

Semtech

**Business Unit:** 

# PRODUCT / PROCESS CHANGE NOTIFICATION PCN-000772

**Date: November 4, 2021** P1/2

Semtech Corporation, 200 Flynn Road, Camarillo CA 93012								
Change Details								
Part Number(s) Affecto		Customer Part Number(s) Affected: N/A						
SX1272IMLTRT SX1273IMLTRT								
Description, Purpose	and Effect of Chang	je:						
assembly for the abov	e-mentioned parts.	ech will start using qualifie erformed at Carsem (Mala						
The assembly of this part is currently performed at Carsem (Malaysia). Second-source assembly has been qualified at Greatek (Taiwan).								
Change Classification	⊠ Major 🗌 Mino	r Impact to Form, Fit, Function	☐ Yes					
Impact to Data Sheet	☐ Yes	New Revision or Date	⊠ N/A					
Impact to Performance No impact to perform change.		r Reliability: cs or reliability is expect	ed as a result of this					
Implementation Date	February 4, 2022	2 Work Week	2206					
Last Time Ship (LTS) Of unchanged product	N/A	Affecting Lot No. / Serial No. (SN)	N/A					
Sample Availability	November 4, 2021 (SX1272)	Qualification Report Availability	November 4, 2021					
Supporting Documents for Change Validation/Attachments:  • From-To analysis  • Reliability qualification report available upon request.								

Wireless and Sensing Product Group

**Issuing Authority** 



# PRODUCT / PROCESS CHANGE NOTIFICATION PCN-000772

**Date: November 4, 2021** P2/2

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PCN No. 000772

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

### Introduction



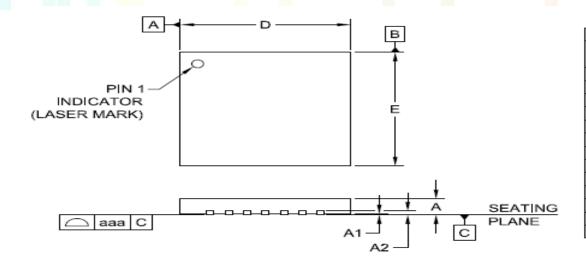
- In order to increase the overall production capacity, Semtech is qualifying Greatek as a second source for assembly and test. Assembly is currently performed at Carsem.
  - ☐ The change affect applicable to products:

    SX1276IMLTRT, SX1272IMLTRT, SX1278IMLTRT, SX1231IMLTRT, SX1232IMLTRT, SX1211I084TRT, SX1781IMLTRT.
  - Qualification Vehicles selected are SX1276IMLTRT
  - ☐ Schedule for Implementation

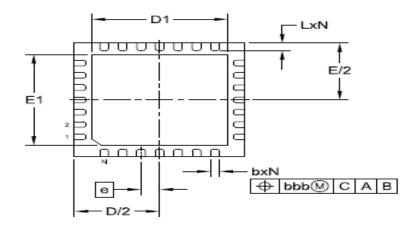
    Passing REL qualification MSL 3 under Rel job# 7140.

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





DIMENSIONS							
ым	MILLIMETERS						
D <sub>E</sub>	МΝ	MAX					
Α	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				
е	0	.65 BS	O				
L	0,30	0,40	0,50				
Z	28						
aaa		0.08					
bbb	0,10						



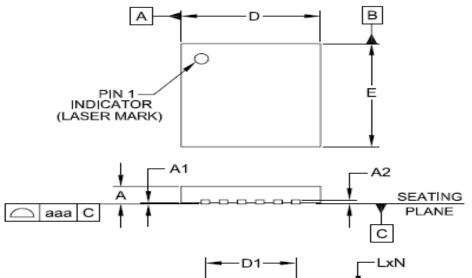
No Change in Package Outline.

#### NOTES:

- 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)





Г	DIMENSIONS							
<b>├</b>								
DIM	MILLIMETERS							
D	MIN	NOM	MAX					
Α	0.80	_	1.00					
A1	0.00	ı	0.05					
A2	ı	(0.20)	ı					
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					
е	0.	65 BS	C					
L	0,35	0.40	0.45					
N	24							
aaa	80,0							
bbb		0,10						

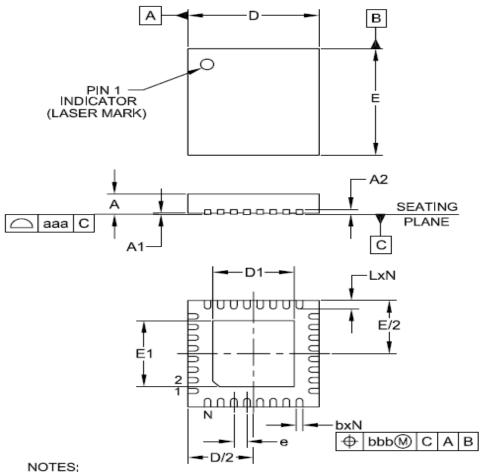
No Change in Package Outline.

