



Future Technology Devices International Ltd.

Application Note AN_116

FTDI Devices T&R Dimensions

Document Reference No.: FT_000154

Version 1.5

Issue Date: 2012-12-10

This document provides information on the tape and reel dimensions for FT232BL, FT245BL, FT232BQ, FT245BQ, FT232RL, FT245RL, FT232RQ, FT245RQ, FT2232D, FT2232HL, FT2232HQ, FT4232HL, FT4232HQ, FT-X series chips, FT12 series chips, FT311D, FT313H, VNC1L and VNC2

This Application Note supersedes the FTDI Application Note AN232B-11

Future Technology Devices International Limited (FTDI)

Unit 1,2 Seaward Place, Glasgow G41 1HH, United Kingdom

Tel.: +44 (0) 141 429 2777 Fax: + 44 (0) 141 429 2758

E-Mail (Support): support1@ftdichip.com Web: <http://www.ftdichip.com>
Copyright © 2011 Future Technology Devices International Limited

Table of Contents

| | | |
|------------|---------------------------------------------------------|-----------|
| 1 | Introduction | 4 |
| 2 | Packaging options | 5 |
| 2.1 | Tape and Reel Packaging | 5 |
| 2.2 | Tray/Tube Packaging | 6 |
| 3 | FT232BL, FT245BL and FT2232D Tape Dimensions | 7 |
| 4 | FT232BL, FT245BL and FT2232D Reel Dimensions | 8 |
| 5 | FT232BQ and FT245BQ Tape Dimensions | 9 |
| 6 | FT232BQ and FT245BQ Reel Dimensions | 10 |
| 7 | FT232RL and FT245RL Tape Dimensions | 11 |
| 8 | FT232RL and FT245RL Reel Dimensions | 12 |
| 9 | FT232RQ and FT245RQ Tape Dimensions | 13 |
| 10 | FT232RQ and FT245RQ Reel Dimensions | 14 |
| 11 | FT2232HL and FT4232HL Tape Dimensions | 15 |
| 12 | FT2232HL and FT4232HL Reel Dimensions | 16 |
| 13 | FT2232HQ and FT4232HQ Tape Dimensions | 17 |
| 14 | FT2232HQ and FT4232HQ Reel Dimensions | 18 |
| 15 | FT232HL and FT232HQ Reel Dimensions | 19 |
| 16 | FT232HL Cover Tape Dimensions | 20 |
| 17 | FT232HQ Cover Tape Dimensions | 21 |
| 18 | FT232HL Carrier Tape Dimensions | 22 |
| 19 | FT232HQ Carrier Tape Dimensions | 23 |
| 20 | FT232HL Tray Dimensions | 24 |
| 21 | FT232HL Tray Dimensions – Side View | 25 |
| 22 | FT232HQ Tray Dimensions | 29 |
| 23 | FT232HQ Tray Dimensions – Side View | 30 |
| 24 | FT232HL and FT232HQ Protective Belt | 36 |
| 25 | VNC1L – A – Reel Vendor Part No. RD33008SW | 37 |
| 26 | VNC1L – A – Cover Tape Vendor Part No. AA13305NP | 38 |

| | |
|--------------------------------------------------------------------------------------------------------------------|-----------|
| 27 VNC1L – A – Carrier Tape Vendor Part No. Q07X07-A ... | 39 |
| 28 VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48 and QFN-64 , FT311D-LQFP Reel Dimensions | 40 |
| 29 VNC2 – LQFP-32 VNC2 – LQFP-48, FT311D – LQFP Cover Tape Dimensions..... | 41 |
| 30 VNC2 –LQFP-64, QFN-32, QFN-48, QFN-64, FT311D-QFN Cover Tape Dimensions..... | 42 |
| 31 VNC2 – LQFP-32, VNC2 – LQFP-48, FT311D – LQFP Carrier Tape Dimensions..... | 43 |
| 32 VNC2 – LQFP-64 Carrier Tape Dimensions..... | 44 |
| 33 VNC2 – QFN-32, FT311D-QFN Carrier Tape Dimensions | 45 |
| 34 VNC2 – QFN-48 and QFN-64 Carrier Tape Dimensions... | 46 |
| 35 VNC2 – LQFP-32 VNC2 – LQFP-48 and FT311D QFN Tray Dimensions | 47 |
| 36 VNC2 – LQFP-32, VNC2 – LQFP-48 and FT311D LQFP Tray Dimensions – Side View | 48 |
| 37 VNC2 – LQFP-64 Tray Dimensions | 52 |
| 38 VNC2 – LQFP-64 Tray Dimensions – Side View..... | 53 |
| 39 VNC2 – QFN-32 and FT311D QFN Tray Dimensions | 57 |
| 40 VNC2 – QFN-48 and QFN-64 Tray Dimensions..... | 58 |
| 41 VNC2 – QFN-48 and QFN-64 Tray Dimensions – Side View | 59 |
| 42 VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48, QFN-64 and FT311D-LQFP, FT311D-QFN Protective Belt.... | 65 |
| 43 FT200XD Reel Dimensions..... | 66 |
| 44 FT200XD Tape Dimensions..... | 67 |
| 45 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN Reel Dimensions..... | 68 |
| 46 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN Tape Dimensions | 69 |
| 47 FT201XQ, FT220XQ, FT230XQ SSOP Reel Dimensions ... | 70 |

| | |
|---------------------------------------------------------------|-----------|
| 48 FT201XQ, FT220XQ, FT230XQ SSOP Tape Dimensions .. | 71 |
| 49 FT221XQ, FT231XQ, FT240XQ SSOP Reel Dimensions ... | 72 |
| 50 FT221XQ, FT231XQ, FT240XQ SSOP Tape Dimensions .. | 73 |
| 51 FT120T, FT122T TSSOP Reel Dimensions | 74 |
| 52 FT120T, FT122T TSSOP Tape Dimensions..... | 75 |
| 53 FT121T, FT120Q, FT121Q, FT122Q Reel Dimensions | 76 |
| 54 FT120Q, FT122Q QFN Tape Dimensions | 77 |
| 55 FT121T TSSOP Tape Dimensions | 78 |
| 56 FT121Q QFN Tape Dimensions | 79 |
| 57 FT201XS, FT220XS, FT230XS, FT240XS Reel Dimensions | |
| 80 | |
| 58 FT221XS, FT231XS Reel Dimensions | 81 |
| 59 FT313H-QFN Reel Dimensions..... | 82 |
| 60 FT313H-QFN Tape Dimensions | 83 |
| 61 FT313H-LQFP Reel Dimensions | 84 |
| 62 FT313H-LQFP Tape Dimensions..... | 85 |
| 63 FT313H-TQFP Reel Dimensions | 86 |
| 64 FT313H-TQFP Tape Dimensions..... | 87 |
| 65 Contact Information..... | 88 |
| Appendix A – List of Figures and Tables..... | 89 |
| List of Figures | 89 |
| List of Tables | 90 |
| Appendix B – Revision History | 91 |

1 Introduction

This document provides information on the tape and reel dimensions for FT232BL, FT245BL, FT232BQ, FT245BQ, FT232RL, FT245RL, FT232RQ, FT245RQ, FT2232D, FT2232HL, FT2232HQ, FT4232HL, FT4232HQ, FT-X series chips, FT12 series chips, FT311D, FT313H, VNC1L and VNC2.

2 Packaging options

FTDI can supply devices packaged in tape and reel packaging or in trays or tubes. The quantities in each package type are described below.

2.1 Tape and Reel Packaging

| IC – Tape and Reel | Package | Quantities (pieces) |
|------------------------------------------------------------------------------------|---------|---------------------|
| FT232BL, FT245BL – R | LQFP | 1000 |
| FT232BQ, FT245BQ – R | QFN | 2500 |
| FT232RL, FT245RL – R | SSOP | 2000 |
| FT232RQ, FT245RQ – R | QFN | 6000 |
| FT2232D – R | LQFP | 1000 |
| FT2232HL – R | LQFP | 1000 |
| FT2232HQ – R | QFN | 4000 |
| FT4232HL – R | LQFP | 1000 |
| FT4232HQ – R | QFN | 4000 |
| VINC1L – A – R | LQFP | 2000 |
| VNC2-32LQFP | LQFP | 1500 |
| VNC2-48LQFP | LQFP | 1500 |
| VNC2-64LQFP | LQFP | 1000 |
| VNC2-32 QFN 7x7x.9 | QFN | 3000 |
| VNC2-48 QFN 8x8x.9 | QFN | 3000 |
| VNC2-64 QFN 8x8x.9 | QFN | 3000 |
| FT311DLQFP | LQFP | 1500 |
| FT311D QFN 7X 7 X .9 | QFN | 3000 |
| FT200XD- R | DFN | 5000 |
| FT201XS – R, FT220XS – R, FT221XS – R, FT230XS – R, FT231XS – R, FT240XS – R | SSOP | 3000 |
| FT201XQ- R, FT220XQ – R, FT221XQ – R, FT230XQ – R, FT231XQ - R, FT240XQ - R | QFN | 5000 |
| FT120T- R, FT121T - R , FT122T - R | TSSOP | 2500 |
| FT120Q- R, FT121Q - R, FT122Q - R | QFN | 6000 |
| FT313HQ - R | QFN | 3000 |
| FT313HL - R | LQFP | 1000 |
| FT313HP – R | TQFP | 2500 |

Table 2.1 – Tape and Reel Quantities

2.2 Tray/Tube Packaging

| IC – Tray/Tube | Package | Quantities (pieces) | Box of Trays/Tube (pieces) |
|---------------------------------------------------|----------------|----------------------------|-----------------------------------|
| FT232BL, FT245BL – Tray | LQFP | 250 | 2500 |
| FT232BQ, FT245BQ | QFN | 250 | - |
| FT232RQ, FT245RQ – Tray | QFN | 490 | 4900 |
| FT2232D – Tray | LQFP | 250 | 2500 |
| FT2232HL – Tray | LQFP | 160 | - |
| FT2232HQ – Tray | QFN | 260 | - |
| FT4232HL – Tray | LQFP | 160 | - |
| FT4232HQ – Tray | QFN | 260 | - |
| VINC1L – A – Tray | LQFP | 250 | 2500 |
| VNC2-32LQFP | LQFP | 250 | |
| VNC2-48LQFP | LQFP | 250 | |
| VNC2-64LQFP | LQFP | 160 | |
| VNC2-32 QFN 7x7x.9 | QFN | 260 | |
| VNC2-48 QFN 8x8x.9 | QFN | 260 | |
| VNC2-64 QFN 8x8x.9 | QFN | 260 | |
| FT311DLQFP | LQFP | 250 | |
| FT311D QFN 7X 7 X .9 | QFN | 260 | |
| FT200XD- T | DFN | 490 | |
| FT201XS- U, FT220XS- U, FT230XS- U, | SSOP | 100 | |
| FT240XS - U | SSOP | 58 | |
| FT201XQ- T, FT220XQ- T, FT230XQ- T, FT240XQ- T | QFN | 490 | |
| FT120T- U, FT122T - U | TSSOP | 50 | |
| FT120Q- T, FT121Q - T, FT122Q - T | QFN | 490 | |
| FT121T- U | TSSOP | 96 | |
| FT313HP - T | TQFP | 2500 | |
| FT313HQ – T | QFN | 2600 | |
| FT313HL – T | LQFP | 1600 | |

