



**PRODUCT / PROCESS CHANGE NOTIFICATION**  
**PCN-000772**

**Date: November 4, 2021**

P1/2

Semtech Corporation, 200 Flynn Road, Camarillo CA 93012

**Change Details**

<b>Part Number(s) Affected:</b>  SX1272IMLTRT SX1273IMLTRT	<b>Customer Part Number(s) Affected:</b> <input checked="" type="checkbox"/> N/A
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**Description, Purpose and Effect of Change:**

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

The assembly of this part is currently performed at Carsem (Malaysia). Second-source assembly has been qualified at Greatek (Taiwan).

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

<b>Implementation Date</b>	February 4, 2022	<b>Work Week</b>	2206
<b>Last Time Ship (LTS) Of unchanged product</b>	N/A	<b>Affecting Lot No. / Serial No. (SN)</b>	N/A
<b>Sample Availability</b>	November 4, 2021 (SX1272)	<b>Qualification Report Availability</b>	November 4, 2021

**Supporting Documents for Change Validation/Attachments:**

- From-To analysis
- Reliability qualification report available upon request.

**Issuing Authority**

<b>Semtech Business Unit:</b>	Wireless and Sensing Product Group
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P2/2

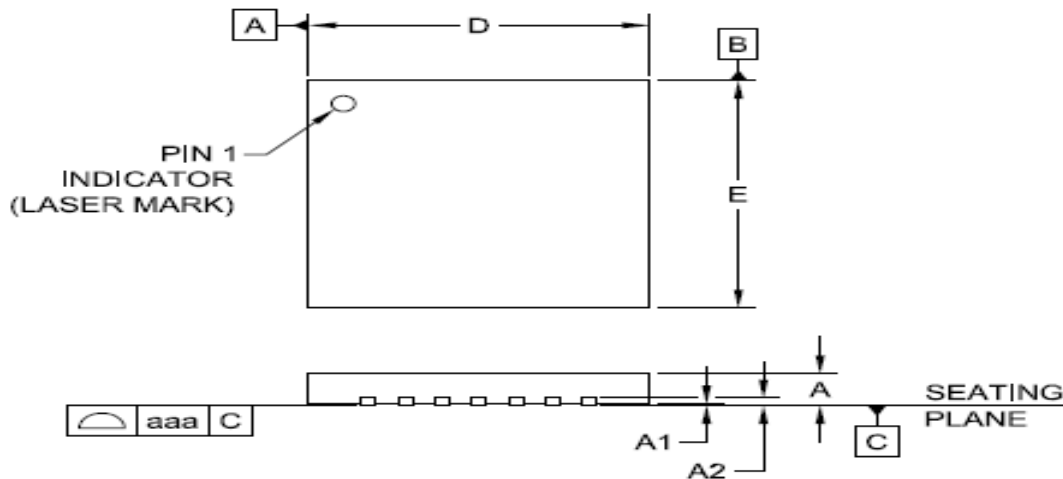
<b>Semtech Contact Info:</b>	Anne Lévy-Mandel Sr Quality Assurance Manager, Wireless & Sensing Products  Semtech Neuchâtel SA Gouttes d'Or 40 CH-2000 Neuchâtel  <a href="mailto:Alevymandel@semtech.com">Alevymandel@semtech.com</a>  Office: + 41 32 729 40 61 Fax: + 41 32 729 40 01	Digital signatu  re
<b>FOR FURTHER INFORMATION &amp; WORLDWIDE SALES COVERAGE:</b> <a href="http://www.semtech.com/contact/index.html#support">http://www.semtech.com/contact/index.html#support</a>		



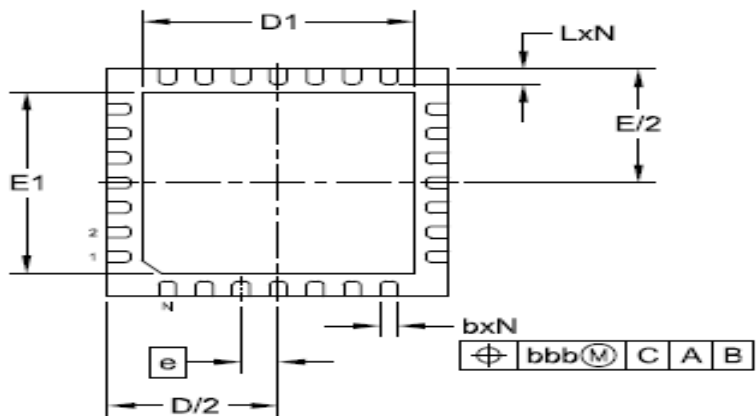
# Introduction

- ❑ 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 change affect applicable to products:  
SX1276IMLTRT, SX1272IMLTRT, SX1278IMLTRT, SX1231IMLTRT, SX1232IMLTRT, SX1211I084TRT, SX1781IMLTRT.
  
- ❑ Qualification Vehicles selected are SX1276IMLTRT
  
- ❑ Schedule for Implementation  
Passing REL qualification MSL 3 under Rel job# 7140.

