

		SPECIFICATION	PRODUCT	LINEAR VIBRATOR
			MODEL	DMJBRN0934AA
			REVISION NO.	-

No. _____

SPECIFICATION for APPROVAL

■ Customer	: "Standard"
Customer Model	:
■ Product	: Linear Vibrator(Φ9.0x3.4T)
SEMCO Model	: DMJBRN0934AA
■ Date	: SEP. 19. 2012

Front View	Back View
	

Customer's Approval

Date	Designed	Checked	Approved
SEP. 19. 2012	A.S.YOON	Y.J.KIM	J.H.KIM



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4. Measurement Conditions, Input Voltage / 측정조건, 입력전압
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2. Applications / 적용범위

These specifications provide structure,function and usage condition of Linear Vibrator used in mobile communication devices for silence call. Linear Vibrator is designed and manufactured by SAMSUNG ELECTRO-MECHANICS CO., LTD.

본 사양서는 무음착신을 위하여 모바일통신기기에 사용되어지는 Linear Vibrator의 구조,기능,사용조건을 제공한다. Linear Vibrator는 (주)삼성전기가 설계하고 제조한다.

3. Storage, Operating Temperature Conditions / 보존,동작 온도조건

NO	Item / 항목	Condition / 조건
3-1	Operating Temperature Range 동작온도범위	-15 Celsius ~ +55 Celsius
3-2	Storage Temperature Range 보존온도범위	-20 Celsius ~ +60 Celsius

4. Measurement Conditions, Input Voltage / 측정조건, 입력전압

NO	Item / 항목	Condition / 조건
4-1	Temperature / 온도	20 Celsius $\pm$ 5 Celsius
4-2	Humidity / 습도	65%RH $\pm$ 20%RH
4-3	Rated Input Voltage / 정격입력전압	2.0 Vrms AC, Sinewave
4-4	Input Voltage Range / 입력전압범위	0.1 ~ 2.05 Vrms AC
4-5	Input Frequency / 입력주파수	205 $\pm$ 0.1 Hz
4-6	Operating Attitude / 동작자세	Refer to Figure 1 / Figure 1 참조



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※ Test Method / 측정방법

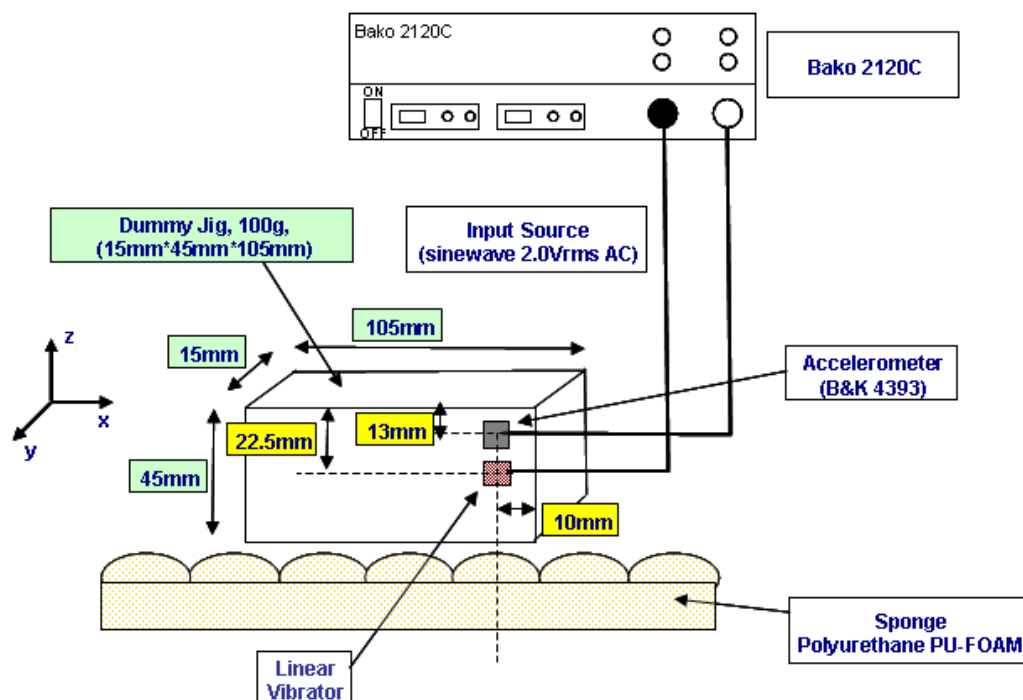


Figure 1. An Example of Measurement Method of Linear Vibrator

■ Linear Vibrator/ Accelerometer mounting position (refer to Figure 1)