Table 2.2 – Tube/Tray Quantities

3 FT232BL, FT245BL and FT2232D Tape Dimensions

★ Pin 1 Identifier

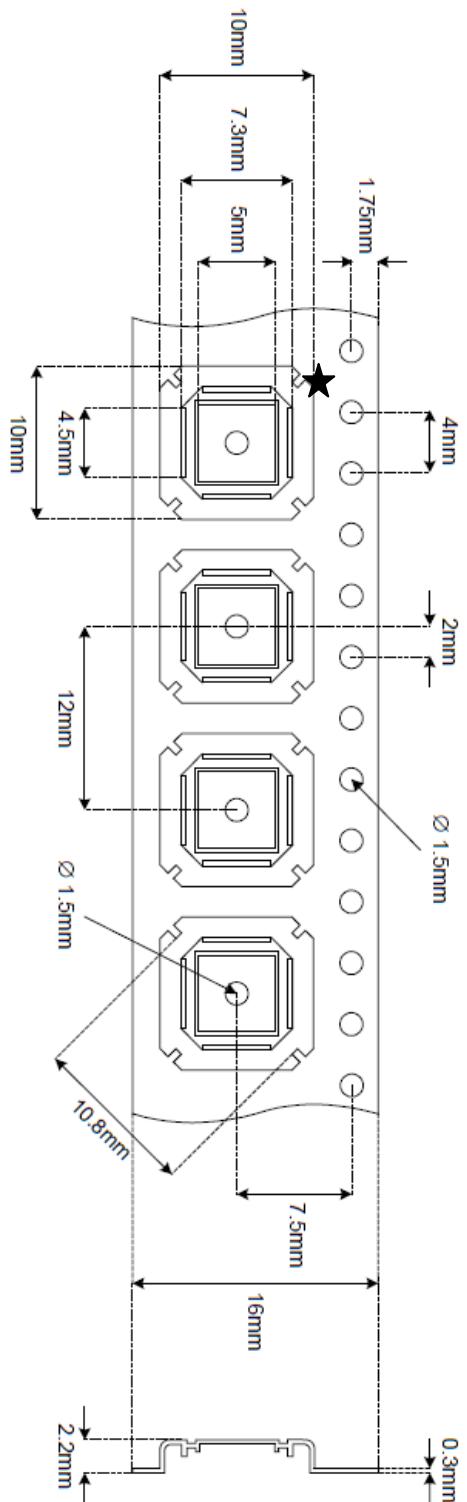


Figure 3.1 – FT232BL, FT245BL and FT2232D Tape Dimensions

4 FT232BL, FT245BL and FT2232D Reel Dimensions

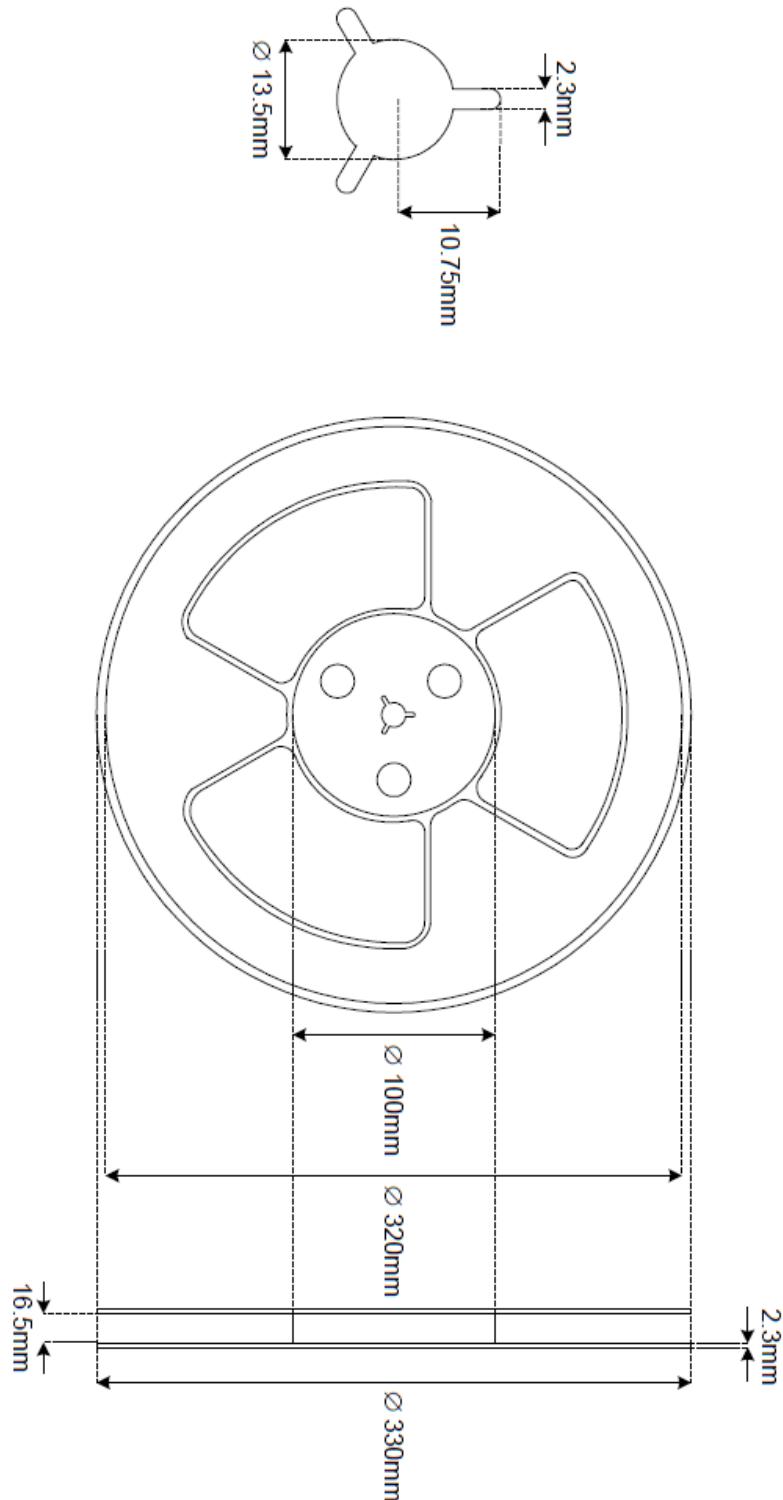
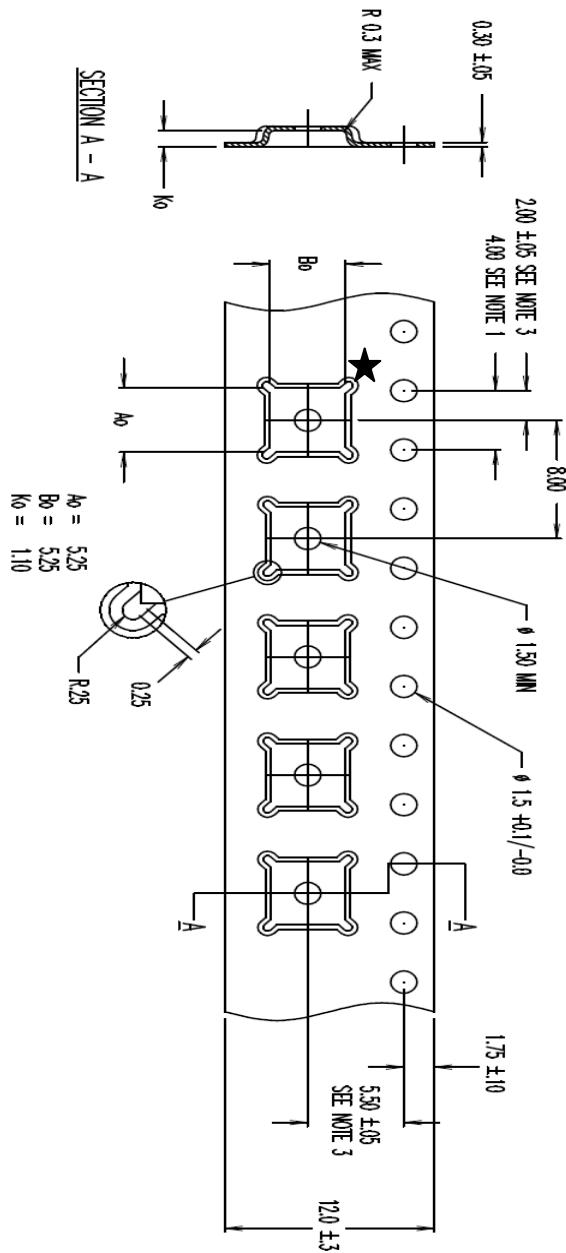


Figure 4.1 – FT232BL, FT245BL and FT2232D Reel Dimensions

5 FT232BQ and FT245BQ Tape Dimensions

Notes:

1. 10 sprocket hole pitch cumulative tolerance \pm 0.2
 2. Camber not to exceed 1mm in 100mm.
 3. Material: Black Advantek Polystyrene.
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.



★ Pin 1 Identifier

Figure 5.1 – FT232BQ and FT245BQ Tape Dimensions

6 FT232BQ and FT245BQ Reel Dimensions

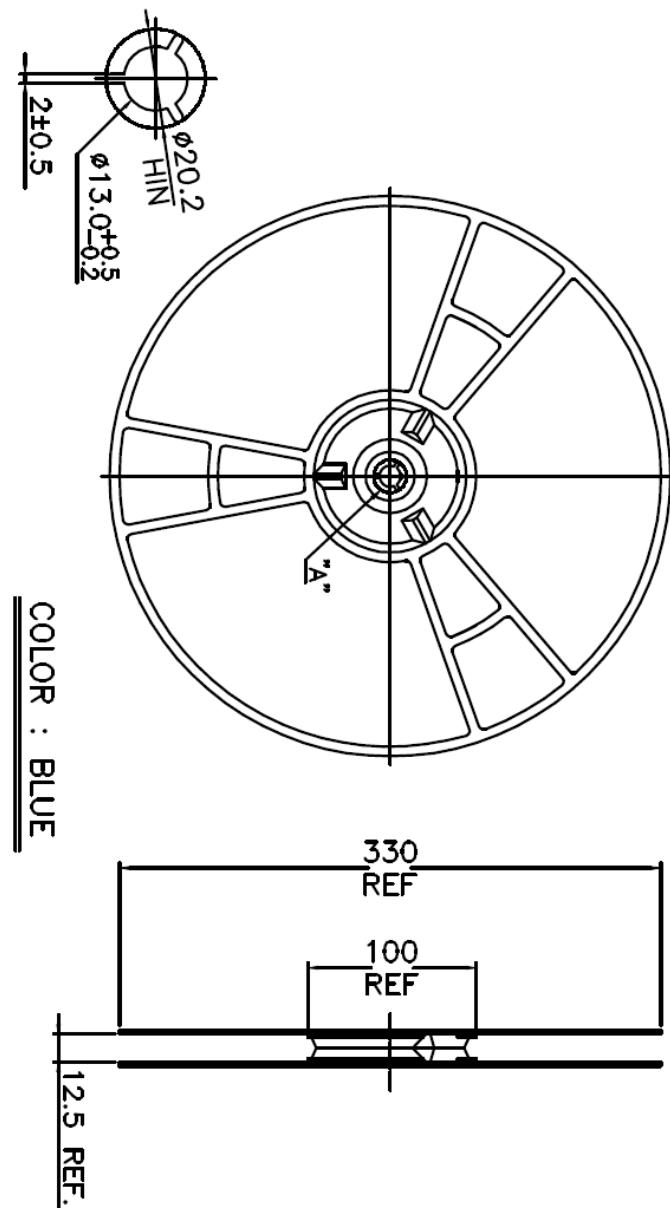


Figure 6.1 – FT232BQ and FT245BQ Reel Dimensions

7 FT232RL and FT245RL Tape Dimensions

- Notes:
- 10 sprocket hole pitch cumulative tolerance ± 0.2
 2. Camber not to exceed 1mm in 100mm
 3. Material: Black Conductive Advantek Polystyrene
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

