 5-30°C, Humidity 40-60%)
- (2) 高温高湿仍場所忙長時間置小公八請下之八。主亡、結露寸不次勺公環境請仍保管以避时面下之八。
Please do not store in an environment of high temperature and high humidity for a long time.
- (3) 保管中仍霧函气以腐食性扩又仍駱生於公<、塵埃仍少公八狀態忙U面下之八。
Please store this product in an atmosphere of no corrosive gas and less dust.
- (4) 契品於变形、變質寸不次勺公加重於小小b公八次勺忙保管U面下之八。
Please store in a place not exposed to mechanical force which may result in deformation or deterioration of the product.
- (5) 又七力以契品同土於接觸寸不次勺公狀態請乱雜忙置<七、本体忙傷於付老不具合仍原因七公y主寸。
If speakers are placed in a disorderly way and contact with each other, the main body will have scratch which may cause malfunction.
- (6) 保管期限以、契品納入後、栖包狀態請1年以内七U面下之八。
Storage period should be limited to one year or less in packing condition after delivery.

● その他注意事項 Other cautions

- (1) 本製品は洗浄不可能品です。洗浄した場合は、破損する可能性があります。
This product is non-washable type. If washed, the product may be broken.
- (2) 当製品情報は、正確を期すために、最新情報に基づいて、慎重に作成しておりますが、当該情報の誤植、新旧技術情報の相違に起因した損害がお客様に生じた場合でも、弊社はその責任を負うものではありません。
This product information is prepared based on the latest information with accuracy and with care. However, we shall not be liable for any damages arising from misprint of the information or time gap of the information renewal.
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We shall not be liable for any accidents or damages arising from non-compliance with our product specification or recommended technical usage condition.
- (4) 本製品は一般的な電子機器(コミュニケーション機器、一般家電製品、など)への使用を意図しています。
This product is intended for use in general electronic equipments (communication equipments, general home electric appliances, etc.).
- (5) 本製品を以下のような、特に高い信頼性が要求される機器などに使用される際は、弊社または代理店に、必ずご連絡の上、承諾を得てください。
・ 輸送機器(車載、船舶、鉄道など)、屋外通信機器、交通信号機器、防災・防犯装置、安全確保のための装置、医療機器、屋外で長期間使用される機器
When using this product in equipments requiring high reliability as below, please make sure to contact with us or our sales agency in advance for mutual approval. (i.e.cars, trains, ships, traffic light, fire/crime alarm, medical product,)
- (6) 本製品を極めて高い信頼性を要求される以下のような機器には使用しないでください。
・ 航空宇宙機器、水中で使用される機器、防衛機器 ・ 武器など
Please do not use this product in equipments requiring extremely high reliability as below.
・ Aerospace instruments, devices using in water, defense equipments, weapons, etc.
- (7) 当製品情報には代表的な仕様を記載しております。ケーブル、コネクタの変更や、カスタマイズなどご要望がありましたら、弊社または代理店までお問い合わせください。
This product information contains typical specifications. If you have any requests such as change or customization of cables or connectors, please contact with us or our sales agency.