Linear Vibrator / Accelerometer 장착위치 (그림 1 참고)

- Linear Vibrator는 Dummy Jig의 15mm 방향(y 방향)으로 진동하도록 장착한다.
- Linear Vibrator should be mounted to vibrate 15mm direction (y-direction) on Dummy Jig
- Accelerometer도 'y방향' 진동을 측정할 수 있도록 Jig에 부착시킨다.
- Also, Accelerometer should be mounted to measure y-direction vibration on Dummy Jig

■ Dummy Jig position / Dummy Jig 장착상태

- Dummy Jig는 15mm*105mm 면이 Sponge면에 접하도록 올려 놓는다.
- 15mm*105mm plane of Dummy Jig should be located on Sponge
- Dummy Jig의 진동발생방향(y 방향)으로 외부간섭이 최소화되도록 하여 진동가속도 값을 측정한다.
- At measurement of acceleration, Dummy Jig should be stabilized.

■ Measurement of Acceleration / 진동가속도 측정

- Input Source(2.0Vrms AC, sinewave) 인가후 2~3초 경과시점에 진동가속도를 측정한다
- Acceleration of Linear Vibrator should be measured 2~3 second later when source inputed (2.0Vrms AC, sinewave)
- 정밀측정을 위해서는 측정시료 1EA에 대하여 진동가속도를 3회 측정하여 평균값을 진동가속도 값으로 취한다.
- For the precise measurement, Acceleration of Linear Vibrator is average data (repeat 3 times each Linear Vibrator)



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5. Specifications / 사양

Measurement Standard : Refer to No. 4 Measurement Conditions

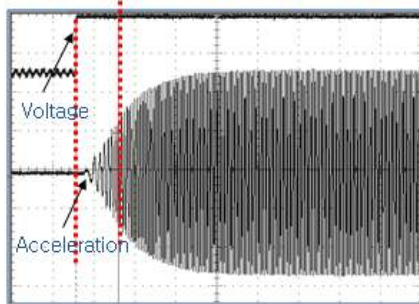
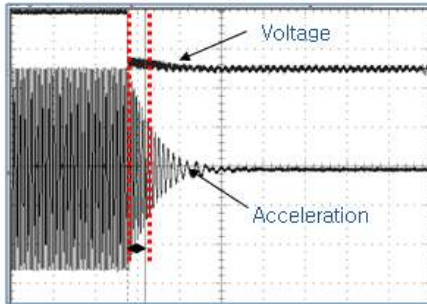
/ 측정기준 : 4항의 측정조건

NO	Item / 항목	Specification / 사양
5-1	Resistance / 저항	24 Ohm $\pm$ 10%
5-2	Rated Current / 정격전류	Max 90 mArms (Input Source : 205Hz, 2.0Vrms AC, sinewave)
5-3	Acceleration / 진동가속도	Min. 1.0 Grms (Input Source : 205Hz, 2.0Vrms AC, sinewave)
5-4	Resonance Frequency / 공진주파수	205 $\pm$ 5 Hz
5-5	Frequency Characteristics / 주파수 특성	Refer to Graph 1 / Graph 1 참조
5-6	Motor Height / 모터높이 치수	3.4 $\pm$ 0.1mm - Put the Case of the motor on JIG, after zero setting, and measure center point of Bracket by Height Gauge. - 측정설비: Height Gauge - 측정방법: Case면을 JIG위에 올려놓고 Zero setting한후 Bracket 중앙부를 측정한다
5-7	Noise / 소음	Max 50 dBA (10cm distance from microphone, Input Source : 205Hz, 2.0Vrms AC, sinewave)
5-7-1	Noise by mechanical touch (Noise_T) / 기계적 터치에 의한 소음 (따닥소음)	5-7항의 소음을 양산시 전수검사하기 위한 방법으로 별도의 측정설비를 사용할 수 있다. ■ 측정조건 - 측정설비 모델 : Bako 2120C - 측정방법 : Harmonic성분(205Hz배수)을 제외한 나머지 성분의 합으로 검출 ■ SPEC : Max 35dB (Input Source : 2.0Vrms AC, sinewave)
5-8	Ringing Force / 잔진동	Max 0.45Grms (0.2Vrms, 주파수sweep시 최대값)
5-9	Insulation Resistance / 절연저항	Min 10 Mega Ohm (100V DC input, between Case and Lead Wire)



