



PRODUCT / PROCESS CHANGE NOTIFICATION
PCN-000785

Date: May 23, 2022

P1/2

Semtech Corporation, 200 Flynn Road, Camarillo CA 93012

Change Details

| | |
|--|--|
| Part Number(s) Affected: SX1236IMLTRT SX1277IMLTRT SX1279IMLTRT | Customer Part Number(s) Affected: <input checked="" type="checkbox"/> N/A |
|--|--|

Description, Purpose and Effect of Change:

For business continuity purposes, Semtech will start using qualified alternate sources for assembly and test for the above-mentioned parts.

The assembly of these parts is currently performed at Carsem and ASEM (Malaysia). An alternate source assembly has been qualified at Greatek.

The production final electrical test for these parts is currently performed at Carsem and ASE (Malaysia) on Teradyne Flex testers, and on Advantest 93000 testers at Giga (Taiwan). This Advantest 93000 test has been validated also at Greatek (Taiwan).

| | | | |
|------------------------------|--|--------------------------------------|---|
| Change Classification | <input checked="" type="checkbox"/> Major <input type="checkbox"/> Minor | Impact to Form, Fit, Function | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Impact to Data Sheet | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | New Revision or Date | <input checked="" type="checkbox"/> N/A |

Impact to Performance, Characteristics or Reliability:

No impact to performance, characteristics or reliability is expected as a result of this change.

| | | | |
|--|-----------------------------|--|--------------|
| Implementation Date | August 23, 2022 | Work Week | 2234 |
| Last Time Ship (LTS) <small>Of unchanged product</small> | N/A | Affecting Lot No. / Serial No. (SN) | N/A |
| Sample Availability | May 23, 2022 (SX1276/78) | Qualification Report Availability | May 23, 2022 |

Supporting Documents for Change Validation/Attachments:

Assembly :

- From-To analysis.



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- Qualification report available upon request.

Test:

- Validation report available upon request.

Issuing Authority

**Semtech
Business Unit:**

Wireless and Sensing Product Group

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Qualification of Greatek Taiwan as a second source Assembly manufacturer for LORA and ISM products

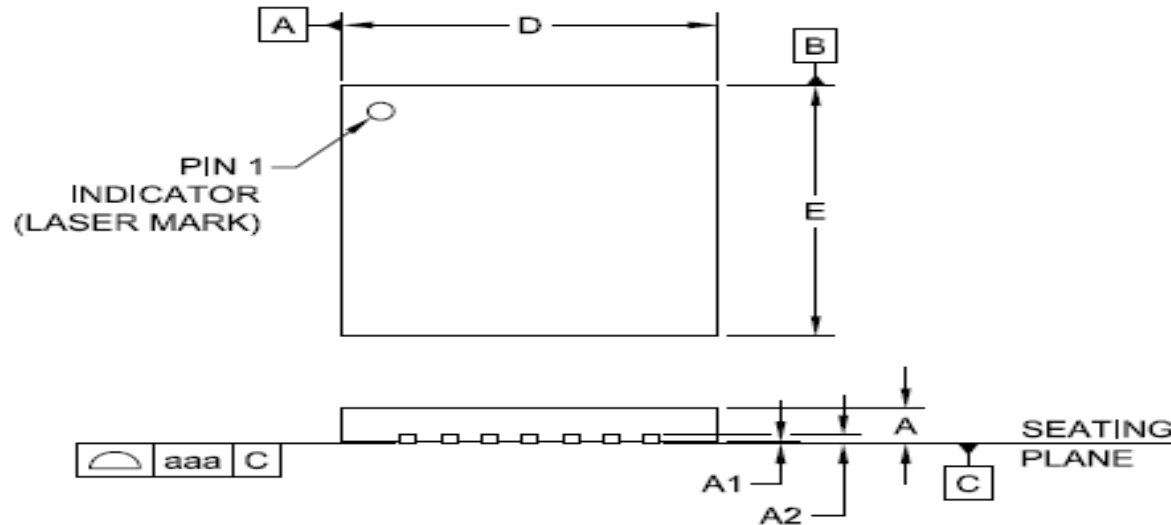
Introduction

- ❑ In order to increase the overall production capacity, Semtech is qualifying Greatek as a second source for assembly and test. Assembly is currently performed at Carsem.

