

# SPECIFICATION FOR APPROVAL

## 承認書

Description : Piezo Audio Transducer

Kingstate Part No. : KMTG1102-A1

Customer's Model No. : \_\_\_\_\_

Specification No. : POD-7273

Number Of The Edition : 1.6

### CUSTOMER'S APPROVED SIGNATURE

|  |  |  |
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志豐電子股份有限公司 KINGSTATE ELECTRONICS CORP.

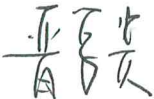


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| Approved by                                                                                       | Checked by                                                                                   | Issued by          |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------|
| <br>2013.10.18 | <br>10/18 | ChenLi<br>10/18/13 |

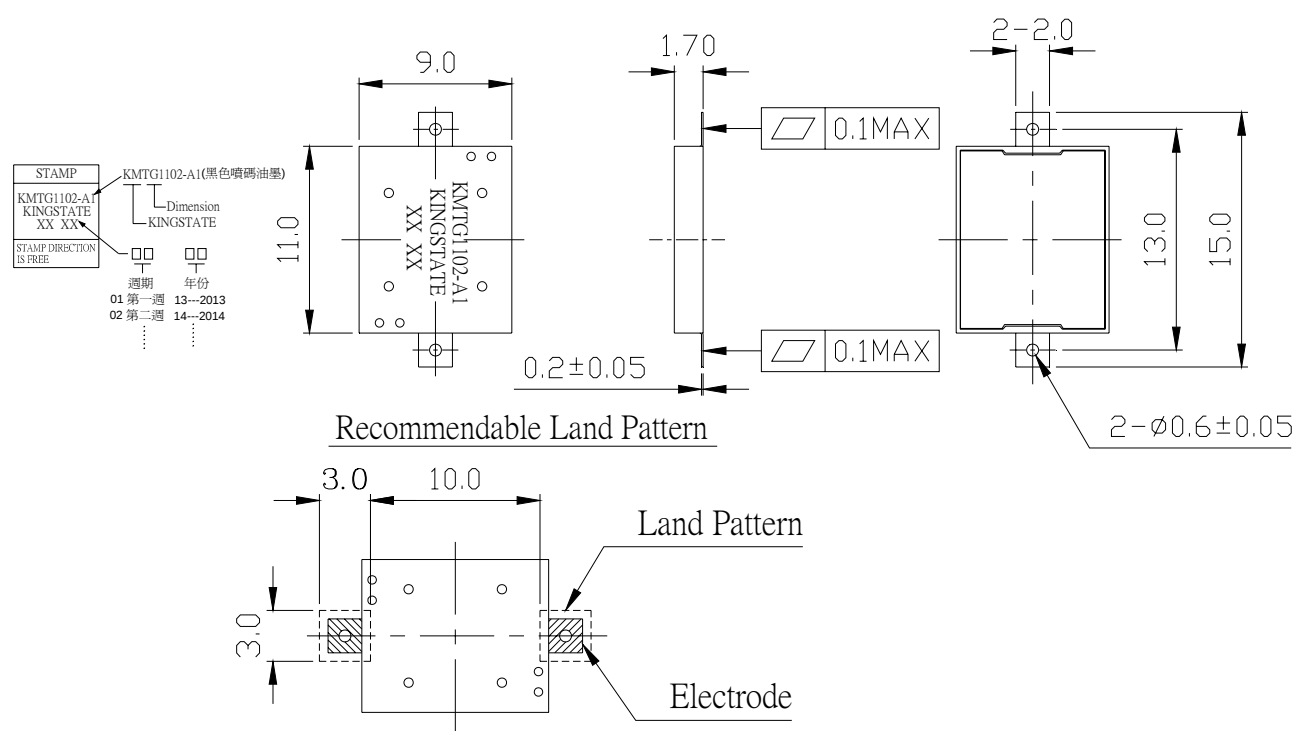
A. SCOPE 範疇

This specification applies piezo audio transducer, **KMTG1102-A1**  
此規格書適用於壓電式蜂鳴器, **KMTG1102-A1**