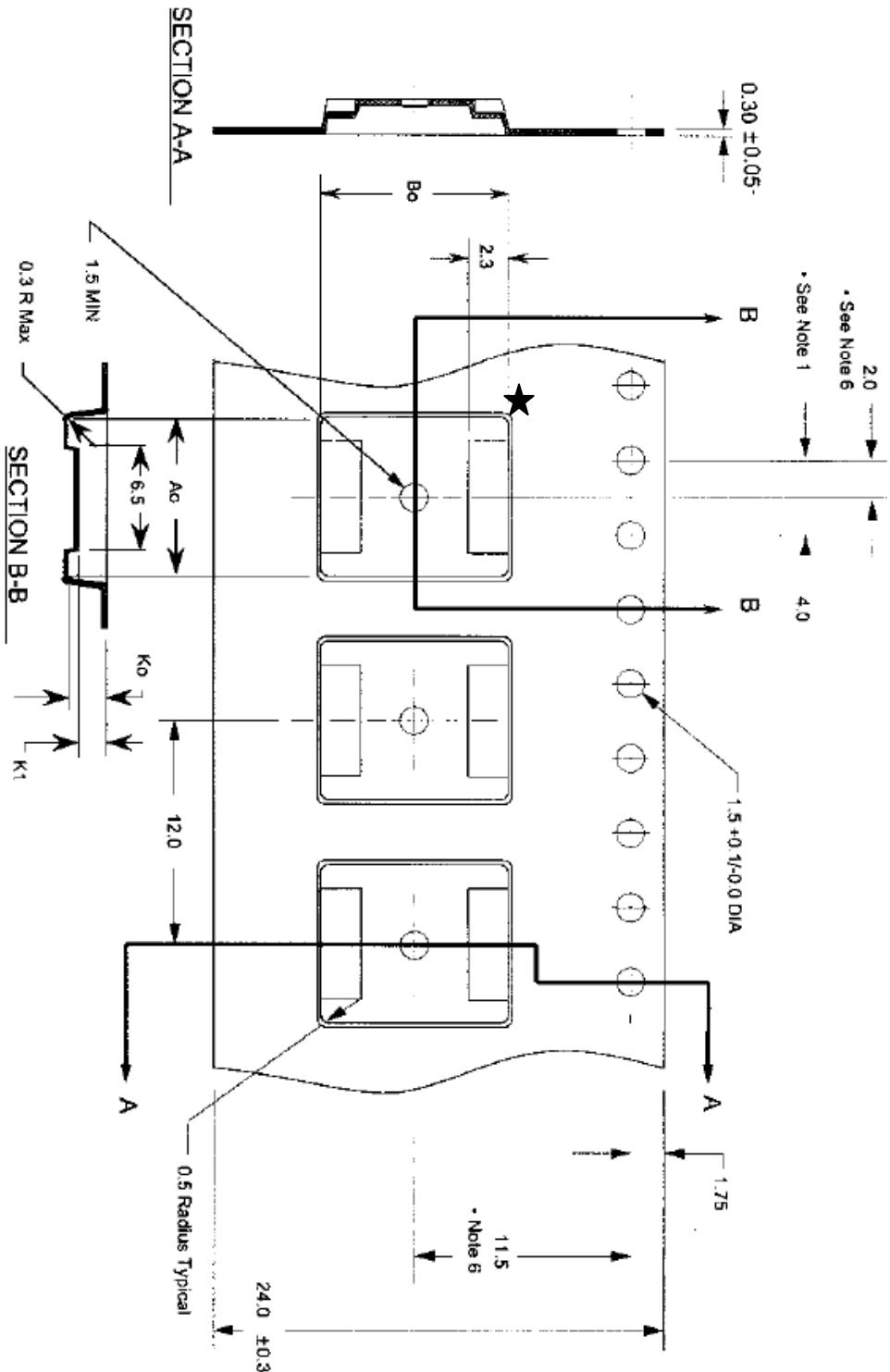


Figure 7.1 – FT232RL and FT245RL Tape Dimensions

8 FT232RL and FT245RL Reel Dimensions

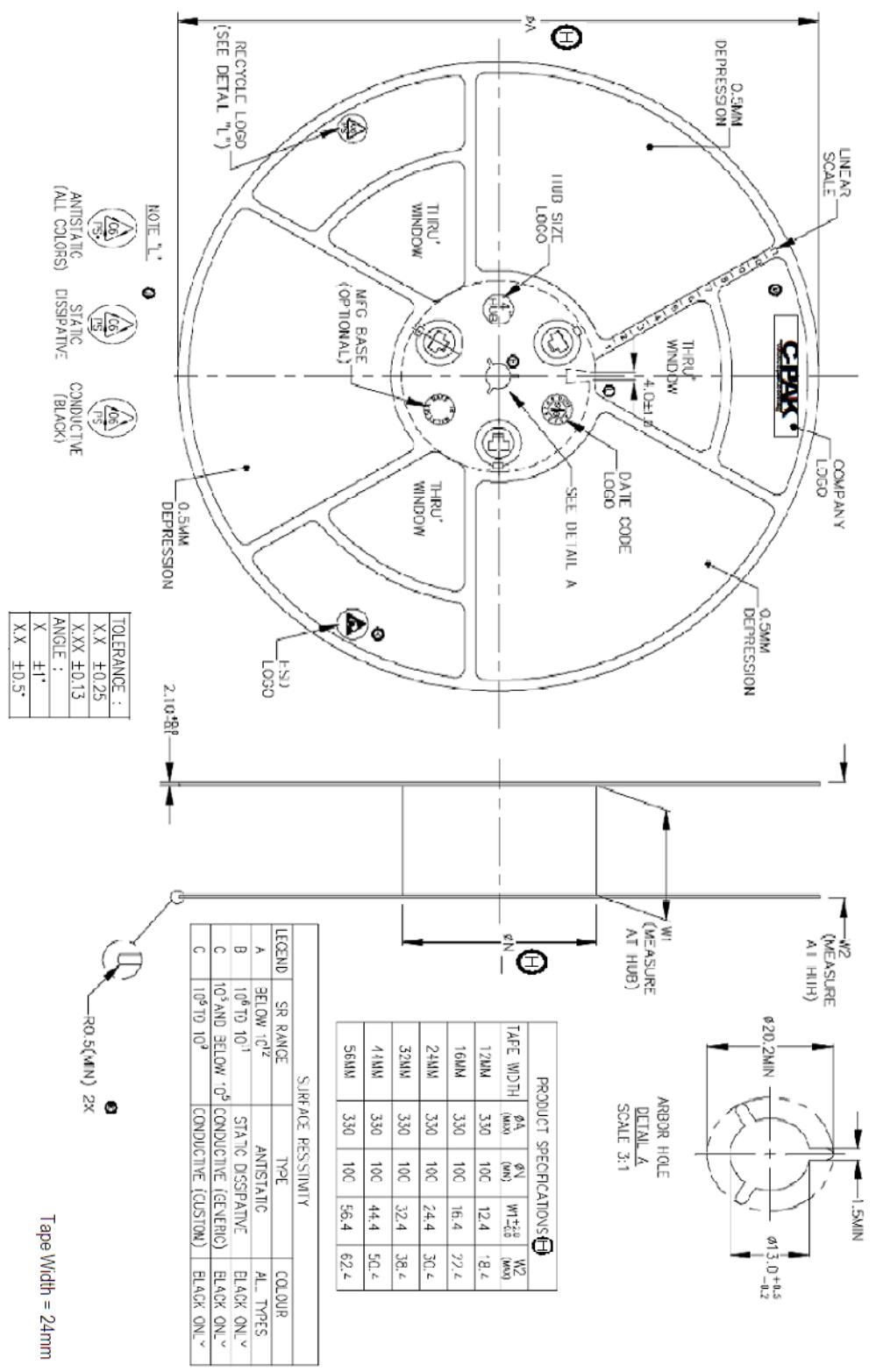


Figure 8.1 – FT232RL and FT245RL Reel Dimensions

9 FT232RQ and FT245RQ Tape Dimensions

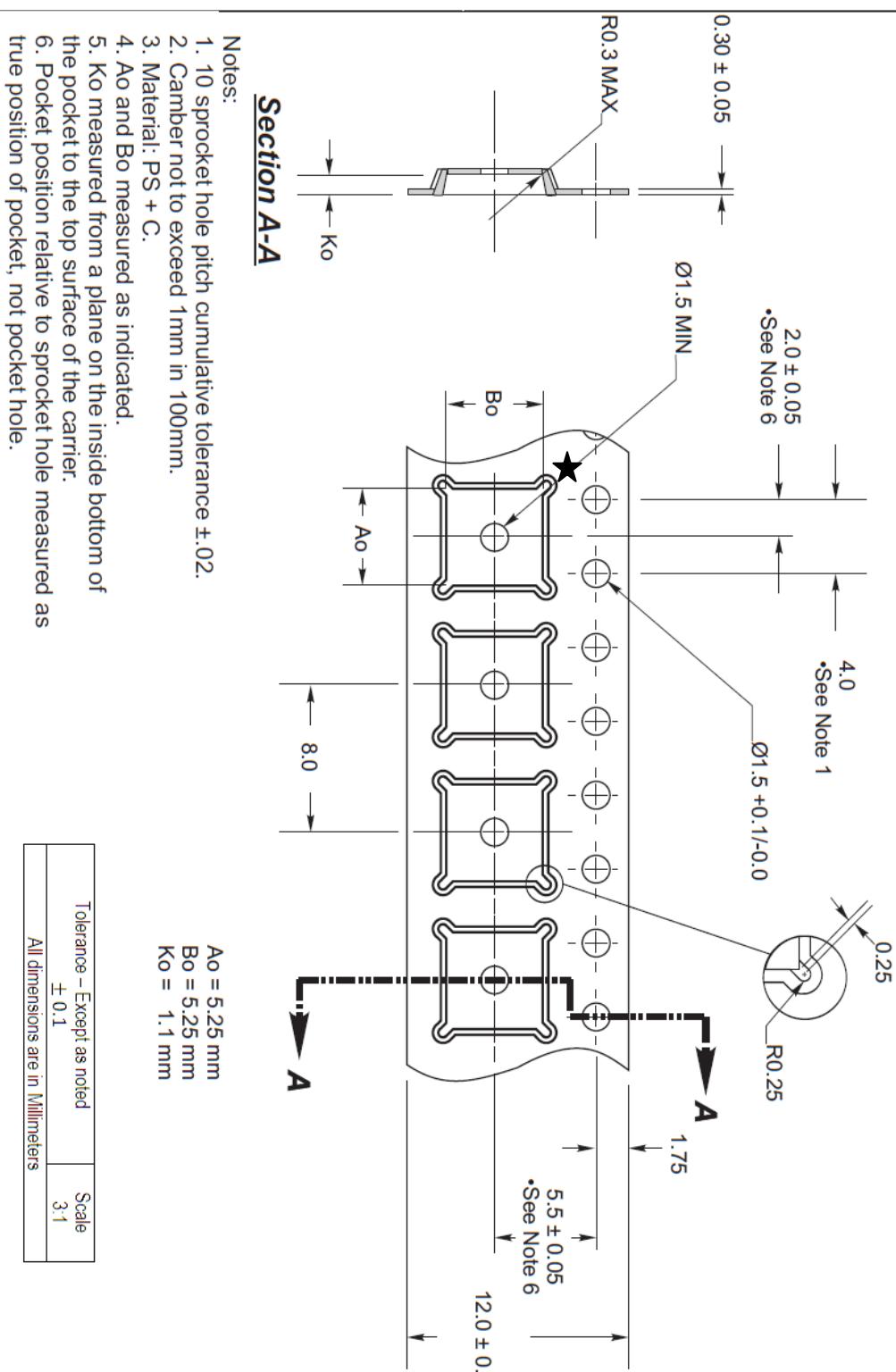


Figure 9.1 – FT232RQ and FT245RQ Tape Dimensions

10 FT232RQ and FT245RQ Reel Dimensions

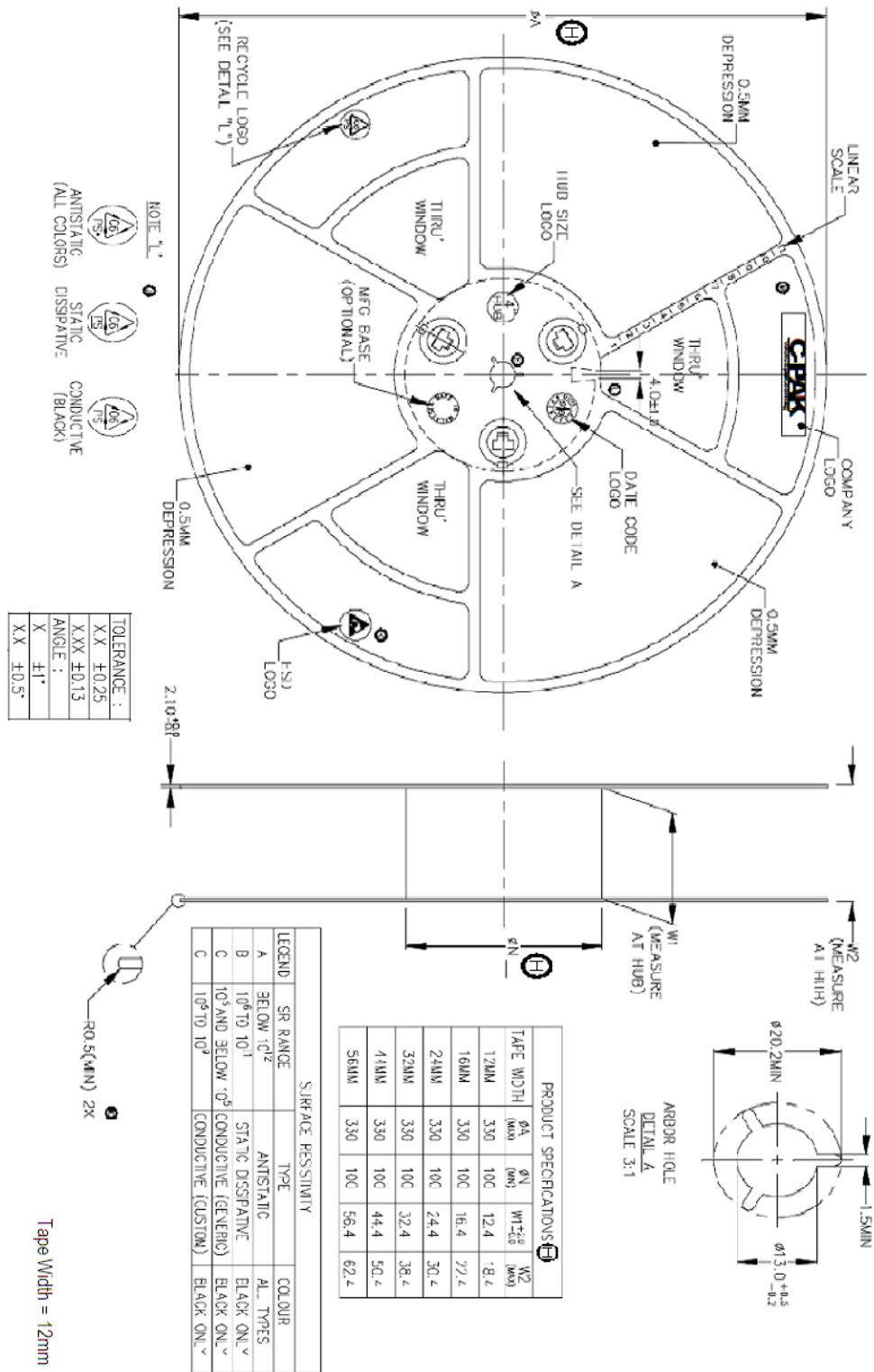


Figure 10.1 – FT232RQ and FT245RQ Reel Dimensions

11 FT2232HL and FT4232HL Tape Dimensions