#### NOTES:

- 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)





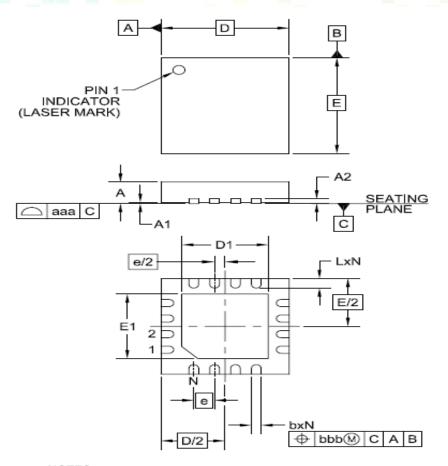
	DIMENSIONS									
DIM	II.	NCHE	S	MILLIMETERS						
DIM	MIN	MOM	MAX	MIN	NOM	MAX				
Α	.028	.030	.031	0.70	0,75	08.0				
A1	.000	-	.002	00,00	-	0,05				
A2	ı	(800.)	ı	ı	(0.20)	-				
b	.008	.010	.012	0,18	0.25	0,30				
О	.193	,197	,201	4.90	5.00	5.10				
D1	.118	.122	.126	3.00	3.10	3.20				
E	.193	.197	.201	4.90	5.00	5.10				
E1	.118	,122	.126	3.00	3.10	3,20				
е	.0	20 BS	C	0	50 BS	C				
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.

- 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)





DIMENSIONS									
DІМ	11	NCHE	S	MILLIMETERS					
Dilvi	MIN	NOM	MAX	MIN	MIN NOM				
Α	.031	-	.040	0.80	-	1.00			
A1	.000	-	.002	0.00	-	0.05			
A2	-	(800.)	-	-	(0.20)	_			
р	,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			
е	Ÿ.	026 BS	O	0.65 BSC					
L	.012	.016	.020	0.30	0.40	0.50			
N		16		16					
aaa		.003		0.08					
bbb		.004			0.10				

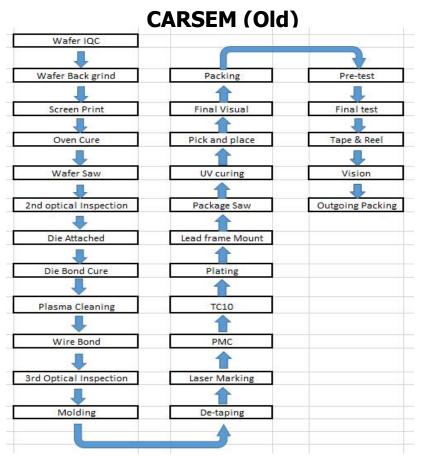
No Change in Package Outline.

#### NOTES:

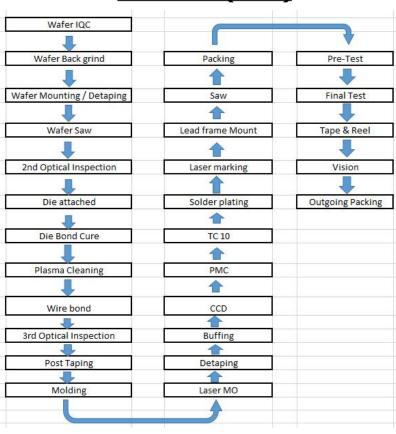
- CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
- 2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
- 3. DAP IS 2.9 x 2.9 mm

# Assembly Process Flow (Carsem vs. Greatek)

### **Assembly Process Flow:**



### **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)**



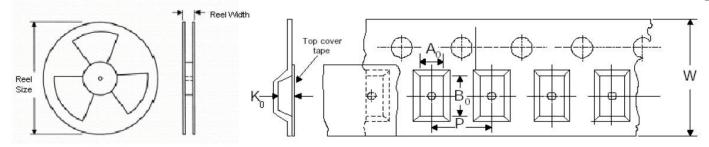
	Carsen	n (Old)		Greatek (New)			
Ероху	Leadframe	Wire Type	Mold compound	Ероху	Leadframe	Wire Type	Mold compound
QMI519 Conductive epoxy	AgCu LDF	1.0 mils Au wire	G770HCD	EN-4900 Conductive epoxy	AgCu LDF	1.0 mils Au wire	G700HA