# SEMTECH Package Outline on SX1276IMLTRT/ SX1278IMLTRT/ SX1272IMLTRT (Carsem and Greatek)



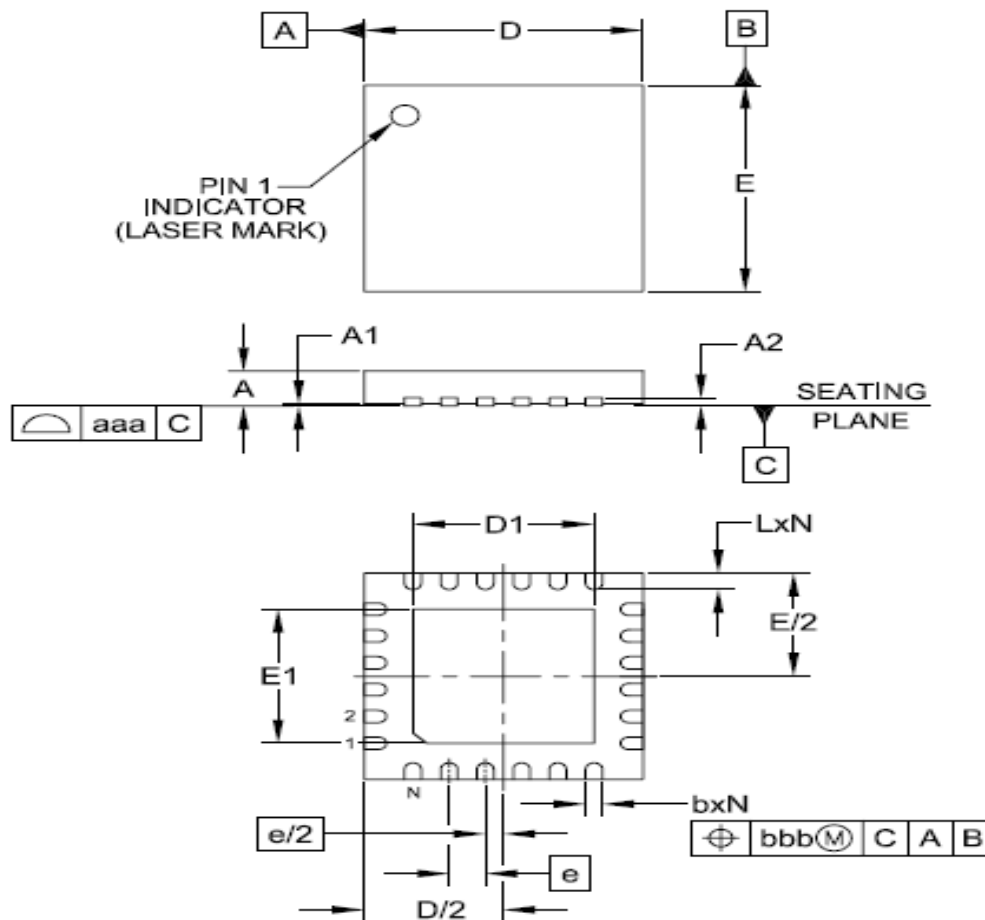
DIM	DIMENSIONS MILLIMETERS		
	MIN	NOM	MAX
A	0.80	—	1.00
A1	0.00	—	0.05
A2	(0,20)		
b	0.25	0.30	0.35
D	5.90	6.00	6.10
D1	4.65	4.80	4.90
E	5.90	6.00	6.10
E1	4.65	4.80	4.90
e	0.65 BSC		
L	0.30	0.40	0.50
N	28		
aaa	0.08		
bbb	0.10		



**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.

# SEMTECH Package Outline on SX1231IMLTRT/ SX1232IMLTRT (Carsem and Greatek)



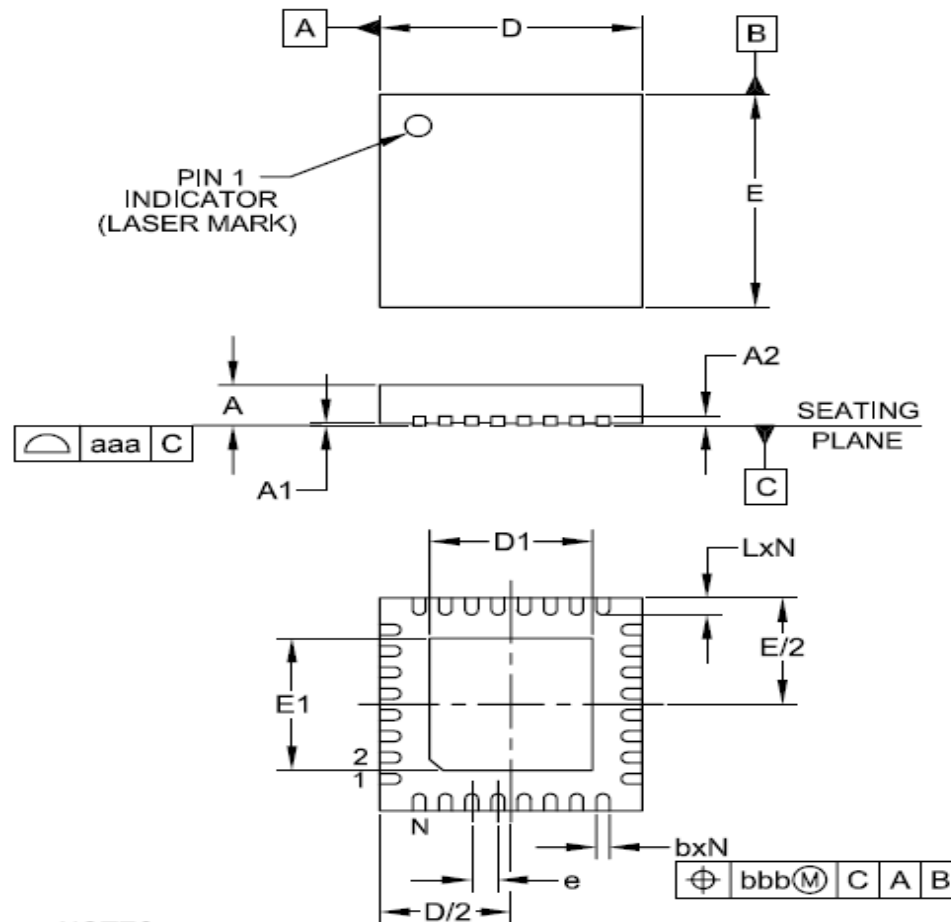
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.80	-	1.00
A1	0.00	-	0.05
A2	-	{0.20}	-
b	0.25	0.30	0.35
D	4.90	5.00	5.10
D1	3.20	3.25	3.30
E	4.90	5.00	5.10
E1	3.20	3.25	3.30
e	0.65 BSC		
L	0.35	0.40	0.45
N	24		
aaa	0.08		
bbb	0.10		

