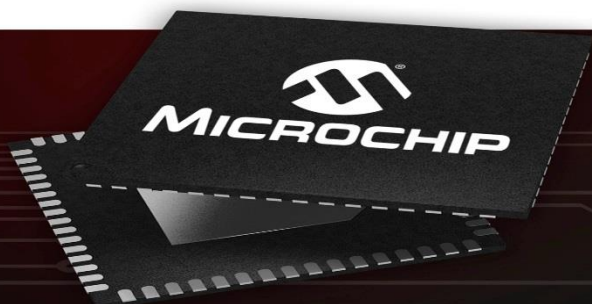




MICROCHIP



A Leading Provider of Microcontroller,
Mixed-Signal, Analog & Flash-IP Solutions



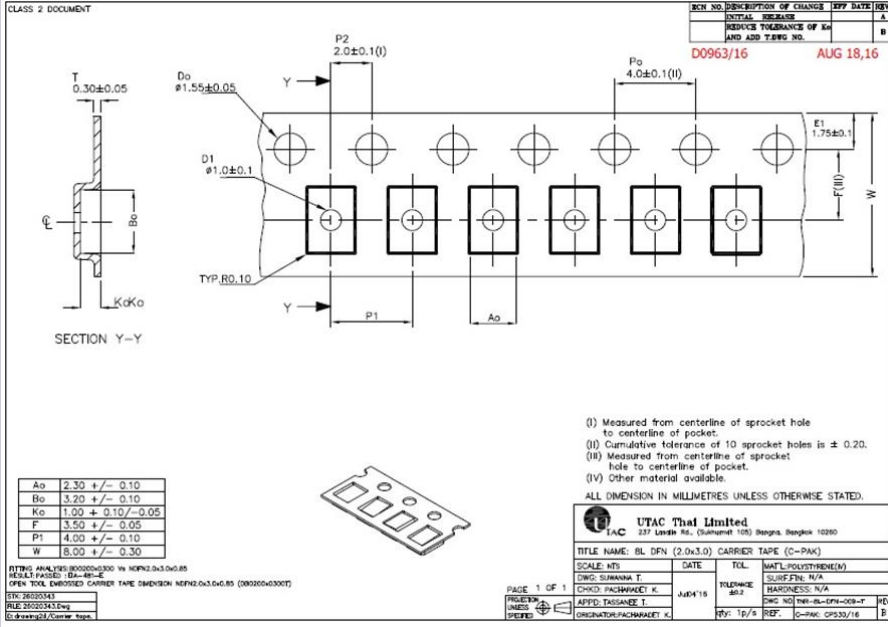
PCN #: GBNG-18NQCZ306

Implement new Tape and Reel packing media for selected Atmel products of the 35.4k wafer technology available in 8L UDFN (2x3x0.6mm) and WDFN (2x3x0.8mm) packages at MTAI assembly site.