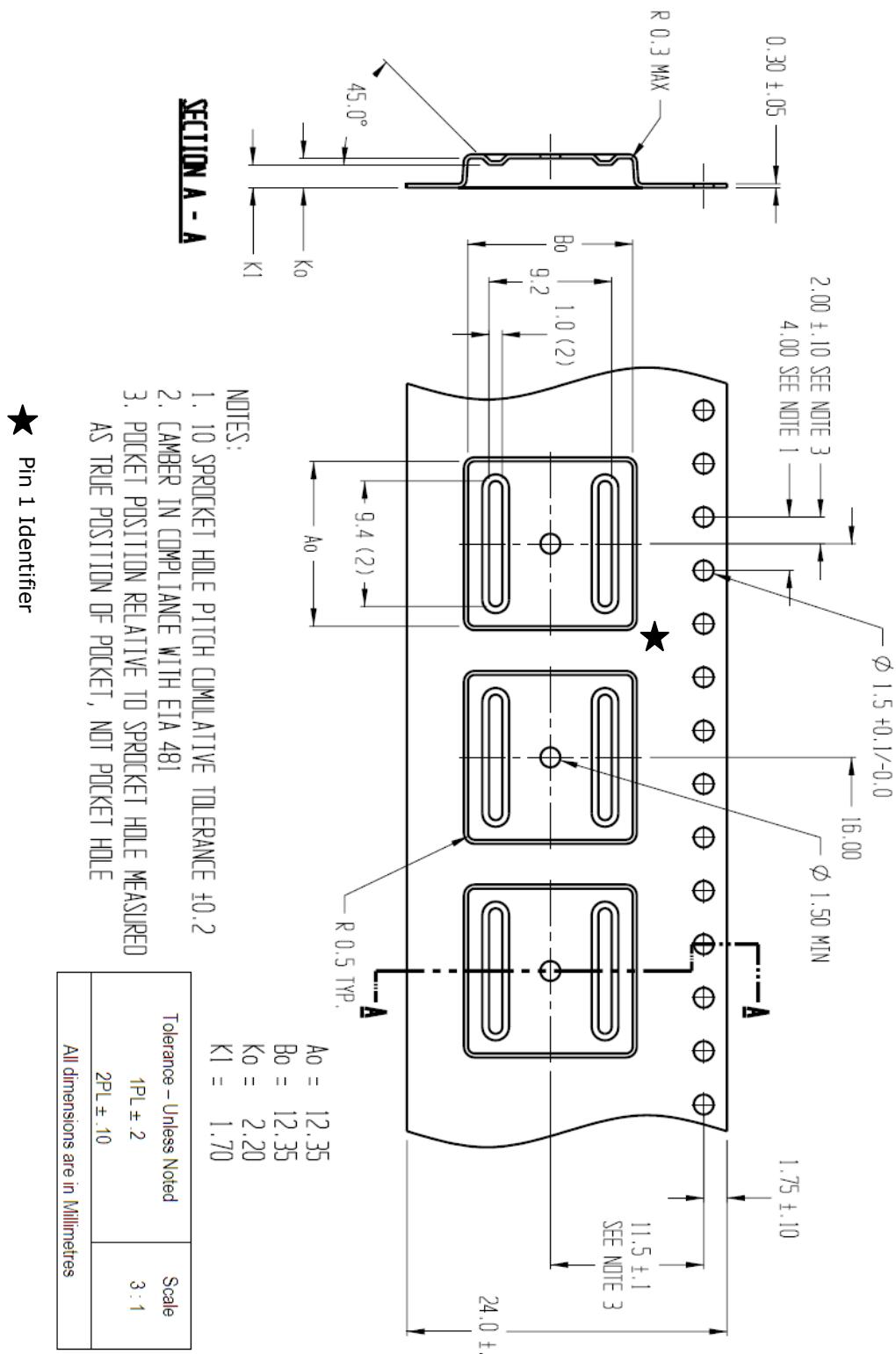


Figure 11.1 – FT2232HL and FT4232HL Tape Dimensions

12 FT2232HL and FT4232HL Reel Dimensions

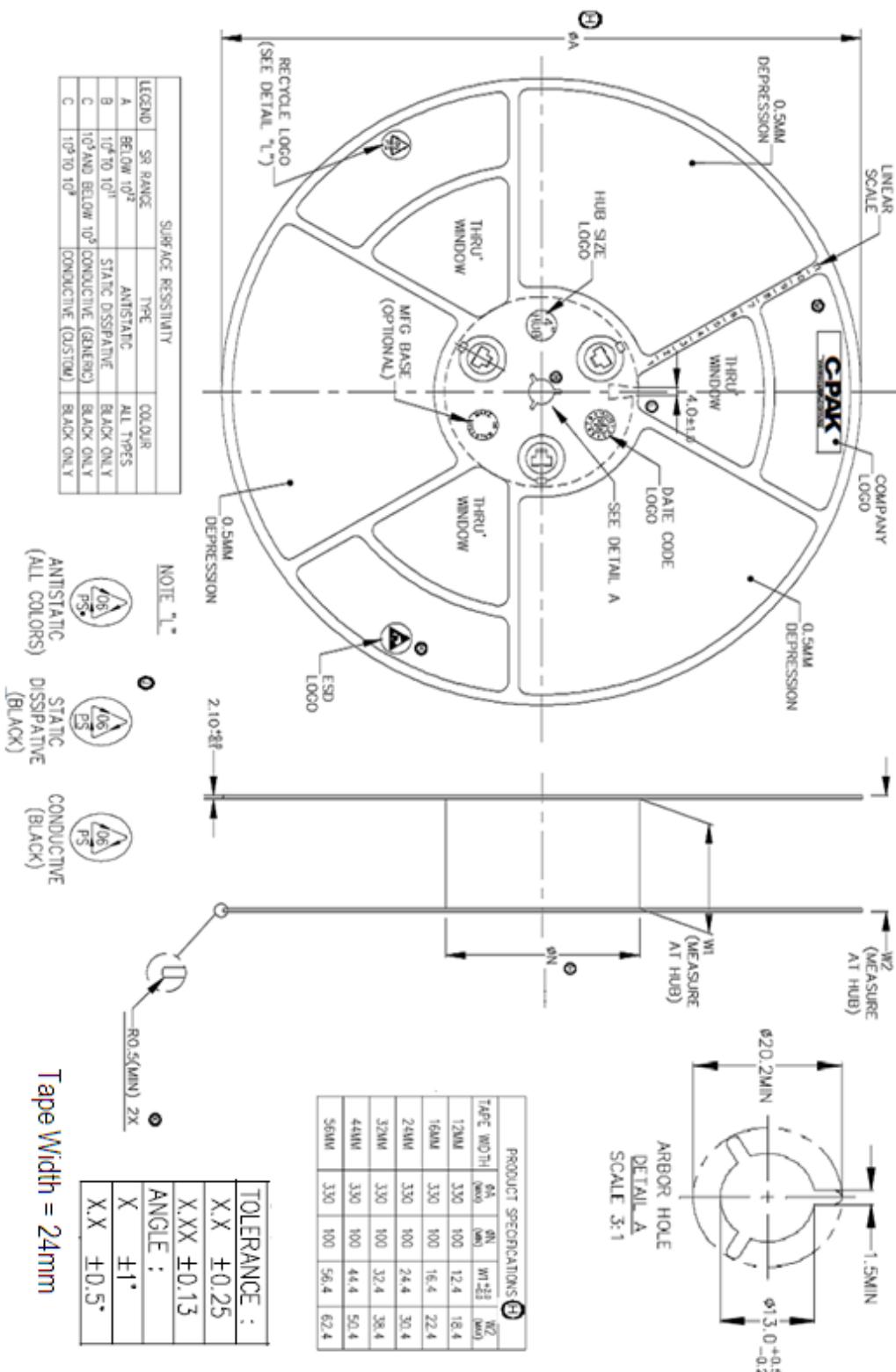


Figure 12.1 – FT2232HL and FT4232HL Reel Dimensions

13 FT2232HQ and FT4232HQ Tape Dimensions

★ Pin 1 Identifier

- Notes:
1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
 2. Camber not to exceed 1mm in 100mm.
 3. Material: PS + C.
 4. Ao and Bo measured as indicated.
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

