

PQFN Tape and Reel Information

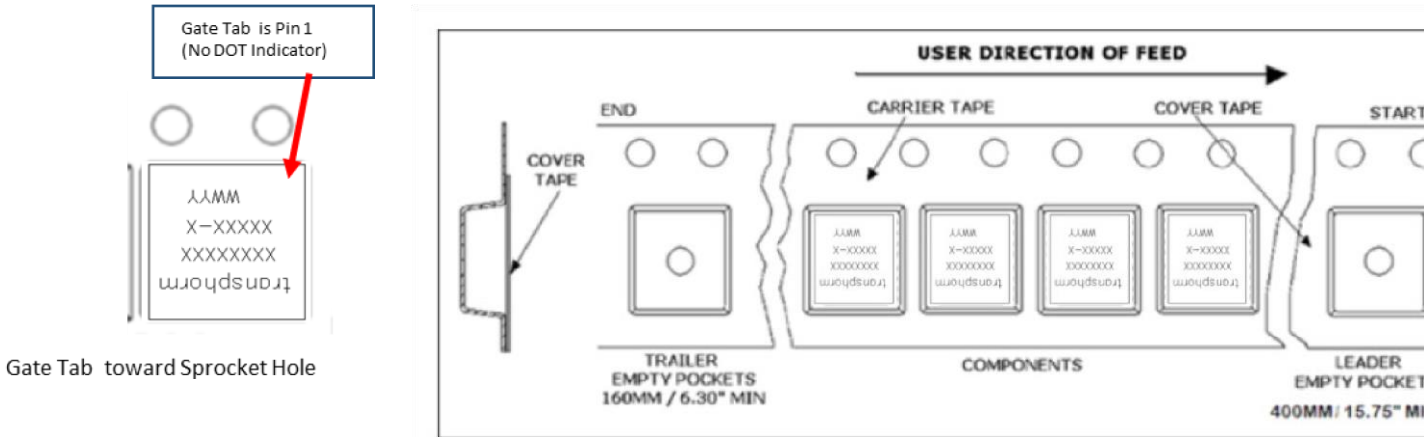
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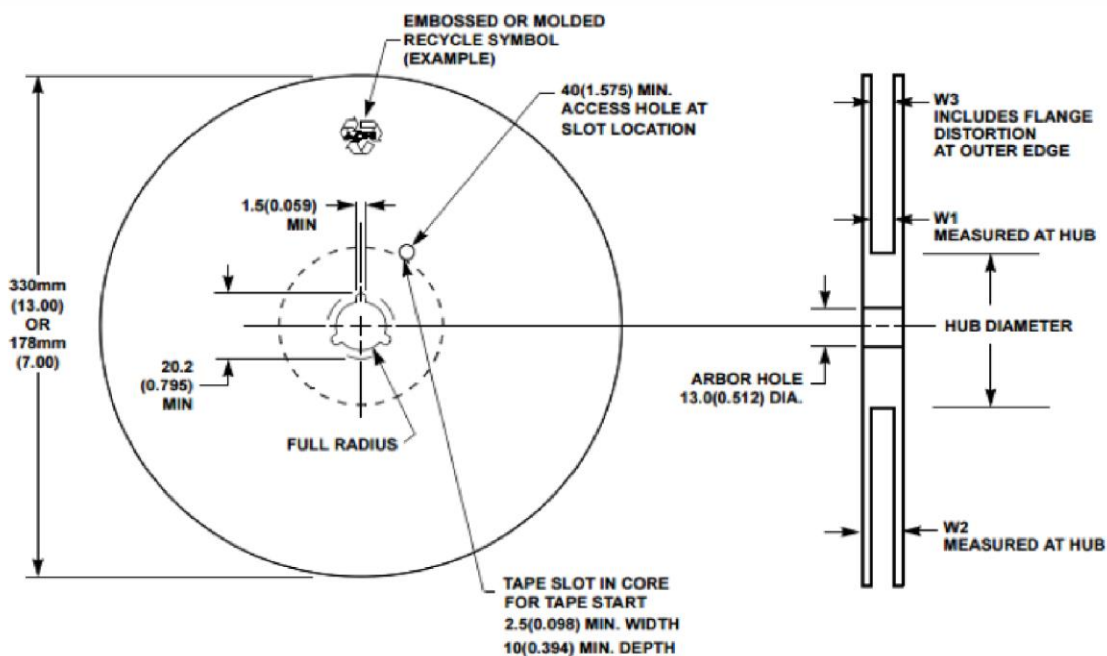
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1. GEN III 8X8mm PQFN TAPE & REEL INFORMATION

Part I: Product Orientation



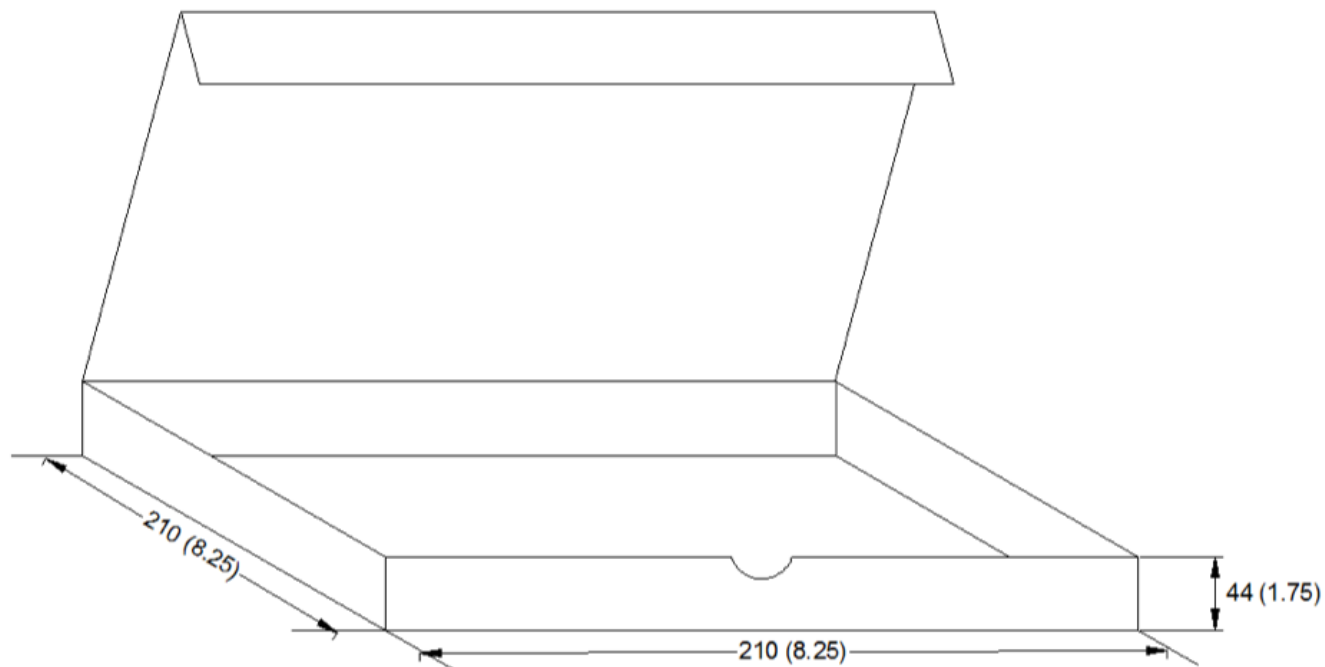
- Leader Empty Pockets: 400mm / 15.75" min
- Trailer Empty Pockets: 160mm / 6.30" min
 - Quantity per Reel: 500pcs



TAPE WIDTH	W1 (NOMINAL)	W2 (MAXIMUM)	W3 (MAXIMUM)
8mm (0.315)	8.4 (0.331)	14.4 (0.567)	10.9 (0.429)
12mm (0.472)	12.4 (0.488)	18.4 (0.724)	15.4 (0.606)
16mm (0.629)	16.4 (0.646)	22.4 (0.882)	19.4 (0.764)
24mm (0.945)	24.4 (0.961)	30.4 (1.197)	27.4 (1.079)
32mm (1.260)	32.4 (1.276)	38.4 (1.512)	35.4 (1.394)
44mm (1.732)	44.4 (1.748)	50.4 (1.984)	47.4 (1.866)

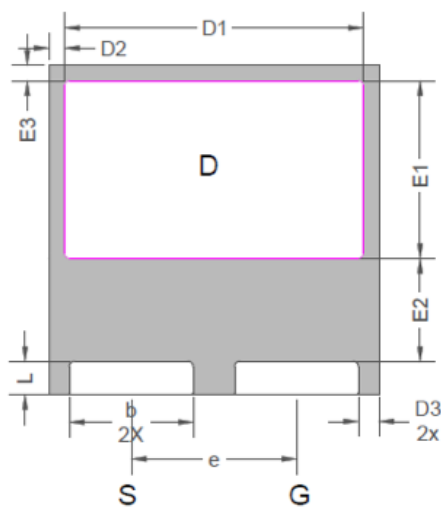
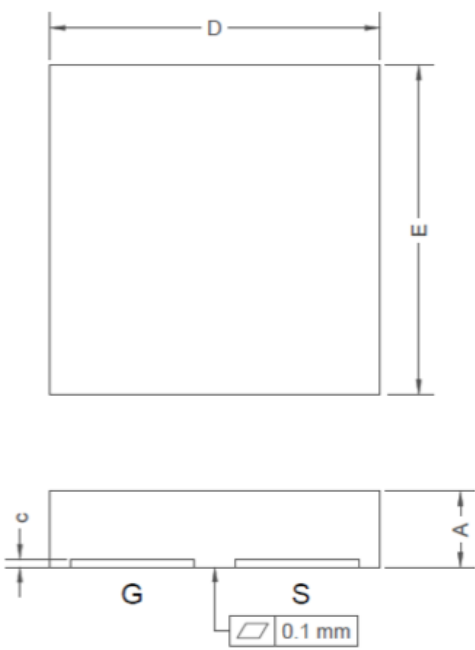
Dimensions are in millimeters (inches are in brackets for reference only).

- Part IV: Box Size



Dimensions are in millimeters (inches are in brackets for reference only).

- Part V: Package POD for LDG Version

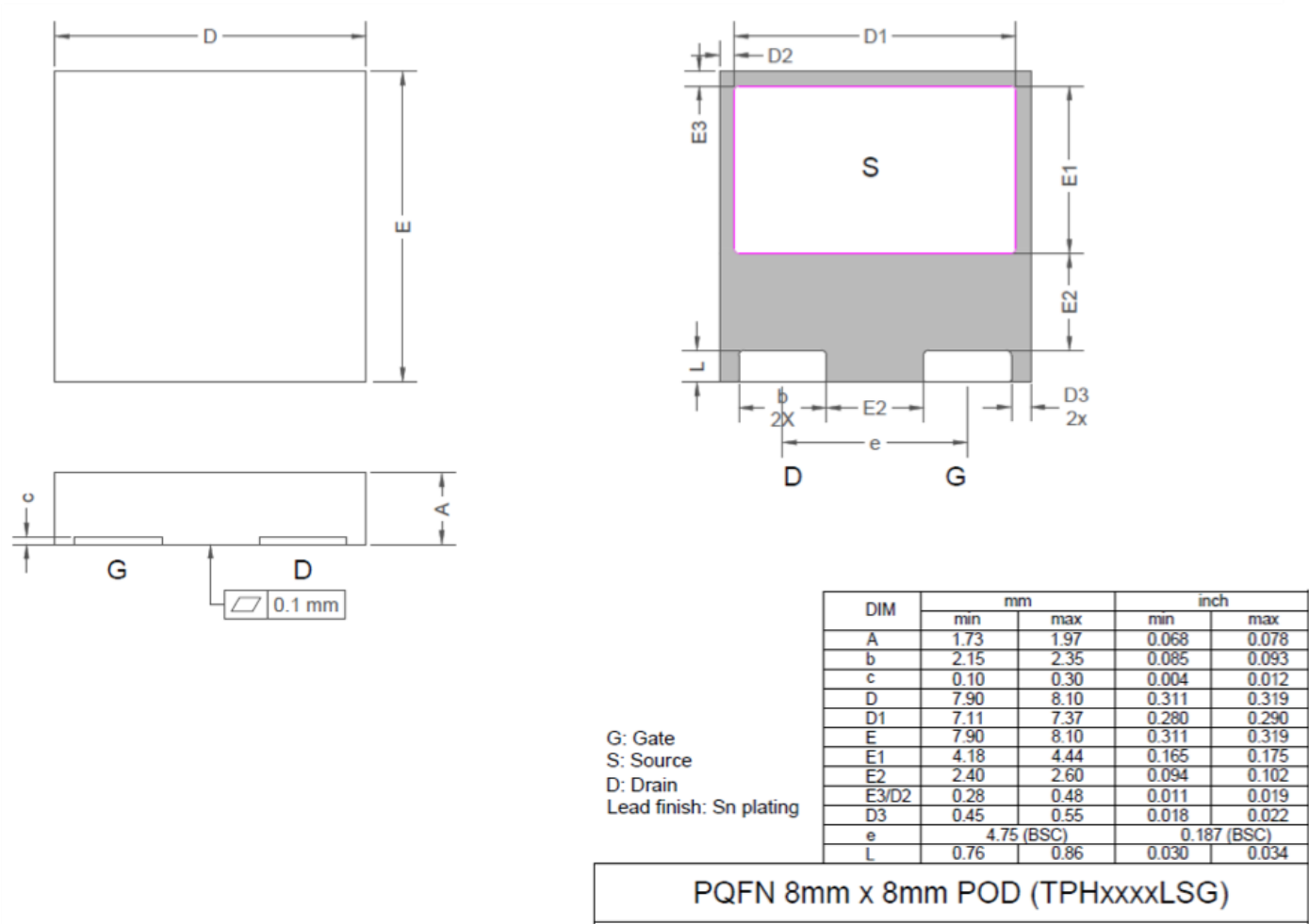


G: Gate
S: Source
D: Drain
Lead finish: Sn plating

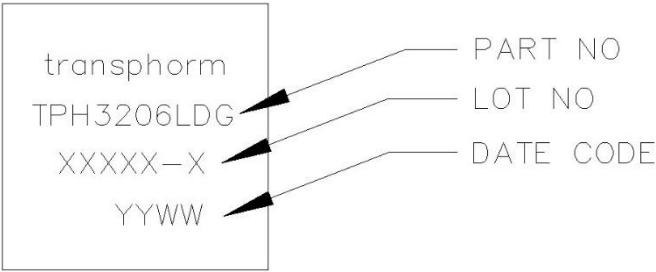
DIM	mm		inch	
	min	max	min	max
A	1.73	1.97	0.068	0.078
b	2.90	3.10	0.114	0.122
c	0.10	0.30	0.004	0.012
D	7.90	8.10	0.311	0.319
D1	7.11	7.37	0.280	0.290
E	7.90	8.10	0.311	0.319
E1	4.18	4.44	0.165	0.175
E2	2.40	2.60	0.094	0.102
E3/D2	0.28	0.48	0.011	0.019
D3	0.45	0.55	0.018	0.022
e	4.00 (BSC)		0.157 (BSC)	
L	0.76	0.86	0.030	0.034