- 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)



Carri	er tape Cars	em - CPAK	(Old)	Carrier tape Greatek - UPAK (New)				
Ao	Во	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	



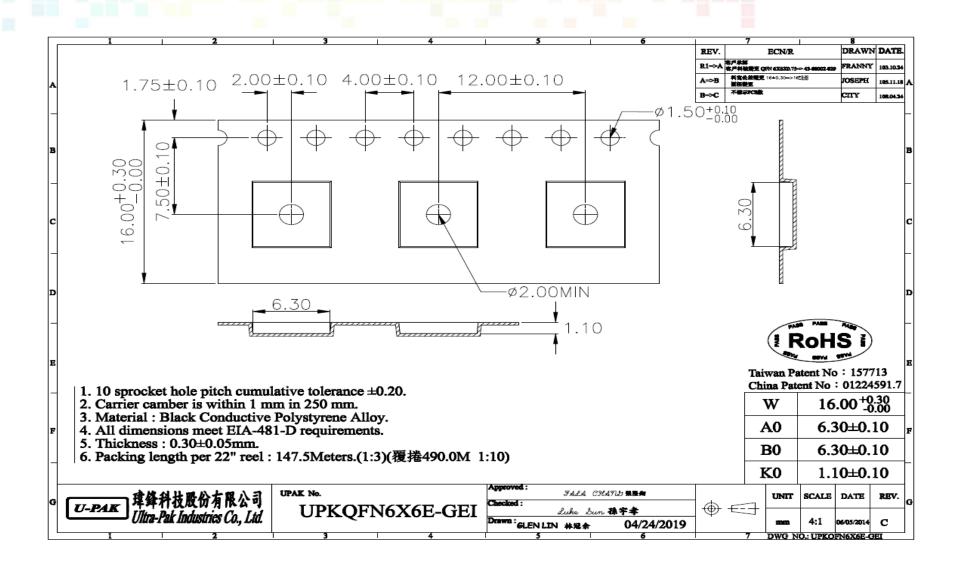
User Direction of Feed

		Car	rier tape (r	nm)	H271	Re	eel			
Pkg size	Tape Width (W)	Pocket Pitch (P)	Ao	Во	Ko	Reel Size (in)	Reel Width (mm)	Minimum Trailer Length (mm)	Minimum Leader Length (mm)	QTY per Reel
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.

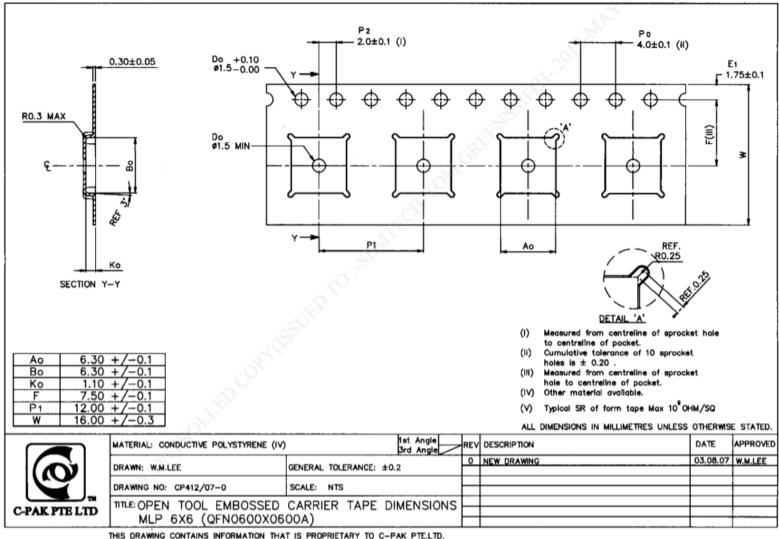
## Carrier tape for Greatek (New)





# Carrier tape for Carsem 6x6 (Old)

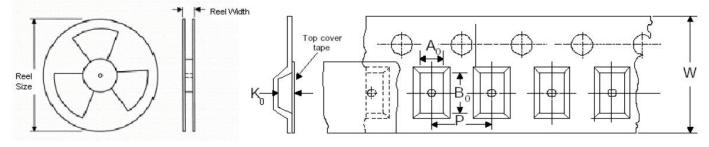




# Carrier tape 4x4 comparison (Carsem Vs Greatek)



Carri	ier tape Cars	em - CPAK	(Old)	Carrier tape Greatek - Advantek (New)			
Ao	Во	Ko	W	Ao	Во	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