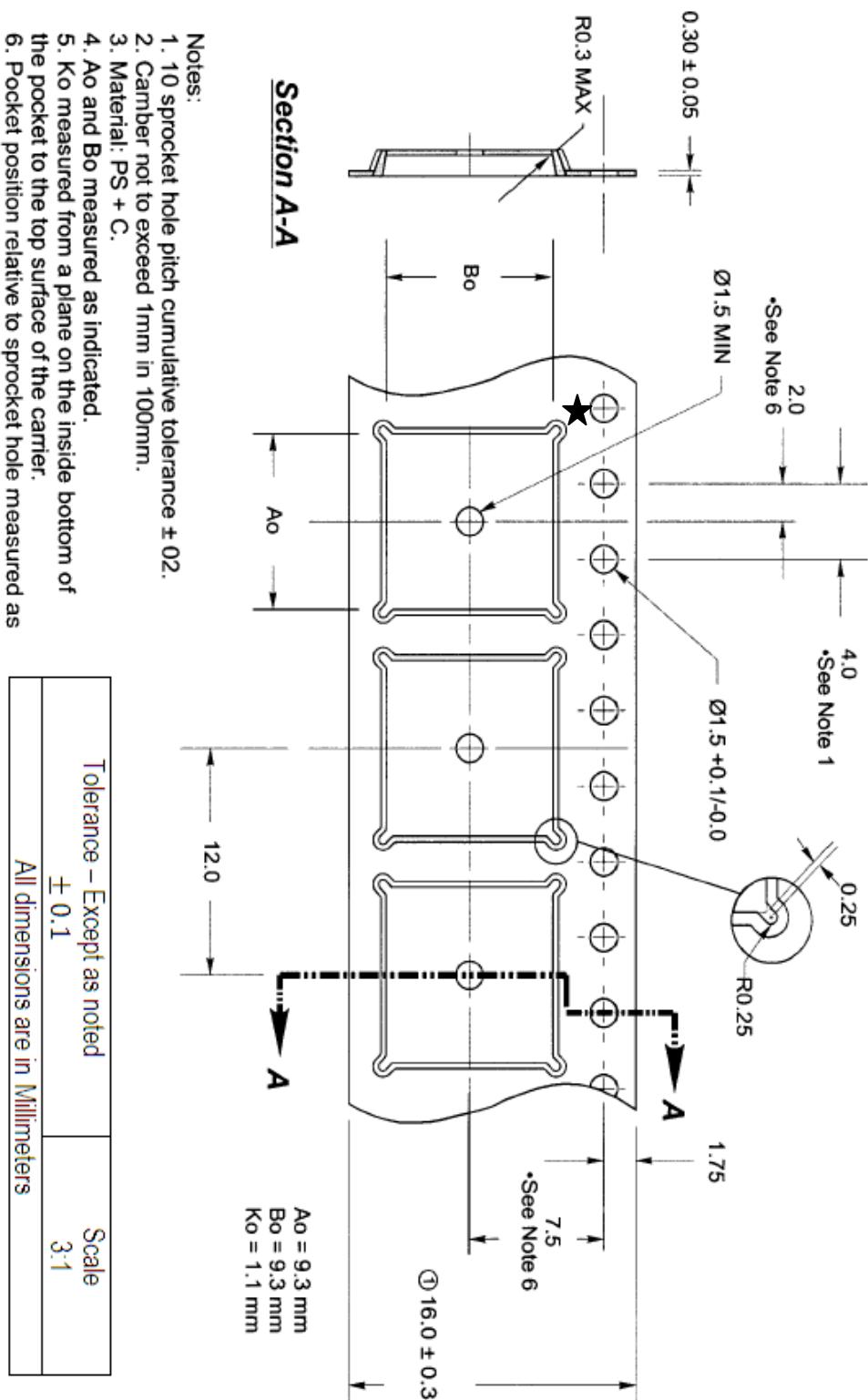


Figure 13.1 – FT2232HQ and FT4232HQ Tape Dimensions

14 FT2232HQ and FT4232HQ Reel Dimensions

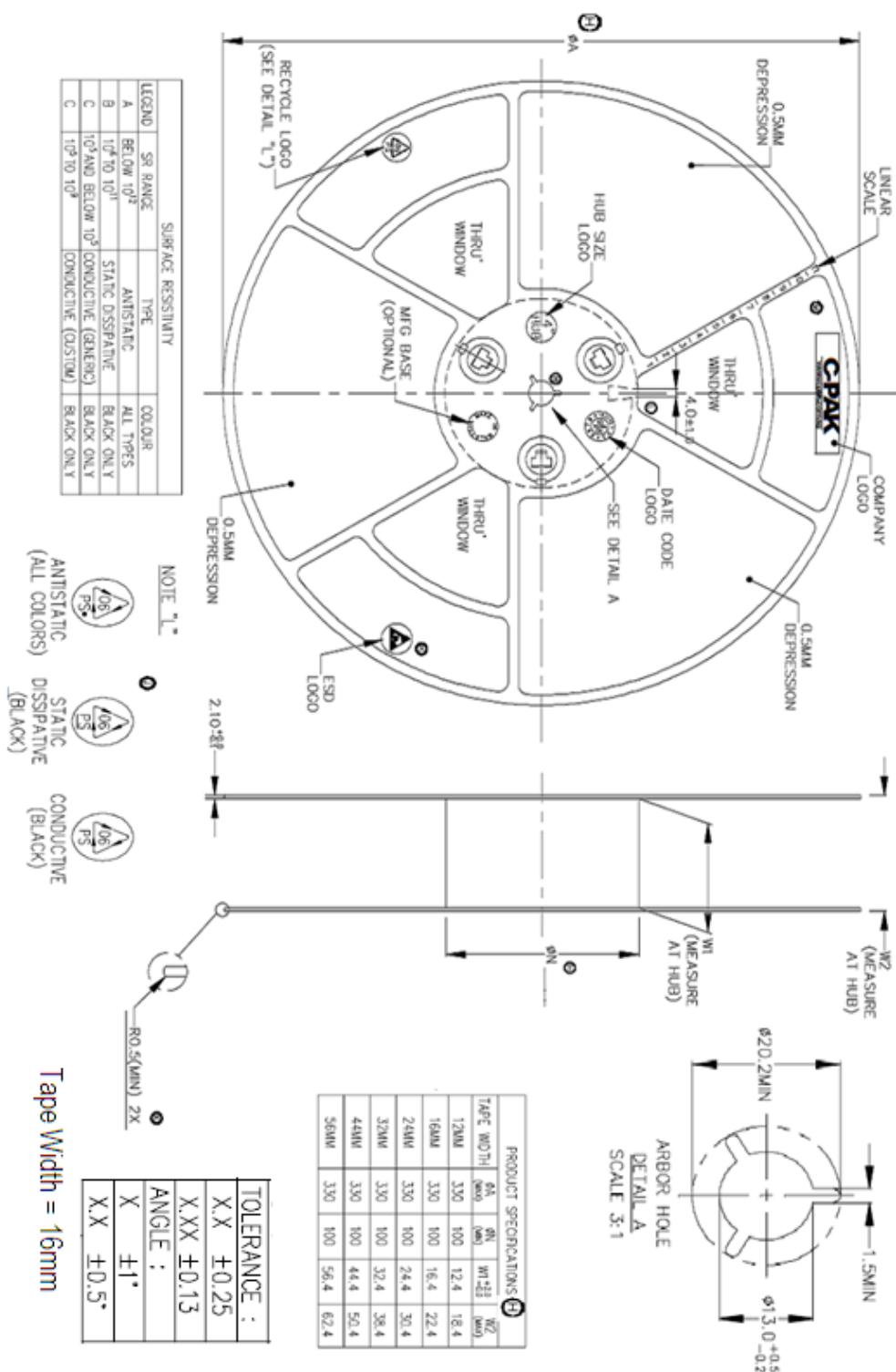


Figure 14.1 – FT2232HQ and FT4232HQ Reel Dimensions

15 FT232HL and FT232HQ Reel Dimensions

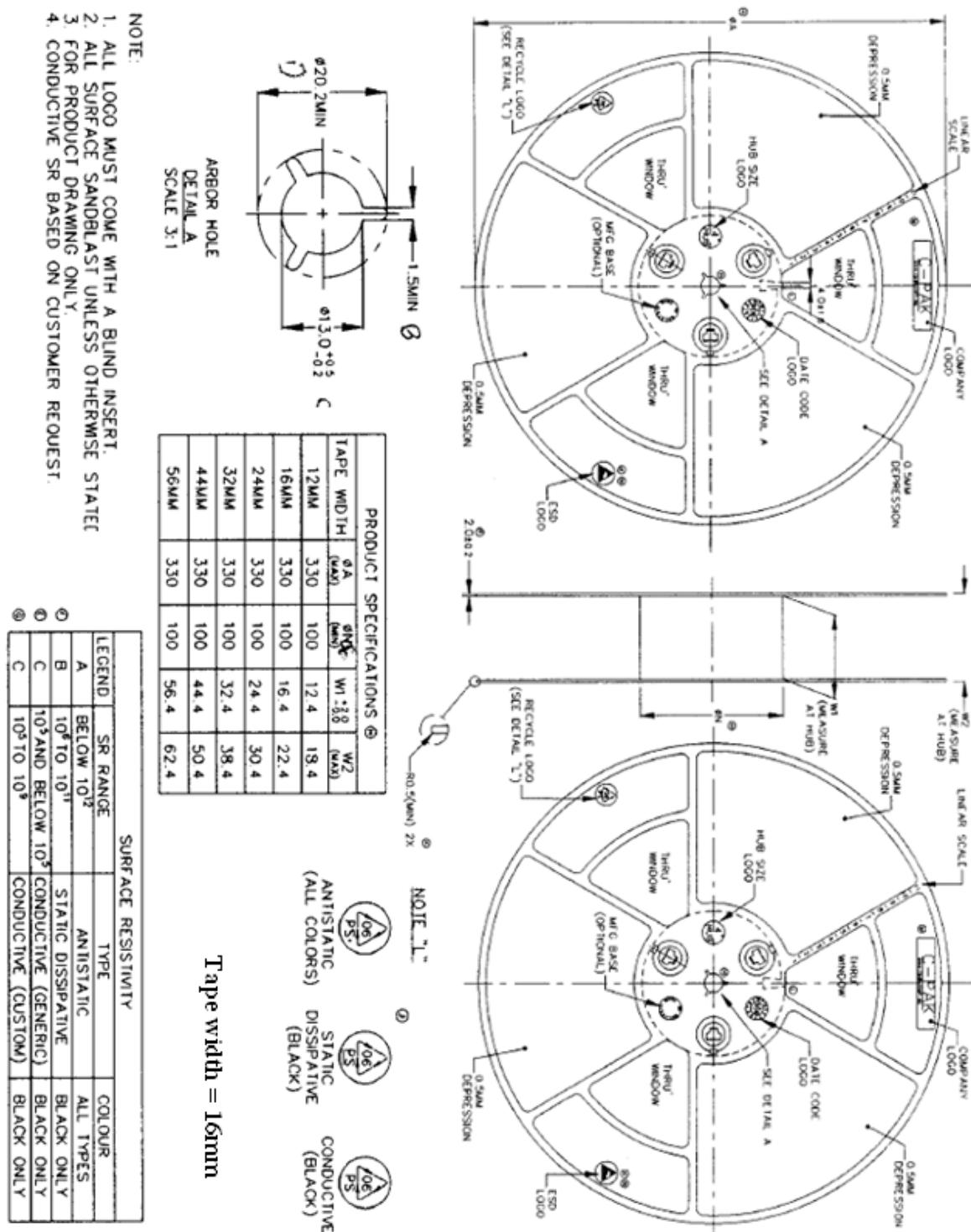


Figure 15.1 – FT232HL and FT232HQ Reel Dimensions

16 FT232HL Cover Tape Dimensions

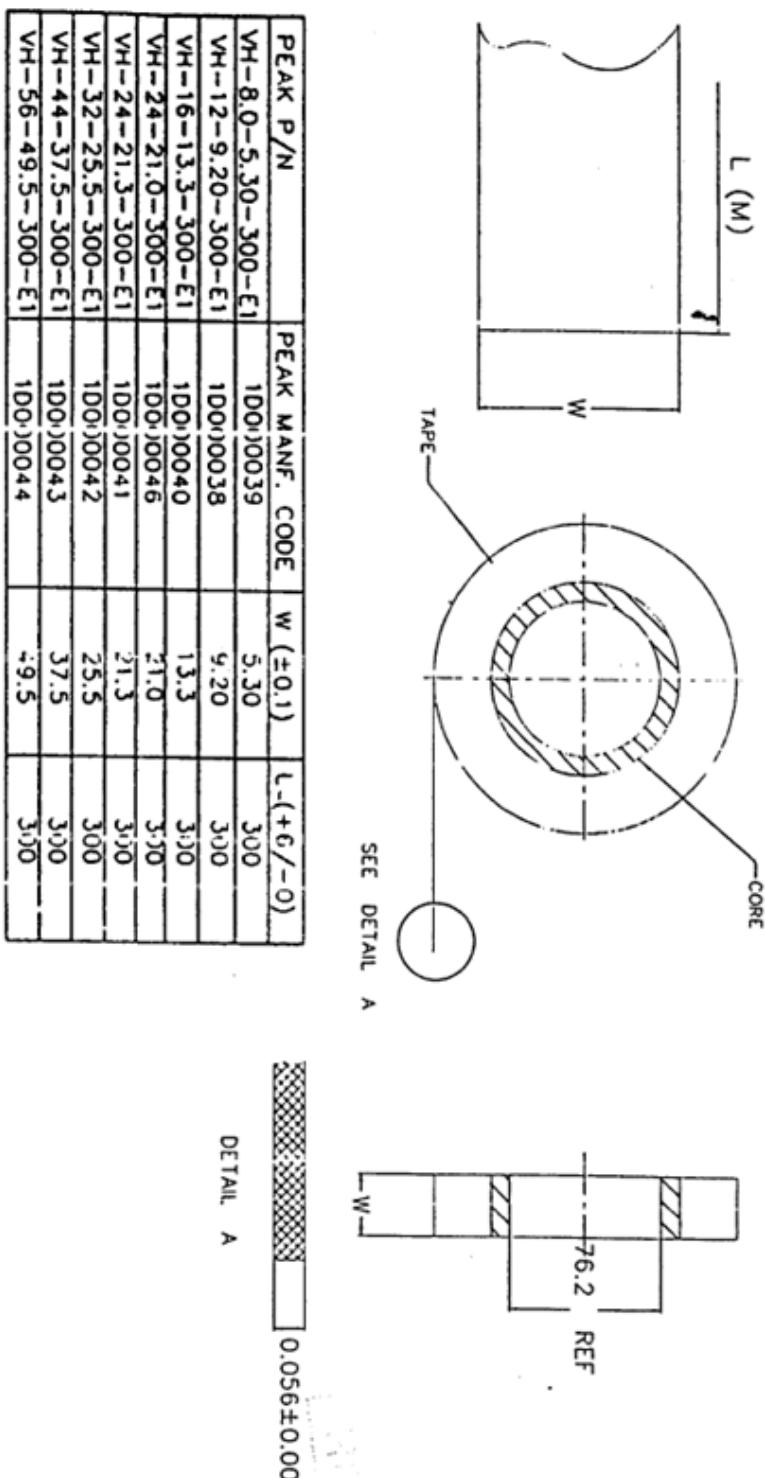