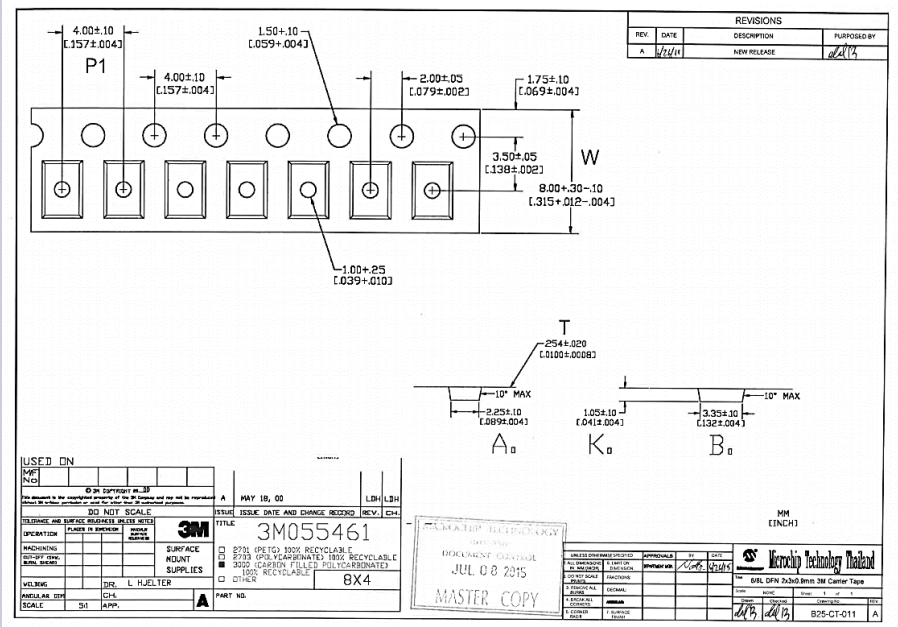
CCB 3875

Carrier Tape Pre and Post Change

PRE CHANGE



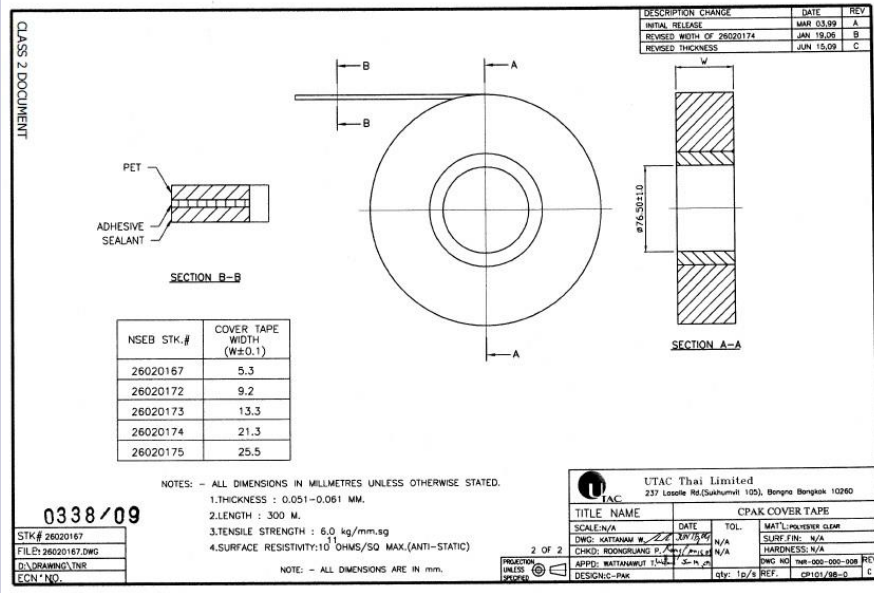
POST CHANGE



| Location | Width (mm) | Pitch (mm) | A0 (mm) | B0 (mm) | K0 (mm) |
|-------------|-------------|------------|-----------|-----------|-----------------|
| Pre Change | 8 +0.3 | 4 ±0.1 | 2.30 ±0.1 | 3.20 ±0.1 | 1.00 +0.1/-0.05 |
| Post Change | 8 +0.3/-0.1 | 4 ±0.1 | 2.25 ±0.1 | 3.35 ±0.1 | 1.05 ±0.1 |

Cover Tape Pre and Post Change

Existing



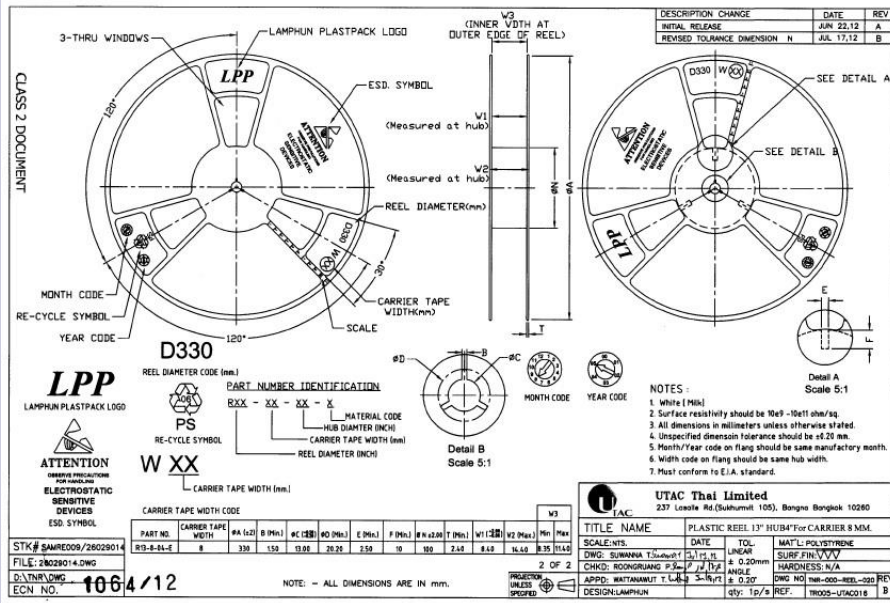
New

| Item | Specification | | | |
|-------------------------------|---------------|---------|---------|---------|
| | Nominal | Min | Max | |
| Dimension (mm) | Thickness | 0.062 | 0.049 | 0.075 |
| | Width | 5.4 | 5.3 | 5.5 |
| Surface Resistivity (ohms/sq) | Back Side | 1.0E+10 | 1.0E+08 | 1.0E+11 |
| | Seal Side | 1.0E+10 | 1.0E+08 | 1.0E+12 |
| Tensile Strength (Mpa) | | 42 | | |
| Elongation (%) | | 70 | | |

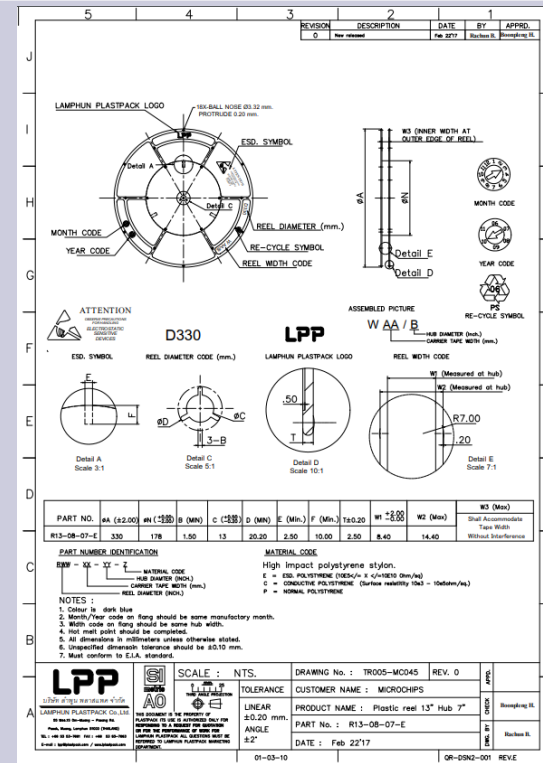
| Location | Width (mm) or Specific | Thickness (mm) |
|-------------|------------------------|----------------|
| Pre Change | 5.3 ±0.1 | 0.056 ±0.005 |
| Post Change | 5.4 ±0.1 | 0.062 ±0.013 |