**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.

# SEMTECH Package Outline on SX1211I084TRT (Carsem and Greatek)

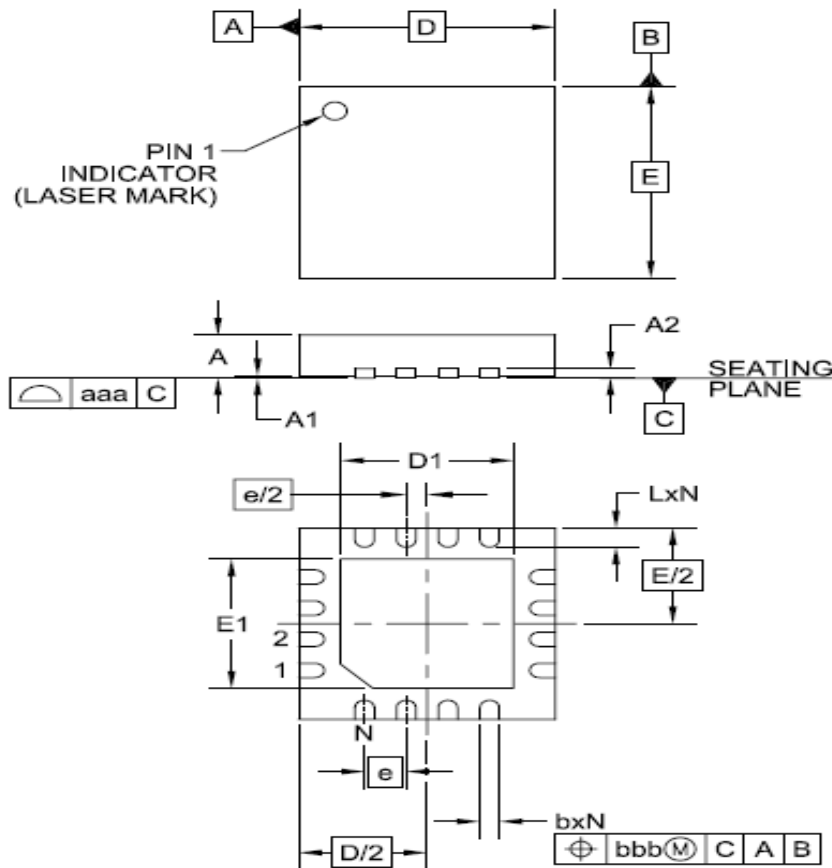


DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.028	.030	.031	0.70	0.75	0.80
A1	.000	-	.002	0.00	-	0.05
A2	-	(.008)	-	-	(0.20)	-
b	.008	.010	.012	0.18	0.25	0.30
D	.193	.197	.201	4.90	5.00	5.10
D1	.118	.122	.126	3.00	3.10	3.20
E	.193	.197	.201	4.90	5.00	5.10
E1	.118	.122	.126	3.00	3.10	3.20
e	.020 BSC			0.50 BSC		
L	.012	.016	.020	0.30	0.40	0.50
N	32			32		
aaa	.003			0.08		
bbb	.004			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.

# SEMTECH Package Outline on SX1781IMLTRT (Carsem and Greatek)



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.031	-	.040	0.80	-	1.00
A1	.000	-	.002	0.00	-	0.05
A2	-	(.008)	-	-	(0.20)	-
b	.010	.012	.014	0.25	0.30	0.35
D	.153	.157	.161	3.90	4.00	4.10
D1	.100	.106	.110	2.55	2.70	2.80
E	.153	.157	.161	3.90	4.00	4.10
E1	.100	.106	.110	2.55	2.70	2.80
e	.026 BSC			0.65 BSC		
L	.012	.016	.020	0.30	0.40	0.50
N	16			16		
aaa	.003			0.08		
bbb	.004			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.
3. DAP IS 2.9 x 2.9 mm



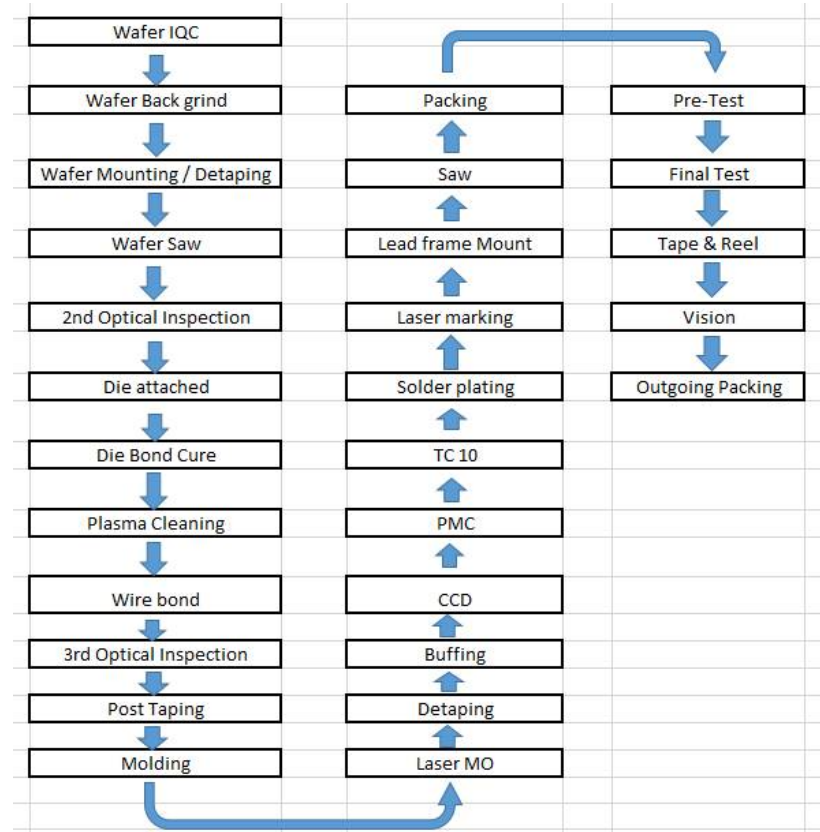
# Assembly Process Flow (Carsem vs. Greatek)