B. SPECIFICATION 規格

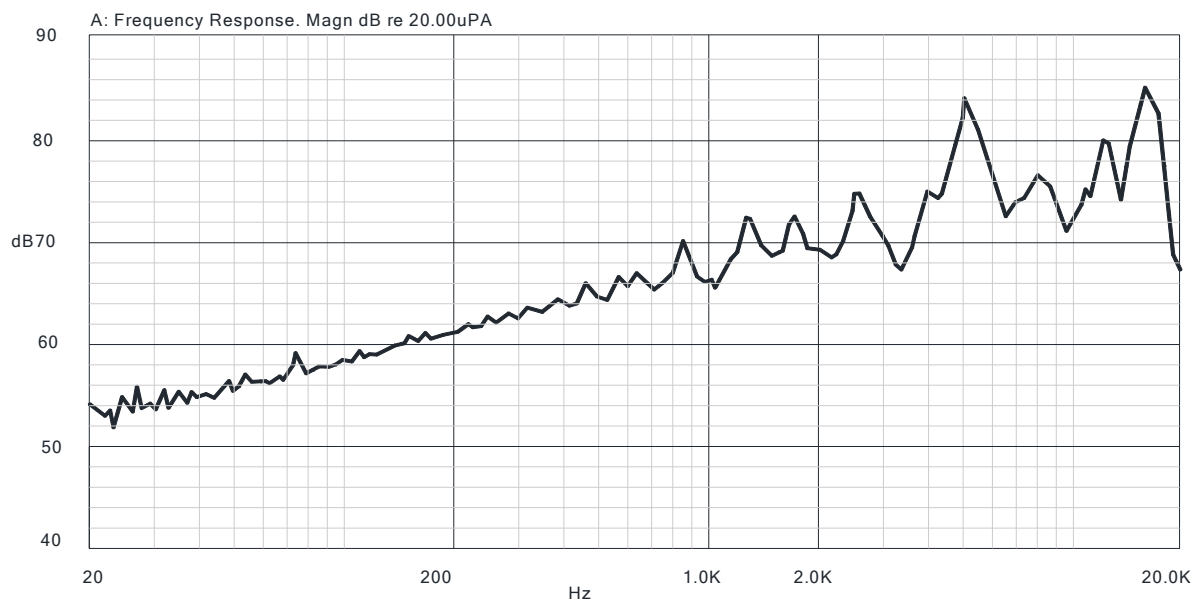
| No. | Item                                           | Unit | Specification       | Condition                          |
|-----|------------------------------------------------|------|---------------------|------------------------------------|
| 1   | Operating Volt. Range<br>最大操作電壓                | Vp-p | MAX 25              |                                    |
| 2   | Current consumption<br>消耗電流                    | mA   | MAX 4.5             | at 5Vp-p,square wave,4.1KHz.       |
| 3   | Sound pressure level<br>輸出音壓                   | dB   | MIN 73              | at 10cm/5Vp-p,square wave,4.1KHz   |
| 4   | Electrostatic capacity<br>靜電容量                 | pF   | 12,000 ± 30%        | at 1KHz/1V                         |
| 5   | Operating temp.<br>操作溫度                        | ℃    | -40 ~ +80           |                                    |
| 6   | Storage temp.<br>儲存溫度                          | ℃    | -40 ~ +80           |                                    |
| 7   | Dimension<br>尺寸                                | mm   | L11.0 x W9.0 x H1.7 | See appearance drawing<br>請參照外觀尺寸圖 |
| 8   | Weight (MAX)<br>重量                             | gram | 0.30                |                                    |
| 9   | Material<br>材質                                 |      | LCP (White)         |                                    |
| 10  | Terminal<br>端子                                 |      | SMD type            | See appearance drawing<br>請參照外觀尺寸圖 |
| 11  | Environmental Protection<br>Regulation<br>環保法規 |      | RoHS                |                                    |