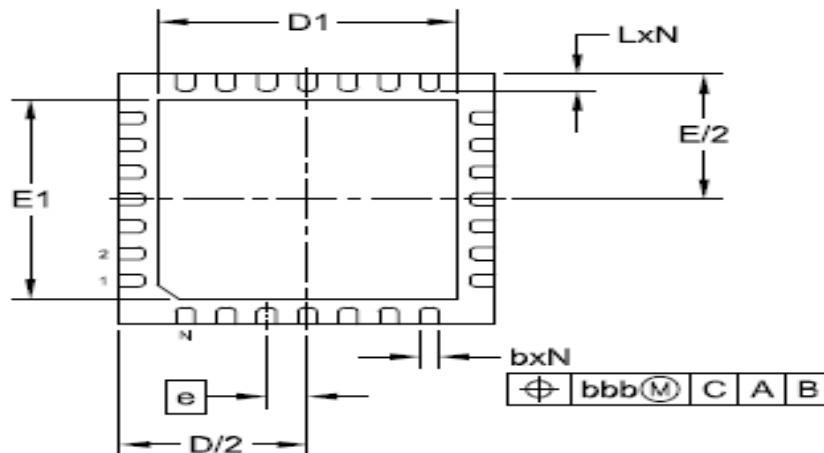
- ❑ The selected qualification vehicle is SX1276IMLTRT.

- ❑ Schedule for Implementation :
 - Passing REL qualification MSL 3 under Rel job# 7140.

SEMTECH Package Outline on SX1236IMLTRT/ SX1277IMLTRT/SX1279IMLTRT (Carsem and Greatek)



| DIM | DIMENSIONS | | |
|-----|-------------|------|------|
| | MILLIMETERS | | |
| | MIN | NOM | MAX |
| A | 0.80 | — | 1.00 |
| A1 | 0.00 | — | 0.05 |
| A2 | (0,20) | | |
| b | 0.25 | 0.30 | 0.35 |
| D | 5.90 | 6.00 | 6.10 |
| D1 | 4.65 | 4.80 | 4.90 |
| E | 5.90 | 6.00 | 6.10 |
| E1 | 4.65 | 4.80 | 4.90 |
| e | 0.65 BSC | | |
| L | 0.30 | 0.40 | 0.50 |
| N | 28 | | |
| aaa | 0.08 | | |
| bbb | 0.10 | | |



**No Change in
Package Outline.**

NOTES:

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.



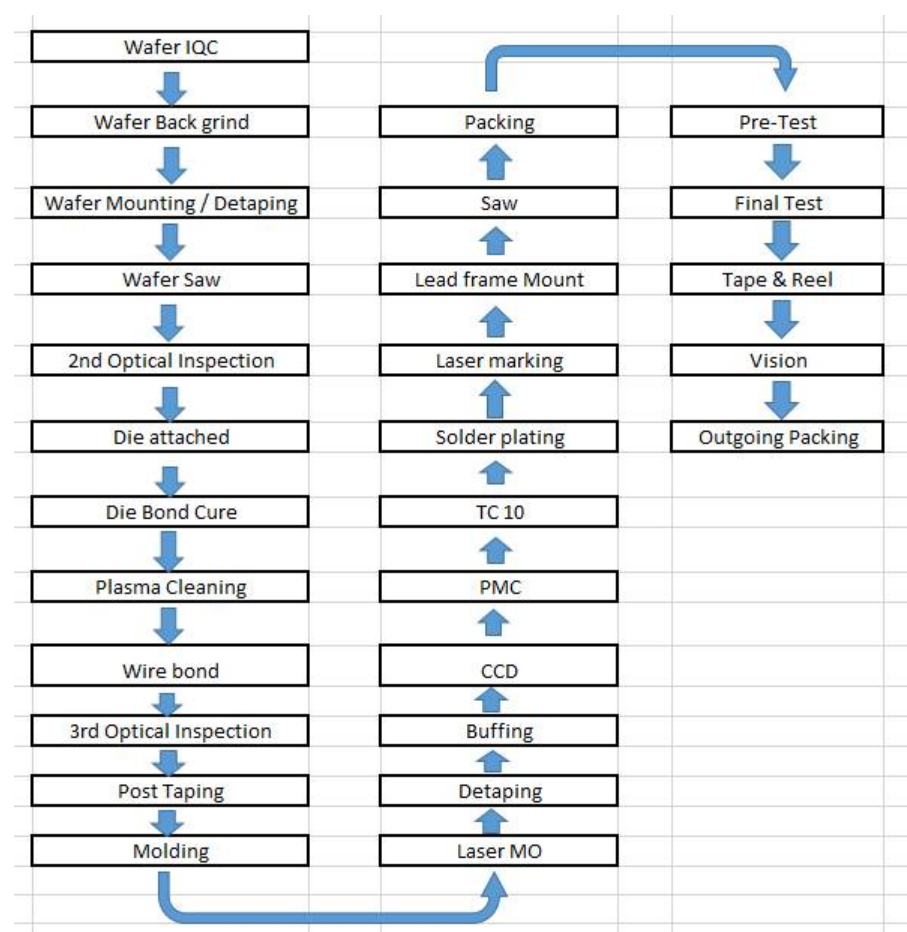
Assembly Process Flow (Carsem vs. Greatek)

Assembly Process Flow:

CARSEM (Old)



GREATEK (New)



- No major Change in manufacturing Flow
- 1X IR reflow process step is applied in the assembly flow for both Carsem and Greatek.