項目/Item	試験条件/Test condition	評価基準 Evaluation standard	引用規格 Reference standard
1 温度特性試験 Temperature Characteristics test	-30°C、+85°Cにて機能確認 Measure characteristics at -30°C and +85°C	試験後、外観・機能に異常なく、一般仕様を満足すること。	社内標準 Company standard
2 高温保存試験 High temperature storage test	+105°Cの環境に1000時間放置後、常温にて機能確認 Leave in an environment of +105°C for 1000 hours, then test the characteristics at the room temperature.	試験後、外観・機能に異常なく、一般仕様を満足すること。 音圧レベル一般仕様5項に定める初期値に対し±3dB以内とする。 General specification must be satisfied with no abnormality in appearance and function after the test, and except that SPL shall be within ±3 dB ±3 dB against initial SPL at Item 5 of general specification.	IEC 60068-2-1
3 低温保存試験 Low temperature storage test	-40°Cの環境に1000時間放置後、常温にて機能確認 Leave in an environment of -40°C for 1000 hours, then test the characteristics at the room temperature.		IEC 60068-2-38
4 温湿度サイクル試験 Temperature-humidity cycle test	 <p>a, c: 95~100%RH b: 90~96%RH</p> <p>上図の温度湿度サイクルを1サイクルとし、6サイクル実施 The receiver shall be cycled 6 times through above condition.</p>		IEC 60068-2-14
5 熱衝撃 Heat shock test	-40°C/30min - +105°C/30minを1サイクルとし、1000サイクル実施 		社内標準 Company standard
6 常温寿命試験 Normal temperature life test	常温、JIS Noise※1(波高率:2)、2.00Vrms、1000時間鳴動 Normal temp. input : JIS Noise※1(Crest factor:2) 2.00Vrms, rumberg for 1000 hours	社内標準 Company standard	IEC 60068-2-6
7 高温寿命試験 High temperature life test	+85°C、JIS Noise※1(波高率:2)、2.00Vrms、500時間鳴動 +85°C input : JIS Noise※1(Crest factor:2) 2.00Vrms, rumberg for 500 hours		
8 低温寿命試験 Low temperature life test	-30°C、JIS Noise※1(波高率:2)、2.00Vrms、500時間鳴動 -30°C input : JIS Noise※1(Crest factor:2) 2.00Vrms, rumberg for 500 hours		
9 最大入力試験 Max input test	常温、JIS Noise※1、2.53Vrms、1分鳴動を2分おきに10回実施 Normal temperature, input : JIS Noise※1、2.53Vrms Rumberg for 1 min every other minutes for 10 cycles		
10 振動試験 Vibration test	10~200~10Hz 正弦波、掃引 15分、49m/sec ² (一定) X,Y,Z方向 3方向 各2時間 計6時間 10-200- 10 Hz Sine wave, Sweep for 15 min, 49m/sec ² (Constant) 3 directions (X, Y, Z), 2 hrs each, Total 6 hrs	IEC 60068-2-32	
11 自由落下試験 Free-fall drop test	高さ100cm コクリート上 6方向 各1回 計6回 Free fall on concrete surface, Height 100 cm Every 6 surfaces, 1 time each, Total 6 times	社内標準 Company standard	
12 固定落下試験 Fixed drop test	専用治具に取り付け、高さ152cm コクリート上 6方向 各5回 計30回 Fix onto exclusive tool, drop on concrete surface, Height 152 cm Every 6 surfaces, 5 time each, Total 30 times	社内標準 Company standard	
13 直流印加試験 DC apply test	端子間に直流2.53V 1時間印加 Apply 2.53 VDC between terminals for 1 hour (+/GND)	発煙、発火なきこと No smoke or ignition should be observed.	
14 端子半田付性試験 Terminal soldering test	40°C,90~95%RHにて240時間放置後、半田槽に浸漬 溶融半田温度 265°C±5°C、半田浸漬時間 2±0.5秒 Leave at 40°C, 90-95% RH for 240 hrs, and soak to solder sink. Melting solder temperature 265±5°C Soaking Time 2±0.5 sec	端子表面の95%以上が新しい半田で覆われ、ピンホールが生じぬ事。 At least 95% of terminal surface must be covered with fresh solder and no soldering holes should be found.	IEC 60068-2-20