C. APPEARANCE DRAWING 外觀尺寸圖



Tol: ± 0.3  
Unit: mm

## D. TYPICAL FREQUENCY RESPONSE CURVE 頻率響應曲線



## E. MEASURING METHOD 測量方法

S.P.L. Measuring Circuit 音壓測試接線圖

Input Signal: at 10cm/5Vp-p,4.1kHz, Square Wave

輸入信號: at 10cm/ 5Vp-p,4.1kHz, 方波



Mic : RION S.P.L meter UC30 or equivalent

Mic : RION 噪音計 UC30 或同等品

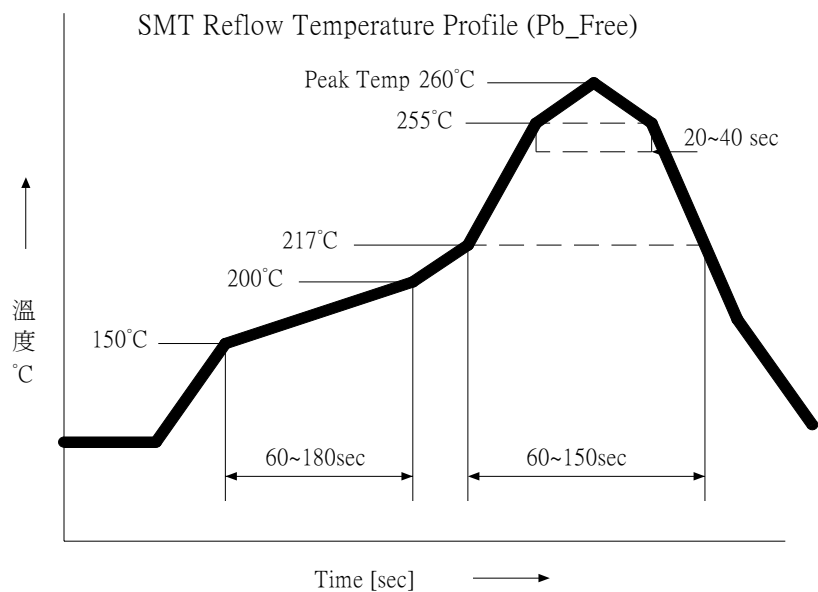
S.G : Hewlett Packard 33120A Function Generator or equivalent

S.G : Hewlett Packard 33120A 函數信號產生器或同等品

## F. MECHANICAL CHARACTERISTICS 機械特性

| No. | Item                                                                     | Test condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Evaluation standard                                                                                                                                                                                                                        |
|-----|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Solderability<br>焊錫附著性                                                   | Lead terminals are immersed in rosin for 5 seconds and then immersed in solder bath of $+350 \pm 5^{\circ}\text{C}$ for $3 \pm 1$ second.<br>端子浸松香液中 5 秒後置於錫膏內,錫膏溫度: $+350 \pm 5^{\circ}\text{C}$ . 焊接時間: $3 \pm 1$ 秒.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 95% surface of lead pads must be covered with fresh solder<br>錫膏須覆蓋端子上方 95%                                                                                                                                                                |
| 2   | Soldering<br>Heat<br>Resistance<br>焊錫耐熱性                                 | 1)IR reflow 遠紅外線熱風迴焊爐<br>Pre-heating conditions shall be $+150$ to $+200^{\circ}\text{C}$ for 60 to 180 seconds. Ascending time up to $+255^{\circ}\text{C}$ shall be longer than 55 seconds.<br>Heating conditions shall be within 20~40 seconds at $+255^{\circ}\text{C}$ min. But peak temperature shall be lower than $+260^{\circ}\text{C}$ , then being place in natural condition for 1 hour, sounder shall be measured<br>預熱條件為加熱到 $+150$ to $+200^{\circ}\text{C}$ 為 60 到 180 秒. 加熱到 $255^{\circ}\text{C}$ 時間須長於 55 秒.<br>焊接條件為 20~40 秒最低 $+255^{\circ}\text{C}$ , 最高不可超過 $+260^{\circ}\text{C}$ . 結束後須靜置於室溫中 1 小時後進行檢測<br>2)Soldering Iron 烙鐵<br>Soldering iron of $+350 \pm 5^{\circ}\text{C}$ shall be placed 0.5mm above from electrode of sounder. Melting solder through soldering iron shall be applied to electrode for $3 \pm 1$ seconds, then being place in natural condition for 4 hours, sounder shall be measured.<br>$+350 \pm 5^{\circ}\text{C}$ 的烙鐵置於電極上方 0.5mm 處, 以烙鐵將焊錫熔於電極上 $3 \pm 1$ 秒,然後置於室溫中 4 小時後進行檢測. | No interference in operation.<br>操作上無任何不良.                                                                                                                                                                                                 |
| 3   | Terminal<br>Mechanical<br>Strength<br>端子強度                               | The force 10 seconds of 9.8N is applied to each terminal is axial direction.<br>對每一端子以軸方向, 施 9.8N 拉力 10 秒.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | No damage and cutting off<br>端子不鬆動, 不脫落                                                                                                                                                                                                    |
| 4   | Vibration<br>振動測試                                                        | The part shall be subjected to a vibration cycle of 10Hz to 55Hz in a period of 1 minute. Total peak amplitude shall be 1.55mm. The vibration test shall consist of 2 hours per axis in each three axes (X, Y, Z), Total 6 hours.<br>振幅 1.55mm, 頻率 10Hz-55Hz, 時間 1 分鐘. X,Y,Z 3 個方向各 2 小時, 共 6 小時.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | After the test the part shall meet specifications without any damage in appearance and performance except SPL. The SPL shall be in $\pm 10\text{dB}$ compared with initial one.<br>經測試後,單體除音壓外,外觀及電氣特性須符合規格.輸出音壓變化量須在 $\pm 10\text{dB}$ 內. |
| 5   | Temperature<br>tolerance of<br>Conductive<br>Silver Paste<br>導電銀漿耐<br>溫性 | Conductive Silver Paste curing at $150^{\circ}\text{C}$ and then it can bear temperature less than $260^{\circ}\text{C}$ .<br>導電銀漿在 $150^{\circ}\text{C}$ 下固化後最高可承受 $260^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | No interference in operation.<br>操作上無任何不良.                                                                                                                                                                                                 |
| 6   | Survivability<br>of Reflow<br>process<br>迴流焊次數                           | Buzzer cannot through reflow process more than 2 times and please reference Temperature profile as figure 'G. Recommended Temperature Profile For Reflow Oven' is recommended.<br>依照“建議迴焊爐溫度曲線”圖,最多可承受兩次迴流焊                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | No interference in operation.<br>操作上無任何不良.                                                                                                                                                                                                 |