Figure 16.1 – FT232HL Cover Tape Dimensions

17 FT232HQ Cover Tape Dimensions

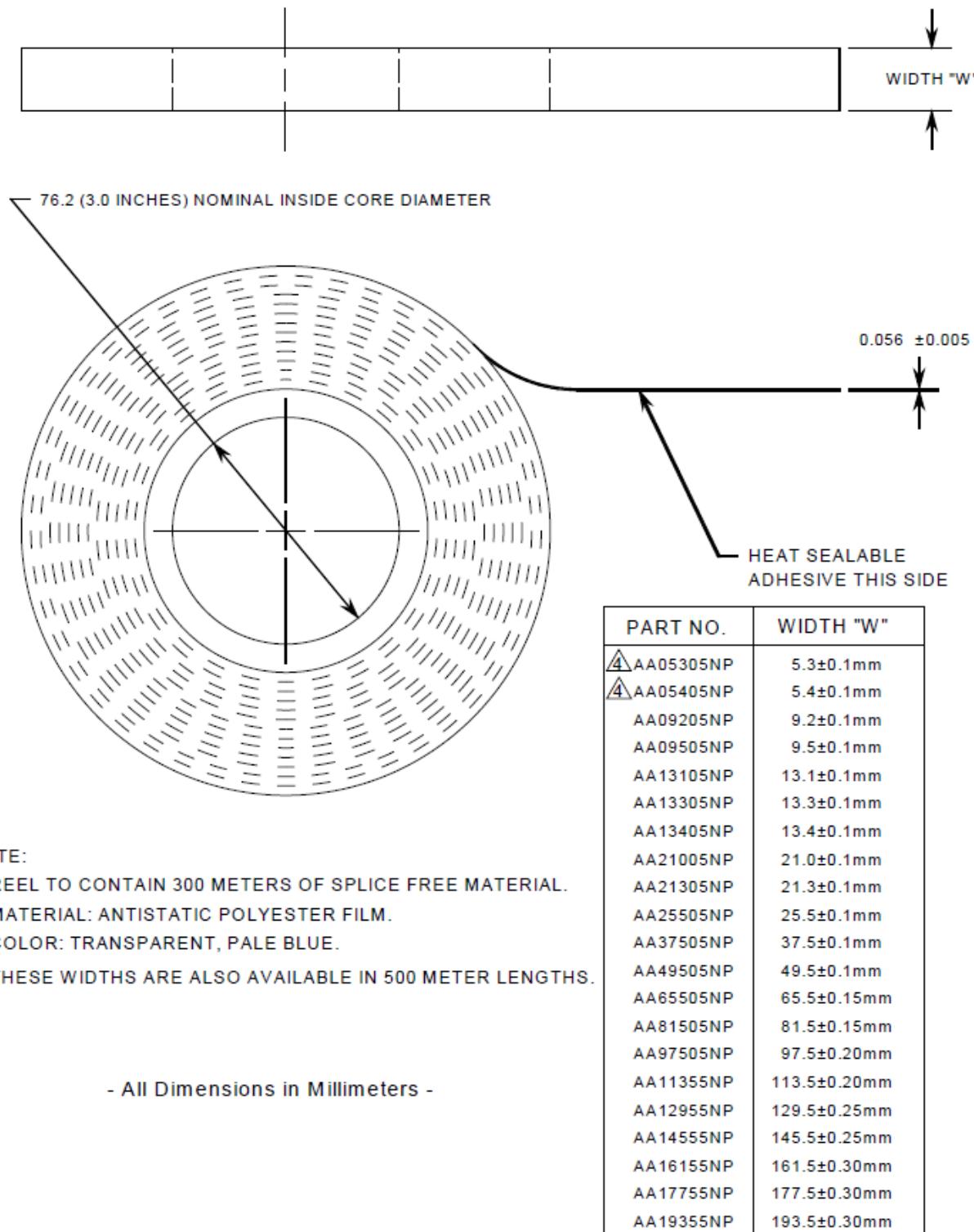


Figure 17.1 – FT232HQ Cover Tape Dimensions

18 FT232HL Carrier Tape Dimensions

Notes:

1. 10 sprocket hole pitch cumulative tolerance \pm 0.2
2. Camber not to exceed 1mm in 100mm
3. Material: Black Conductive Advantek Polystyrene
4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

