台灣半導體股份有限公司
231 台北縣新店市北新路三段205號11樓
電話:886-2-8913-1588
傳真:886-2-8913-1788

TAIWAN SEMICONDUCTOR CO., LTD.
11F, No. 205 Sec. 3, Beishin RD.
Shindian Dist., New Taipei City, Taiwan, R.O.C. 231
Tel:886-2-8913-1588 Fax:886-2-8913-1788

PCN17027【A new fully-automated SMC backend assembly line increase for Consumer】Comparison Report

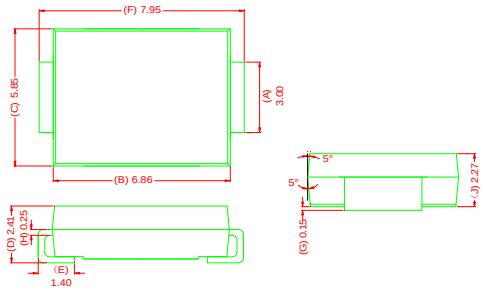
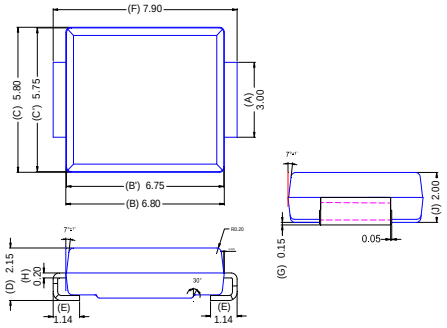
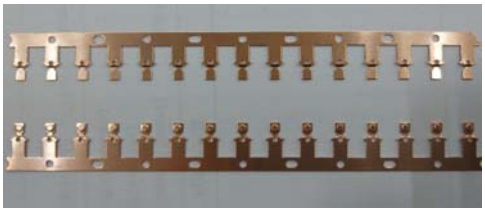
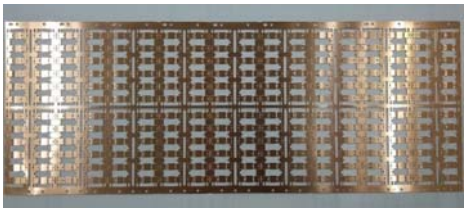
Prepared by Lucy Fan
Checked by Reyn Qin
Approved by Reyn Qin
Issued date at 2017.9.19
Reversion for 4

台灣半導體股份有限公司
231 台北縣新店市北新路三段205號11樓
電話:886-2-8913-1588
傳真:886-2-8913-1788

TAIWAN SEMICONDUCTOR CO., LTD.
11F, No. 205 Sec. 3, Beishin RD.
Shindian Dist., New Taipei City, Taiwan, R.O.C. 231
Tel:886-2-8913-1588 Fax:886-2-8913-1788

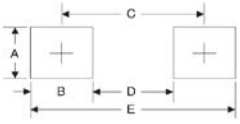
Comparison report

Subject PCN NO: PCN17027
SMC VS Matrix SMC Comparison Report

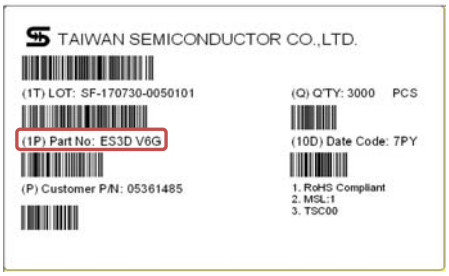
No	Item	SMC	Matrix SMC	Remark
1	**Processes**	Manual SMC production line	Fully-automated SMC production line	Refer the attached Page 4 Processes Comparison
2	**General appearance**	Follow D/S POD refer to the attached	Follow D/S POD refer to the attached	Refer the attached Page 5-7 Appearance Comparison
3	**Package Outline**			
3-1	**Package Dimension**			
4	**Pad Layout**			No Change
5	**Dice**	Material : Si Dice size: No Change	Material : Si Dice size: No Change	
6	**Lead Frame**	Supplier : A Material : KFC 	Supplier : B Material : KFC 	Refer the attached Page 8 Lead Frame Comparison