Plastic Reel Pre and Post Change

PRE CHANGE



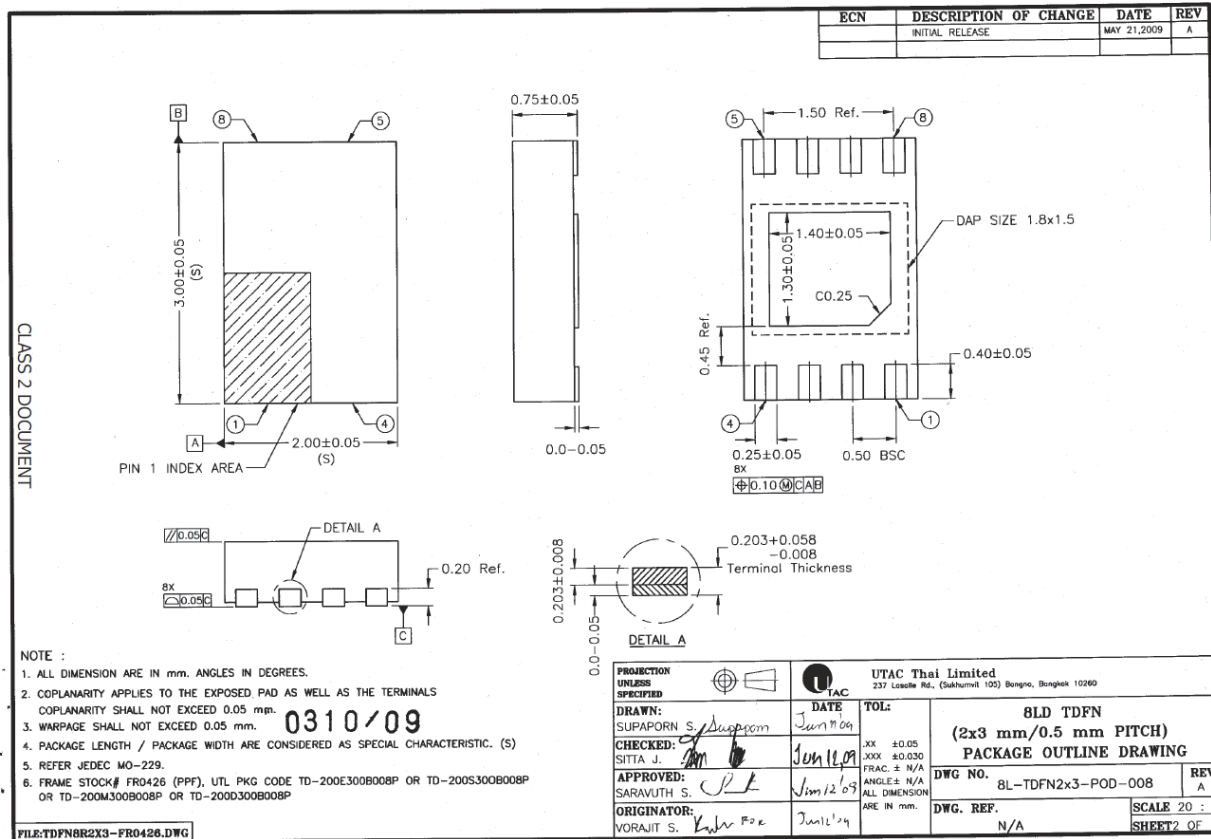
POST CHANGE



| Location | Carrier Width | (A) Reel Dia. (mm) ±3.0 | (N) Hub Dia. (mm) ±1.5 | (W1) Reel Thickness (mm) +2.0/-0.0 | (W2) Total Thickness (mm) Max | (C) Center Hole Dia. (mm) ±0.2 | Color |
|-------------|---------------|-------------------------|------------------------|------------------------------------|-------------------------------|--------------------------------|-----------|
| Pre Change | 8mm | 330 +/- 2.0 | 100 ± 2.0 | 8.4 +2.0/-0 | 14.4 | 13 +0.5/-0.2 | White |
| Post Change | 8mm | 330 +/- 2.0 | 178 +0/- 2.0 | 8.4 +2.0/-0 | 14.4 | 13 +0.5/-0.2 | Dark Blue |