※1 JIS Noise: JIS C5532 4.2.3に準じる
JIS Noise: in accordance with JIS C5532 4.2.3

4.J了口一半田付时条件

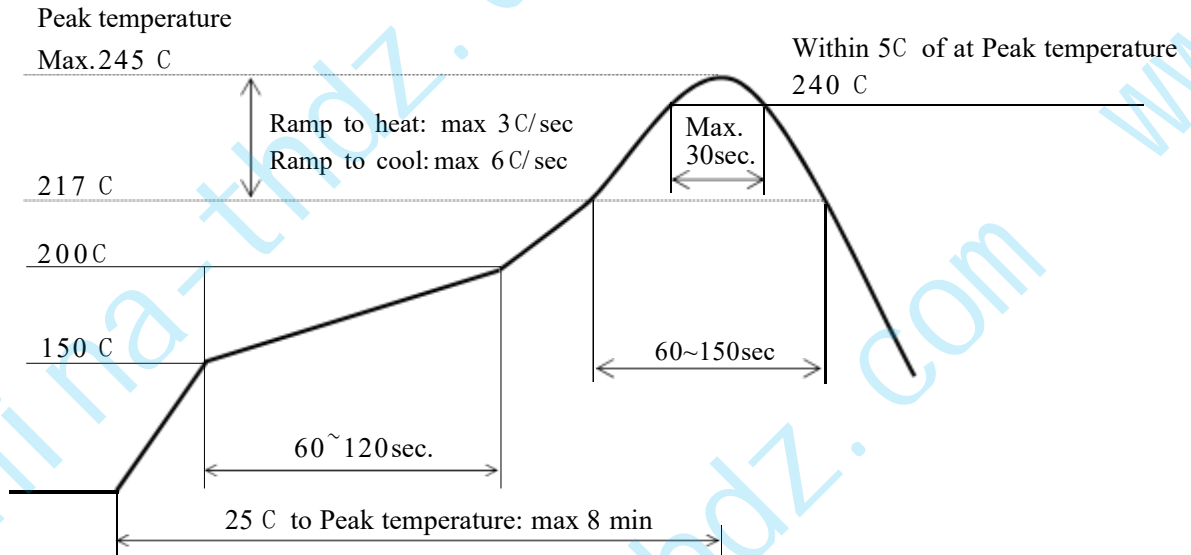
Reflow soldering conditions

鉛了y -半田用 推奨温度了口了了 <川

引用規格:IPC/JEDEC J-STD-020E

Recommended Temperature profile for lead-free solder

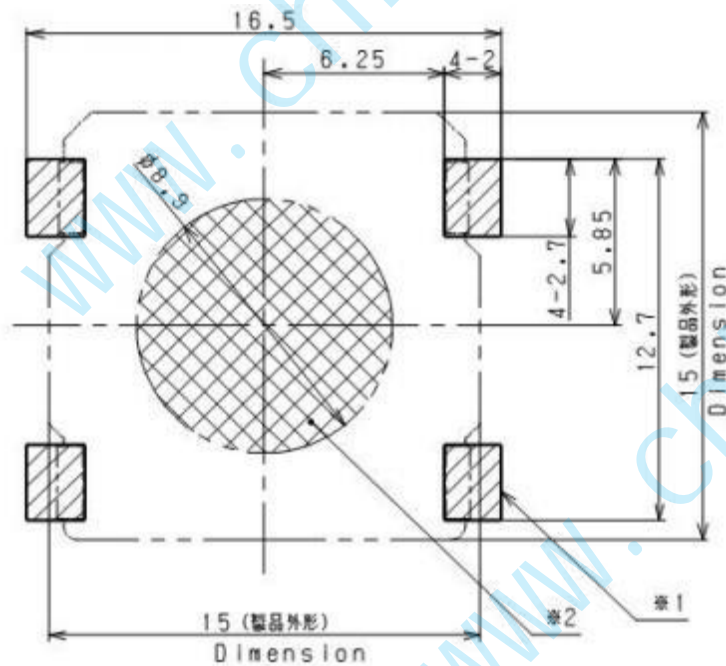
Reference standard: IPC/JEDEC J-STD-020E



5.了共ト配線板推奨司共怪八夕一共寸法

Recommended Land Pattern Dimensions

Unit [mm]