ITEM	A			B			C			D			E			F			G			H			J		
	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max
JEDEC DO-214AB	2.90	-	3.20	6.60	-	7.15	5.55	5.90	6.25	1.95	2.30	2.65	0.75	1.15	1.60	7.75	7.95	8.15	0.05	0.15	0.20	0.15	-	0.41	1.90	2.15	2.45
TSC Data Sheet	2.90	3.05	3.20	6.60	6.86	7.11	5.59	5.91	6.22	2.00	2.31	2.62	1.00	1.30	1.60	7.75	7.94	8.13	0.10	0.15	0.20	0.15	0.23	0.31	-	-	-
Manual SMC	-	3.00	-	-	6.86	-	-	5.85	-	-	2.41	-	-	1.40	-	-	7.95	-	-	0.15	-	-	0.25	-	-	2.27	-
Matrix SMC	-	3.00	-	-	6.80	-	-	5.80	-	-	2.15	-	-	1.14	-	-	7.90	-	-	0.15	-	-	0.20	-	-	2.00	-

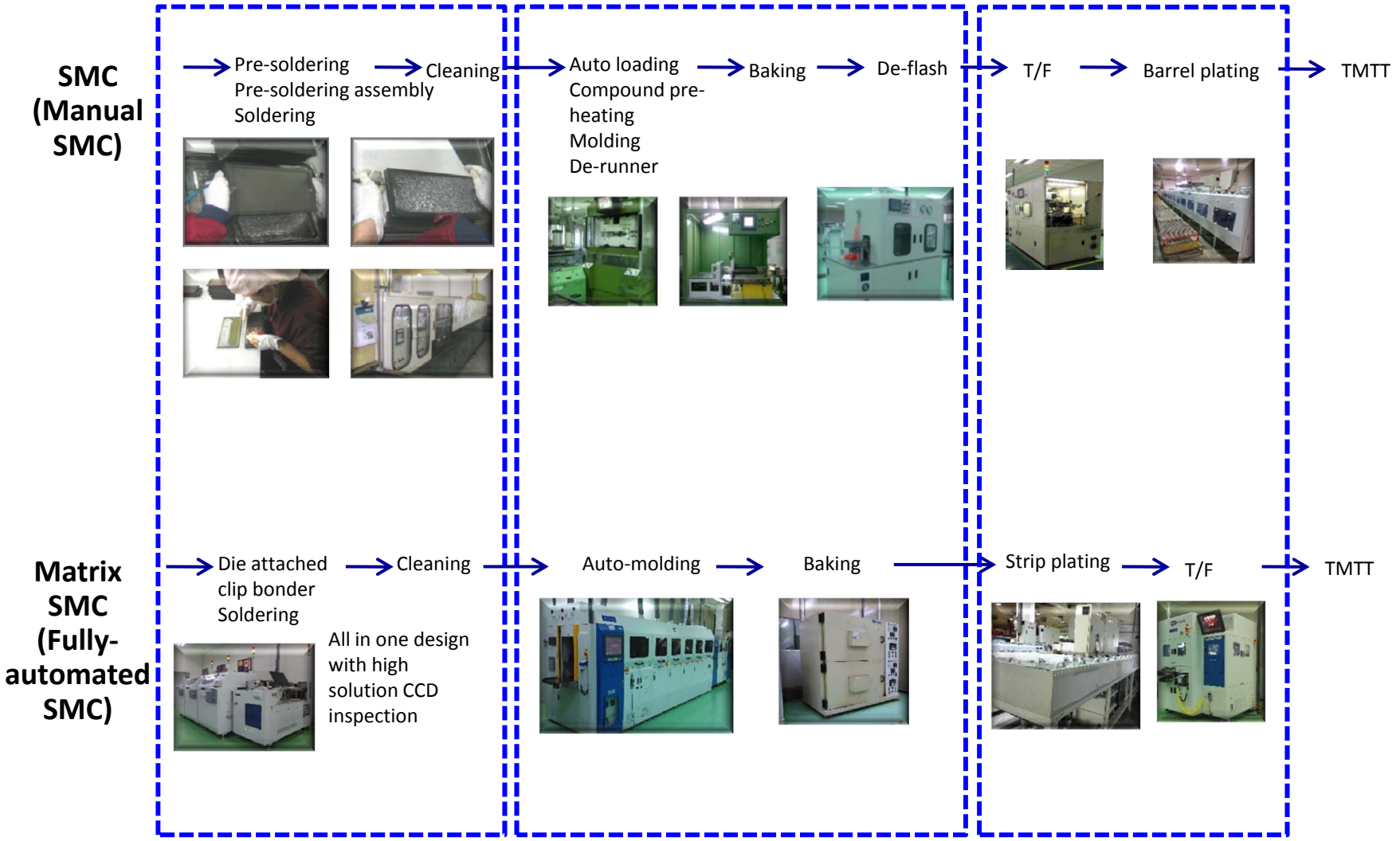
SUGGESTED PAD LAYOUT



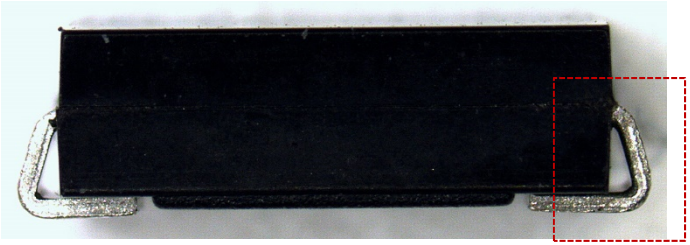
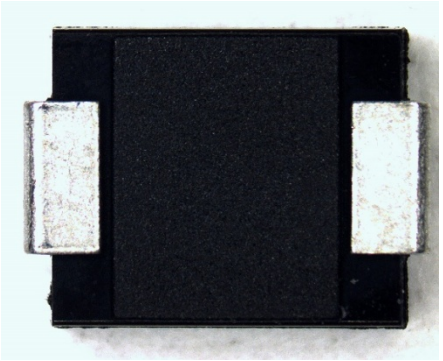
Symbol	Unit (mm)	Unit (inch)
A	3.3	0.130
B	2.5	0.098
C	6.8	0.268
D	4.4	0.173
E	9.4	0.370

No	Item	SMC	Matrix SMC	Remark
7	**Molding Compound**	Automotive (Non-HF) Type: EME-66XX Material : Epoxy Automotive (HF) Type: EME-E500 Material : Epoxy Consumer (Non-HF) Type: EME-1100/EME-1200 Material : Epoxy Consumer (HF) Type: EME-E110G Material : Epoxy	Automotive (HF) Type: EME-E500 Material : Epoxy Consumer (HF) Type: EME-E500 Material : Epoxy	
8	**Packing code**	M6 : 13" Diameter Plastic Reel R6 : 13" Diameter Paper Reel R7 : 7" Diameter Plastic Reel	V6 : 13" Diameter Plastic Reel V7 : 7" Diameter Plastic Reel	
9	**Marking**	Marking no square around datecode	Marking add special square around datecode	Refer the attached Page 9 Marking Comparison
10	**Label**			Label format no Change
11	**Packing**	refer to the attached Packing Comparison	refer to the attached acking Comparison	Refer the attached Page 10 Packing Comparison