G. Recommended Temperature Profile For Reflow Oven 建議迴焊爐溫度曲線



Note: 260°C is Less than 20 sec  
備注: 260°C不可超過 20 秒

H. ENVIRONMENT TEST 環境測試

| No. | Item                    | Test Condition                                                                                                       | Evaluation standard                                                                                                                                                                                                                                                                               |
|-----|-------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | High temp. test<br>高溫測試 | After being placed in a chamber at +80°C for 240 hours<br>置於+80°C環境中 240 小時                                          | Being placed for 4 hours at +25°C, buzzer shall be measured. The value of oscillation frequency/ current consumption should be in ±10% compared with initial ones .The SPL should be in ±10dB compared with initial one.<br>經測試後, 靜置於+25°C (室溫) 環境中 4 小時後, 諧振頻率與消耗電流變化量須在±10%內. 輸出音壓變化量須在±10dB 內. |
| 2   | Low temp. test<br>低溫測試  | After being placed in a chamber at -40°C for 240 hours<br>置於-40°C環境中 240 小時                                          |                                                                                                                                                                                                                                                                                                   |
| 3   | Humidity test<br>相對濕度測試 | After being placed in a chamber at +40°C and 90±5% relative humidity for 240 hours<br>置於+40°C, 相對濕度 90±5% 環境中 240 小時 |                                                                                                                                                                                                                                                                                                   |
| 3   | Temp. Cycle<br>溫度循環測試   | <p>The part shall be subjected to 5 cycles.<br/>單體承受溫度循環測試 5 次. 其循環內容如圖示.</p> <p>Unit : minute</p>                   |                                                                                                                                                                                                                                                                                                   |