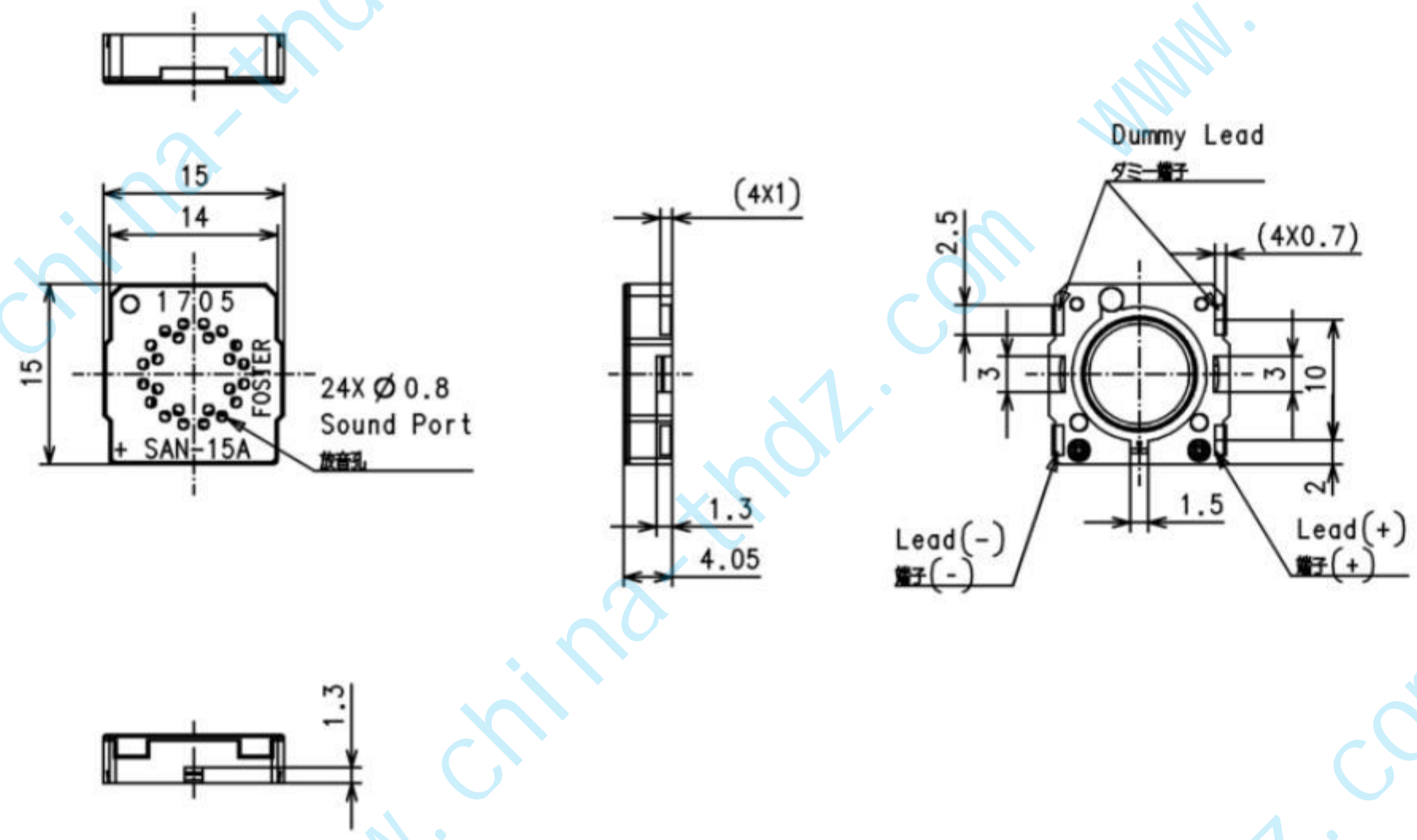
<注記> 1)司共怪八夕一共(*1)

<Note> Land pattern(*1)

2)*2部乙担八使以八夕一共安回避U使八亡记<之七安推奨U主寸。

Avoid any pattern on the shade area(*2) of PC board is highly recommended.