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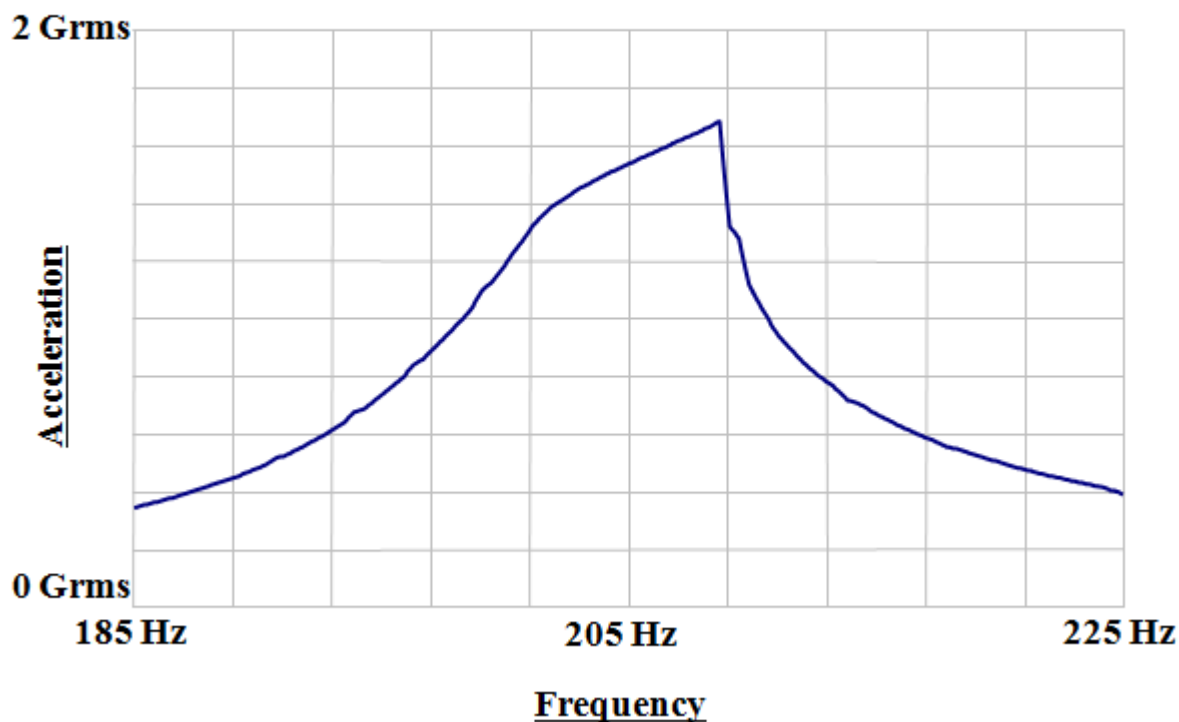
NO	Item / 항목	Specification / 사양
5-10	Rising Time / 응답시간	Max 50msec 진동 최대치의 50% 수준에 도달하는 시간 ◆ Rising Time [msec] – 50% 
5-11	Falling Time / 감쇄시간	Max 80msec 전원 off 후 진동 최대치의 50% 수준에 도달하는 시간 ◆ Falling Time [msec] – 50% 



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Acceleration Characteristics