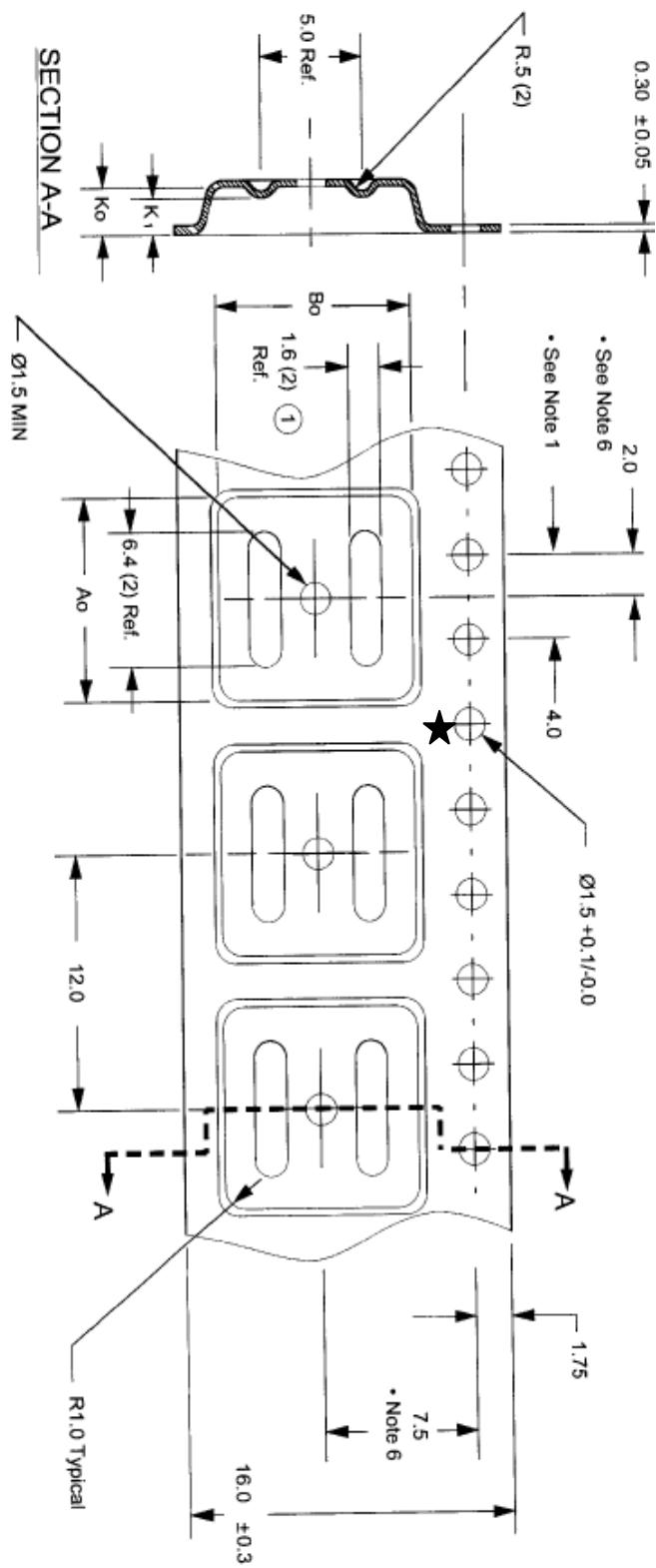


Figure 18.1 – FT232HL Carrier Tape Dimensions

19 FT232HQ Carrier Tape Dimensions

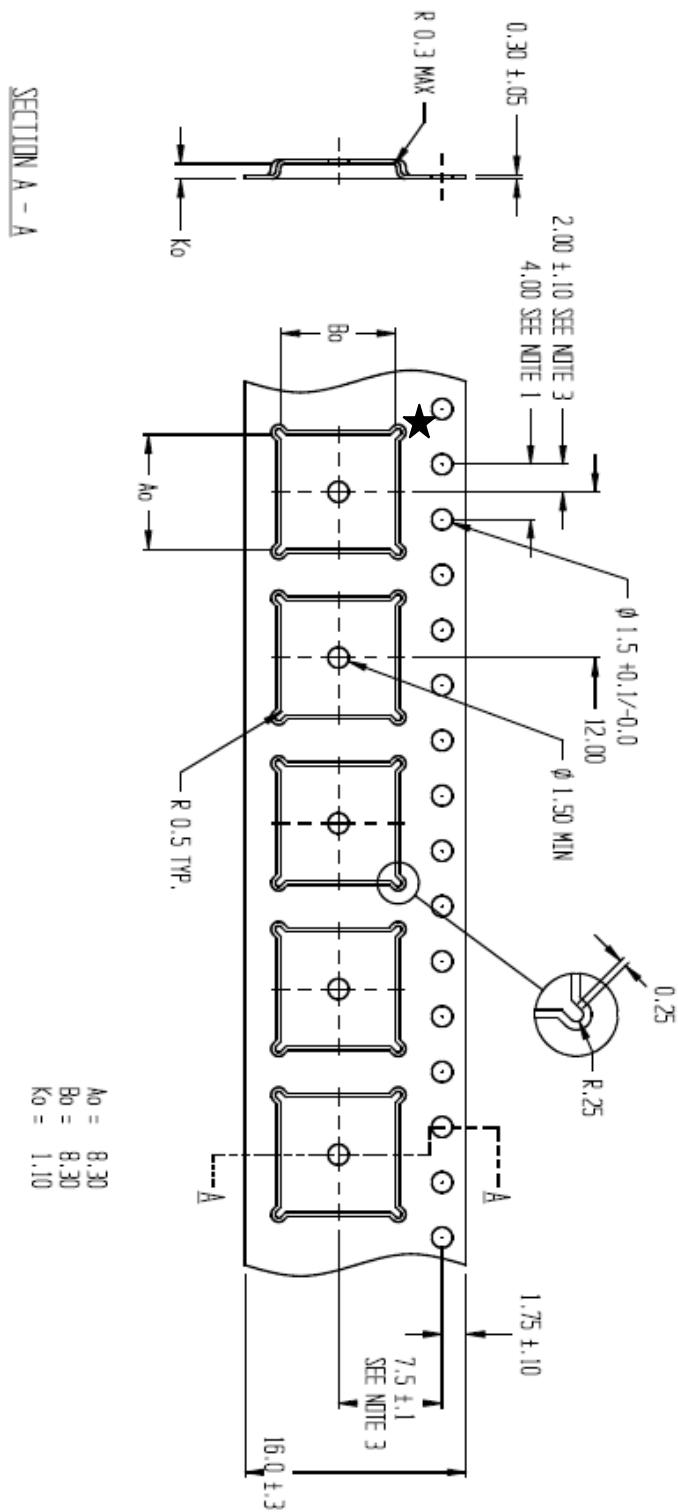


Figure 19.1 – FT232HQ Carrier Tape Dimensions

20 FT232HL Tray Dimensions

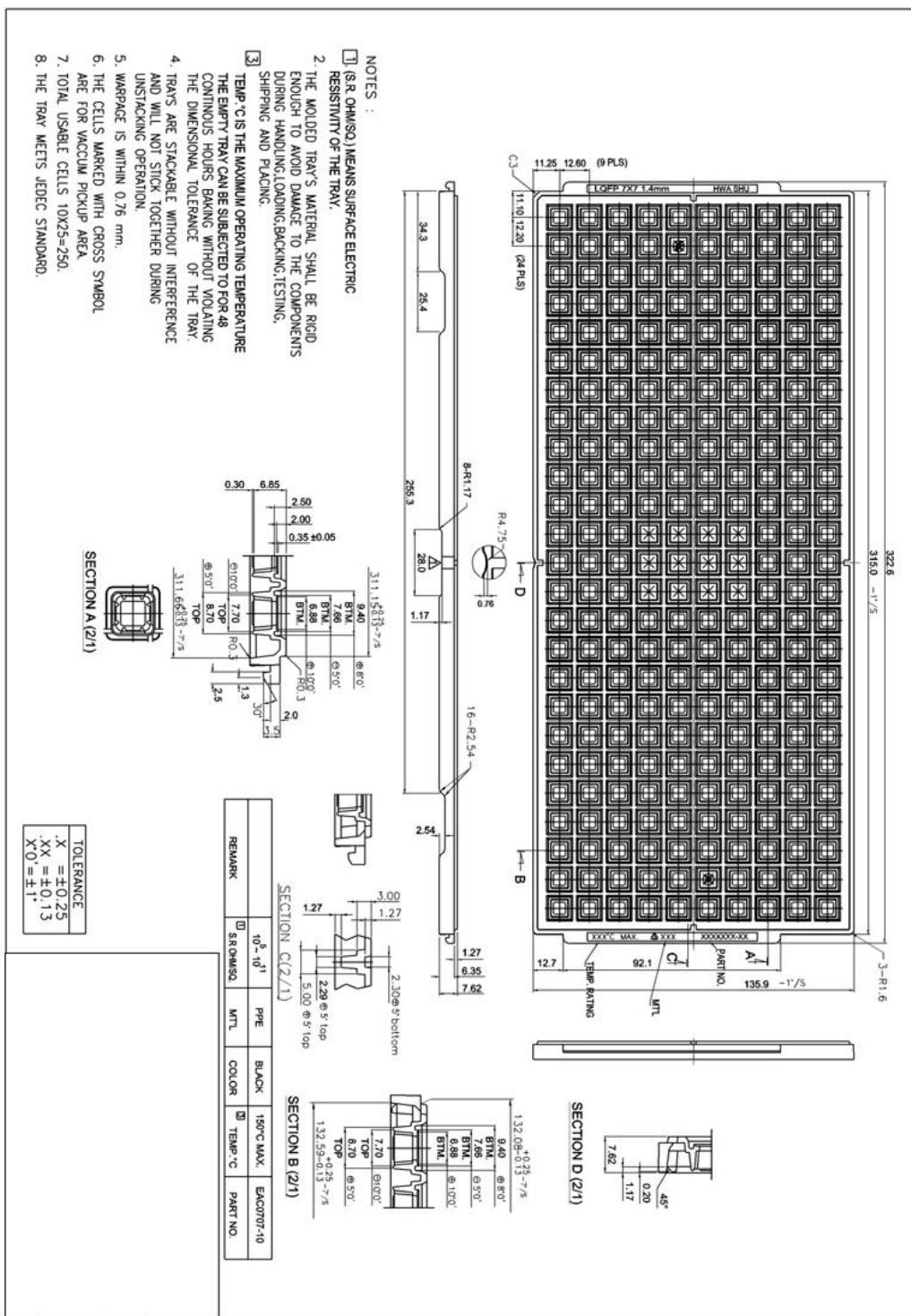
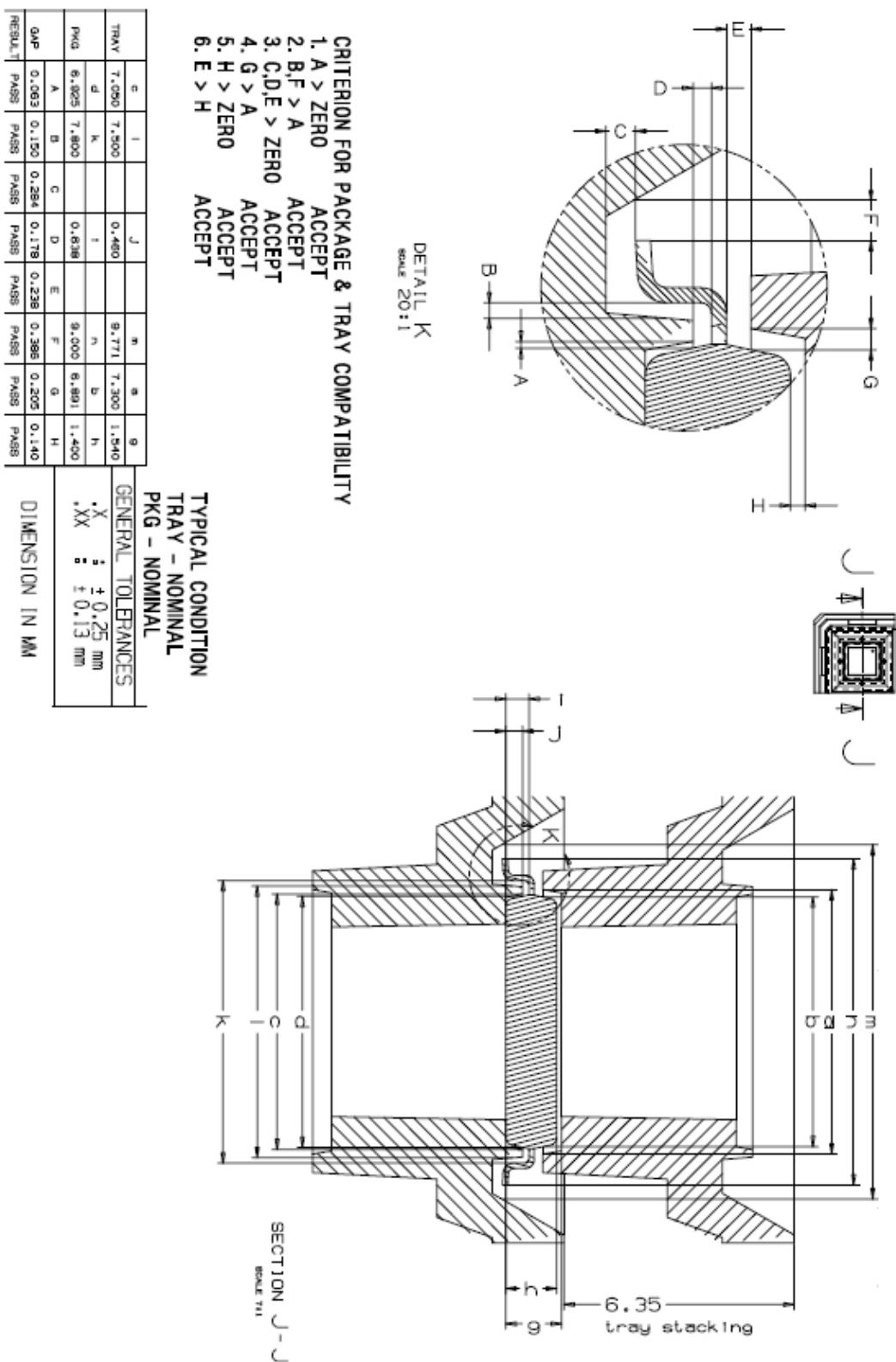
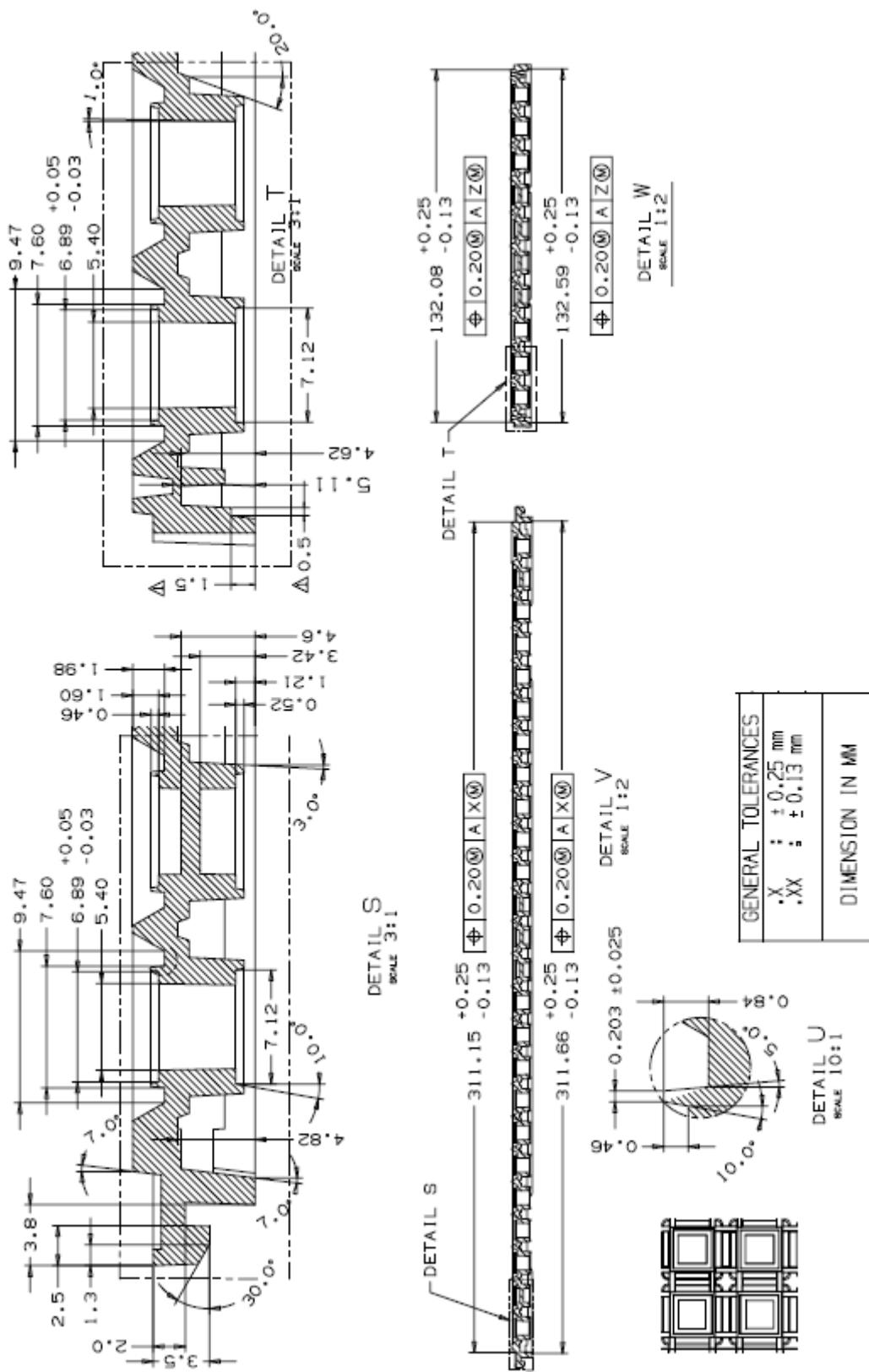