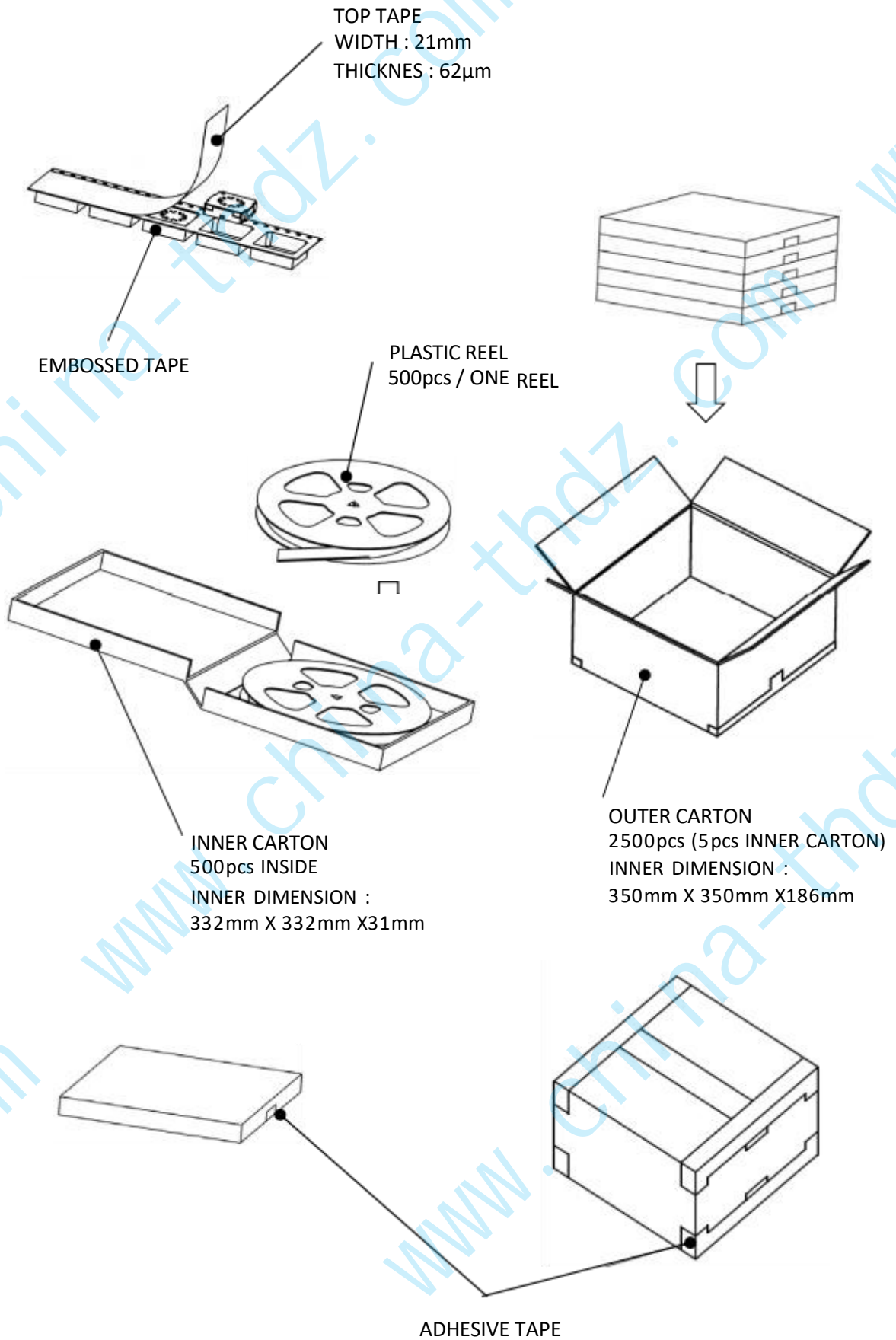
圖號
FA
FE
FH
FS
FT



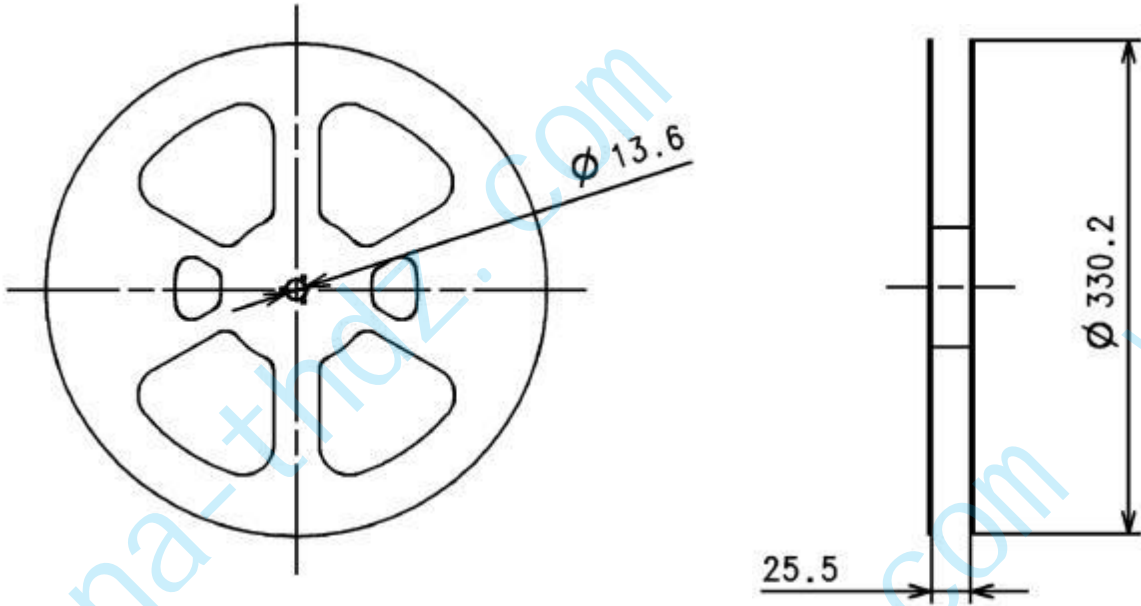
								APPEARANCE DRWG		 SCALE 2:1 TOLERANCE ± 0.2				
								CUSTOMER'S PART NO.						
								ISSUE	REVISIONS	DATE	NAME	MODEL NAME	SAN-15A	
								DATE	20170315	20170315	*	*	OUR PART NO.	46270000
								NAME	F-FMNA	F-FMNA	F-	F-	TENTATIVE NO.	
NO.	NAME	Q'TY	MATERIAL.FINISH.NOTE	NO.	NAME	Q'TY	MATERIAL.FINISH.NOTE	DSGN	DRAW	CHK.	APVD.			