Graph 1. Linear Vibrator Frequency Characteristics
/ 주파수 특성



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6. Reliability Test / 신뢰성시험

NO	Item / 항목	Conditions / 조건
6-1	Life test 수명시험	Operating at rated input voltage (2.0Vrms AC, Sinewave), input frequency (205Hz) for 200,000cycle, on(2sec)/off(1sec). 정격입력전압 (2.0Vrms AC, Sinewave), 입력주파수(205Hz)에서 2초on/1초off, 200,000cycle 동작
6-2	Thermal shock test 열충격시험	-40 Celsius ~ 85 Celsius in each of 2Hrs(1cycle), Total 15cycles. Transition time is 5 minutes max. After the test, the Vibrator should be measured after room-temperature storage for 4Hrs. -40 Celsius 2시간, +85 Celsius 2시간(1cycle), 총15cycle. 변화시간은 5분이하. 시험후 상온에서 4시간 보존후 측정
6-3	High temperature storage test 고온보존시험	+70 Celsius, 168Hrs, After the test, the Vibrator should be measured after room-temperature storage for 4Hrs. +70 Celsius, 168시간, 시험후 상온에서 4시간 보존후 측정
6-4	Low temperature storage test 저온보존시험	-30 Celsius, 168Hrs, After the test, the Vibrator should be measured after room-temperature storage for 4Hrs. -30 Celsius, 168시간, 시험후 상온에서 4시간 보존후 측정
6-5	Static humidity test 내습보존시험	+50℃, 95%RH, 120Hrs, After the test, the Vibrator should be measured after room-temperature storage for 4Hrs. +50 Celsius, 95%RH, 120시간, 시험후 상온에서 4시간 보존후 측정
6-6	Vibration test 진동시험	Vibrator that is attached to a 160 gram dummy jig is vibrated with 2.2G, 10~55Hz/min for 10minutes in each of X,Y,Z axis. Vibrator는 160g dummy jig 안에 장착되고, X,Y,Z 3방향에서 2.2G, 10~55Hz로 각 10분간 진동시킨다.
6-7	Mechanical shock test 비포장낙하시험	The Vibrator that is attached to a 160 gram dummy jig is dropped to a steel floor 30 times(6face, 5times in each of X,Y,Z axis) from 1.5 meters in height. Vibrator는 160g dummy jig 안에 장착되고, 1.5m 높이에서 30회(6면,5회) 철판에 떨어뜨린다.



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▶ **JUDGEMENT / 판정조건**

① **After test, following specifications must be satisfied.**

시험후에, 다음의 사양들이 만족되어야 한다.

- **Acceleration / 진동가속도 : Initial Value $\pm 30\%$ / 초기치대비 변화율 $\pm 30\%$ 이하**
- **Rated Current / 정격전류 : 90 mArms Max**
- **Noise_T / 소음 : 38dB Max**

② **There should be no abnormalities in appearance and structure.**

외관 및 구조상 이상이 없을것



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7. Caution for Use / 주의사항

(1) Do not press the product with more than 0.5 kgf or drop it.

It can cause the transformation of performance or external appearance.

0.5kgf 이상의 힘을 가하거나 떨어뜨리지 않도록 주의하십시오.

기능상 또는 외관구조상 변화를 초래할 수도 있습니다.

(2) Don't use under the following conditions. It may cause a decline in performance.

다음과 같은 조건에서 사용하지 않도록 주의하시기 바랍니다. 성능저하를 초래할 수 있습니다.

- Do not drop into fluid (such as: water, alcohol, etc.)

물이나 알코올과 같은 유동성물질에 담그지 않도록 하십시오.

- Do not keep at high temperature or high humidity for extended periods of times

고온이나 고습에서 장시간 방치하지 않도록 주의하십시오.

- Do not use near gases which cause erosion

부식성 가스 근처에서 사용하지 마시기 바랍니다.

- Please refrain from operating the vibrator near magnetic devices.

자성을 띠는 장치 근처에서 사용하지 마십시오.

(3) The vibrator has a strong magnet, so please be aware that it has a magnetic force on the surface of the bracket.

vibrator 내부에는 강력한 자석을 사용하고 있습니다. 외관마감재인 case, bracket의 외부로 자기력이 누설될 수도 있으니 주의하시기 바랍니다.

(4) To optimize the vibration force, rated frequency and voltage could be changed as to assemble condition.

진동량을 최적화하기 위하여, 정격주파수와 정격전압은 제품조립조건에 따라서 변경될 수 있습니다.

(5) Packing : Please refer to the packaging drawing.