PQFN 8mm x 8mm POD (TPHxxxxLDG)

- Part VI: Package POD for LSG Version & Laser Marking Sample

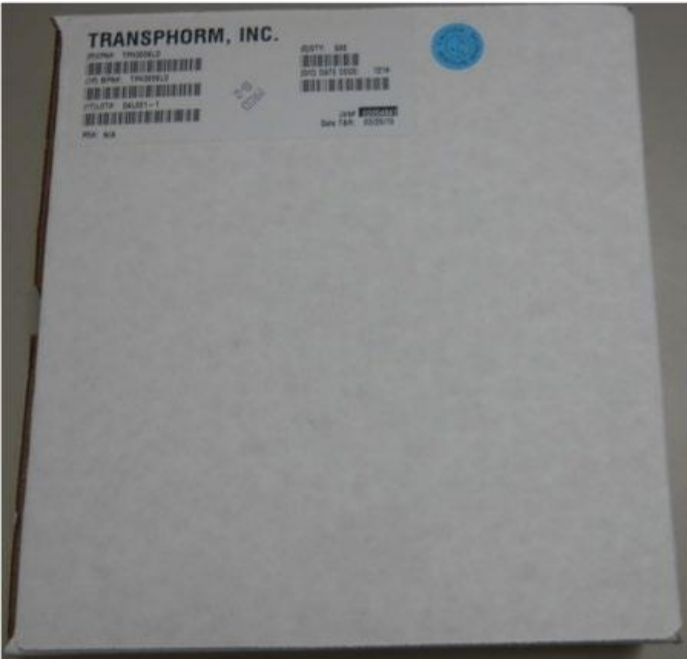


Laser Marking Sample



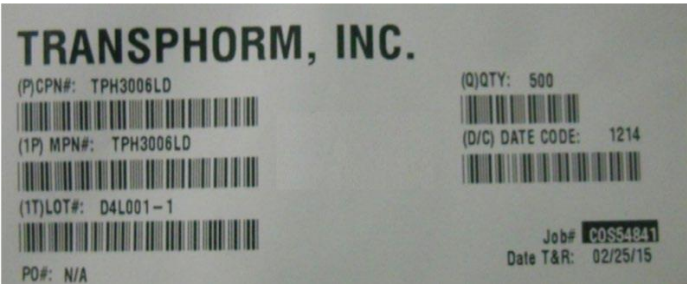
TOP MARKING (LASER)

- Part VIII: Internal Shipping Box Information



Internal Shipping Box

- Tape internal box closed using ESD Label.
- Place Internal Shipping Label.



- Internal Shipping Box Label

CPN: Customer Part Number
MPN: Renesas Part Number
Lot #: Assembly Lot Number

QTY: Quantity contained inside the

box

D/C: Date Code

Job #: Tape and Reel job number

Date T&R: Bag seal date

• Part IX: External Shipping Box Information



External Shipping Box Label

From: Renesas shipping address

To: Customer name, address attention to, and phone number

Customer PO: Customer Purchase Order Number

Customer P/N: Customer Part Number

Quantity: Total product quantity contain in external shipping box

Renesas P/N: Renesas Product Number

Country of Origin: Country of Origin where product was manufactured

Package Count: Number of External Shipping Boxes contained in shipment

Package Weight: Weight of packed External Shipping

External Shipping Box

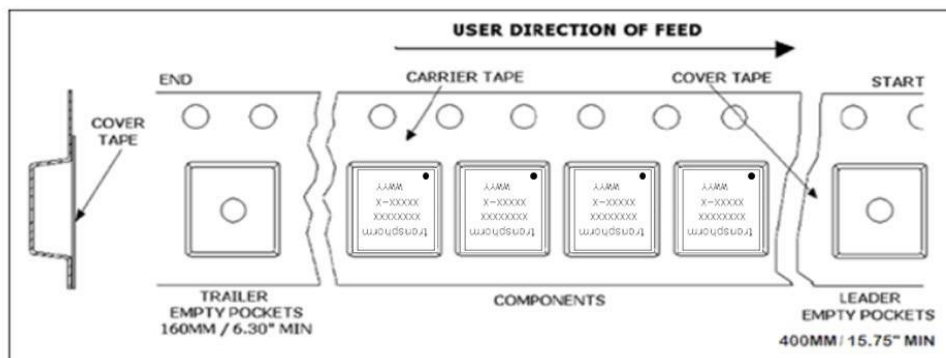
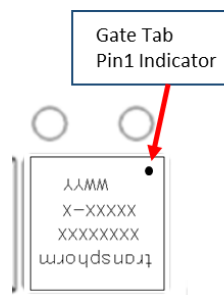
- Internal Shipping Boxes inside External Shipping Box.
- Number of Internal Boxes ranges from 3 to 5.
- Place External Shipping Label.

From: Transphorm, Inc. 115 Castilian Drive Goleta, CA 93117	
To: Customer Name Customer Address Line 1 Customer Address Line 2 City & Zip Code	
ATTN: Customer Name Attention TO Customer ATTN TO phone number	
Customer PO:  CUSTOMER 123-A	
Customer P/N:  HEMT-120	
QTY:  1000	
Transphorm P/N:  TPH3205WS	
	<u>Country of Origin</u> PH
<u>Package Count</u> X of X	<u>Package Weight</u> x.x lbs / x.xx kg

Box

Shipping Box Size and Weight				
Shipment	Units	Weight	Size	Comments
1 box	500pcs	0.8 (lbs) 0.363 (kgs)		FedEx Shipping box
3 boxes	1500pcs	2.4 (lbs) 1.09 (kgs)	12 in x 12 in x 12 in 304.8mm x 304.8mm x 304.8mm	
4 boxes	2000pcs	3.2 (lbs) 1.45 (kgs)	12 in x 12 in x 12 in 304.8mm x 304.8mm x 304.8mm	
5 boxes	2500pcs	4.0 (lbs) 1.81 (kgs)	12 in x 12 in x 12 in 304.8mm x 304.8mm x 304.8mm	

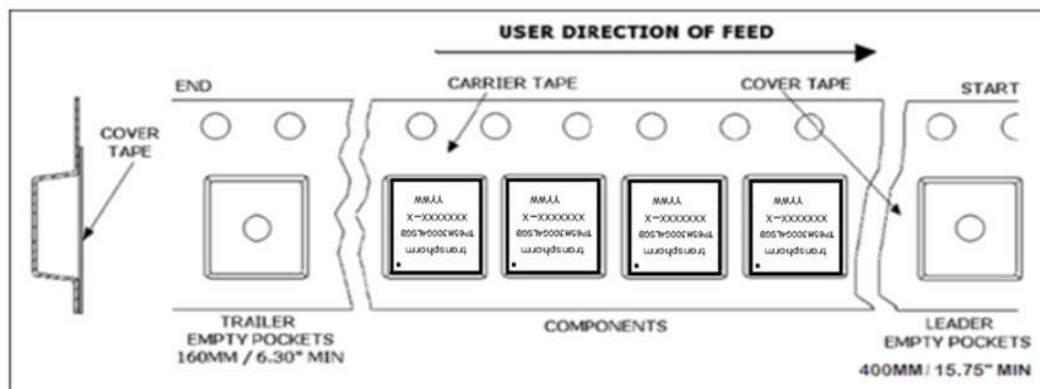
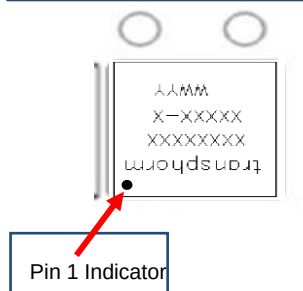
- 2. GEN IV 8X8mm PQFN TAPE & REEL INFORMATION
- Part I: Performance Product Orientation



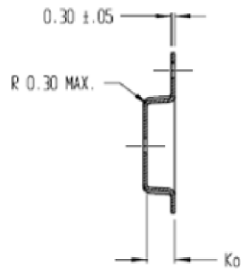
- Leader Empty Pockets: 77
- Trailer Empty Pockets: 37
- Quantity per Reel: 3,000pcs

- Part II: Industry Standard Product Orientation

Gate Tab toward Sprocket Hole



- Leader Empty Pockets: 77
- Trailer Empty Pockets: 37
- Quantity per Reel: 3,000pcs

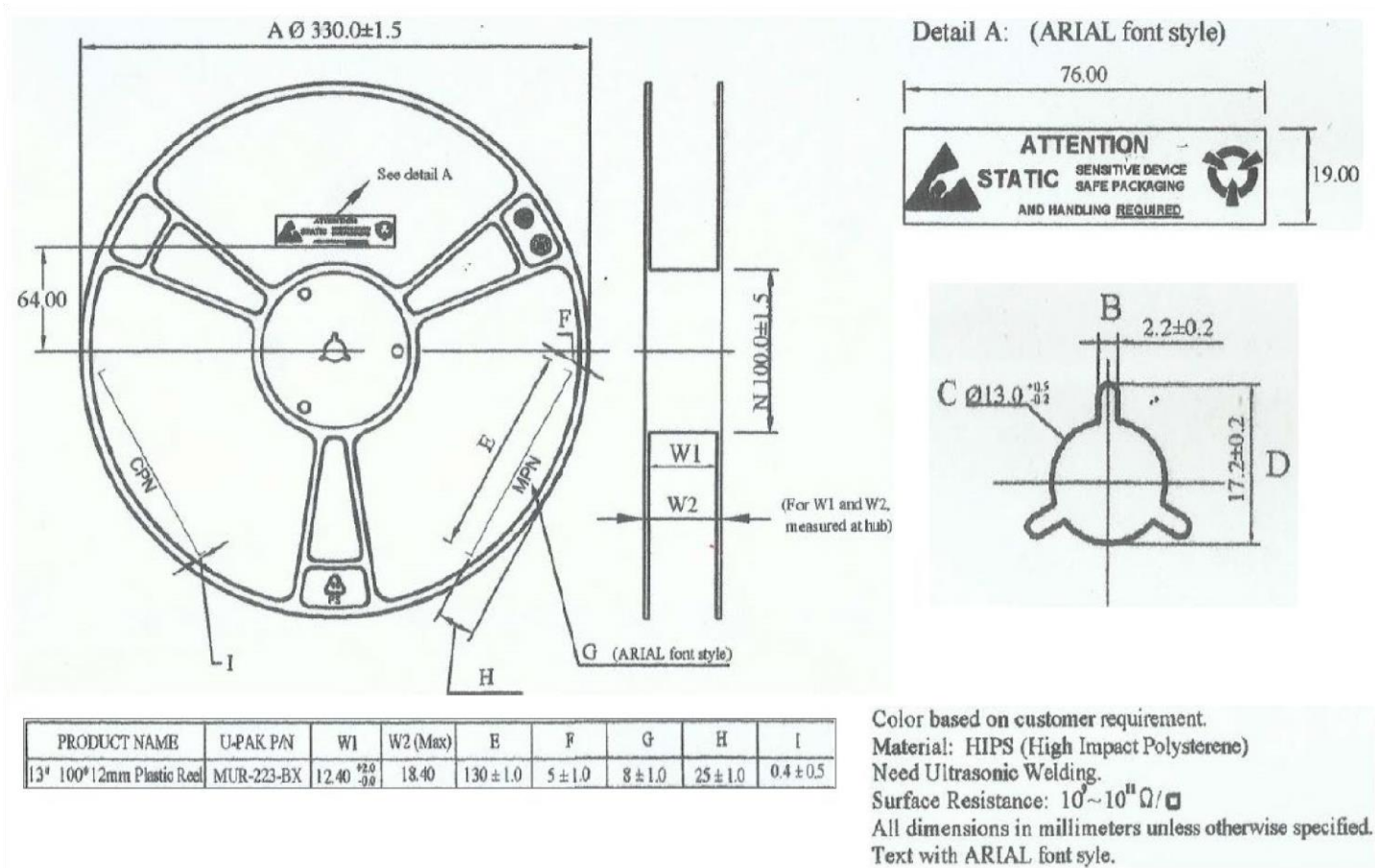


Notes:

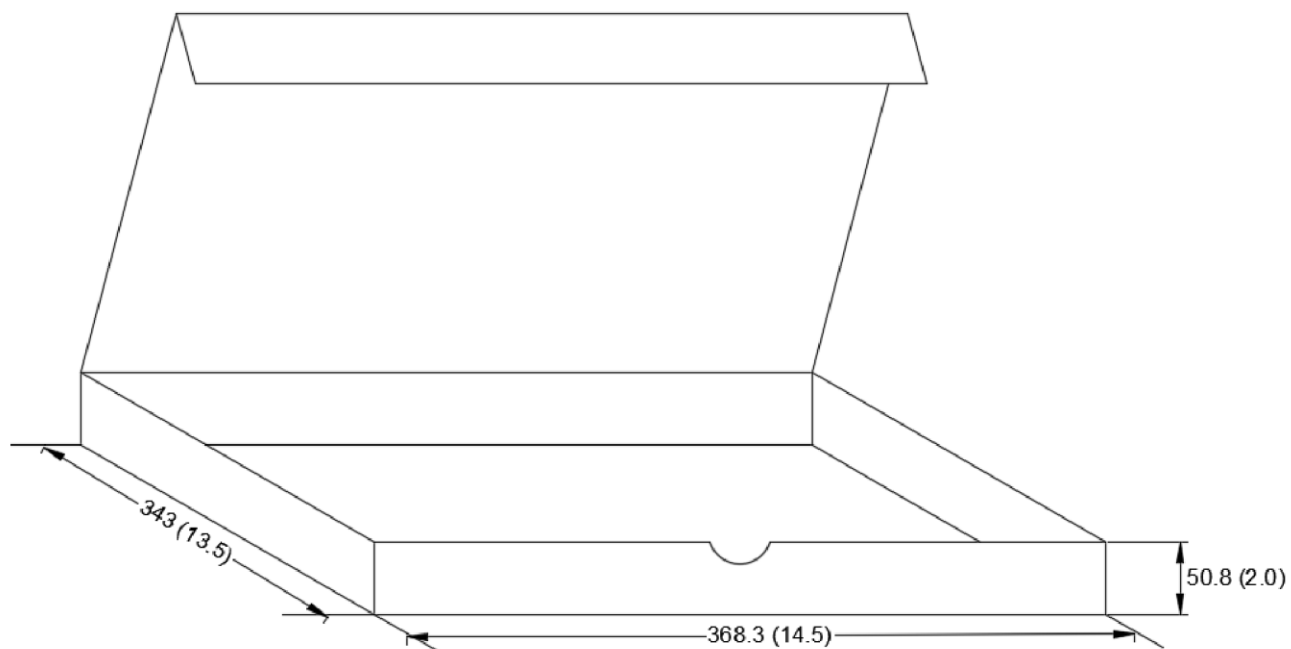
- 10 Sprocket Hole pitch cumulative tolerance ± 0.2 Ko = 1.20 •

Pocket position relative to Sprocket Hole measured as true position of Pocket not Pocket Hole

- Part IV: Reel Dimension
- Reel Size: 330mm

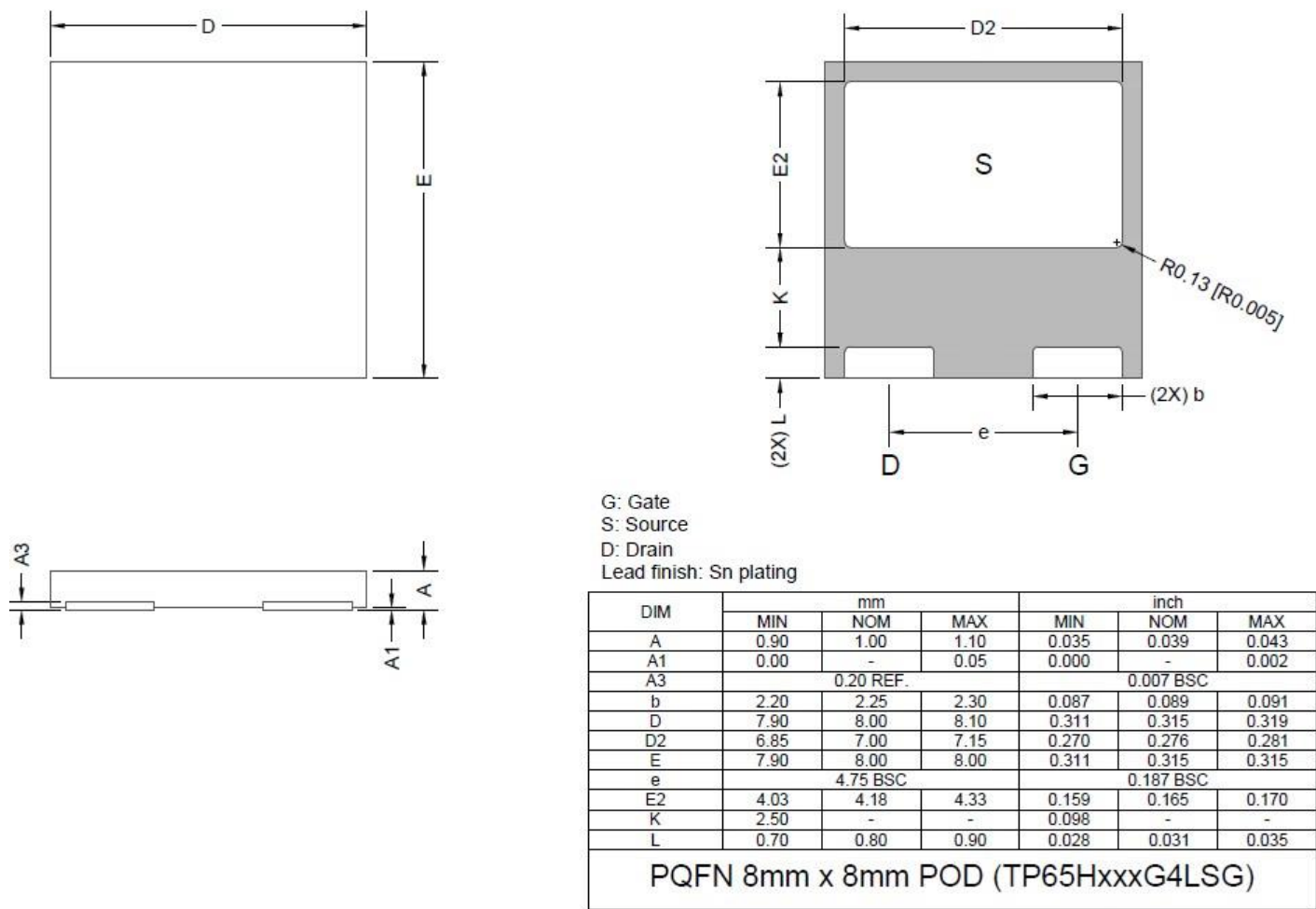


- Part V: Box Size

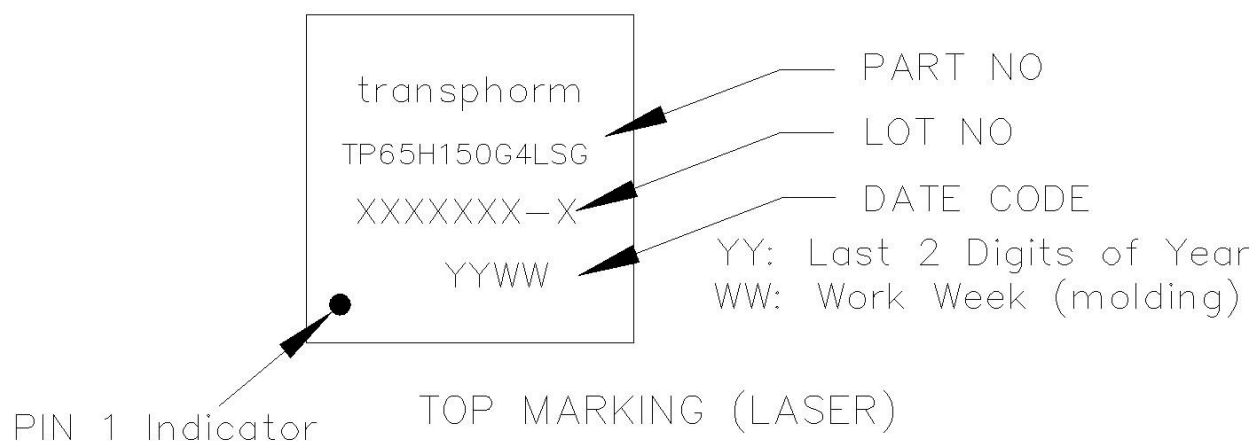


Dimensions are in millimeter (inches are in brackets for reference only)

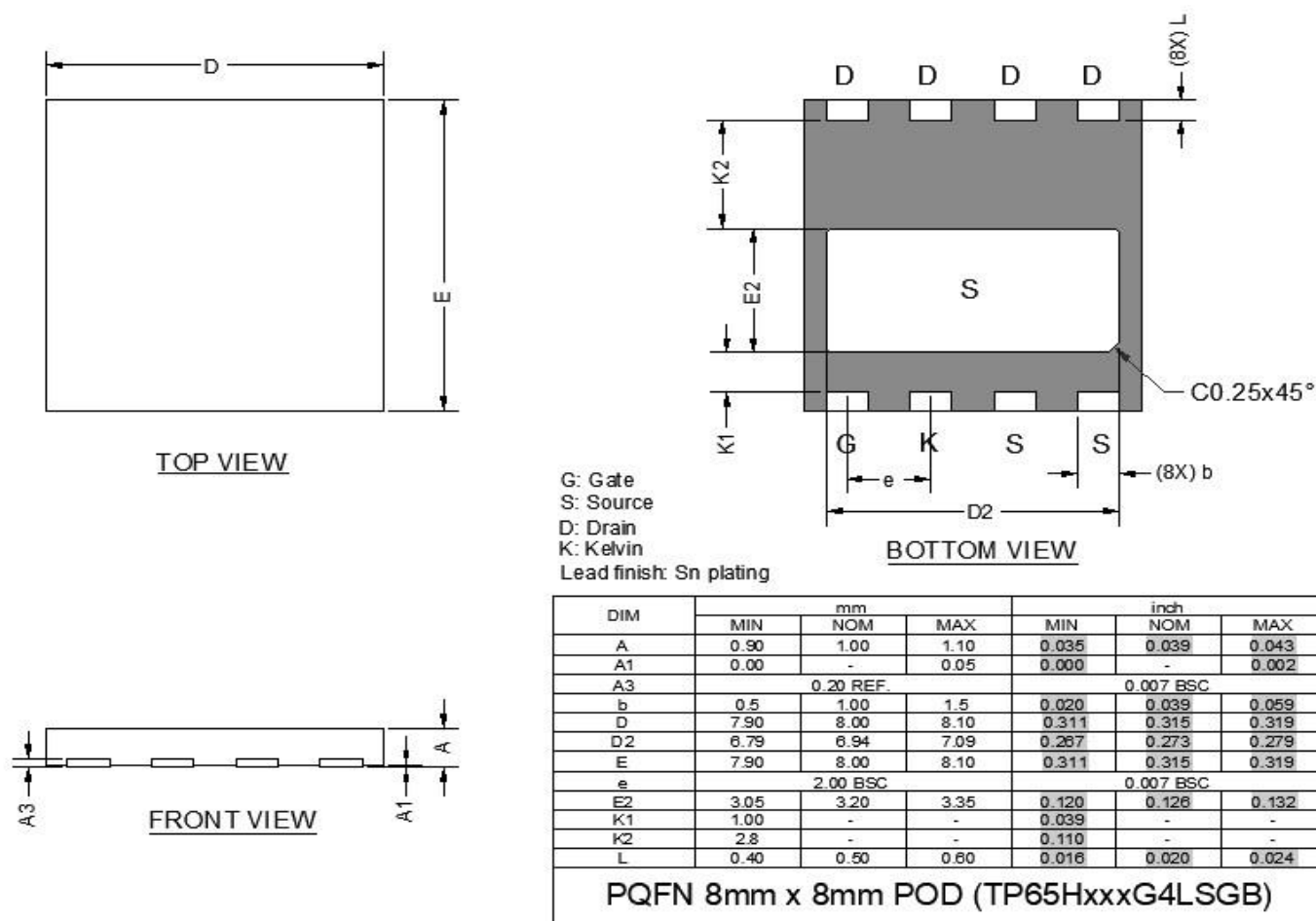
• Part VI: Package POD for Performance Version & Laser Marking Sample



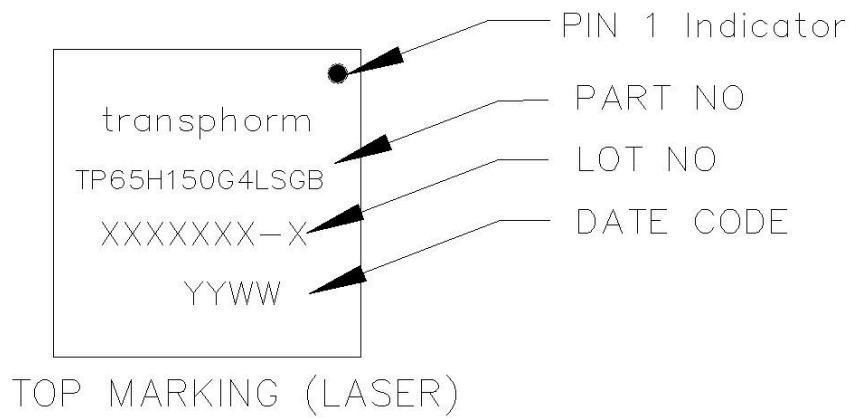
Laser Marking Sample



Part VII: Package POD for Industry Standard Version & Laser Marking



Laser Marking Sample



- Part VIII: Tape and Reel Packaging Information



Tape and Reel Shielding Bag

- 3,000units/reel
- Maximum 1 reel/box
- Place Tape and Reel inside moisture barrier bag
- Seal moisture bag

- Part IX: Internal Shipping Box Information



Internal Shipping Box

- Tape internal box closed using ESD Label
- Place Internal Shipping Label



Internal Shipping Box Label

Supplier P/N: Transphorm Part Number

Quantity: Quantity contained inside the box

Date Code: YYWW

Lot Code: Assembly Lot Number

COO: Country of Origin

2D Barcode: Above information encoded

- Part X: External Shipping Box Information



External Shipping Box

- Internal Shipping Boxes inside External Shipping Box
- Number of Internal Boxes ranges from 2 to 6
- Place External Shipping Label