## 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)

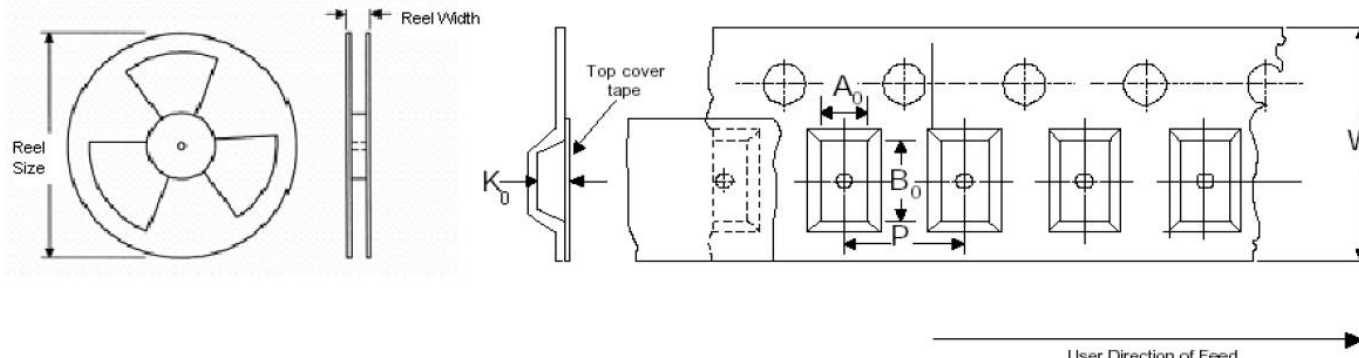


Carsem (Old)				Greatek (New)			
Epoxy	Leadframe	Wire Type	Mold compound	Epoxy	Leadframe	Wire Type	Mold compound
QMI519 Conductive epoxy	AgCu LDF	1.0 mils Au wire	G770HCD	EN-4900 Conductive epoxy	AgCu LDF	1.0 mils Au wire	G700HA

- BOM for both supplier (Greatek/Carsem) is MSL3 qualified.
- Carsem uses conductive epoxy of QMI519. Greatek uses EN-4900 which is also conductive epoxy. Both epoxy are supplier standard BOM with proven MSL3 performance.
- Lead frame base material and finishing is identical for both supplier. These are supplier standard BOM with proven MSL1 performance.
- Wire for both supplier 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 BOM 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 subcon use their previously qualified process. This avoids risk on new assembly process.

# Carrier tape 6x6 comparison (Carsem Vs Greatek)

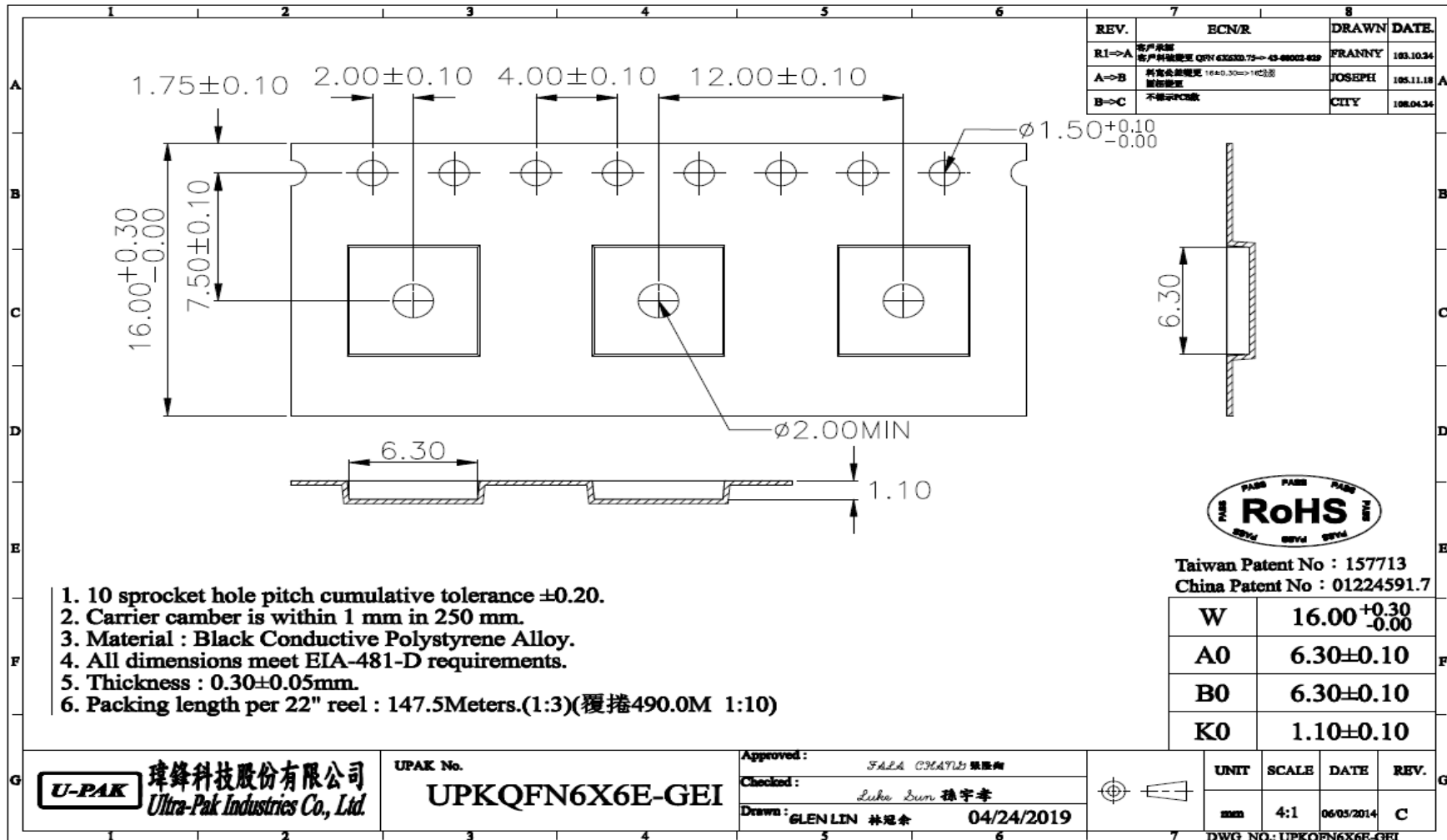
Carrier tape Carsem - CPAK (Old)				Carrier tape Greatek - UPAK (New)			
Ao	Bo	Ko	W	Ao	Bo	Ko	W
6.3+/- 0.1	6.3 +/- 0.1	1.1 +/- 0.1	16	6.3 +/- 0.1	6.3 +/- 0.1	1.1 +/- 0.1	16