Processes Comparison-SMC & Matrix SMC



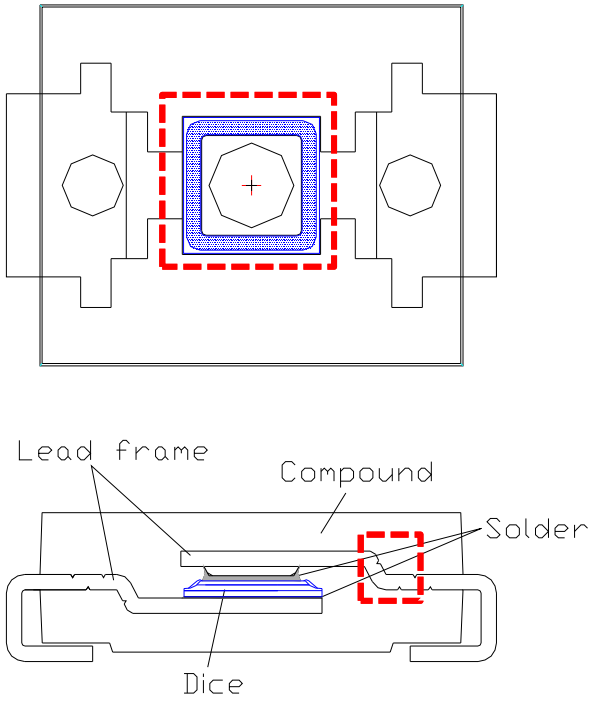
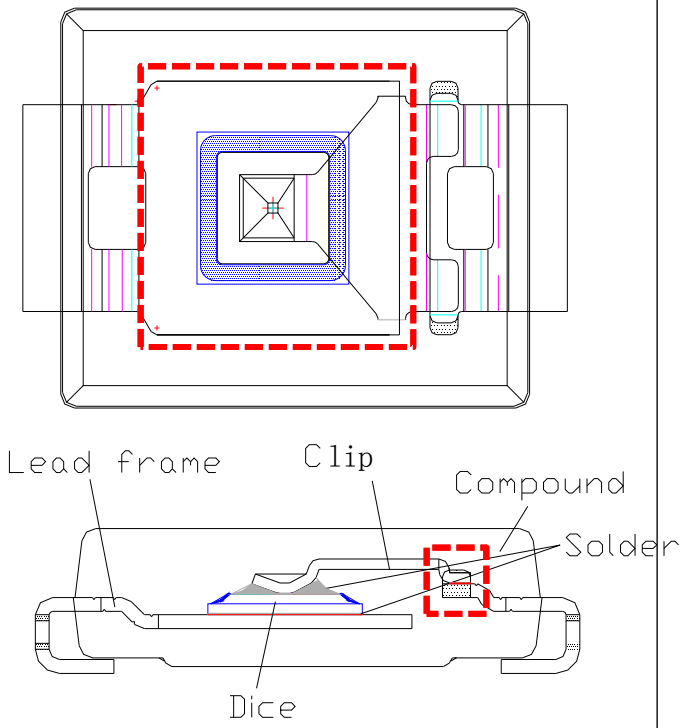
Appearance Comparison-SMC & Matrix SMC