External Shipping Box Label

FROM: Transphorm, Inc. 75 Castilian Drive Goleta, CA 93117	TO: Customer Name ATTN: Attention TO Customer Address Line 1 Customer Address Line 2 City & Zip Code
(K) PO Number: Sample 	
(1P) Supplier Part Number: TP65HxxxG4LSG 	
(Q) Quantity: 3000 	
(4S) Package ID: SO-1288 	
(10D) Data Code: 1452 	(4L) COO: US 
(1T) Lot Code: B9A028 	
  	

From : Renesas shipping address
To : Customer name, Attention TO, and address number
PO Number : Customer Purchase Order Number
Supplier Part Number : Renesas Part Number Quantity : Total product quantity contain in external shipping box
Package ID : Renesas Assigned Number
Date Code: YYWW
Lot Code: Assembly Lot Number
COO: Country of Origin

2D Barcode: Above information encoded

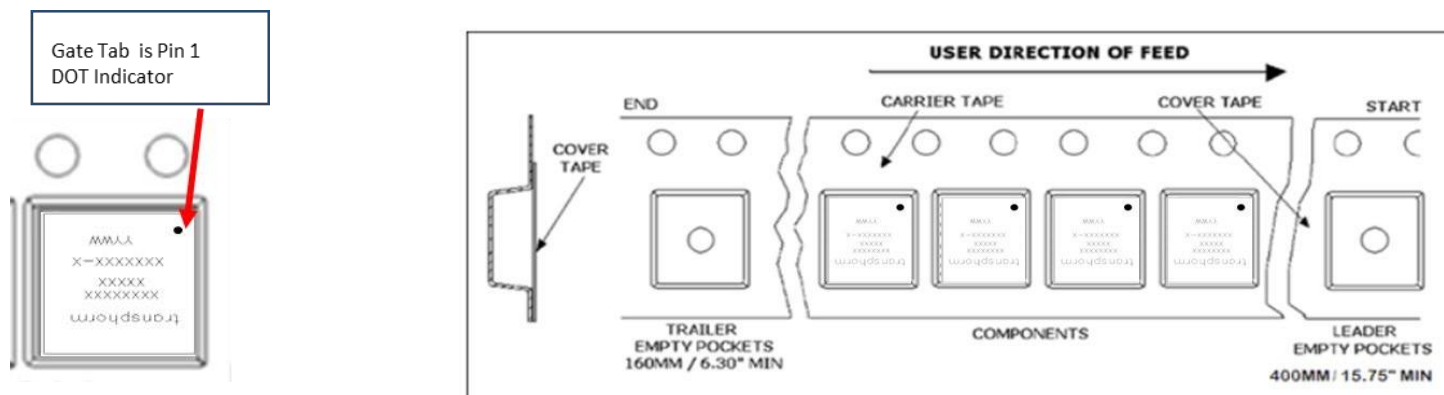
Shipping Box Size and Weight				
Shipment	Units	Weight	Size	Comments
1 box	3,000pcs	3.13 (lbs) 1.42 (kgs)		FedEx Shipping box
3 boxes	9,000pcs	9.39 (lbs) 4.26 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	
4 boxes	12,000pcs	12.52 (lbs) 5.68 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	
5 boxes	15,000pcs	15.65 (lbs) 7.10 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	

Application Note

6-boxes	18,000pcs	18.78 (lbs) 8.52 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	
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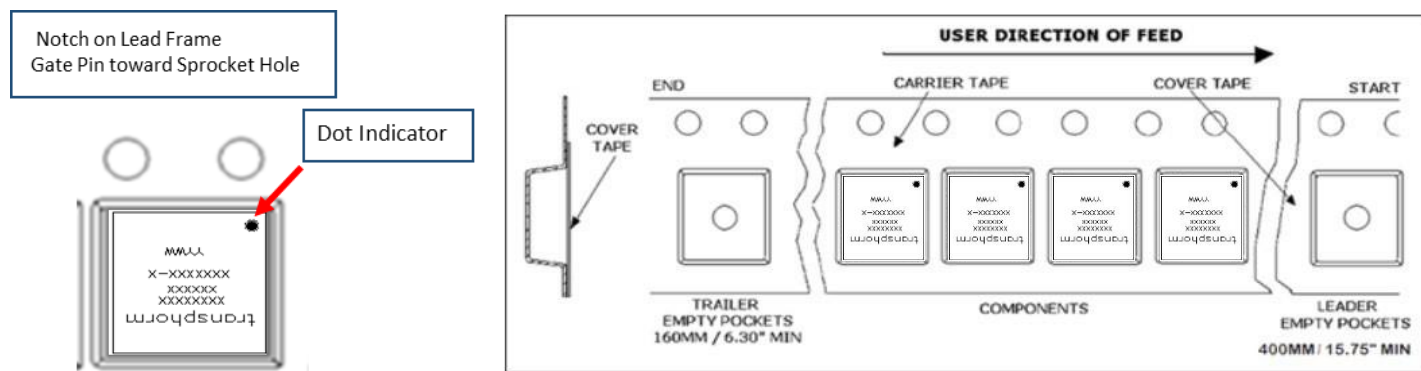
3. GEN IV 5X6mm PQFN TAPE & REEL INFORMATION

Part I: Performance Product Orientation



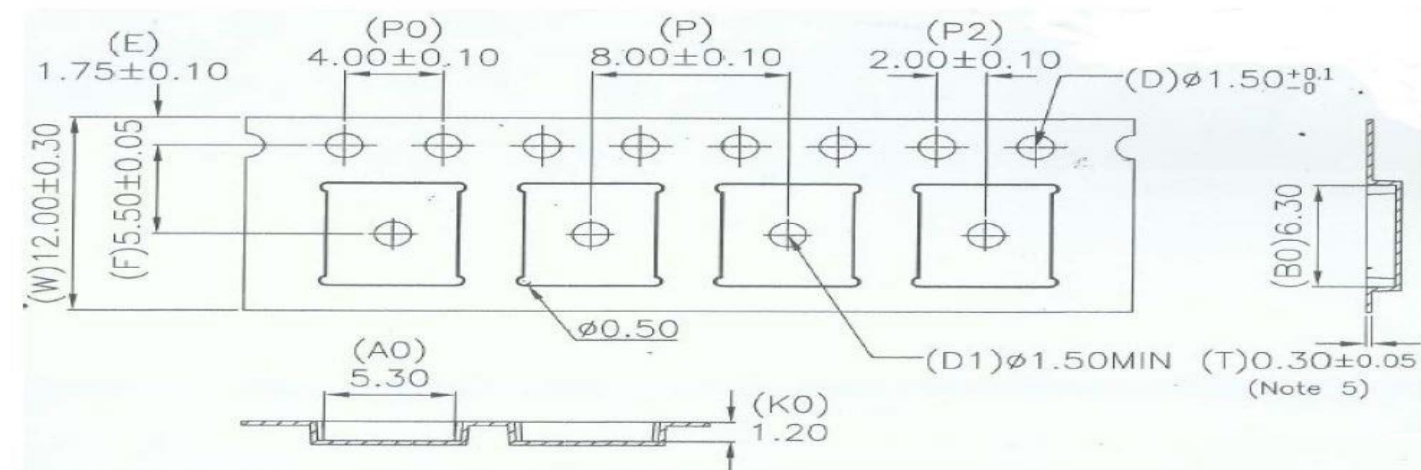
- Leader Empty Pockets: 85
- Trailer Empty Pockets: 40
- Quantity per Reel: 4,000pcs

Part II: Industry Standard Product Orientation



- Leader Empty Pockets: 85
- Trailer Empty Pockets: 40
- Quantity per Reel: 4,000pcs

• Part III: Carrier Tape Dimension



Ao = 5.30

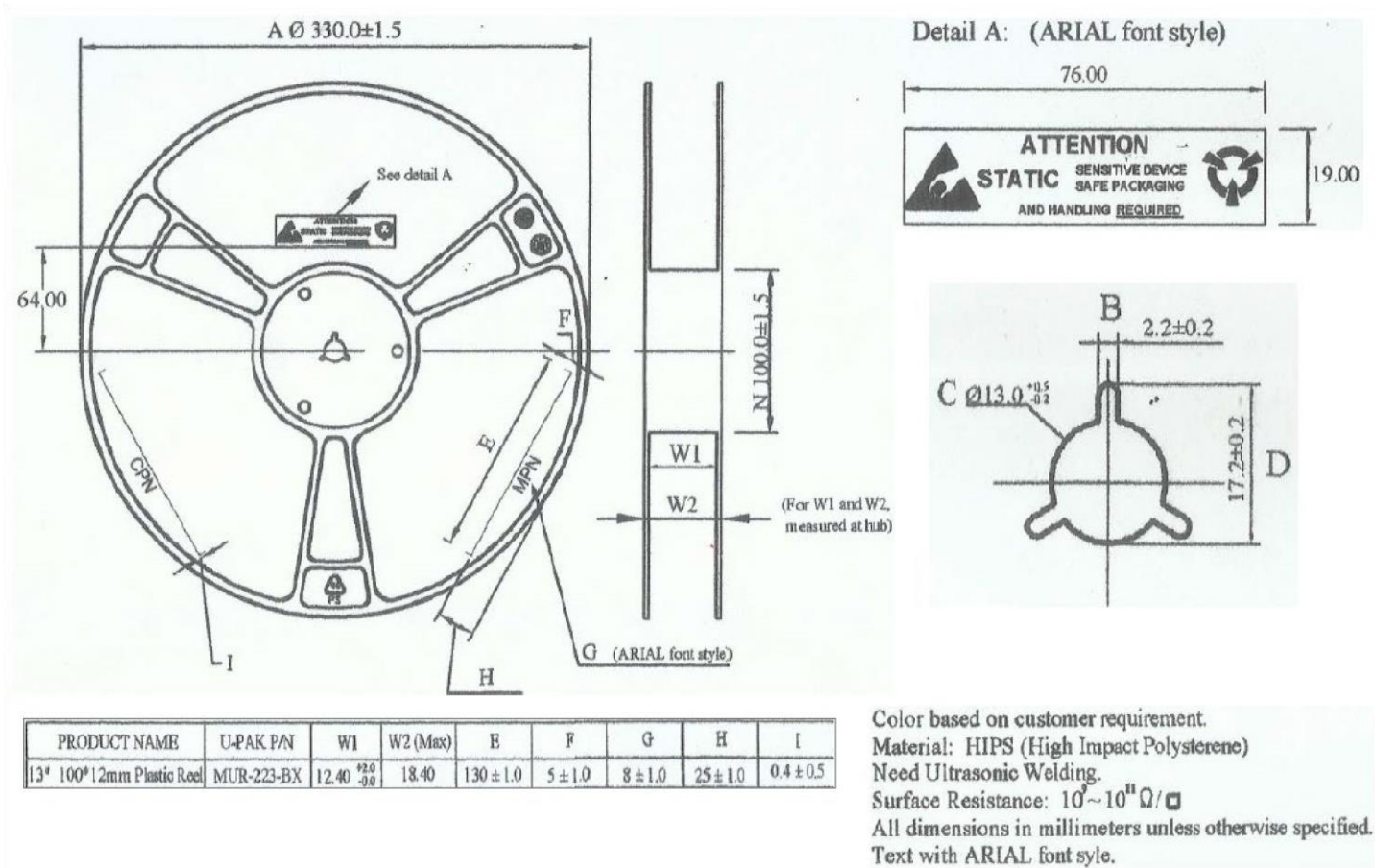
Bo = 6.30

Ko = 1.20

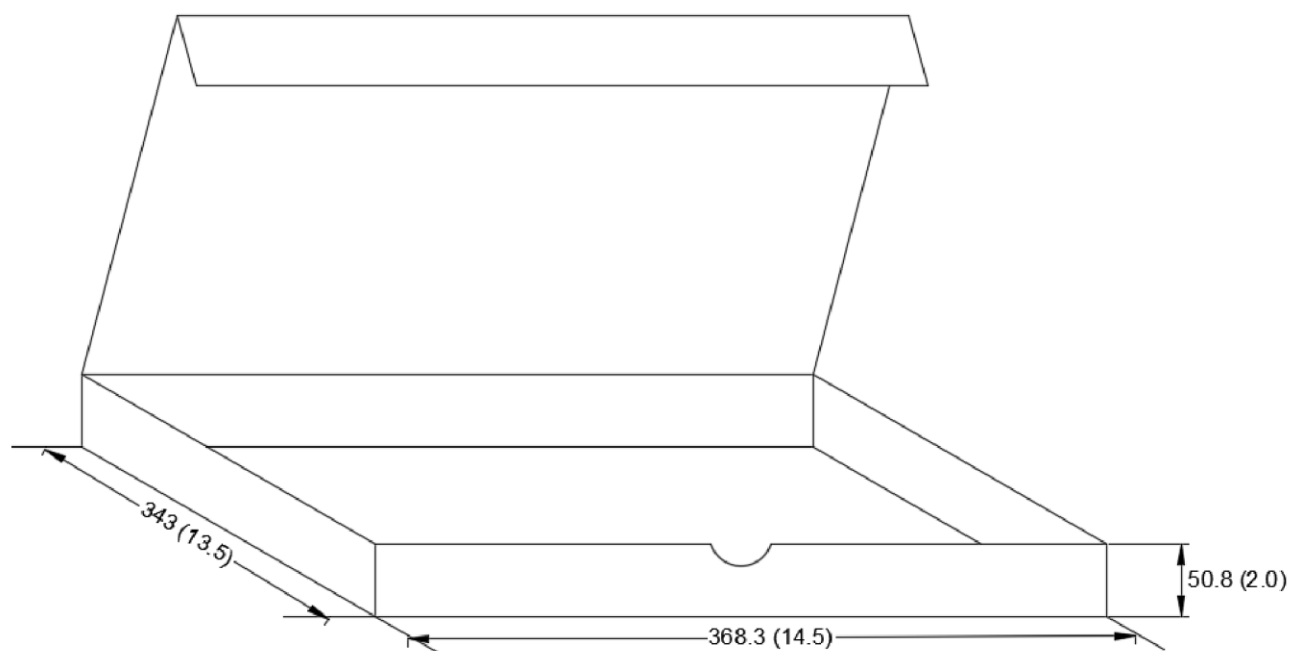
Notes:

- 10 Sprocket Hole pitch cumulative tolerance ±0.2
- Camber in compliance with EIA 481
- Pocket position relative to Sprocket Hole measured as true position of Pocket
not Pocket Hole

- Part IV: Reel Dimension
- Reel Size: 330mm

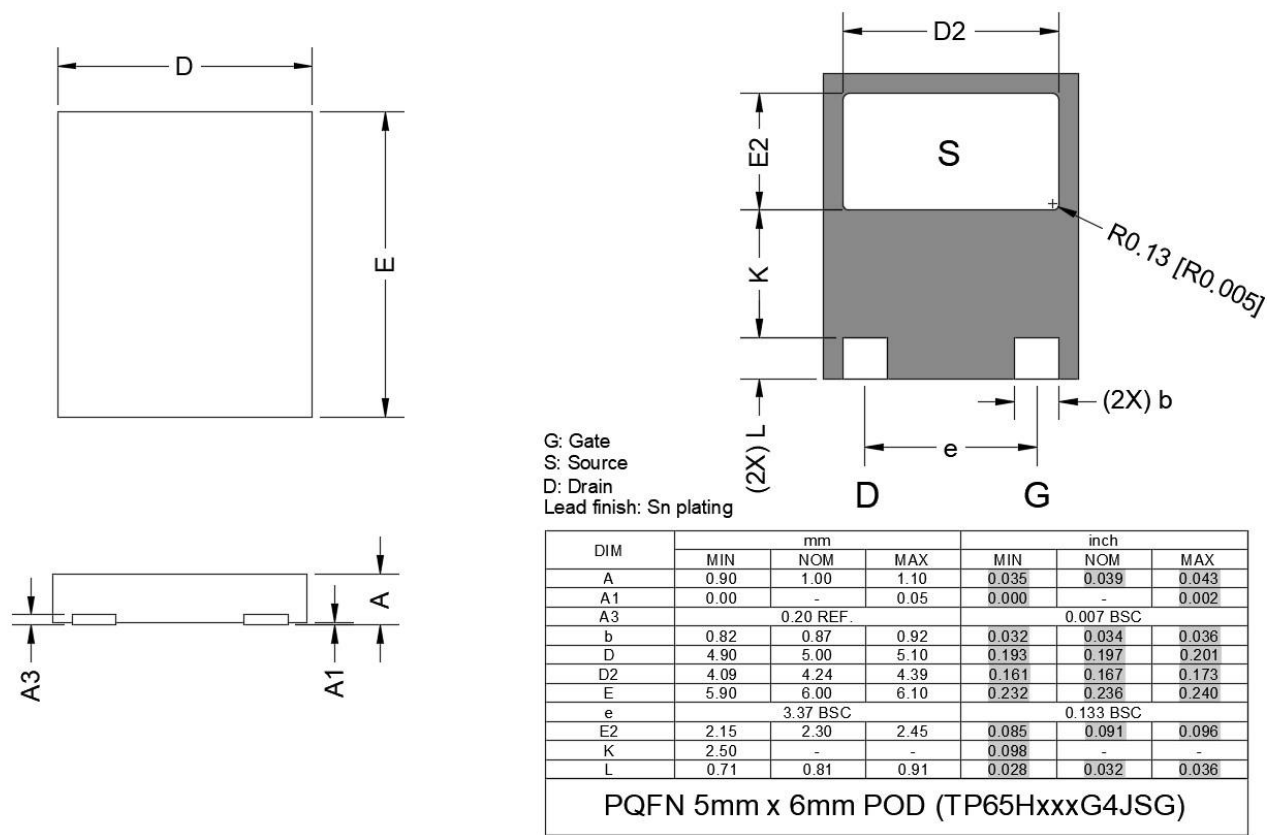


- Part V: Box Size

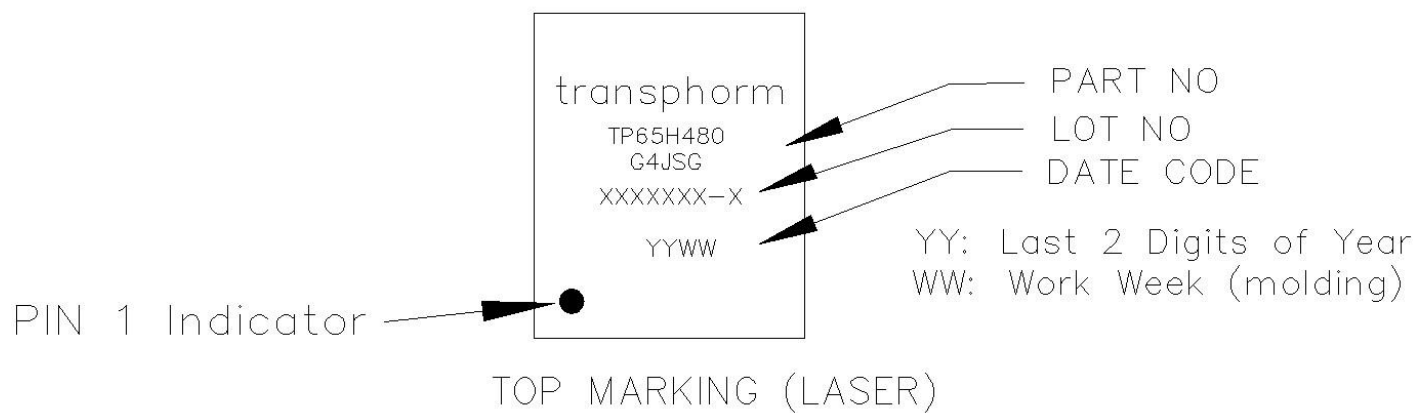


Dimensions are in millimeter (inches are in brackets for reference only)

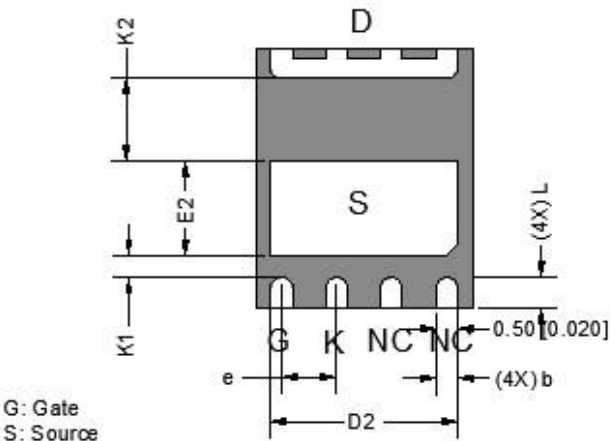
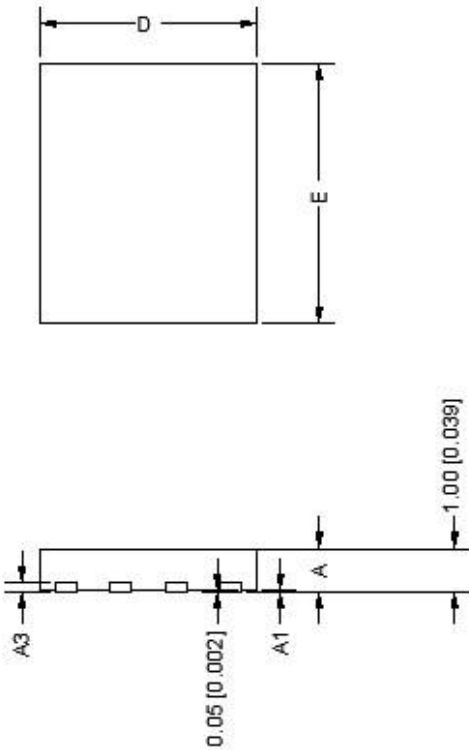
- Part VI: Package POD for Performance Version & Laser Marking Sample



Laser Marking Sample



Part VII: Package POD for Industry Standard LSGB Version & Laser Marking



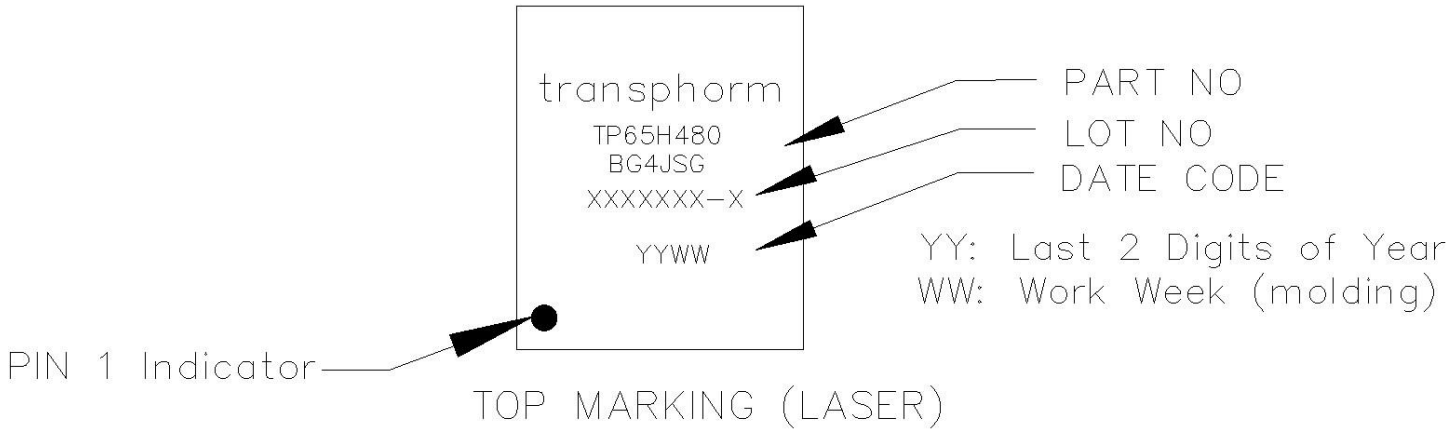
G: Gate
S: Source
D: Drain
K: Kelvin
Lead finish: Sn plating

DIM	mm			inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.00	-	0.05	0.000	-	0.002
A3	0.20 REF.			0.007 BSC		
b	0.45	0.50	0.55	0.018	0.020	0.022
D	4.90	5.00	5.10	0.193	0.197	0.201
D2	4.15	4.30	4.45	0.163	0.169	0.175
E	5.90	6.00	6.10	0.232	0.238	0.240
e	127 BSC			0.133 BSC		
E2	2.05	2.20	2.35	0.081	0.087	0.093
K1	0.50	-	-	0.020	-	-
K2	1.90	-	-	0.075	-	-
L	0.60	0.70	0.80	0.024	0.028	0.031

PQFN 5mm x 6mm POD (TP65HxxxG4JSB)

Note: P/N TP65H150BG4JSG is following this exact POD

Laser Marking Sample



- Part VIII: Tape and Reel Packing Information



Tape and Reel Shielding Bag

- 4,000units/reel
- Maximum 1 reel/box
- Place Tape and Reel inside moisture barrier bag
- Seal moisture bag

- Part IX: Internal Shipping Box Information



Internal Shipping Box

- Tape internal box closed using ESD Label.
- Place Internal Shipping Label.



Internal Shipping Box Label

Supplier P/N: Renesas Part Number

Quantity: Quantity contained inside the box

Date Code: YYWW

Lot Code: Assembly Lot Number

COO: Country of Origin

2D Barcode: Above information encoded

- Part X: External Shipping Box Information



External Shipping Box

- Internal Shipping Boxes inside External Shipping Box
- Number of Internal Boxes ranges from 2 to 6
- Place External Shipping Label

External Shipping Box Label

FROM: Transphorm, Inc. 75 Castilian Drive Goleta, CA 93117	TO: Customer Name ATTN: Attention TO Customer Address Line 1 Customer Address Line 2 City & Zip Code
(K) PO Number: Sample 	
(1P) Supplier Part Number: TP65HboxG4JSG 	
(Q) Quantity: 4000 	
(4S) Package ID: SO-1288 	
(10D) Data Code: 1452 	(4L) COO: US 
(1T) Lot Code: B9A028 	
  	

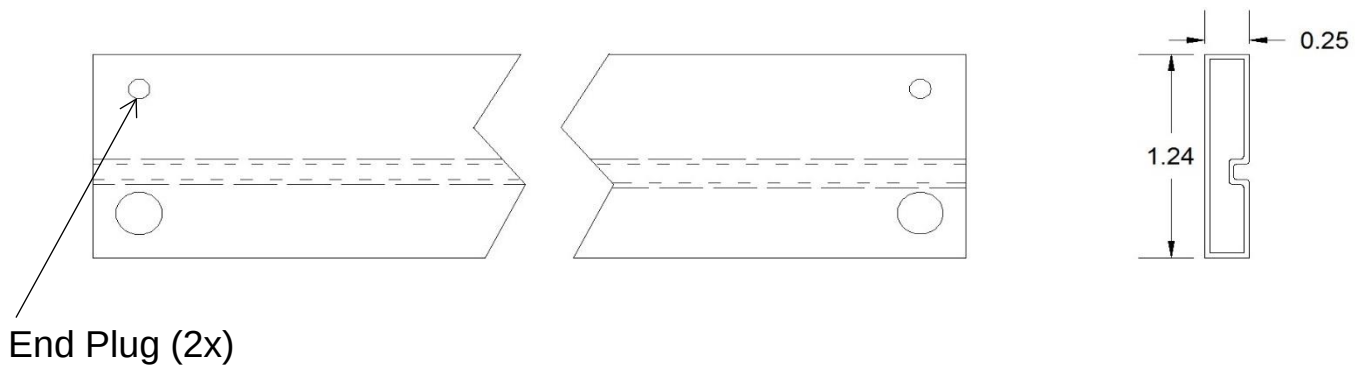
From : Renesas shipping address
To : Customer name, Attention TO, and address number
PO Number : Customer Purchase Order Number
Supplier Part Number : Renesas Part Number Quantity : Total product quantity contain in external shipping box
Package ID : Renesas Assigned Number
Date Code: YYWW
Lot Code: Assembly Lot Number
COO: Country of Origin
2D Barcode: Above information encoded