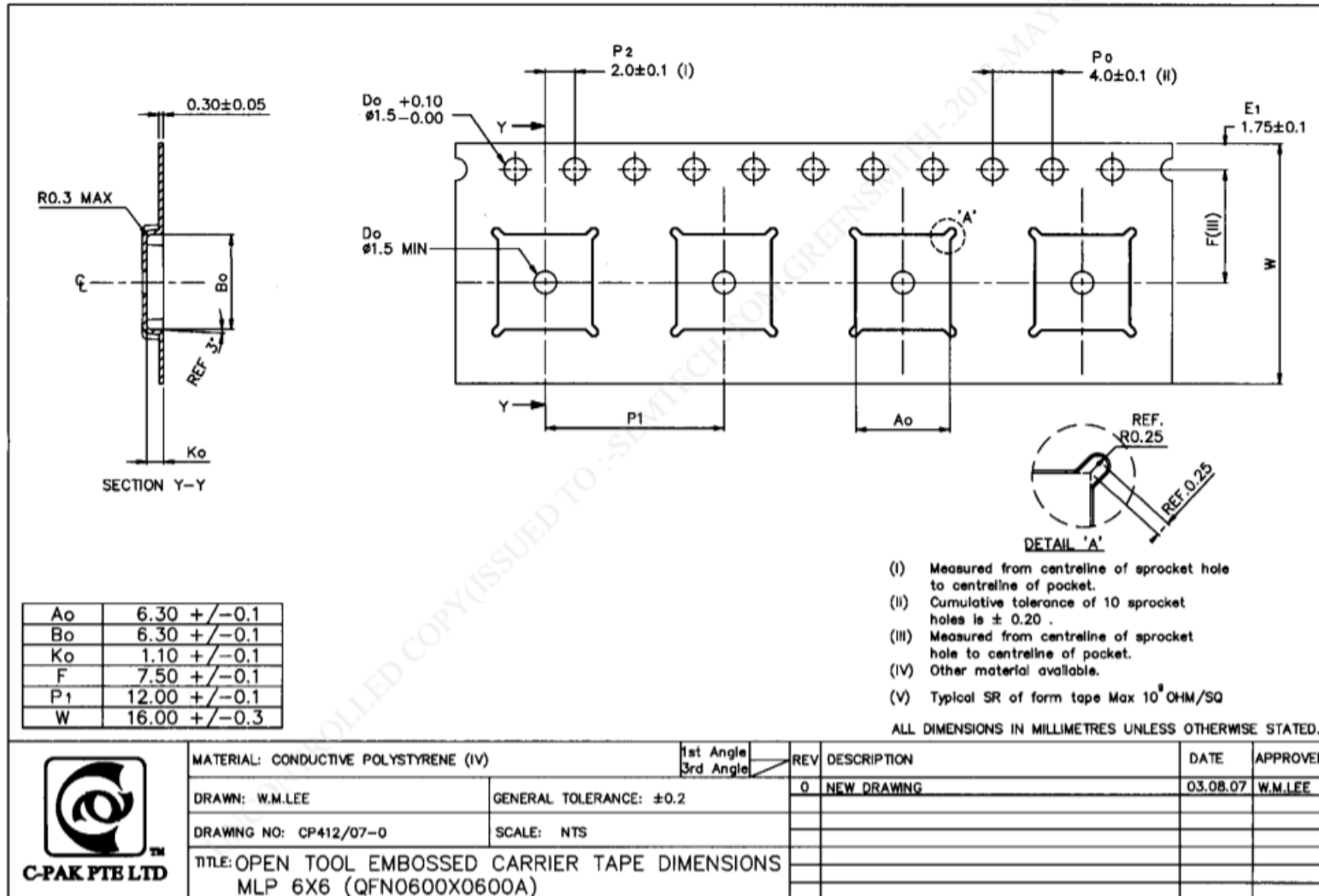
Pkg size	Carrier tape (mm)					Reel		Minimum Trailer Length (mm)	Minimum Leader Length (mm)	QTY per Reel
	Tape Width (W)	Pocket Pitch (P)	Ao	Bo	Ko	Reel Size (in)	Reel Width (mm)			
6x6	16	12	6.30	6.30	1.10	13	16.4	400	400	3000

**Although carrier tape supplier were different but critical dimension were no difference.**

# Carrier tape for Greatek (New)



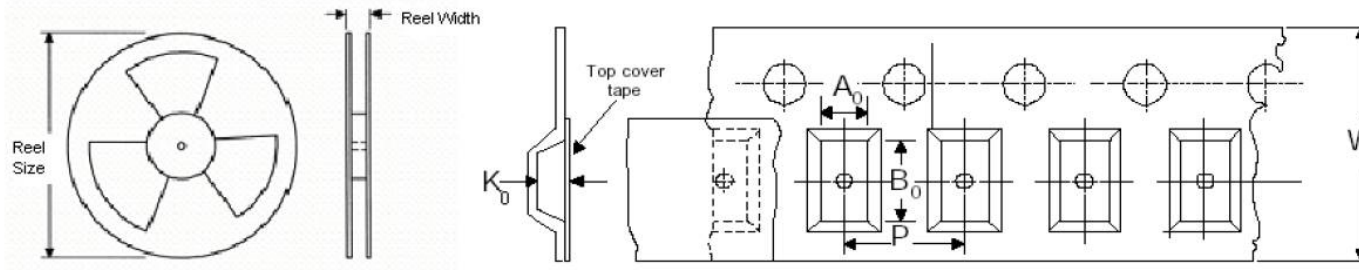
# Carrier tape for Carsem 6x6 (Old)



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# Carrier tape 4x4 comparison (Carsem Vs Greatek)

Carrier tape Carsem - CPAK (Old)				Carrier tape Greatek - Advantek (New)			
Ao	Bo	Ko	W	Ao	Bo	Ko	W
4.35+/- 0.1	4.35 +/- 0.1	1.1 +/- 0.1	12	4.35 +/- 0.1	4.35 +/- 0.1	1.1 +/- 0.1	12