## I. RELIABILITY TEST 信賴性測試

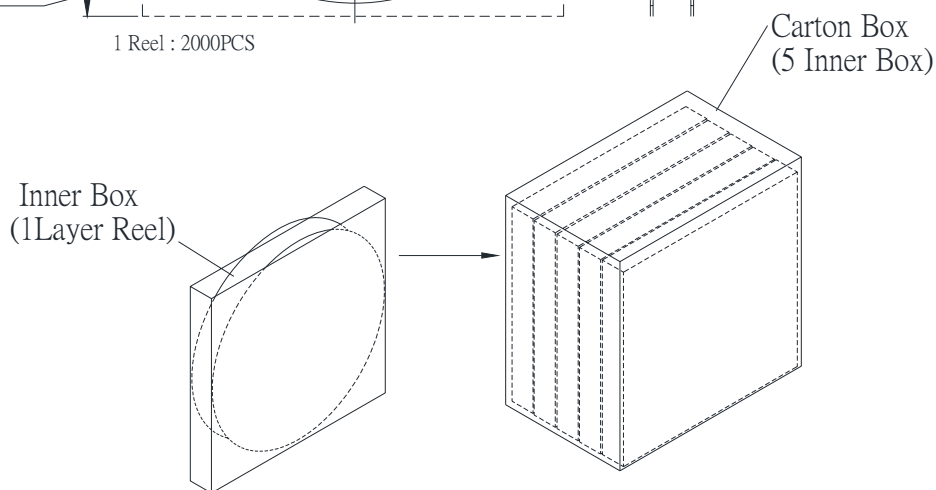
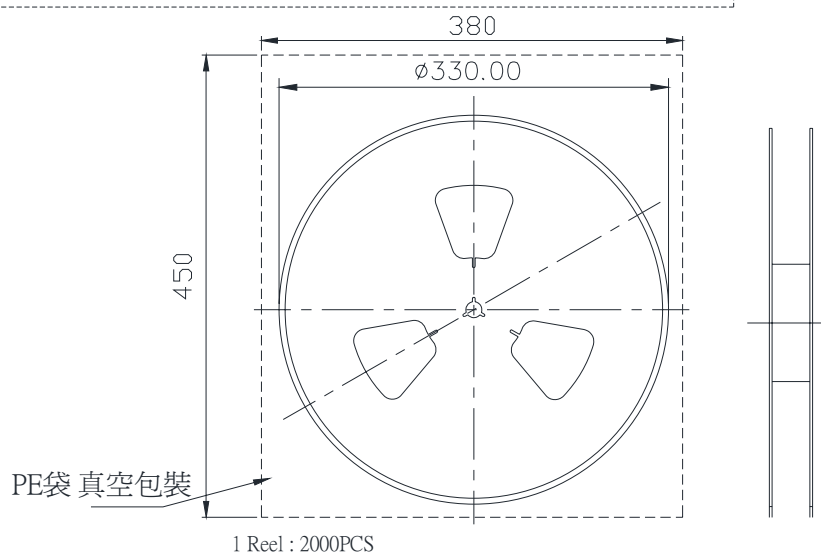
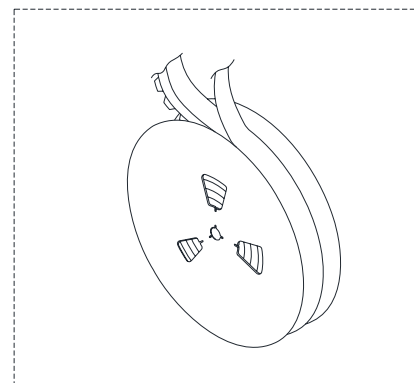
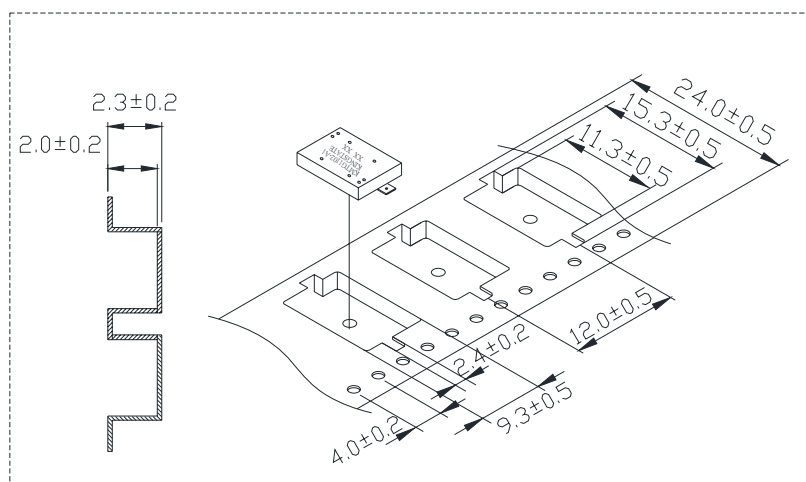
| No. | Item                        | Test condition                                                                                                                                                                                                                                                                                                                                                                    | Evaluation standard                                                                                                                                                                                                                                                                                          |
|-----|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Operating life test<br>壽命測試 | <p>1. Continuous life test 高溫壽命測試(連續)<br/>48 hours continuous operation at +65°C with rated voltage applied.<br/>在+65°C環境下,以額定電壓連續操作 48 小時.</p> <p>2. Intermittent life test 室溫壽命測試(間歇)<br/>A duty cycle of 1 minute on, 1 minutes off, a minimum of 5000 times at room temp. (+25 ±2°C) and rated voltage applied.<br/>在室溫下(+25 ±2°C), 以額定電壓操作, 通電 1 分鐘/斷電 1 分鐘,測試 5000 次循環.</p> | <p>Being placed for 4 hours at +25°C, buzzer shall be measured. The value of oscillation frequency/ current consumption should be in ±10% compared with initial ones. The SPL should be in ±10dB compared with initial one.</p> <p>經測試後, 靜置於+25°C (室溫) 環境中 4 小時後, 諧振頻率與消耗電流變化量須在±10%內. 輸出音壓變化量須在±10dB 內.</p> |