Shipping Box Size and Weight

Shipment	Units	Weight	Size	Comments
1 box	4,000pcs	2.47 (lbs) 1.12 (kgs)		FedEx Shipping box
3 boxes	12,000pcs	7.41 (lbs) 3.36 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	
4 boxes	16,000pcs	9.88 (lbs) 4.48 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	
5 boxes	20,000pcs	12.35 (lbs) 5.60 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	
6-boxes	24,000pcs	14.82 (lbs) 6.72 (kgs)	15.25 in x 13.5 in x 15.5 in 387.35 mm x 342.9mm x 393.7mm	

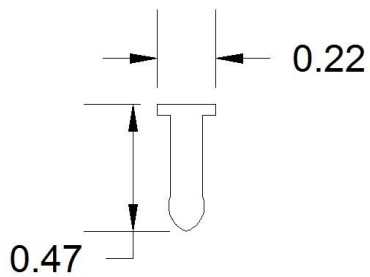
- 4. TO-220 Shipping Information
- Part I: Shipping Tube

Tubes Length = 21 Inches



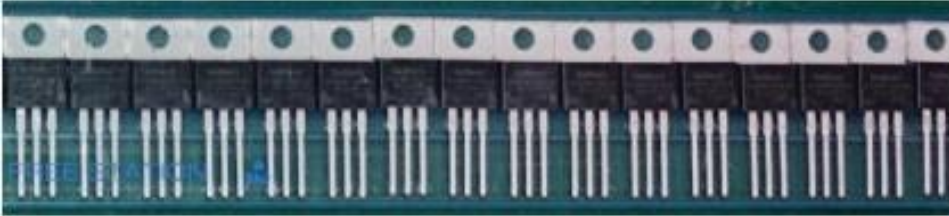
End Plug

Color = Black



- Part II: Tube Quantity

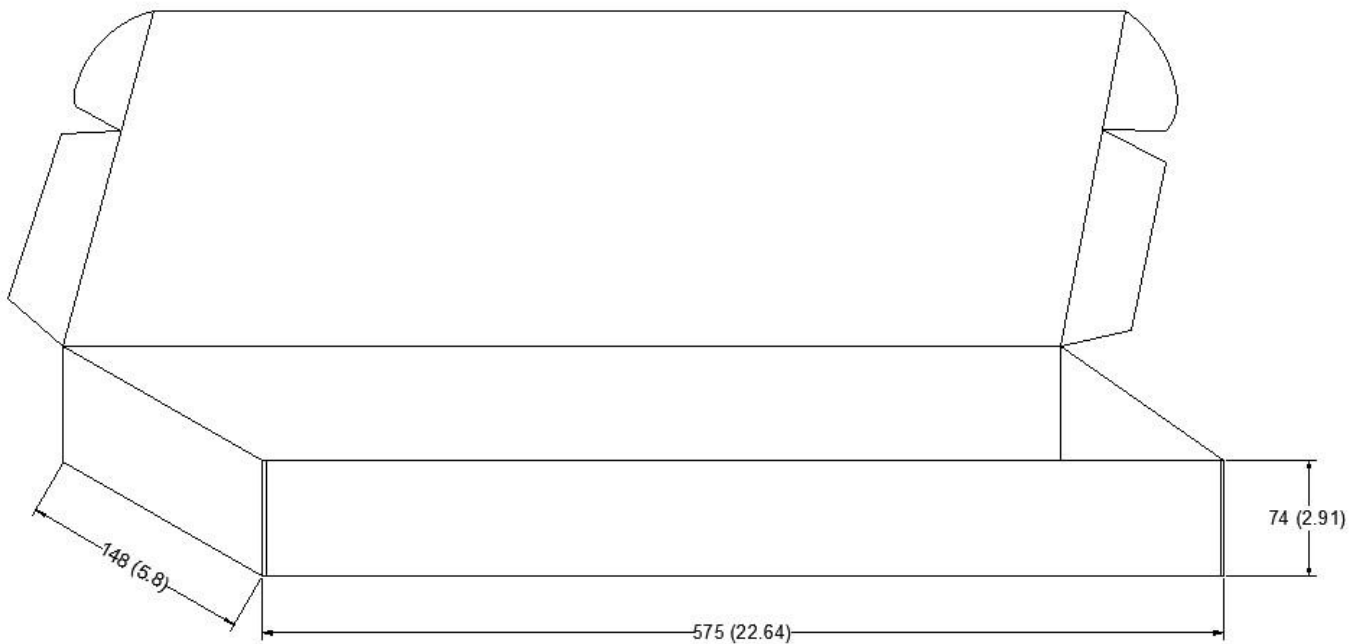
- 50 units per tube.



- Maximum tube per anti-static shielding bag and inner box is 20 tubes or 1000 units per inner box.



- Part III: Box Size



Dimensions are in millimeter (inches are in brackets for reference only)

- Part IV: Internal Shipping Box Information
- Internal Shipping Box
 - Tape internal box closed using ESD Label.
 - Place Internal Shipping Label.



Internal Shipping Box Label

Transphorm, Inc.

CUST: "Customer Name"

CUST P/N:  EM-HEMT120

CUST PO:  CUSTOMER 123-A

Transphorm P/N:  TPH2006PS

D/C:  4210 Lot:  011000001-1

QTY:  1000 COO: PH

Description:

Size: 4" x 2"

CUST: "Customer Name"

CUST P/N: "Customer Part Number"

Renesas P/N: "Renesas Part Number"

D/C: "Date Code"

QTY: "Quantity unit contained in inner box"

COO: "Country of Origin"

- Part V: External Shipping Box Information
- External Shipping Box
 - Bubble sheets on bottom and on both sides of the master box then place 6 inner boxes inside the master box.
 - For 4 inner boxes or less, use small master box.
 - Master box shipping label as shown below and seal the master box following the standard operating procedure.



From: Transphorm, Inc.
115 Castilian Drive
Galesia, CA 91017

To: Customer Name
Customer Address Line 1
Customer Address Line 2
City & ZIP Code
Country

ATTN: Customer Attention TO
Customer ATTN TO phone number

Customer PO:  CUSTOMER123-A

Customer P/N:  EM-HEMT120

Quantity:  1000

Transphorm P/N:  TPH2006PS

Country of Origin
PH

Package Count
6 of 6

Package Weight
6.0000 kg

Net Weight
100000

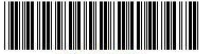
Source
910000

Customer
Customer Name

Tracking
7302 3408 8070

Ship Date
1/12/17

• External Shipping Box Label

From: Transphorm, Inc. 115 Castilian Drive Goleta, CA 93117	
To: Customer Name Customer Address Line 1 Customer Address Line 2 City & ZIP Code Country ATTN: Customer Attention TO Customer ATTN TO phone number	
Customer PO:  CUSTOMER 123-A	
Customer P/N:  EM-HEMT120	
Quantity:  1000	
Transphorm P/N:  TPH2006PS	
<u>Country of Origin</u> PH	
<u>Package Count</u> x of x	<u>Package Weight</u> x.x lbs / x.xx kg
PKG Slip: 100007 Tracking: 7342 3458 9572 Invoice: S100008 Ship Date: 1/15/11 Customer: Customer Name	

From: Renesas Shipping address

To: Customer name, address attention to and phone number

Customer PO: Customer Purchase Order Number

Customer P/N: Customer Part Number

Quantity: Total product quantity contains in external shipping box

Renesas P/N: Renesas Product Number

Country of Origin: Country of Origin where product was manufactured.

Package Count: Number of External Shipping boxes contained in shipment

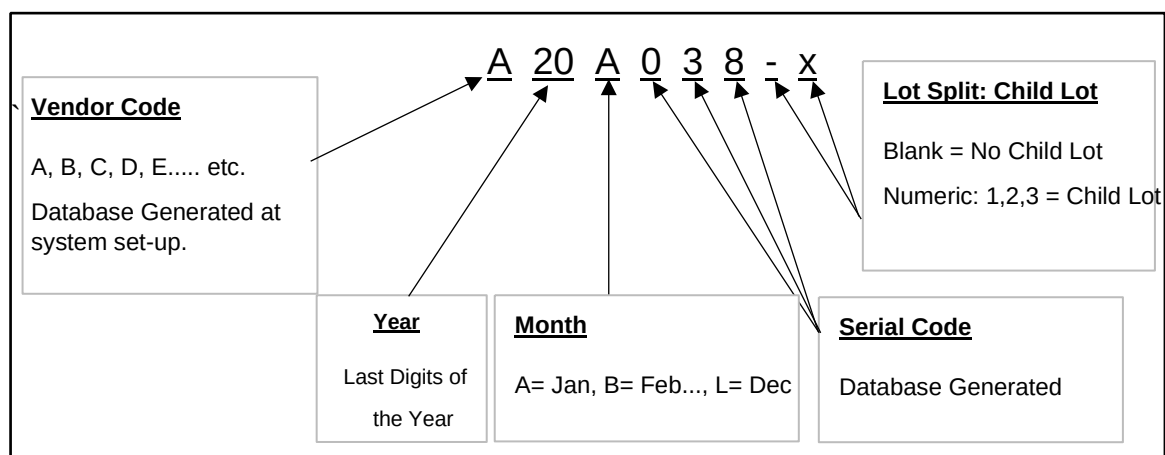
Package Weight: Weight of packed External Shipping Box

Description:

Size: 4" x 6"

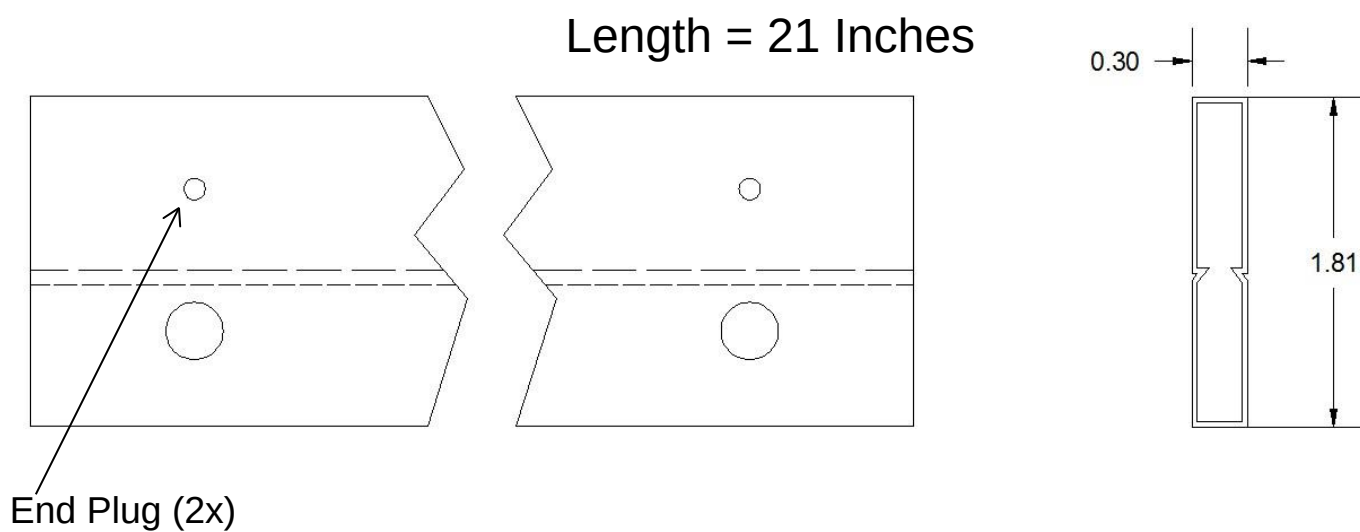
Shipment	Units	Weight	Size	Comments
1pack	1000pcs	2.99 (kgs) 6.61(lb)	575mm X 140mm X 73mm 22.6 in x 5.51in x 2.87 in	one inner box
2 ^{packs}	2000pcs	6.7 (kgs) 14.77(lb)	610mm x 310mm x 190mm 24 in x 12.2 in x 7.5 in	master box with two inner boxes
4 ^{packs}	4000pcs	12.25 (kgs) 27.00(lb)	610mm x 310mm x 190mm 24 in x 12.2 in x 7.5 in	master box with four inner boxes
6 ^{packs}	6000pcs	18.24 (kgs) 40.21(lb)	610mm x 310 mm x 340mm 24 in x 12.2 in x 13.4 in	master box with six inner boxes

- Part VI: Assembly Lot Number Information



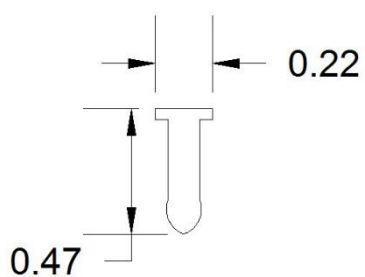
- 5. TO-247 Shipping Information
- Part I: Shipping Tube