Item	SMC (Manual SMC)	Matrix SMC (Fully-automated SMC)
Top		
Side		
Bottom		

Uniform forming designed

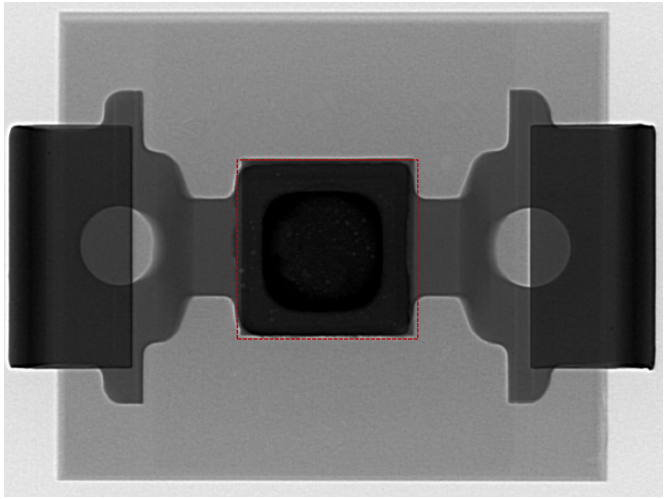
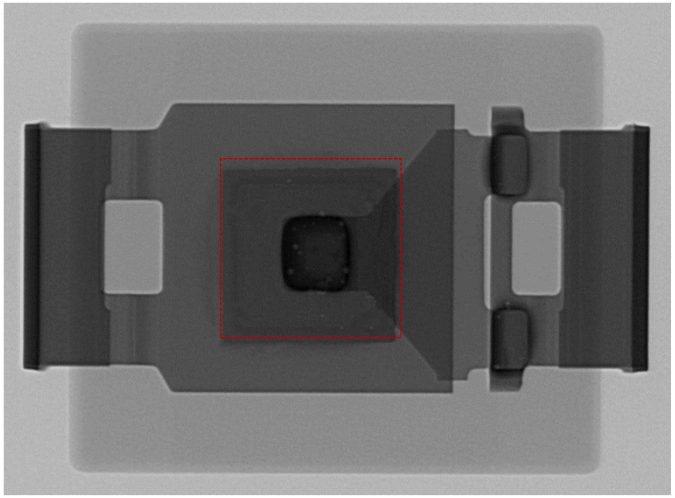
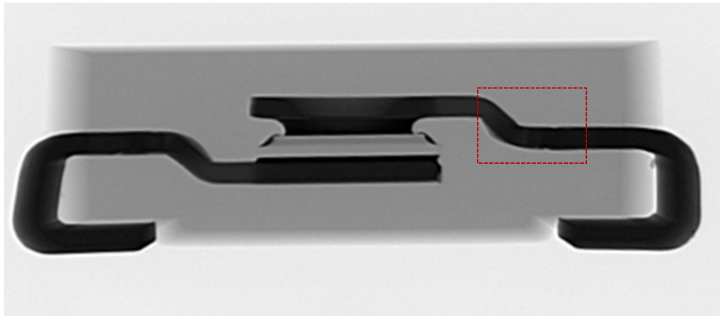
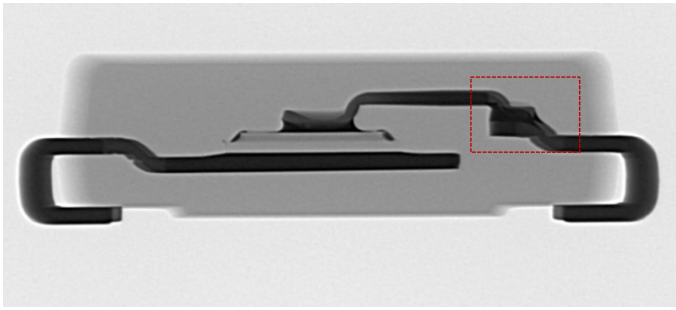
TAIWAN SEMICONDUCTOR

Lead Frame Design Comparison-SMC & Matrix SMC (Example : GPP 88mil)