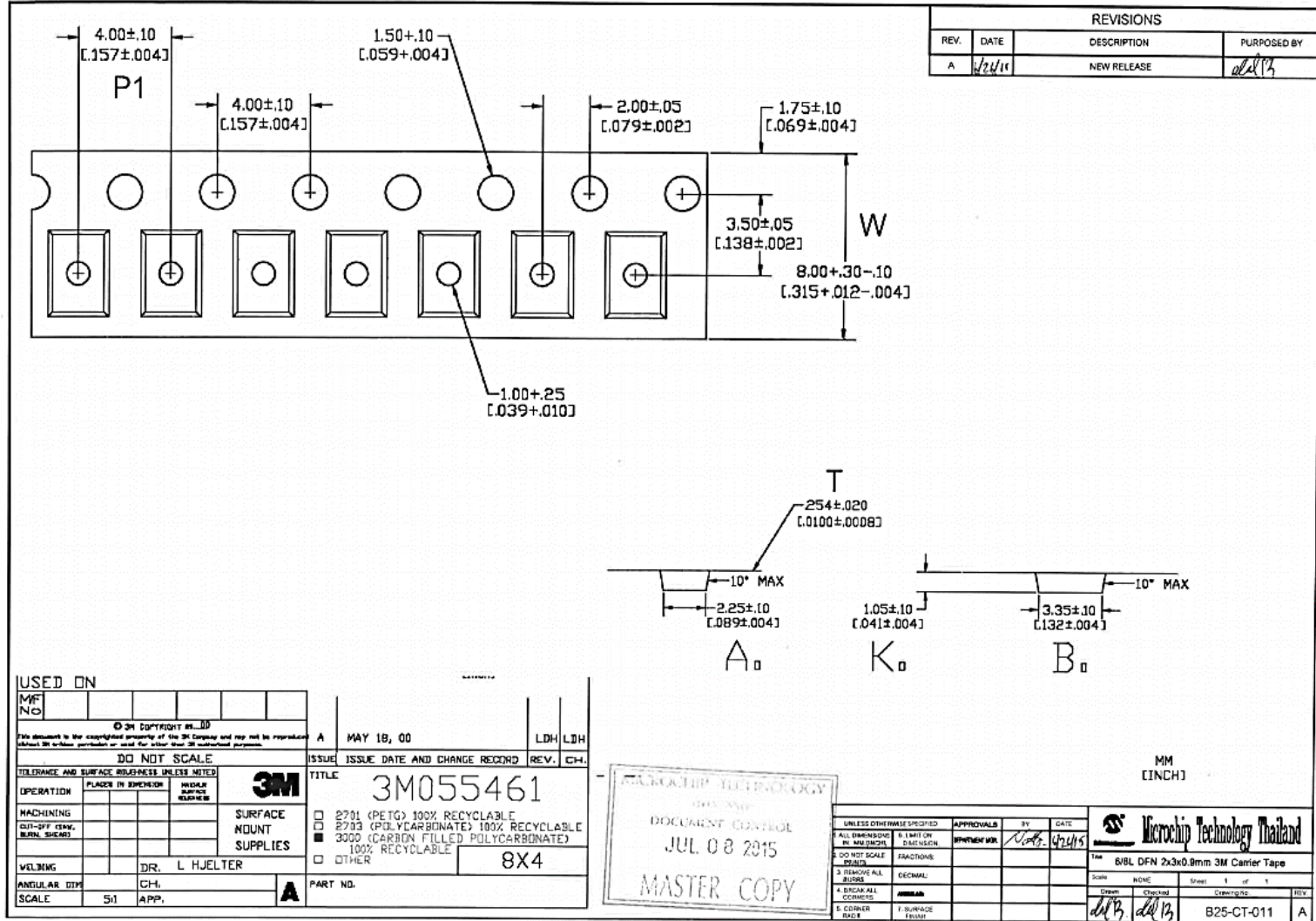
Packing Specs

New Material Package Outline Dimension



| Pkg Code | Package Code Description (50 character maximum) | Package Type (8 Char Max.) | Lead Count | Industry Standard | Package Width Or Size ³ NO SPACES | Microchip Assigned Pkg Otl'n Dwg No. |
|----------|--|-------------------------------|------------|-------------------|---|---|
| QEB | Very Thin Quad Flatpack No-Leads | WDFN | 008 | JEDEC | 2x3x0.8mm | C04-21364 |
| QFB | Very Thin Quad Flatpack No-Leads | WDFN | 008 | JEDEC | 2x3x0.8mm | C04-21365 |