Tubes



End Plug

Color = Black



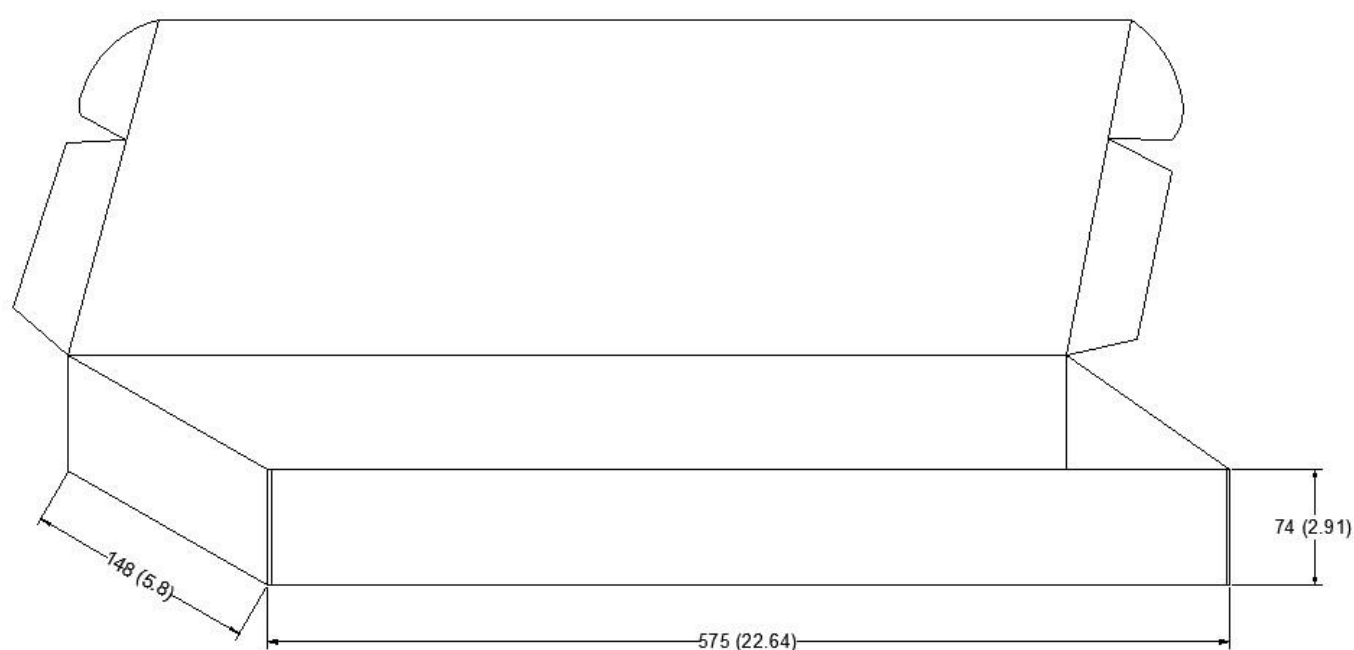
- Part II: Tube Quantity
- 30 units per tube.



- Maximum tube per anti-static shielding bag and inner box is 15 tubes or 450 units per inner box.

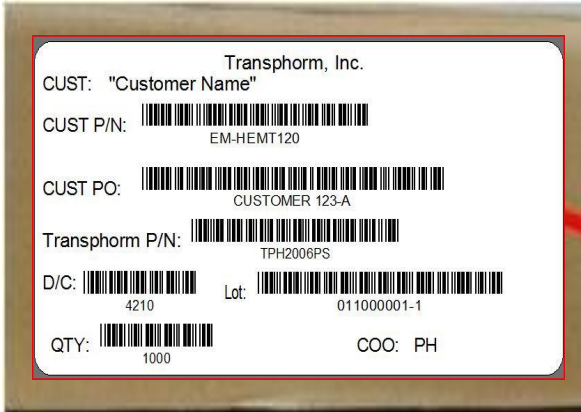


- Part III: Box Size



Dimensions are in millimeter (inches are in brackets for reference only)

- Part IV: Internal Shipping Box Information
- Internal Shipping Box
 - Tape internal box closed using ESD Label.
 - Place Internal Shipping Label.



Transphorm, Inc.
CUST: "Customer Name"
CUST P/N:  EM-HMT120
CUST PO:  CUSTOMER 123-A
Transphorm P/N:  TPH2006PS
D/C:  4210 Lot:  011000001-1
QTY:  1000 COO: PH



- Part V: External Shipping Box Information
- External Shipping Box
 - Bubble sheets on bottom and on both sides of the master box then place 6 inner boxes inside the master box.
 - For 4 inner boxes or less, use small master box.
 - Master box shipping label as shown below and seal the master box following the standard operating procedure.



From: Transphorm, Inc.
115 Cantinas Drive
Gardena, CA 90247
To: Customer Name
Customer Address Line 1
Customer Address Line 2
City & ZIP Code
Country
ATTN: Customer Attention TO
Customer ATTN TO phone number
Customer PO:  CUSTOMER 123-A
Customer P/N:  EM-HMT120
Quantity:  1000
Transphorm P/N:  TPH2006PS
Country of Origin: PH
Package Count: 6 of 6
Package Weight: 1.1 x 1.1 x 1.1 kg
Print Date: 1/15/2024
Tracking: 1234 5678 9012
Ship Date: 1/15/24
Customer: Customer Name

• External Shipping Box Label

From: Transphorm, Inc. 115 Castilian Drive Goleta, CA 93117	
To: Customer Name Customer Address Line 1 Customer Address Line 2 City & ZIP Code Country ATTN: Customer Attention TO Customer ATTN TO phone number	
Customer PO:  CUSTOMER 123-A	
Customer P/N:  EM-HEMT120	
Quantity:  1000	
Transphorm P/N:  TPH2006PS	
<u>Country of Origin</u> PH	
<u>Package Count</u> x of x	<u>Package Weight</u> x.x lbs / x.xx kg
PKG Slip: 100007 Tracking: 7342 3458 9572 Invoice: S100008 Ship Date: 1/15/11 Customer: Customer Name	

Description:

Size: 4" x 6"

From: Renesas Shipping address

To: Customer name, address attention to
and phone number

Customer PO:

Customer Purchase Order
Number

Customer P/N:

Customer Part Number

Quantity: Total product quantity
contains in external shipping box

Renesas P/N: Renesas Product
Number

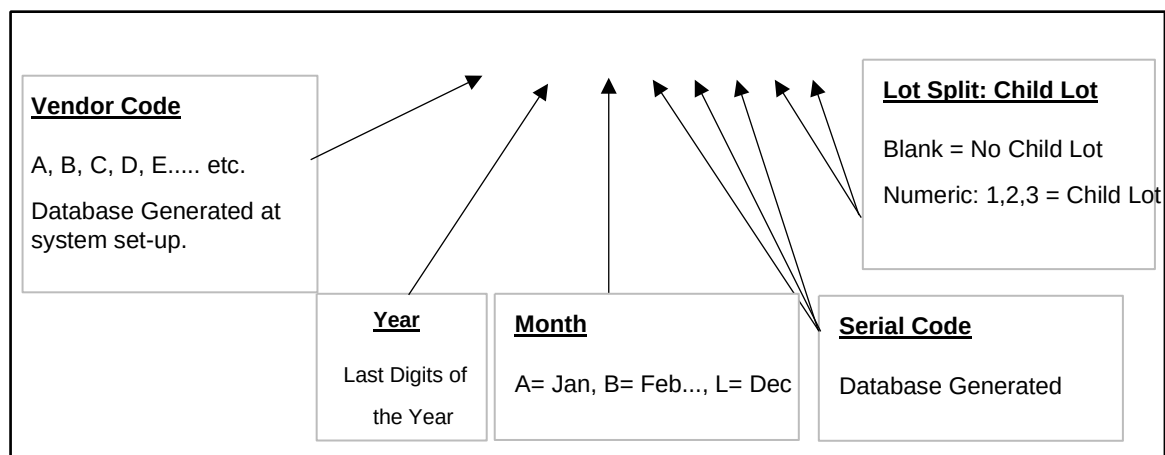
Country of Origin: Country of Origin where product was manufactured.

Package Count: Number of External
Shipping boxes contained in shipment

Package Weight: Weight of packed
External Shipping Box

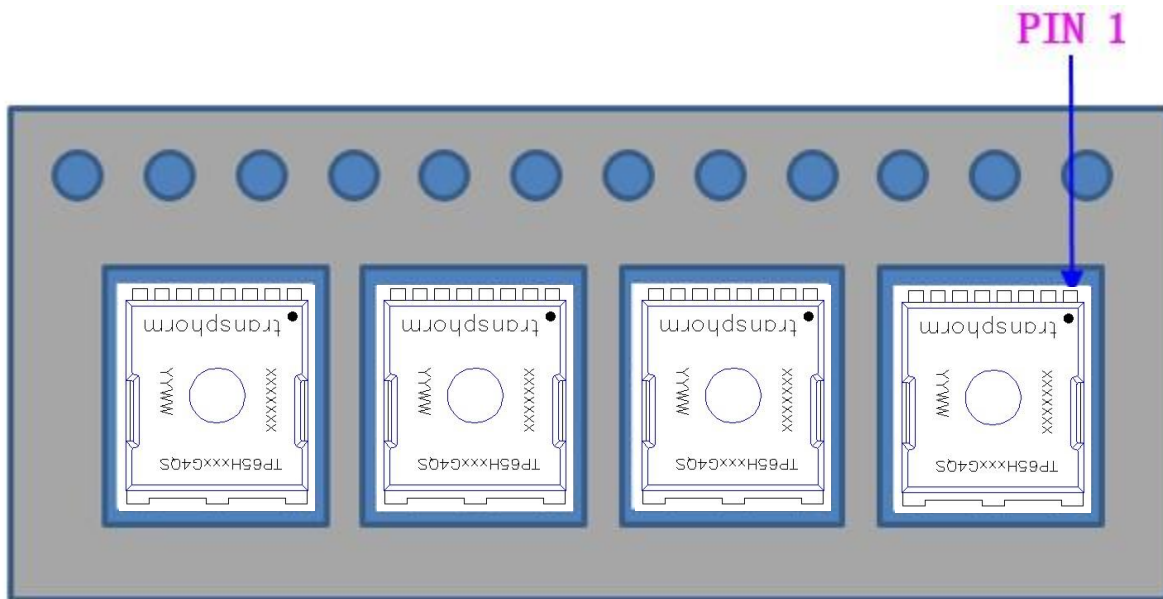
Shipment	Units	Weight	Size	Comments
1pack	450pcs	3.90 (kgs) 8.60(lb)	575mm X 140mm X 73mm 22.6 in x 5.51in x 2.87 in	one inner box
2packs	900pcs	8.05 (kgs) 17.75(lb)	610mm x 310mm x 190mm 24 in x 12.2 in x 7.5 in	master box with two inner boxes
4packs	1,800pcs	15.85 (kgs) 34.95(lb)	610mm x 310mm x 190mm 24 in x 12.2 in x 7.5 in	master box with four inner boxes
6packs	2,700pcs	23.65 (kgs) 52.15(lb)	610mm x 310 mm x 340mm 24 in x 12.2 in x 13.4 in	master box with six inner boxes