User Direction of Feed

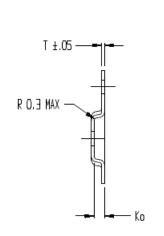
		Cari	rier tape (r	nm)	577	Re	eel				
Pkg size	Tape Width (W)	Pocket Pitch (P)	Ao	Во	Ko	Reel Size (in)	Reel Width (mm)	Minimum Trailer Length (mm)	Minimum Leader Length (mm)	QTY per Reel	
4x4	12	8	4.35	4.35	1.10	7/13	12.4	400	400	1000/3000	

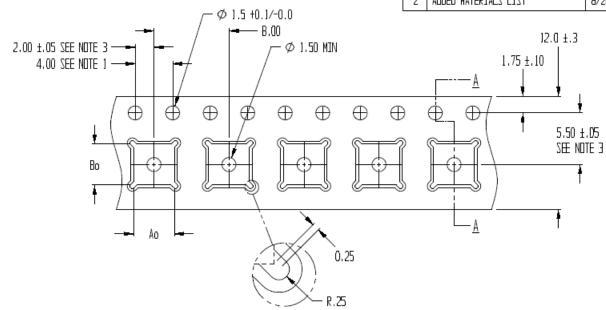
Although carrier tape supplier were different but critical dimension were no difference.

# Carrier tape for Greatek 4x4 (New)



	REVISIONS									
REV	DESCRIPTION	DATE	GS#	APPROVED.						
2	ADDED MATERIALS LIST	8/26/14	30598	TMO						
	12 0 1 2									





SECTION A - A

#### NOTES.

- 1. 10 SPROCKET HOLE PITCH CLMULATIVE TOLERANCE ±0.2
- 2. CAMBER IN COMPLIANCE WITH EIA 4BL
- 3. POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE

An = 4.35 Bn = 4.35 Kn = 1.10

### \*ADVANIEK

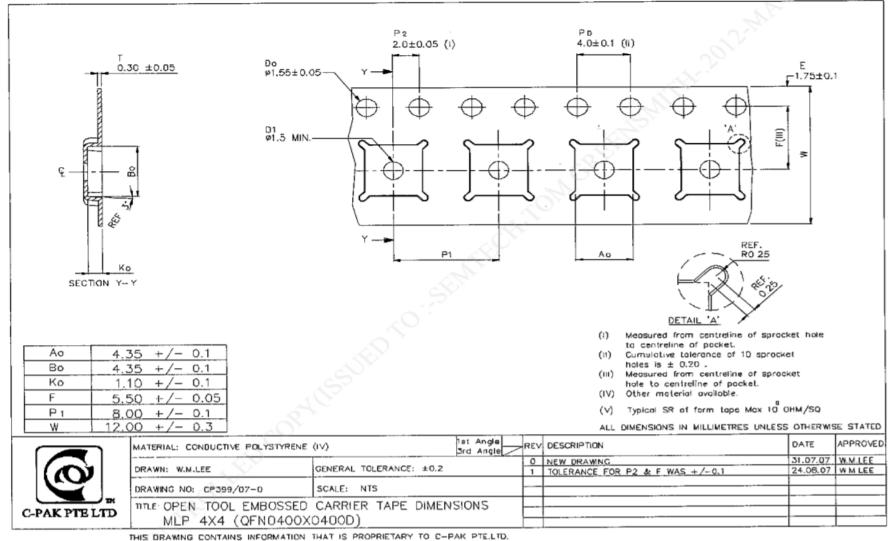
TITLE ADVANTEK PART DRAWING NUMBER MLO404-A

	TOLERANCES	- UNLESS	MATERIAL	ZEE	TABLE
DO NOT A			 		

PART #	T	MATERIAL	DWG #	NOTED 1PL	±.2	2PL ±.1	ALL D	IMENZION	Z IN MIL	LIMETERS	DWG Z	IZE B
MLO404-ABC	100	PC TRILAM		DRAWN BY	ТМП	/BTH	DATE	10/7/9	9	SCALE 4:	1	SHEET 1 OF 1
MLO404-AQ	.33	PC	T111688BT				D-112					<u> </u>
MLO404-AE	.30	PS+E	T102530AT	REFERENCE	NO.	T-9203			DWG NO.	SEE TABLE		REV 2