Packing Specs New Carrier Tape



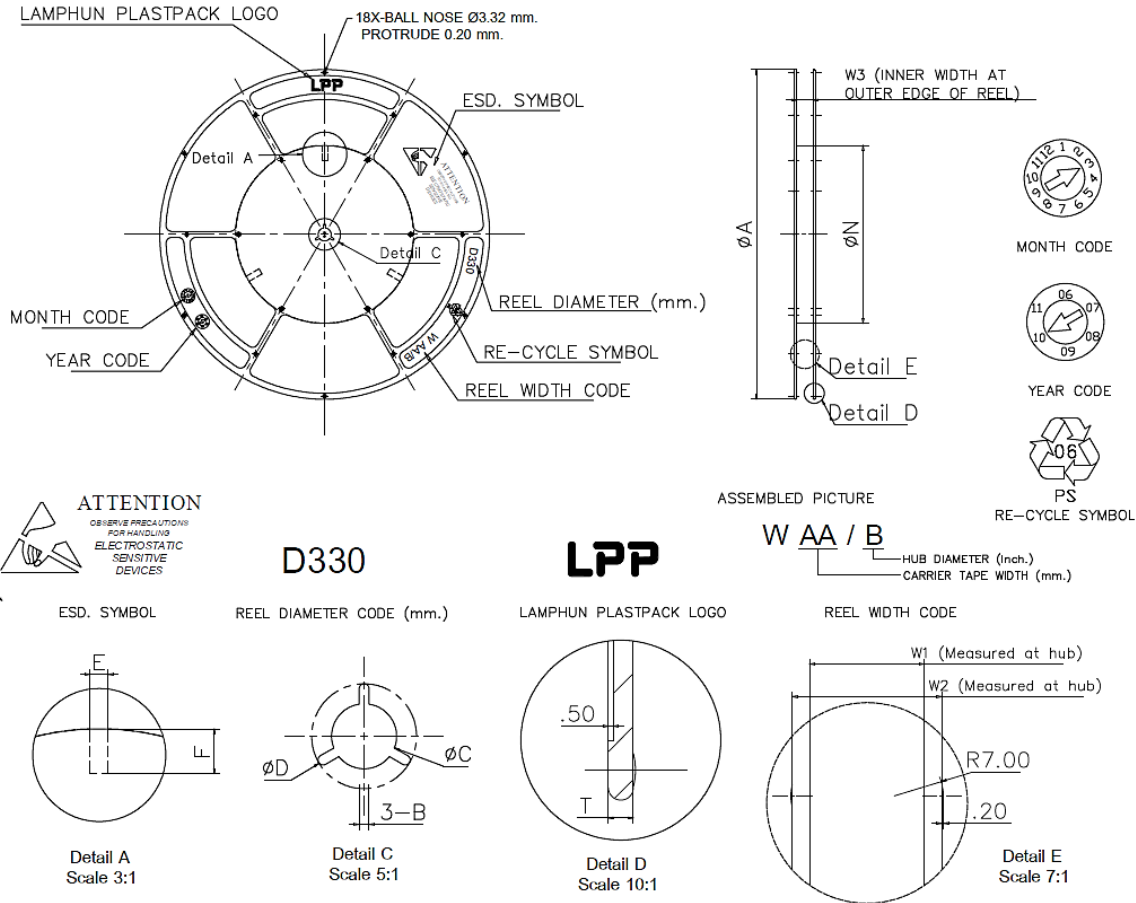


Packing Specs New Cover Tape

| Description | Units | Typical performance | Test notes | Test method | |
|-----------------------|------------------------------|---------------------|-----------------|-------------|---------------------|
| Material properties | Backing type | Polyester | | | |
| | Adhesive type | Heat activated | | | |
| | Sealing temp | °C | 170-220 | 1 | |
| Physical properties | Tensile strength | Mpa | 50 | 2 | Modified ASTM-D3759 |
| | Elongation | % | 100 | 2 | Modified ASTM-D3759 |
| | Haze | % | 29.5 | 3 | ASTM-D1003 |
| | Clarity | % | 80.6 | 3 | ASTM-D1003 |
| | Transmission | % | 85.5 | 3 | ASTM-D1003 |
| | Thickness | mm (in) | 0.062 (0.0024) | 2 | Modified ASTM-D3652 |
| Electrical properties | Resistivity (Back side) | Ohms/sq | 10 ⁹ | 4 | ASTM-D257 |
| | Resistivity (Component side) | Ohms/sq | 10 ⁹ | 4 | ASTM-D257 |
| Product format | Core type | Material | Plastic | | |
| | Core inner diameter | mm (in) | 76.45 (3.0) | | |
| | Roll diameter | mm (in) | 219 (8.62) | | |
| | Roll length | m (yd) | 480 (525) | | |

| Item | | Specification | | |
|----------------------------------|-----------|---------------|---------|---------|
| | | Nominal | Min | Max |
| Dimension (mm) | Thickness | 0.062 | 0.049 | 0.075 |
| | Width | 5.4 | 5.3 | 5.5 |
| Surface Resistivity (ohms/sq) | Back Side | 1.0E+10 | 1.0E+08 | 1.0E+11 |
| | Seal Side | 1.0E+10 | 1.0E+08 | 1.0E+12 |
| Tensile Strength (Mpa) | | | 42 | |
| Elongation (%) | | | 70 | |

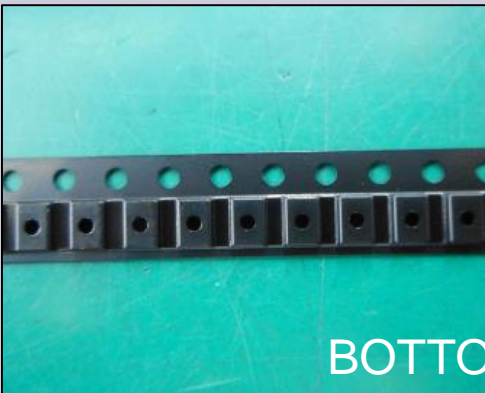
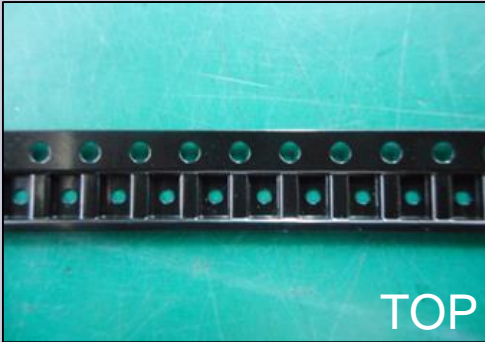
Packing Specs New Plastic Reel



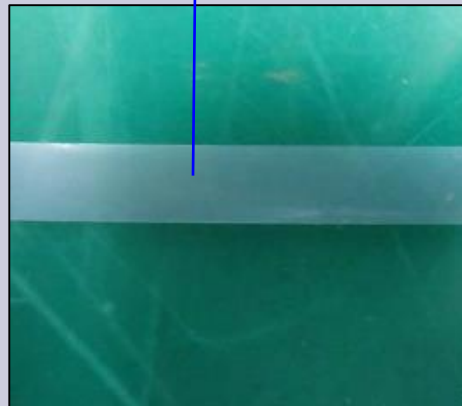
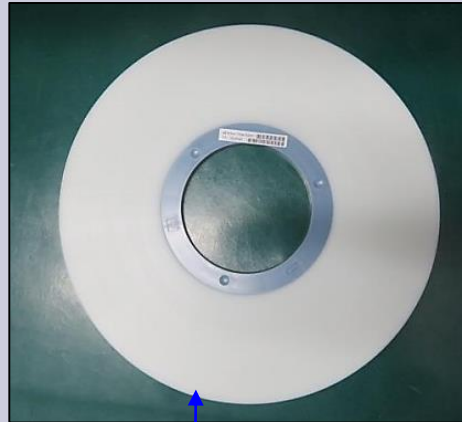
| PART NO. | ØA (±2.00) | ØN (+0.00/-2.00) | B (MIN) | C (+0.50/-0.20) | D (MIN) | E (Min.) | F (Min.) | T±0.20 | W1 +2.00/-0.00 | W2 (Max) | W3 (Max) |
|-------------|------------|------------------|---------|-----------------|---------|----------|----------|--------|----------------|----------|---|
| | | | | | | | | | | | Shall Accommodate Tape Width Without Interference |
| R13-08-07-E | 330 | 178 | 1.50 | 13 | 20.20 | 2.50 | 10.00 | 2.50 | 8.40 | 14.40 | |