(It can be modified by the request of the users.)

포장 : 포장도면 참조하시기 바랍니다. (고객의 요구에 의해서 변경될 수 있습니다.)

(6) If any problems occur, both the user and Samsung Electro-Mechanics Co.,Ltd. shall try to solve the problem by mutual agreement and on reflection of the specification sheet.

문제가 발생하면, 고객과 (주)삼성전기는 상호협의 및 사양서에 근거하여 해결하도록 노력한다.

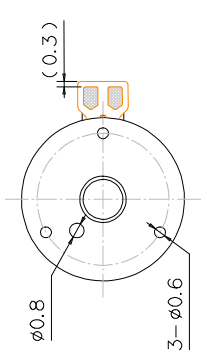
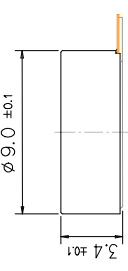
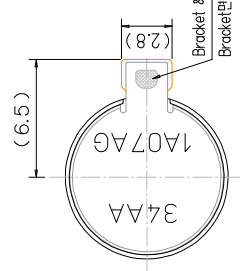


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8. SPEC Drawing / 외관도면

REVISED		DESCRIPTION		DRAWN	CHECKED	APPROVED
ZONE	LTR					

※. NOTES

- 모델명 : DMJBRN0934AA
- 모델 : DMJBRN0934AA
- 이 도면은 외관위주로 명기되어 있으며, 기타 성능부분은 승인원을 참고할 것.
- THIS DRAWING EXPRESS APPEARANCE SIZE, PERFORMANCE OF VIBRATOR REFER TO SPECIFICATIONS OF APPROVAL.
- LOT NUMBER 관리
- MARKING CLASSIFICATION
 - 34AA : MODEL NAME
 - 1 : YEAR (2010 = 0, 2011 = 1, ..., 2020 = 0, ...)
 - A : MONTH (Jan. = 1, ..., Sep. = 9, Oct. = A, Nov. = B, Dec. = C)
 - 07 : A DAY (EX : 9TH = 09, 10TH = 10)
 - A : LINE / DAY OR NIGHT (A = #1/DAY, B = #1/NIGHT, ...)
 - G : MANUFACTURING SITE (EX : G, X, ...)

LINEAR VIBRATOR		MATERIAL	QTY	9PH ± 3.4T	FINAL SIZE	STOCK SIZE	REMARK
DET	NAME						
1	LINEAR VIBRATOR		1				

SIGNATURES		MO/DAY/YR	
DRAWN	CHECKED	J.H.BANG	03/16/12
ENGINEER		S.J.PARK <th>03/16/12</th>	03/16/12
APPROVED		Y.J. KIM <th>03/16/12</th>	03/16/12
		J.H.KIM <th>03/16/12</th>	03/16/12

UNLESS OTHERWISE SPECIFIED		TOLERANCES (LENGTH)	
DEC.		~ 4	4 ~ 20
X	±0.3	±0.5	±0.7
XX	±0.25	±0.4	±0.6
XXX	±0.2	±0.3	±0.5
	±0.020	±0.020	±0.020

UNIT : mm	
ALGUE	±0.1
CHAMFER	±0.1
BREAK SHARP EDGE	0.3 MAX
CORNER RAD	0.3 ~ 0.8

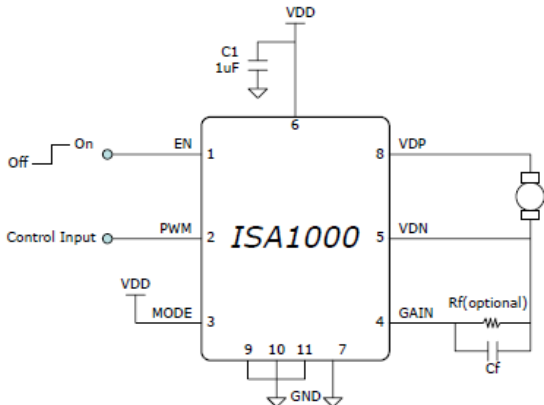
SHEET		PART NO.	
NO.	REV.	DEPT	SCALE
		DMJBRN0934AA	5 / 1
		SPEC DRAWING-00	WT
			Kg
			SHEET 1 OF 1