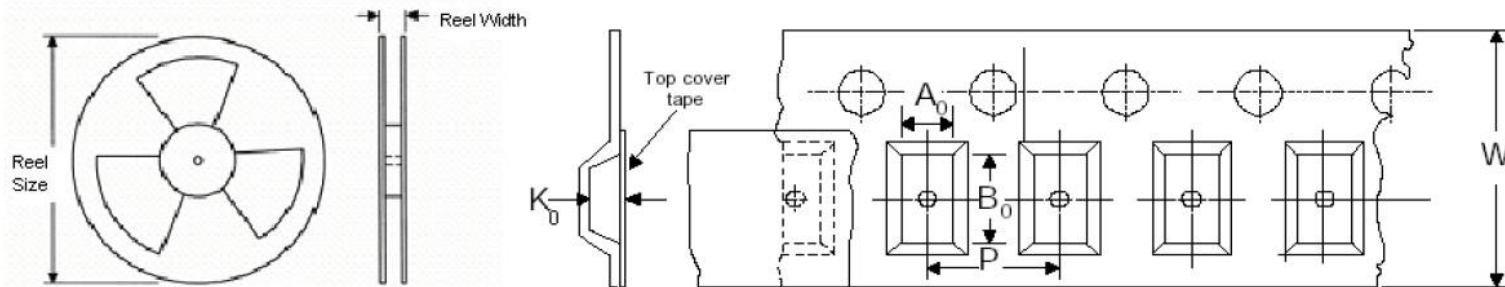
BOM (Carsem vs Greatek)

| Carsem (Current) | | | | Greatek (New) | | | |
|----------------------------|-----------|------------------|---------------|-----------------------------|-----------|------------------|---------------|
| Epoxy | Leadframe | Wire Type | Mold compound | Epoxy | Leadframe | Wire Type | Mold compound |
| QMI519 Conductive epoxy | AgCu LDF | 1.0 mils Au wire | G770HCD | EN-4900 Conductive epoxy | AgCu LDF | 1.0 mils Au wire | G700HA |

- Bill Of Material (BOM) for both suppliers (Greatek/Carsem) is MSL3 qualified.
- Carsem uses conductive epoxy of QMI519. Greatek uses EN-4900 which is also conductive epoxy. Both epoxys are supplier standard BOM with proven MSL3 performance.
- Lead frame base material and finishing is identical for both suppliers. These are supplier standard BOMs with proven MSL1 performance.
- Wire for both suppliers is identical, 1.0mils Au wire.
- Mold compound for Carsem is G770HCD and Greatek is G700HA. This is supplier standard BOM with proven MSL3 performance. Both BOMs running >5years high volume production. Greatek has shipped >100Mu with G700HA on QFN/DFN products.
- BOM selection between Carsem and Greatek is to ensure each subcontractor uses their previously qualified process. This avoids risk on new assembly process.

Carrier tape 6x6 comparison (Carsem Vs Greatek)