- Part VI: Assembly Lot Number Information



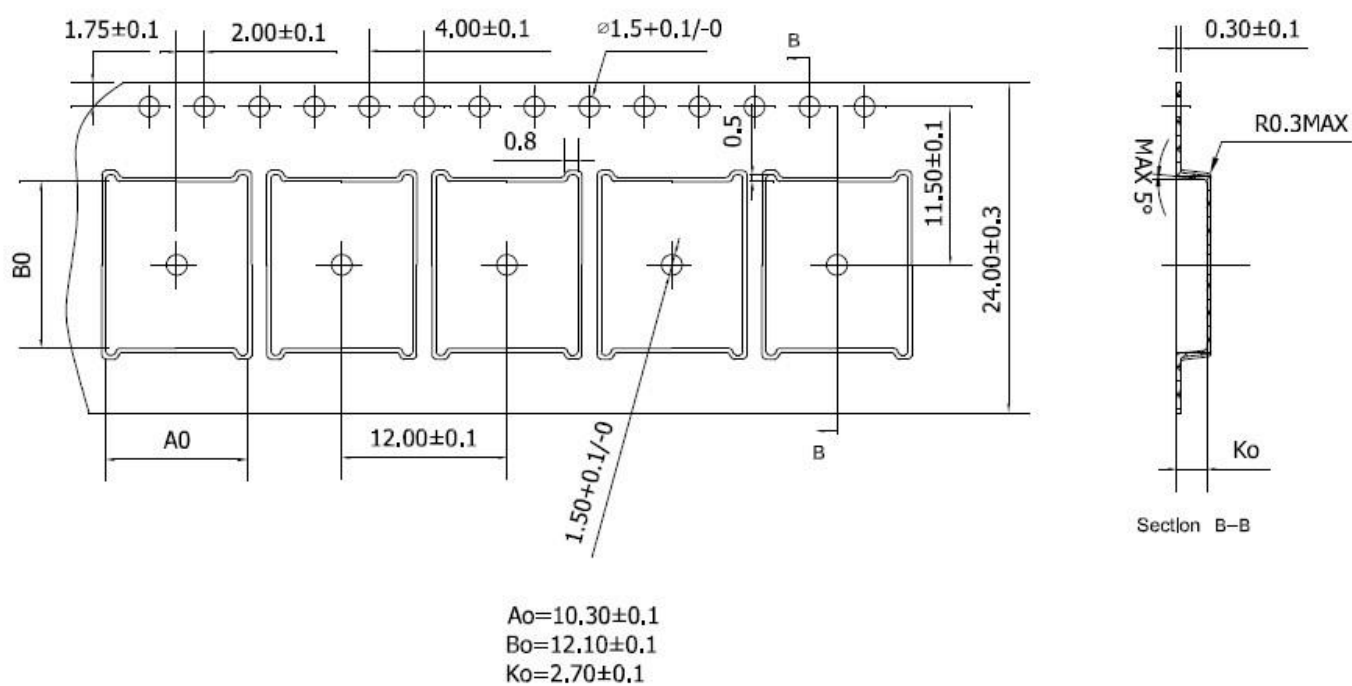
- 6. TOLL TAPE & REEL INFORMATION

- Part I: Product Orientation



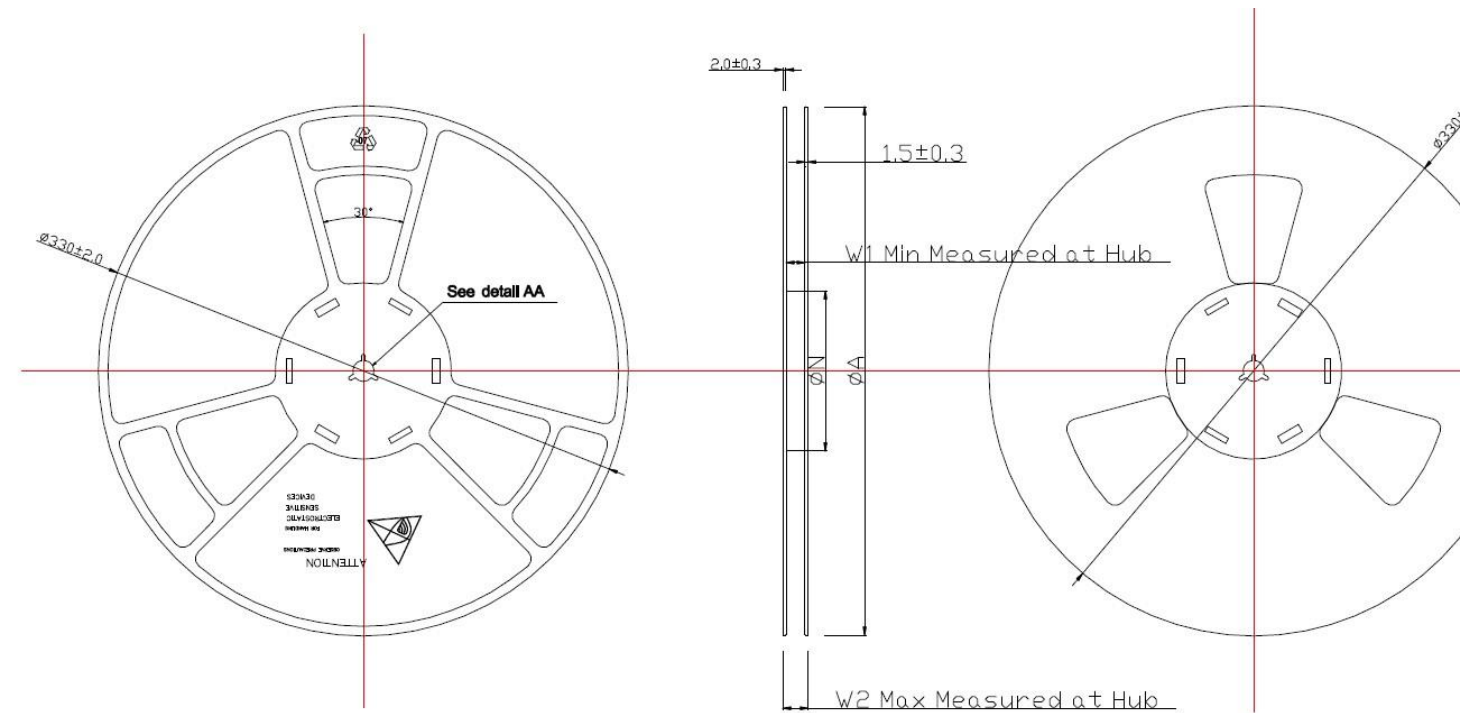
- -Leader Empty Pockets: 400mm / 35 empty pocket
- -Trailer Empty Pockets: 160mm / 15 empty pocket
- -Quantity per Reel: 2,000pcs

- Part II: Carrier Tape Dimension

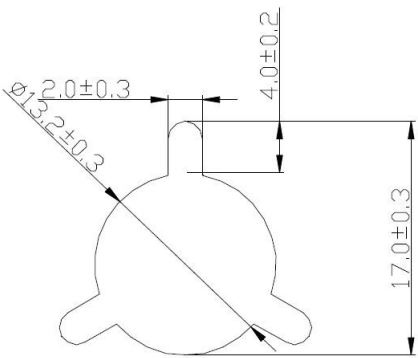


- Part III: Reel Dimension

- Reel Size: 330mm
- Hub Width: 24mm

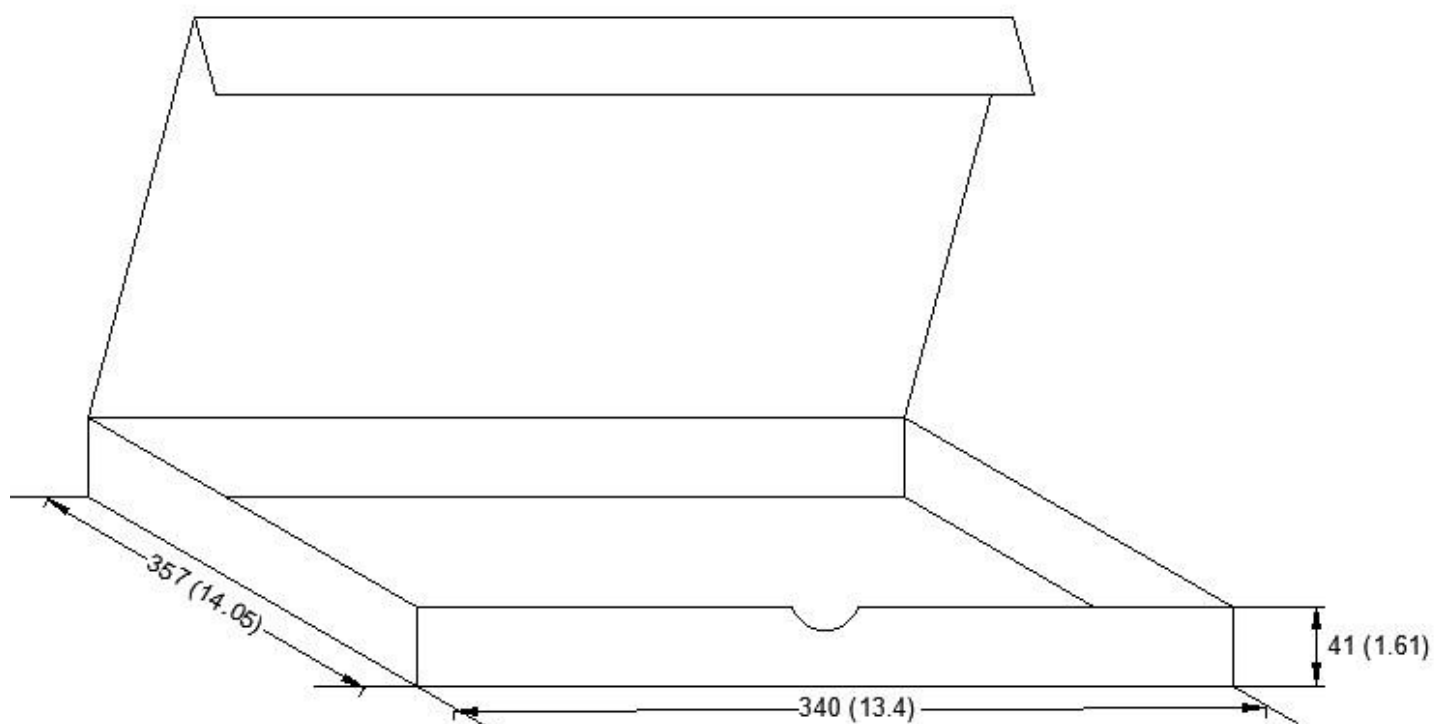


PRODUCT SPECIFICATIONS				
TYPE WIDTH	ϕA	ϕN	W1 (Min)	W2 (Max)
12MM	$330\text{mm} \pm 2.0$	$100\text{mm} \pm 1.0$	12.4mm	19.4mm
16mm	$330\text{mm} \pm 2.0$	$100\text{mm} \pm 1.0$	16.4mm	23.4mm
24MM	$330\text{mm} \pm 2.0$	$100\text{mm} \pm 1.0$	24.4mm	31.4mm
32MM	$330\text{mm} \pm 2.0$	$100\text{mm} \pm 1.0$	32.4mm	39.4mm
44MM	$330\text{mm} \pm 2.0$	$100\text{mm} \pm 1.0$	44.4mm	51.4mm



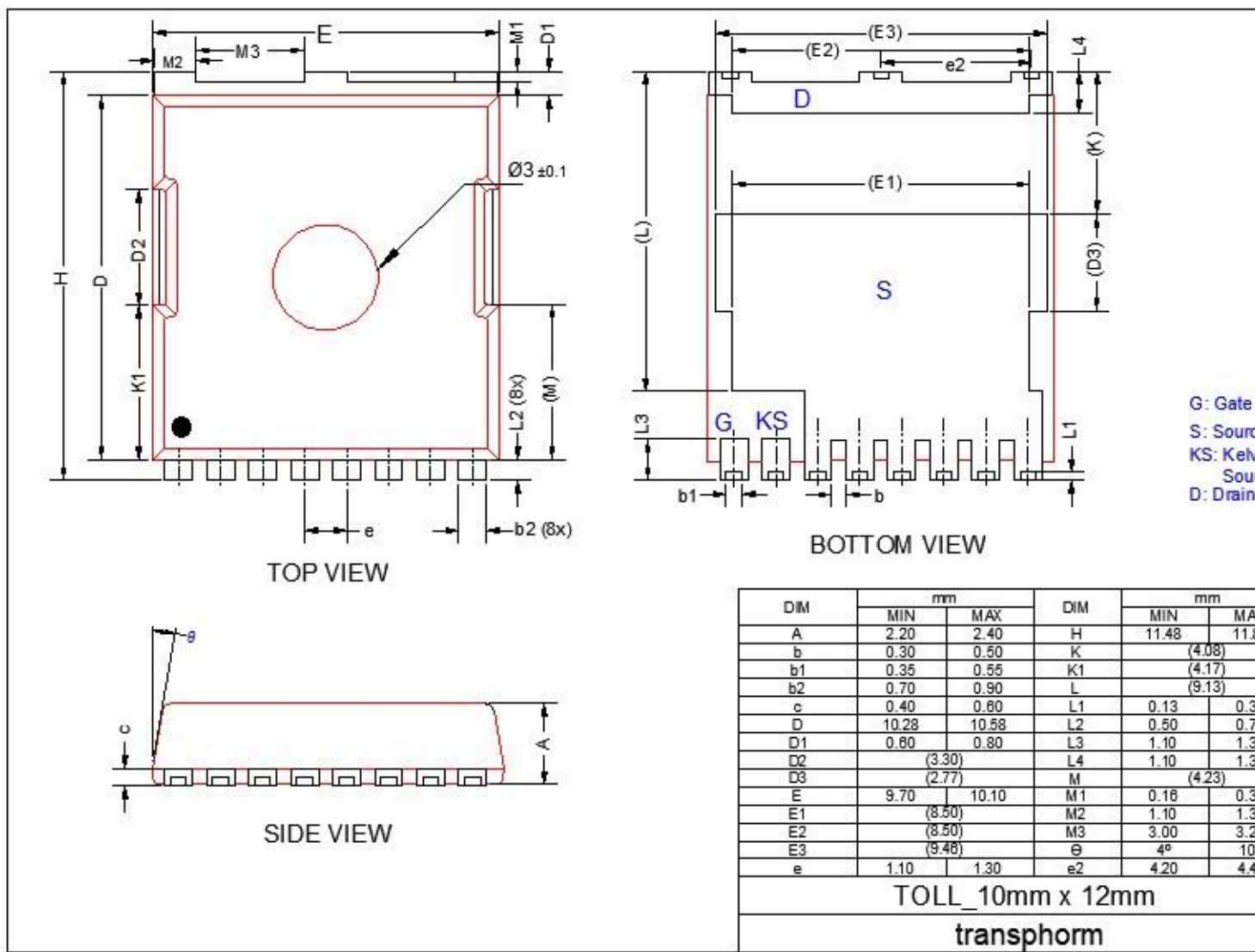
detail AA

- Part IV: Box Dimension



Dimensions are in millimeter (inches are in brackets for reference only)

- Part V: Package POD



- Part VI: Tape and Reel Packing Information



Tape and Reel Shielding Bag

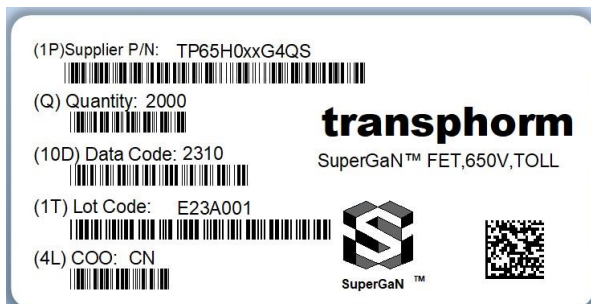
- 2,000 units / reel
Maximum 1 reel / box
- Place Tape and Reel inside moisture barrier bag
- Seal moisture bag

- Part VII: Internal Shipping Box Information



Internal Shipping Box

- Tape internal box closed
- Place Internal Shipping Label



Internal Shipping Box Label

Supplier P/N: Renesas Part Number
Quantity: Quantity contained inside the box
Date Code: YYWW
Lot Code: Assembly Lot Number
COO: Country of Origin

2D Barcode: Above information encoded

- Part VIII: External Shipping Box Information



External Shipping Box

- Internal Shipping Boxes inside External Shipping Box
- Number of Internal Boxes ranges from 2 to 4
- Place External Shipping Label

FROM: Transphorm, Inc. 75 Castilian Drive Goleta, CA 93117	TO: Customer Name ATTN: Attention TO Customer Address Line 1 Customer Address Line 2 City & Zip Code
(K) PO Number: Sample 	
(1P) Supplier Part Number: TP65H0xxG4QS 	
(Q) Quantity: 2000 	
(4S) Package ID: SO-1288 	
(10D) Data Code: 2310 	(4L) COO: CN 
(1T) Lot Code: E23A001 	
  	

External Shipping Box Label

- **From:** Renesas shipping address
- **To:** Customer name, Attention TO, and address number
- **PO Number:** Customer Purchase Order Number
- **Supplier Part Number:** Renesas Part Number
- **Quantity:** Total product quantity contain in external shipping box
- **Package ID:** Renesas Assigned Number
- **Date Code:** YYWW
- **Lot Code:** Assembly Lot Number
- **COO:** Country of Origin
- **2D Barcode:** Above information encoded