Qualification Results Packing Material (NEW)

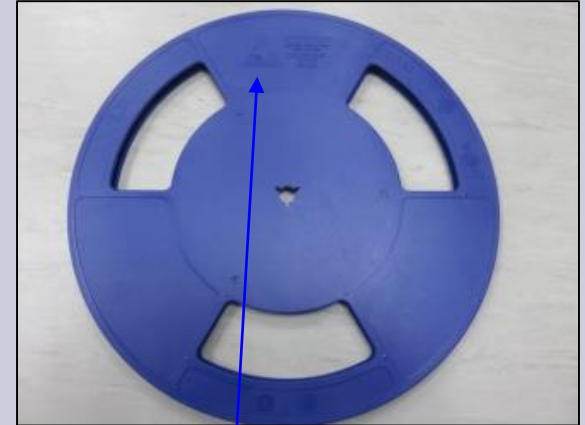
CARRIER TAPE
3M 055461



COVER TAPE
3M 2675 5.4mm



PLASTIC REEL
LPP R13-08-07-E (Dark Blue)





Qualification Results

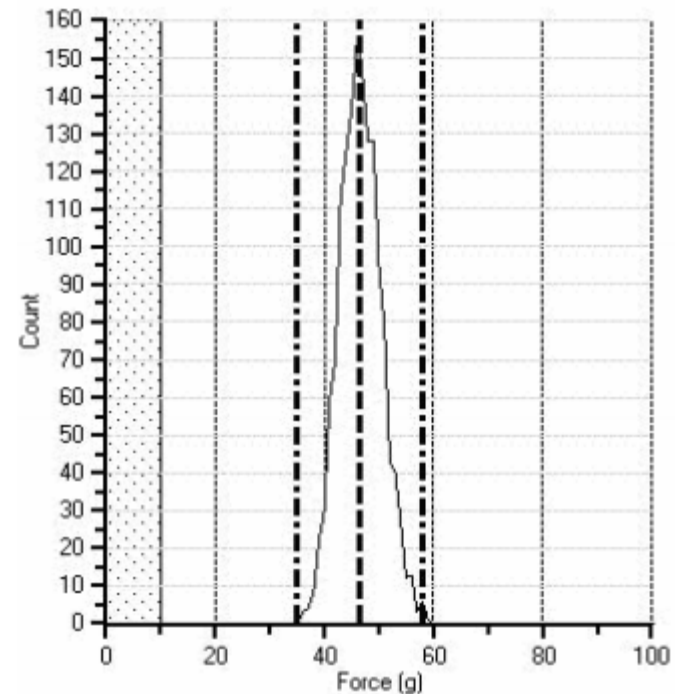
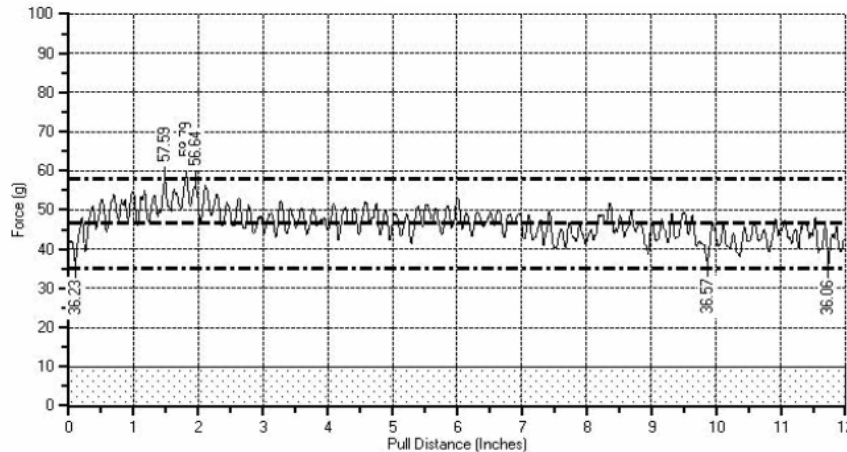
New Carrier Tape Peel Strength Test

Pull Speed (mm/min): 300
 Pull Distance (mm): 304.8
 Carrier Tape: 3M/155049-1/22008403
 Cover Tape: 3M/18349 W2HM/22100306
 Front Shoe Rear Shoe
 Temperature (C): 180 180
 Pressure: 2 2
 Width: 0 0