### TEST CONDITION.

|                          |   |                             |                      |                            |
|--------------------------|---|-----------------------------|----------------------|----------------------------|
| Standard Test Condition  | : | a) Temperature : +5 ~ +35°C | b) Humidity : 45-85% | c) Pressure : 860-1060mbar |
| 一般測試條件                   | : | a) 溫度 : +5 ~ +35°C          | b) 濕度 : 45-85%       | c) 氣壓 : 860-1060mbar       |
| Judgement Test Condition | : | a) Temperature : +25 ± 2°C  | b) Humidity : 60-70% | c) Pressure : 860-1060mbar |
| 爭議時測試條件                  | : | a) 溫度 : +25 ± 2°C           | b) 濕度 : 60-70%       | c) 氣壓 : 860-1060mbar       |

## J. PACKING STANDARD 包裝規格

|                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|---------------|--|----------|--|--------|--|--------|--|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|---------------|--|----------|--|--------|--|--------|--|
|                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| <div><div>KSD</div><div>C / NO.</div></div> | <div><div><div><div>↑↑</div><div>☂</div><div>🍷</div><div>✂</div></div><table><tr><td>Type</td><td></td></tr><tr><td>Specification</td><td></td></tr><tr><td>Quantity</td><td></td></tr><tr><td>Number</td><td></td></tr><tr><td>Weight</td><td></td></tr></table></div><div>VOLUME:CM</div></div> | Type |  | Specification |  | Quantity |  | Number |  | Weight |  | <div><div>KSD</div><div>C / NO.</div></div> | <div><div><div><div>↑↑</div><div>☂</div><div>🍷</div><div>✂</div></div><table><tr><td>Type</td><td></td></tr><tr><td>Specification</td><td></td></tr><tr><td>Quantity</td><td></td></tr><tr><td>Number</td><td></td></tr><tr><td>Weight</td><td></td></tr></table></div><div>VOLUME:CM</div></div> | Type |  | Specification |  | Quantity |  | Number |  | Weight |  |
| Type                                        |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Specification                               |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Quantity                                    |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Number                                      |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Weight                                      |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Type                                        |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Specification                               |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Quantity                                    |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Number                                      |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
| Weight                                      |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |
|                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |                                             |                                                                                                                                                                                                                                                                                                   |      |  |               |  |          |  |        |  |        |  |



1. 內外箱成品料號KMTG1102-A1
2. ① 綠色環保標籤貼於內外箱上

|            |                   |                    |
|------------|-------------------|--------------------|
| Inner Box  | 340mmx340mmx40mm  | 1x2000PCS=2000PCS  |
| Carton Box | 350mmx175mmx355mm | 5x2000PCS=10000PCS |