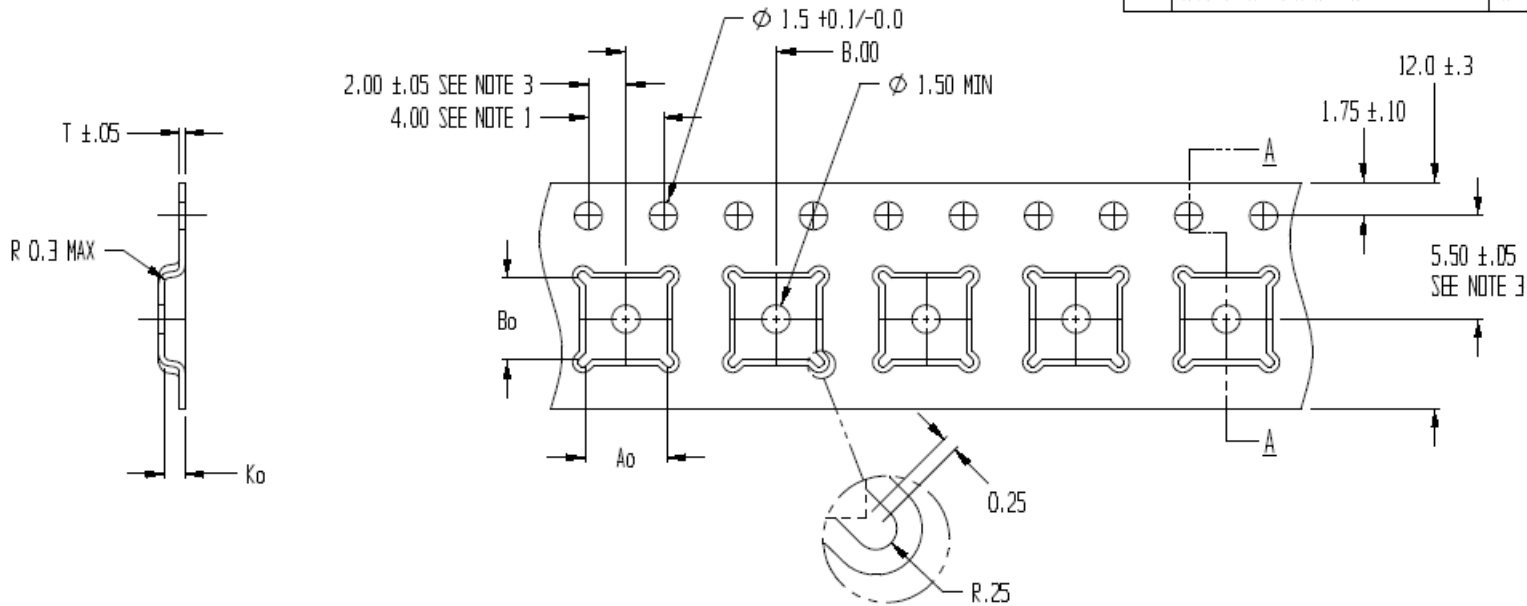


Pkg size	Carrier tape (mm)					Reel		Minimum Trailer Length (mm)	Minimum Leader Length (mm)	QTY per Reel
	Tape Width (W)	Pocket Pitch (P)	Ao	Bo	Ko	Reel Size (in)	Reel Width (mm)			
4x4	12	8	4.35	4.35	1.10	7/13	12.4	400	400	1000/3000

**Although carrier tape supplier were different but critical dimension were no difference.**

# Carrier tape for Greatek 4x4 (New)

REVISIONS				
REV	DESCRIPTION	DATE	GS#	APPROVED
2	ADDED MATERIALS LIST	8/26/14	30598	TMD




SECTION A - A

$A_0 = 4.35$   
 $B_0 = 4.35$   
 $K_0 = 1.10$

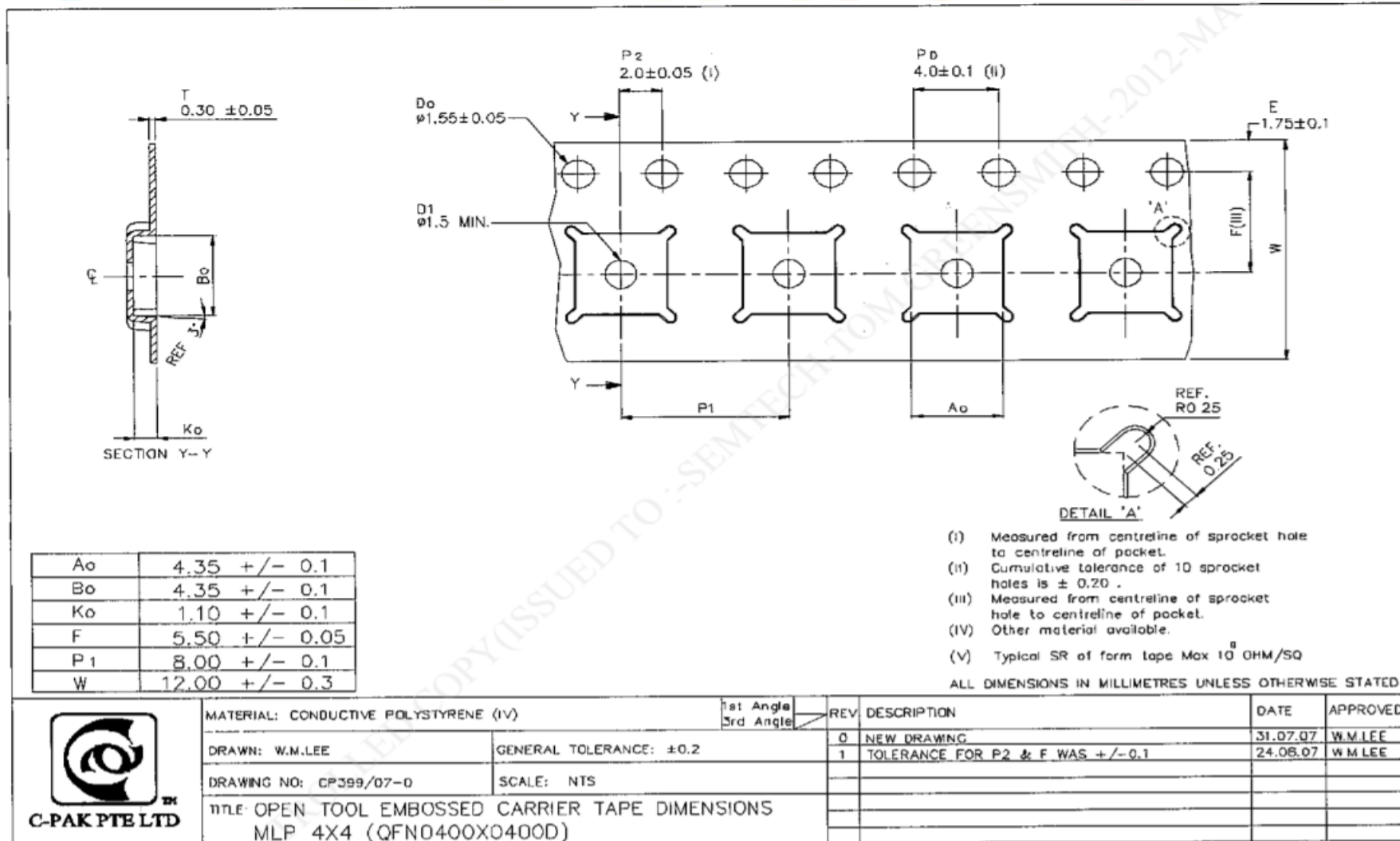
NOTES:

1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE  $\pm 0.2$
2. CAMBER IN COMPLIANCE WITH EIA 481
3. POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE

PART #	T	MATERIAL	DWG #
MLO404-ABC	.30	PC TRILAM	T111689BT
MLO404-AQ	.33	PC	T111688BT
MLO404-AC	.30	PS+C	T102530AT

			
TITLE ADVANTEK PART DRAWING NUMBER MLO404-A CARRIER TAPE			
TOLERANCES - UNLESS NOTED 1PL $\pm 0.2$ 2PL $\pm 0.10$		MATERIAL SEE TABLE	
ALL DIMENSIONS IN MILLIMETERS DWG SIZE B			
DRAWN BY TMD/BTH	DATE 10/7/99	SCALE 4:1	SHEET 1 OF 1
REFERENCE NO. T-9203		DWG NO. SEE TABLE	REV 2

# Carrier tape for Carsem 4x4 (Old)

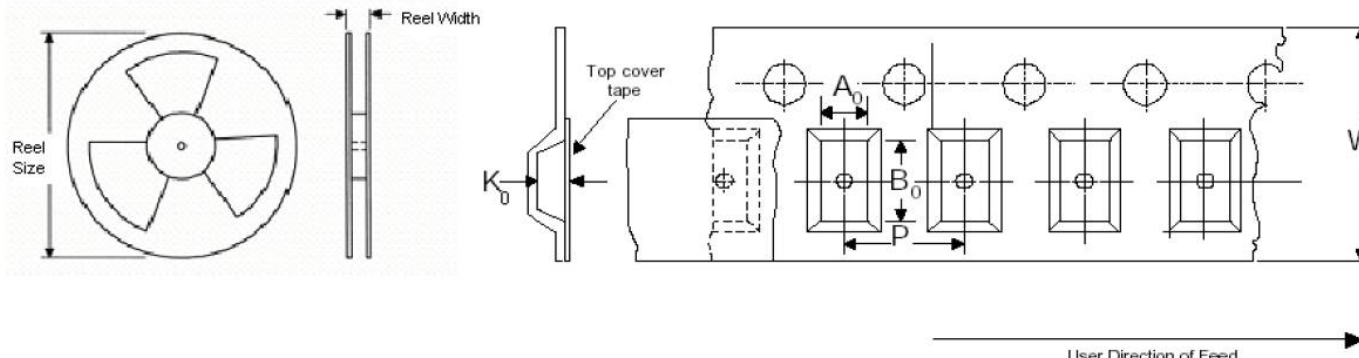


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# Carrier tape 5x5 comparison (Carsem Vs Greatek)

Carrier tape Carsem - CPAK (Old)				Carrier tape Greatek - Advantek (New)			
Ao	Bo	Ko	W	Ao	Bo	Ko	W
5.25+/- 0.1	5.25 +/- 0.1	1.1 +/- 0.1	12	5.25 +/- 0.1	5.25 +/- 0.1	1.1 +/- 0.1	12



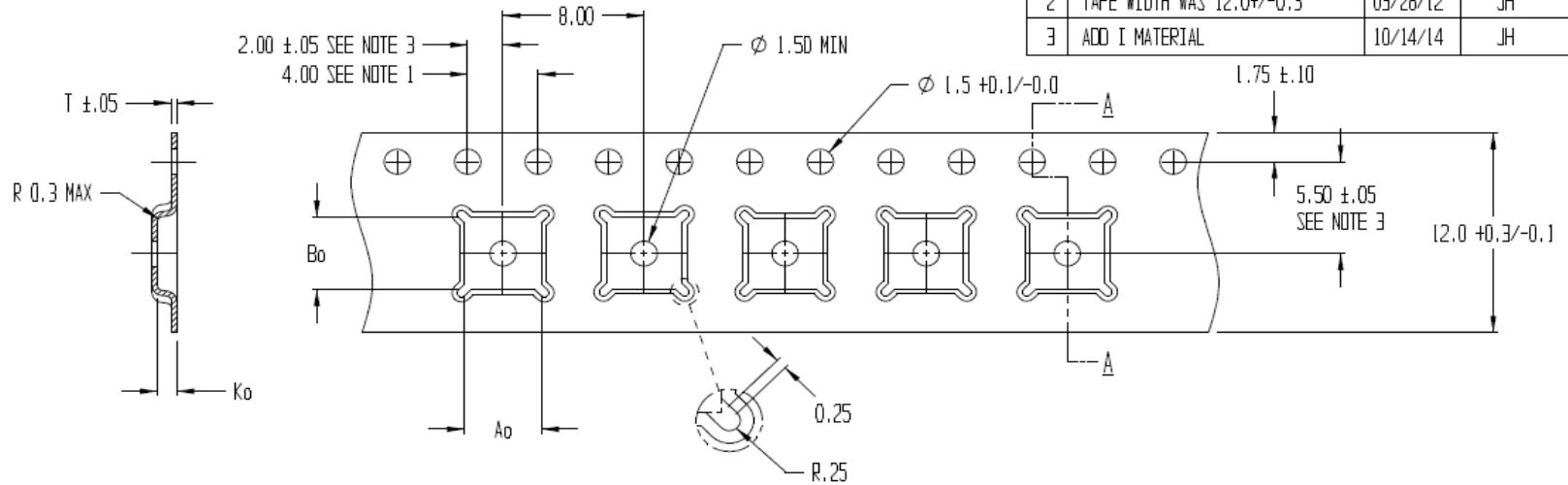
Pkg size	Carrier tape (mm)					Reel		Minimum Trailer Length (mm)	Minimum Leader Length (mm)	QTY per Reel
	Tape Width (W)	Pocket Pitch (P)	Ao	Bo	Ko	Reel Size (in)	Reel Width (mm)			
5x5	12	8	5.25	5.25	1.10	7/13	12.4	200/400	400	500/3000