Test Results: **PASS**

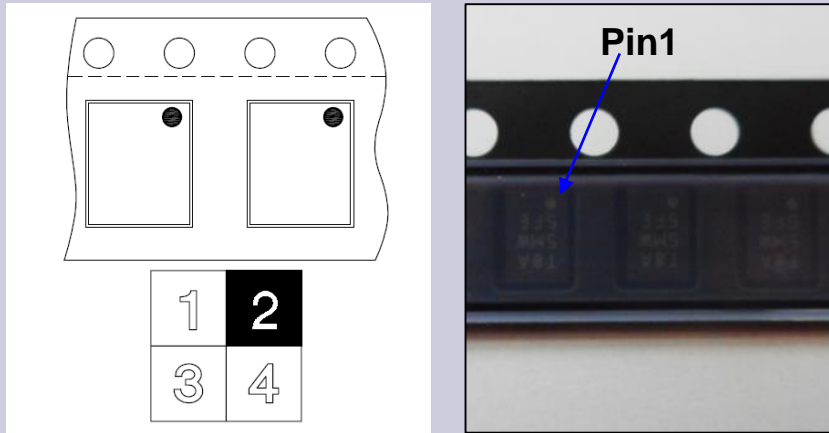
| | | | |
|------------------|-------|--------------|-------|
| Max (g): | 58.79 | Range (g): | 22.73 |
| Min (g): | 36.06 | Std Dev (g): | 3.83 |
| Mean (g): | 46.61 | RMS (g): | 46.77 |
| Mn Max Mkrs (g): | 57.67 | Cpk: | 3.19 |
| Mn Min Mkrs (g): | 36.29 | Cp: | 3.92 |

| <u>Analysis Criteria</u> | <u>Setting</u> | <u>Result</u> |
|--------------------------|----------------|---------------|
| Upper Alarm Lmt (g): | 100 | PASS |
| Lower Alarm Lmt (g): | 10 | PASS |
| Upper Mean Lmt (g): | 60 | PASS |
| Lower Mean Lmt (g): | 45 | PASS |
| Cpk >: | 1.67 | PASS |



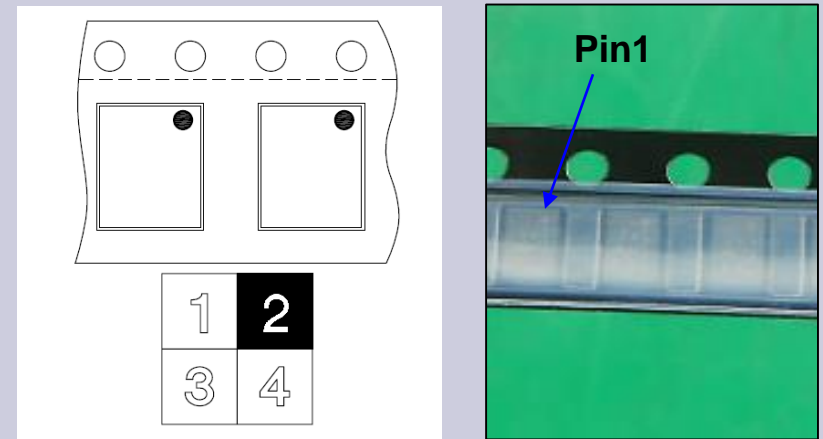
Qualification Results Packing Specification

PRE CHANGE



Quadrant 2

POST CHANGE



Quadrant 2

| Package Type | Lead Count | Package Width | MSL | Pb-Free | Dry Pack | Desiccant per Bag | Tape Width (mm) | Pocket Pitch (mm) | Reel Dia. (mm) | Reel HUB size (mm) Proposal | Units per Reel | Units per Box | Component Orientation Quadrant |
|--------------|------------|---------------|-----|---------|----------|-------------------|-----------------|-------------------|----------------|-----------------------------|----------------|---------------|--------------------------------|
| WDFN | 8 | 2x3x0.8mm | 1 | 260 | N | 0 | 8 | 4 | 330 | 178 | 5000 | 5000 | 2 |
| WDFN | 8 | 2x3x0.8mm | 1 | 260 | N | 0 | 8 | 4 | 330 | 178 | 5000 | 5000 | 2 |