DO NOT SCALE THIS DRAWING

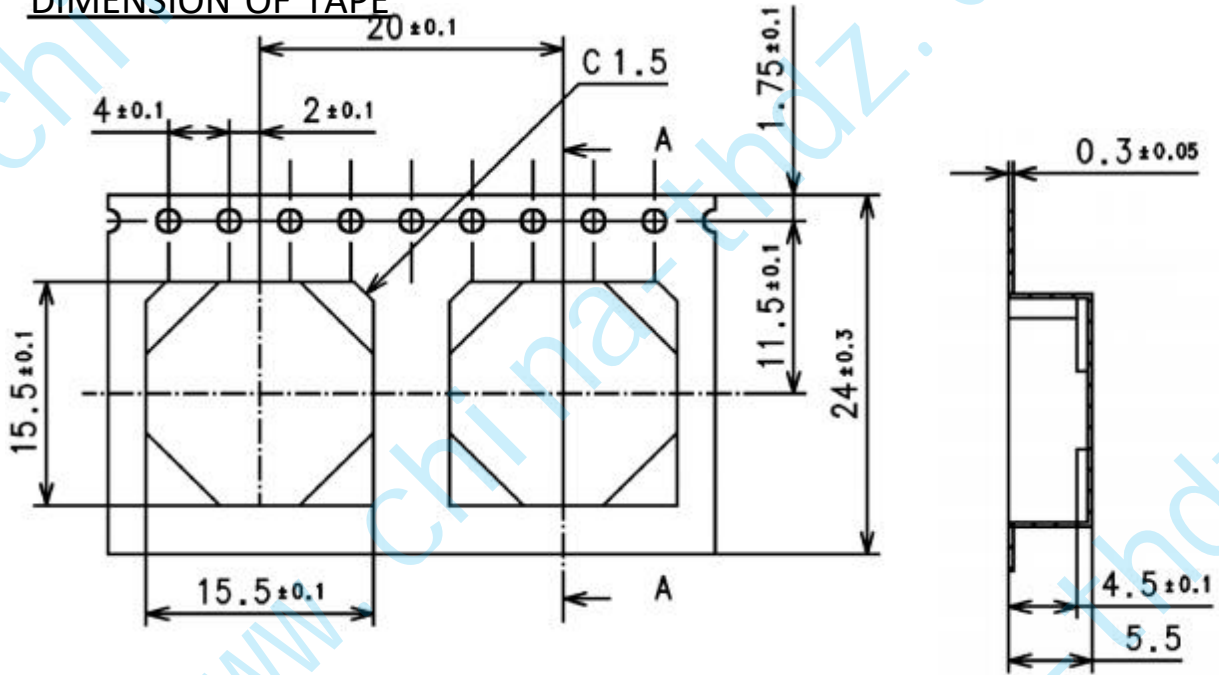
SAN-15A
PACKING



DIMENSION OF REEL

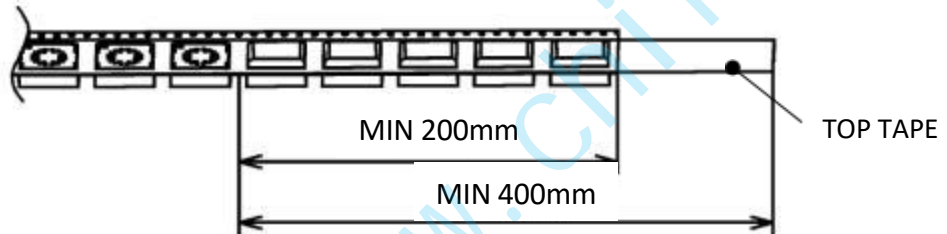


DIMENSION OF TAPE

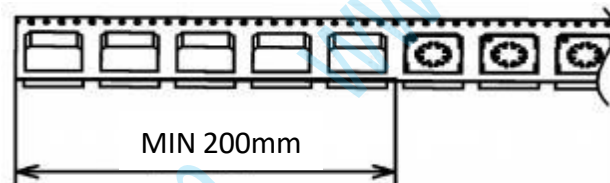


LENGTH OF TAPE

1) LEADER SECTION



2) TRAILER SECTION



SECTION A-A