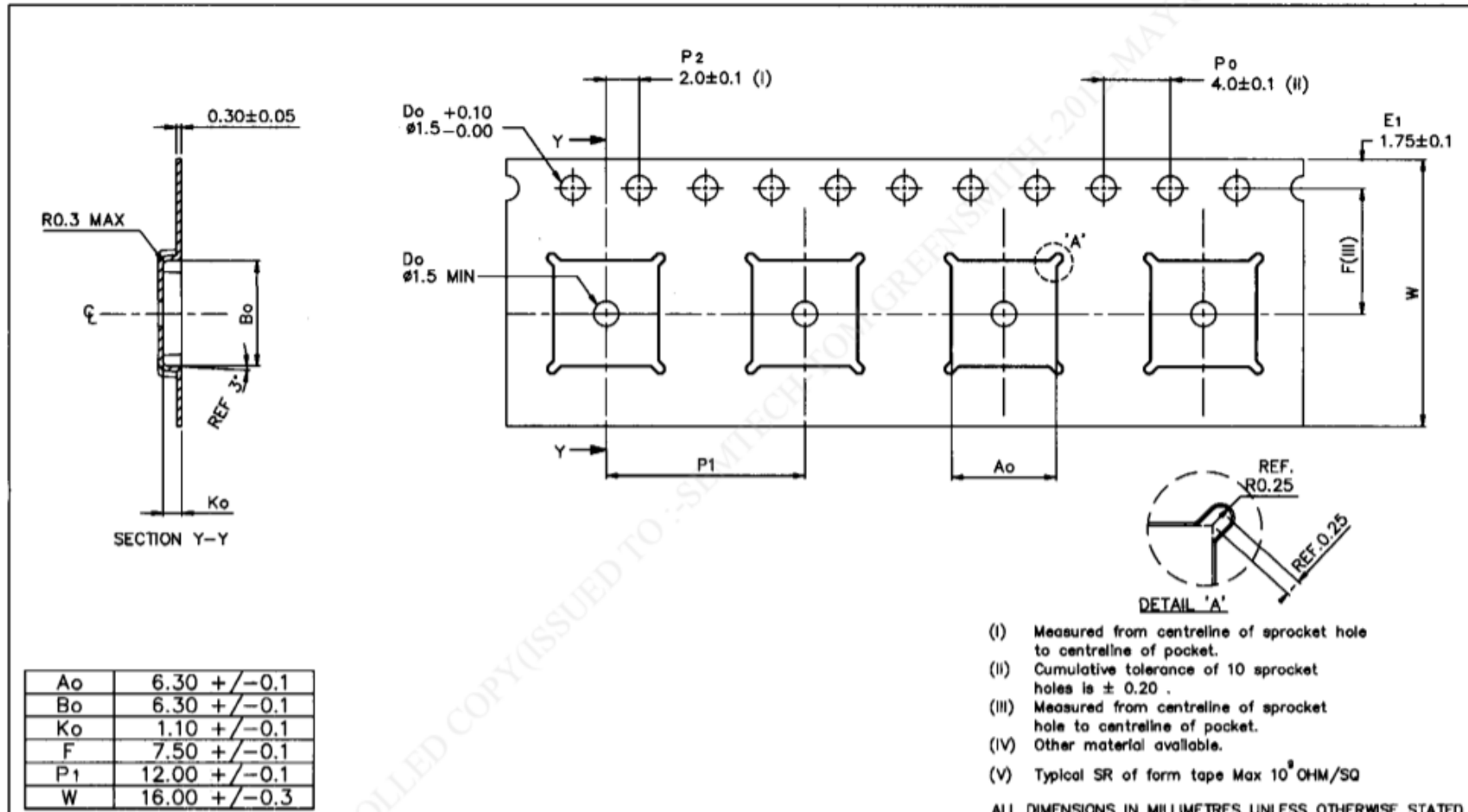
| Carrier tape Carsem - CPAK (Current) | | | | Carrier tape Greatek - UPAK (New) | | | |
|--------------------------------------|-------------|-------------|----|-----------------------------------|-------------|-------------|----|
| Ao | Bo | Ko | W | Ao | Bo | Ko | W |
| 6.3+/- 0.1 | 6.3 +/- 0.1 | 1.1 +/- 0.1 | 16 | 6.3 +/- 0.1 | 6.3 +/- 0.1 | 1.1 +/- 0.1 | 16 |



| Pkg size | Carrier tape (mm) | | | | | Reel | | Minimum Trailer Length (mm) | Minimum Leader Length (mm) | QTY per Reel |
|----------|-------------------|------------------|------|------|------|----------------|-----------------|-----------------------------|----------------------------|--------------|
| | Tape Width (W) | Pocket Pitch (P) | Ao | Bo | Ko | Reel Size (in) | Reel Width (mm) | | | |
| 6x6 | 16 | 12 | 6.30 | 6.30 | 1.10 | 13 | 16.4 | 400 | 400 | 3000 |

Carrier tape suppliers are different but critical dimensions are identical.


Carrier tape for Carsem 6x6 (Current)



- (I) Measured from centreline of sprocket hole to centreline of pocket.
- (II) Cumulative tolerance of 10 sprocket holes is ± 0.20 .
- (III) Measured from centreline of sprocket hole to centreline of pocket.
- (IV) Other material available.
- (V) Typical SR of form tape Max 10^8 OHM/SQ

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

| | |
|----|---------------|
| Ao | 6.30 +/- 0.1 |
| Bo | 6.30 +/- 0.1 |
| Ko | 1.10 +/- 0.1 |
| F | 7.50 +/- 0.1 |
| P1 | 12.00 +/- 0.1 |
| W | 16.00 +/- 0.3 |

| | | | | | | |
|---|--|------------------------------|-----|-------------|----------|----------|
|  | MATERIAL: CONDUCTIVE POLYSTYRENE (IV) | 1st Angle 3rd Angle | REV | DESCRIPTION | DATE | APPROVED |
| | DRAWN: W.M.LEE | GENERAL TOLERANCE: ± 0.2 | 0 | NEW DRAWING | 03.08.07 | W.M.LEE |
| | DRAWING NO: CP412/07-0 | SCALE: NTS | | | | |
| | TITLE: OPEN TOOL EMBOSSED CARRIER TAPE DIMENSIONS MLP 6X6 (QFN0600X0600A) | | | | | |
| | | | | | | |

THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO C-PAK PTE.LTD.

Carrier tape for Greatek (New)