Qualification Results

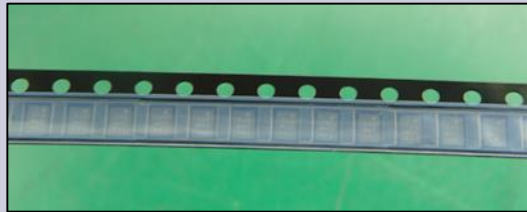
New Carrier Tape Testing Result

Bent Testing



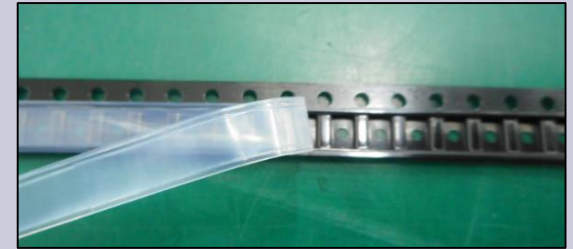
Not Found Seal off

Swing Testing



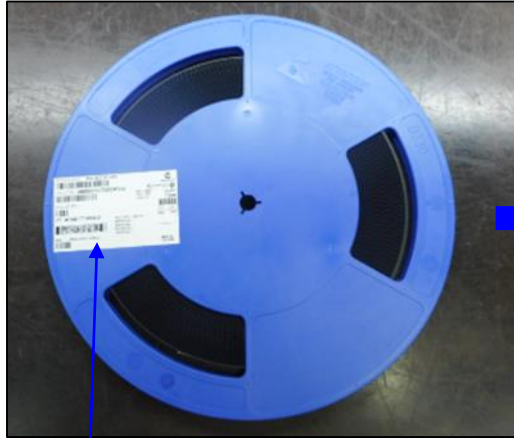
Not Found Seal off

RIP Testing

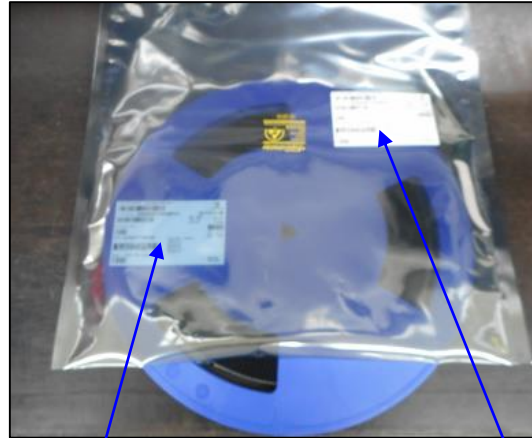


Not found Cover Tape torn

Qualification Results New Packing Method



MCHP STD Label



SSB Bag



MCHP STD Label



Seal SSB Bag

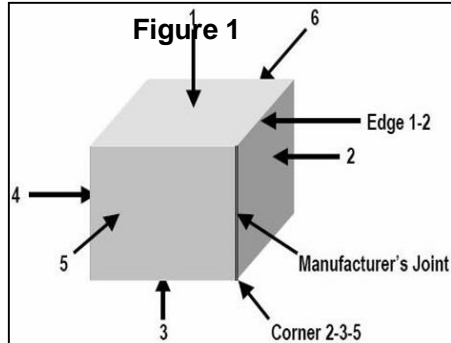


Bubble Sheet



Transparent Tape

New Material Drop Test Result



Drop Test Method:

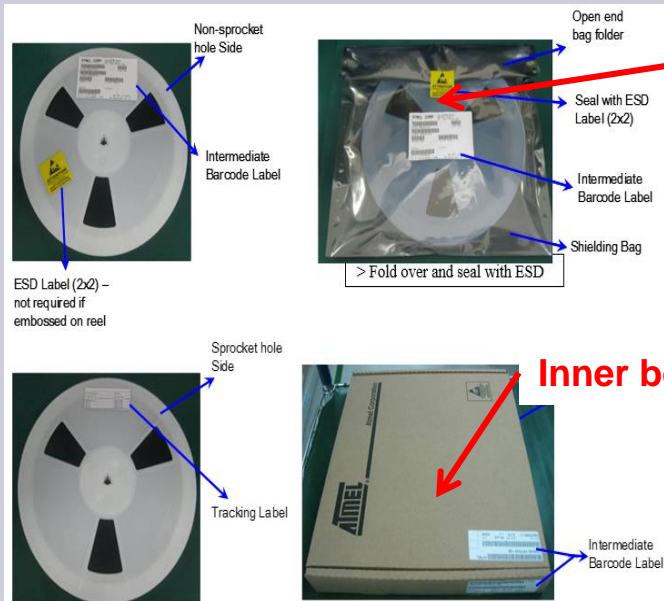
1. Pack IC per Packing Method with BQM 5000 unit per Reel
2. Drop 9 times by height 4 ft. (Per Figure 1)
3. Visual Inspection and see damaged or abnormal



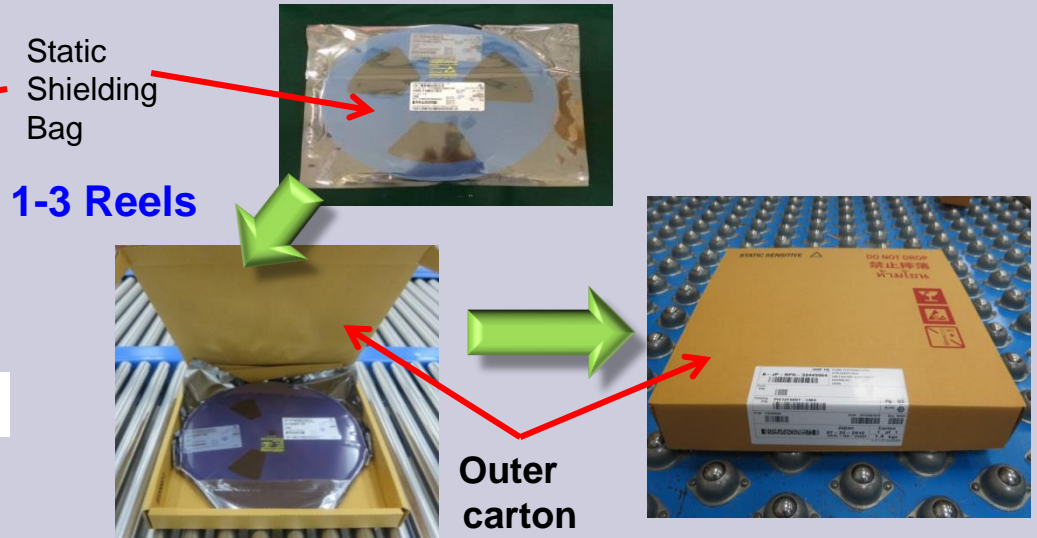
FOI Visual 100% result: **No Any Damage on Tape and Reel, Not Found Seal off, Not found IC damage**
Box Condition: Found minor damaged at inner box

Non dry pack in 13 inch Reel (MSL – 1)

PRE CHANGE



POST CHANGE



4 - 10 Reels



Bubble sheets

11- 18 Reels



Cushion

Outer carton