## Carrier tape for Carsem 4x4 (Old)

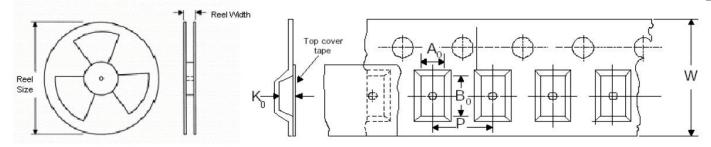




# Carrier tape 5x5 comparison (Carsem Vs Greatek)



Carri	er tape Cars	em - CPAK	(Old)	Carrier tape Greatek - Advantek (New)				
Ao	Во	Ko	W	Ao	Во	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	



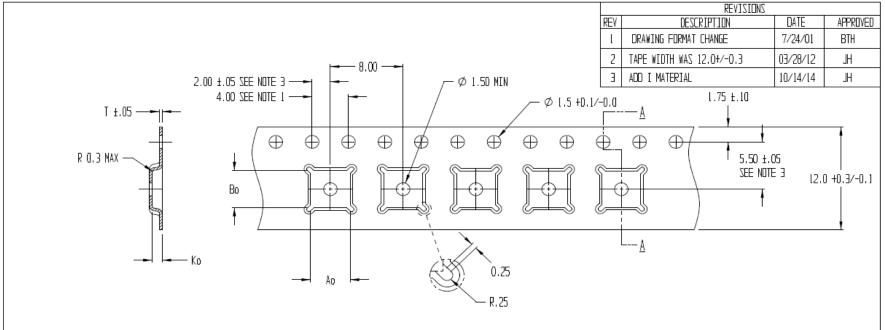
User Direction of Feed

		Car	ri <mark>er tape</mark> (r	nm)	E21	Reel				
Pkg size	Tape Width (W)	Pocket Pitch (P)	Ао	Во	Ko	Reel Size (in)	Reel Width (mm)	Minimum Trailer Length (mm)	Minimum Leader Length (mm)	QTY per Reel
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)





<u>SECTION A - A</u>

Ao = 5.25 Bo = 5.25 Ko = 1.10

### NOTES:

- I. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.2
- CAMBER IN COMPLIANCE WITH FTA 481
- 3. POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE

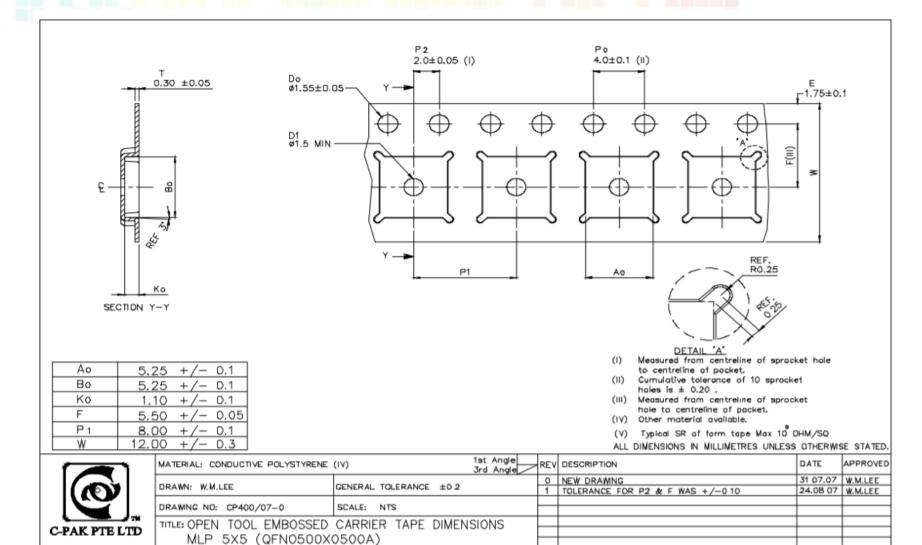
PART#	T	MATERIAL	DRAWING NO.
ML0505-AC	0.30	PS+C	T102531AT
ML0505-AD	0.30	PS+C	T108759BT
ML0505-AI	0.25	PS+E	T111798BT

### \*ADVANIEK

TITLE ADVANTEK PART DRAWING NUMBER ML0505-A CARRIER TAPE								
TOLERANCES - LINLESS	MATERIAL SEE TABLE							
NOTED 1PL ±.2 2PL ±.10	ALL DIMENSIONS IN MILL	.IMETERS DWG S	IZE B					
DRAWN BY TMD/BTH	DATE 10/07/99	SCALE 4:1	SHEET 1 OF 1					
REFERENCE No. T-9204	DWG ND.	SEE TABLE	REV 3					

# Carrier tape for Carsem 5x5 (Old)





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