Package	SMC (Manual SMC)	Matrix SMC(Fully-automated SMC)
Lead Frame		

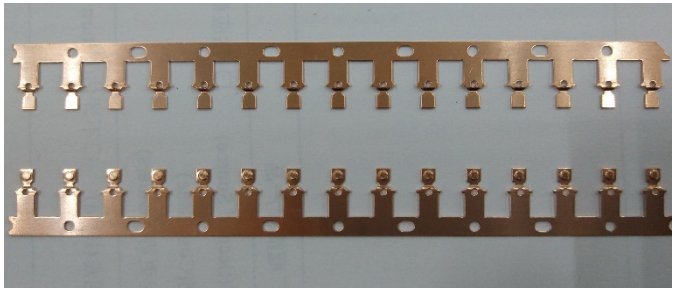
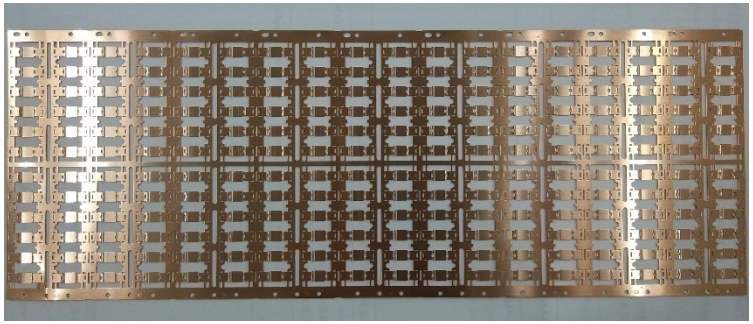
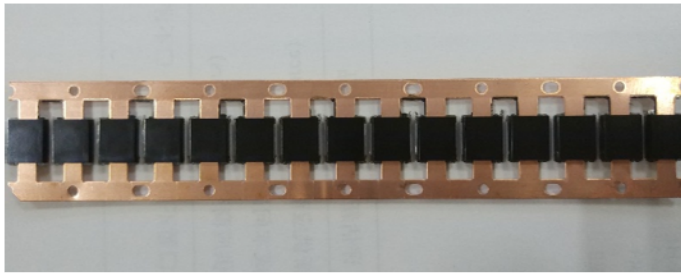
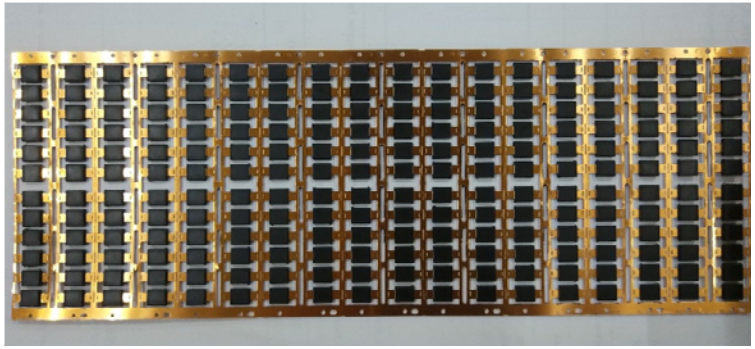
Big die solder pad designed for better thermal dissipation.
Additional solder join between Lead frame and clip reduce soldering thermal stress from wave soldering.

X-RAY Comparison-SMC & Matrix SMC

Item	SMC (Manual SMC)	Matrix SMC (Fully-automated SMC)
Top		
Side		

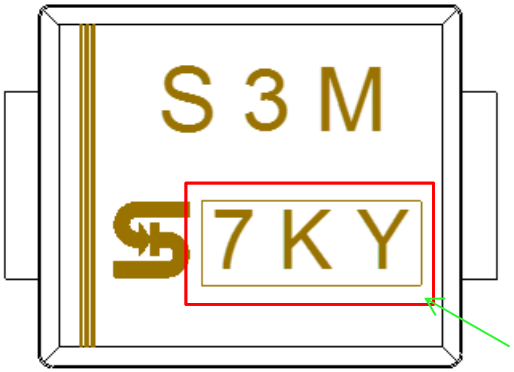
Big die solder pad designed for better thermal dissipation.
Additional solder join between Leadframe and clip reduce soldering thermal stress from wave soldering.
Extension temperature cycle from 1000cyc. To 3000cyc.

Lead Frame Comparison-SMC & Matrix SMC

Package	SMC (Manual SMC)	Matrix SMC (Fully-automated SMC)
Lead Frame		
After Molding		

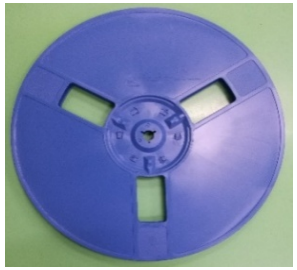
Hi-density leadframe designed instead low productivity designed.

Marking on Device Comparison-SMC & Matrix SMC

SMC (Manual SMC)	Matrix SMC (Fully-automated SMC)
	
	

Device special square around date code during marking to identified new matrix SMC comparing with before

Packing Comparison-SMC & Matrix SMC

Package	SMC (Manual SMC) (Anti-ESD)	Matrix SMC (Fully-automated SMC) (Static Free)
Carry	 Surface resistance: 10^6~10^{11} Term of validity: 12 months	 Surface resistance10^6~10^8; Term of validity: permanent
Reel	 Paper Reel  Plastic Reel Surface resistance < 10^{11}	 Plastic Reel Surface resistance < 10^8
Packing code	M6:13" Diameter Plastic Reel R6:13" Diameter Paper Reel R7:7" Diameter Plastic Reel	V6 :13" Diameter Plastic Reel V7: 7" Diameter Plastic Reel
Pizza Box