**Although carrier tape supplier were different but critical dimension were no difference.**

# Carrier tape for Greatek 5x5 (New)



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
1	DRAWING FORMAT CHANGE	7/24/01	BTH
2	TAPE WIDTH WAS 12.04/-0.3	03/28/12	JH
3	ADD I MATERIAL	10/14/14	JH



SECTION A - A

Ao = 5.25  
Bo = 5.25  
Ko = 1.10

PART#	T	MATERIAL	DRAWING NO.
ML0505-AC	0.30	PS+C	T102531AT
ML0505-AD	0.30	PS+C	T108759BT
ML0505-AI	0.25	PS+C	T111798BT

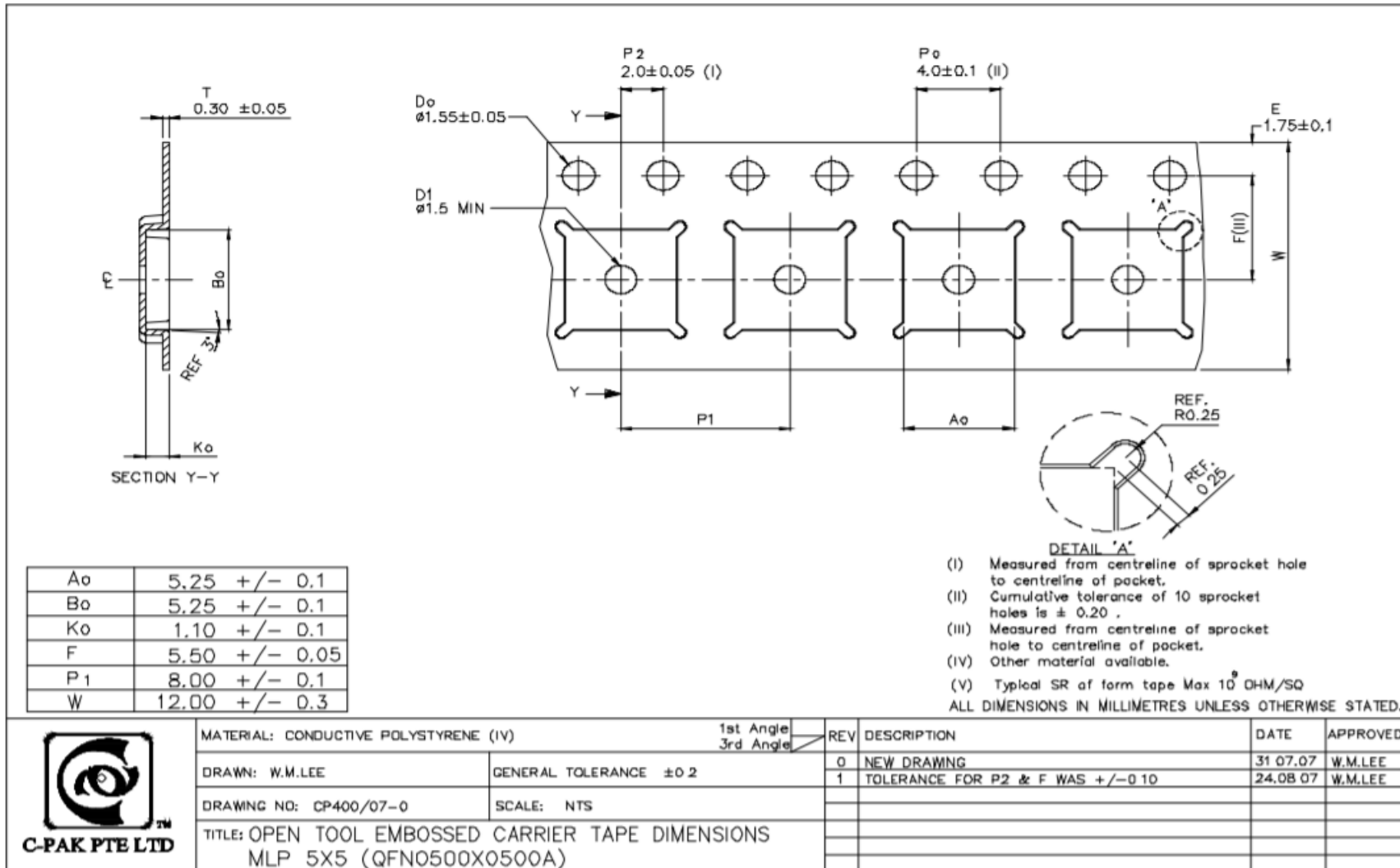
**NOTES:**

- 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE  $\pm 0.2$
- CAMBER IN COMPLIANCE WITH EIA 481
- POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE



TITLE ADVANTEK PART DRAWING NUMBER ML0505-A CARRIER TAPE			
TOLERANCES - UNLESS NOTED 1PL $\pm 0.2$ 2PL $\pm 0.10$		MATERIAL SEE TABLE	DWG SIZE B
DRAWN BY TMD/BTH	DATE 10/07/99	SCALE 4:1	SHEET 1 OF 1
REFERENCE NO. T-9204	DWG NO. SEE TABLE		REV 3

# Carrier tape for Carsem 5x5 (Old)



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