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9. Application Recommendation / 적용 권장사항

NO	Contents / 내용
9-1	<Set Location / Set 장착위치> - To maximize the vibration force and optimize other characteristics, vibrator location in set is recommended as corner of set. - 진동량을 크게하고 다른 특성들을 최적화하기 위하여, Vibrator의 위치는 Set의 모서리에 장착하는 것이 좋습니다. 
9-2	<Drive Circuit / 구동회로> - You can use ISA1000 made by IMAGIS Technology to drive vibrator. - Vibrator를 구동하기 위하여 IMAGIS Technology에서 제조한 ISA1000 driver를 사용할 수 있습니다. 



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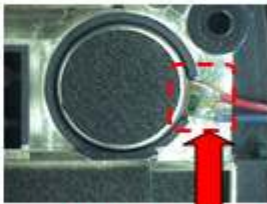
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NO	Contents / 내용
----	---------------

<Mounting example / 마운팅 예>

- It recommends to that it attaches in double side tape & cushion sponge in the top and bottom of Linear vibrator. (Prevention of drop damage and Noise)
- The gap between vibrator and mold-guide is recommended 0.1mm.
- The part which UV bond attaches must be escaped so that it is not interfered.
- 진동모터 상하로는 양면테이프와 cushion sponge를 부착하는 것을 권고함.
(진동량전달 최적화, 낙하시 충격에 의한 파손방지, 구동이음 최소화)
- 옆방향 가이드 기구물은 0.1mm gap이 권장되며, Lead wire가 부착되는 부분은 UV본드로 고정되므로, 간섭되지 않도록 도피되어야 한다.

◆ Mounting Example

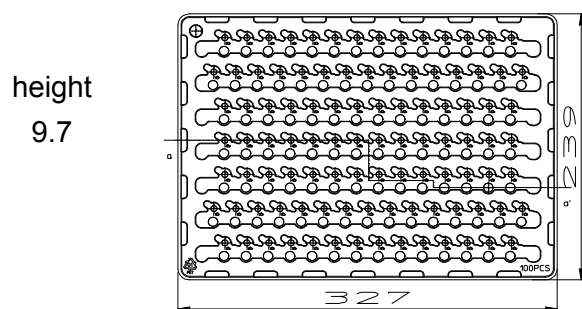
Unit	Before	After	Remark	Picture
Cushion	0.35	0.25	20~40% 压着	
Vibrator	3.10	3.10		
Tape	0.15	0.15	SonyT4000	
Total	3.60	3.50		

UV bond part

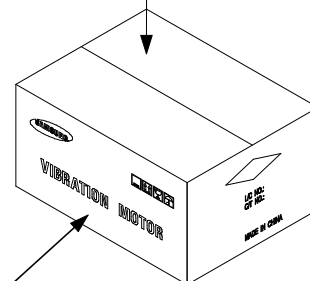
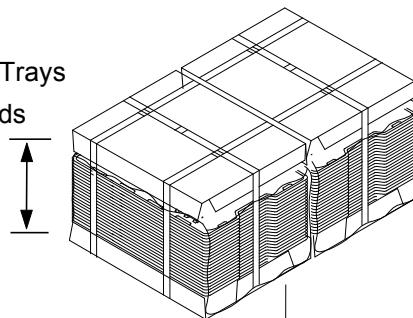
 	SPECIFICATION	PRODUCT	LINEAR VIBRATOR
		MODEL	DMJBRN0934AA
		REVISION NO.	-

10. Packaging / 포장사양

PET tray dimension



20(21) Trays
+ 2 Pads



『 packing status 』

[packing quantity]

- 100ea/ tray
- 1 carton box
 - 40(42) trays with a dummy tray on the top
 - 4000ea/ carton box,



[Halogen Free Marking]

No	Material	Size	Q'ty/Lot	How to Pack
1	PET Tray	327x239x9.7	40(42)	● 40(42) trays are packed with packing vinyl. ● The trays are bound with pad and pp band ● One bound traies are put to a carton. ● Lot Numbering ● Delivery
2	Box	510x350x175	1	
3	Pad		4	
4	Packing vinyl		2	
5	PP-band		-	



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