Figure 20.1 – FT232HL Tray Dimensions

21 FT232HL Tray Dimensions – Side View



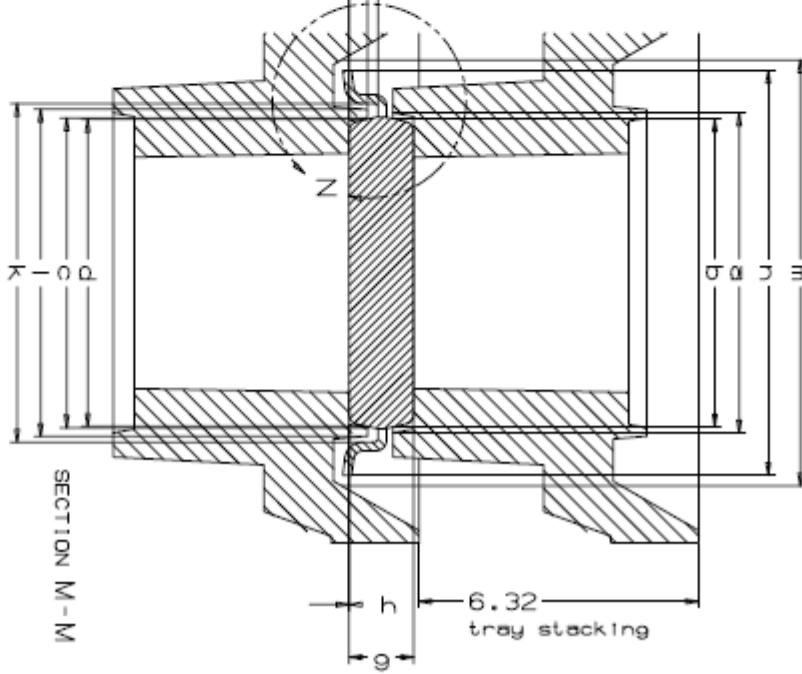
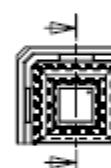
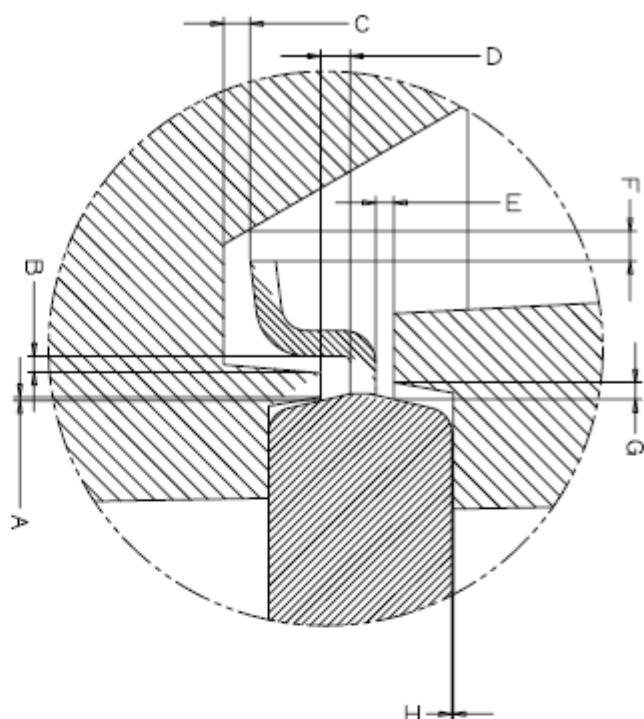


| | c | i | j | m | n | o | g |
|--------|-------|-------|-------|-------|-------|-------|-------|
| TRAY | 7.002 | 7.398 | 0.410 | 9.628 | 7.222 | 1.460 | |
| d | | | l | | n | b | |
| k | | | | | | h | |
| PKG | 6.941 | 7.650 | 0.645 | 9.150 | 8.085 | 1.450 | |
| A | B | C | D | E | F | G | H |
| GAP | 0.030 | 0.126 | 0.235 | 0.145 | 0.239 | 0.136 | 0.010 |
| RESULT | PASS |

- CRITERION FOR PACKAGE & TRAY COMPATIBILITY**
1. A > ZERO ACCEPT
 2. B,F > A ACCEPT
 3. C,D,E > ZERO ACCEPT
 4. G > A ACCEPT
 5. H > ZERO ACCEPT
 6. E > H ACCEPT

**WORST CONDITION(A)
TRAY - MINIMUM
PKG - MAXIMUM**

DETAIL N
SCALE 20:1



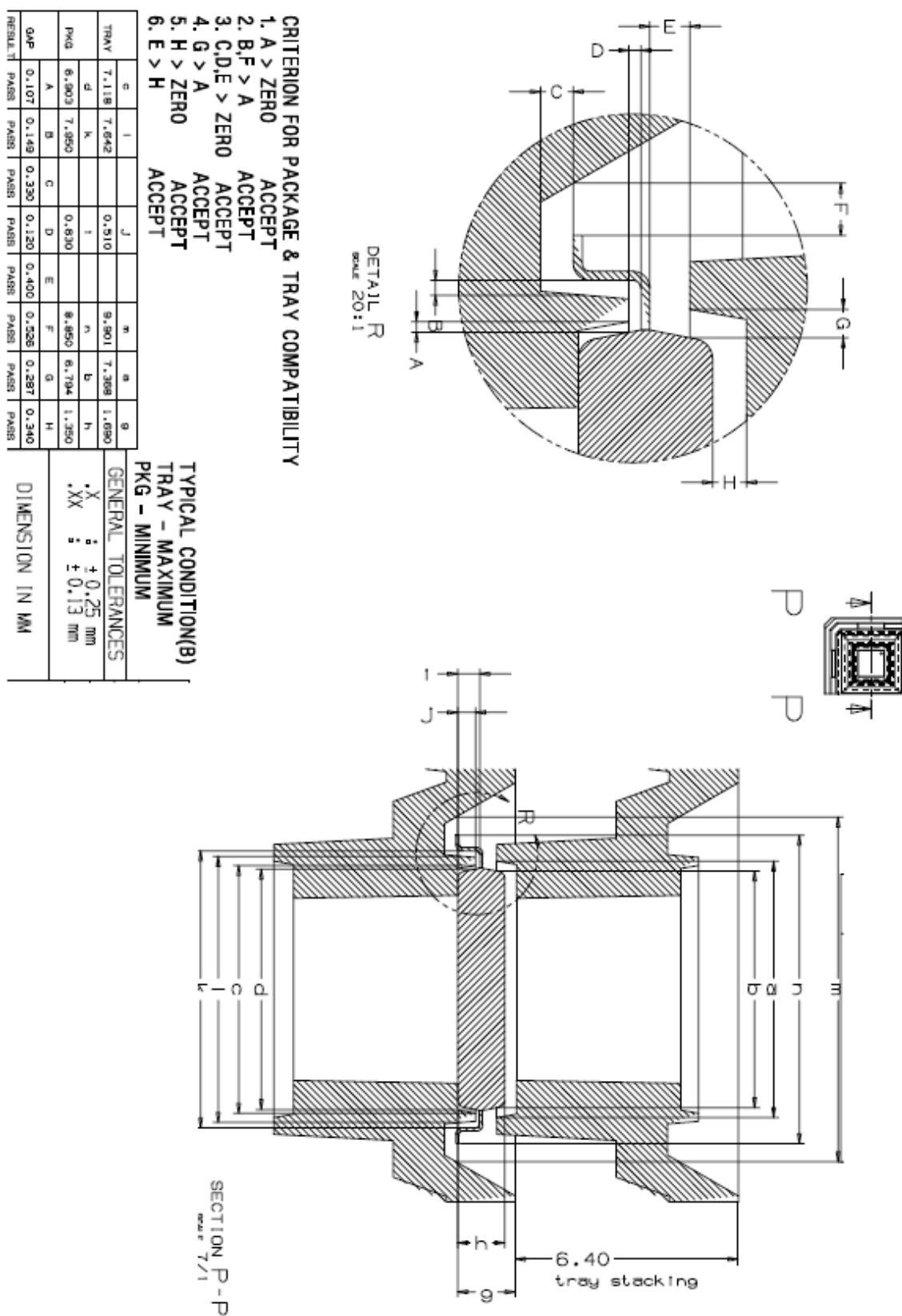


Figure 21.1 – FT232HL Tray Dimensions Side View

22 FT232HQ Tray Dimensions

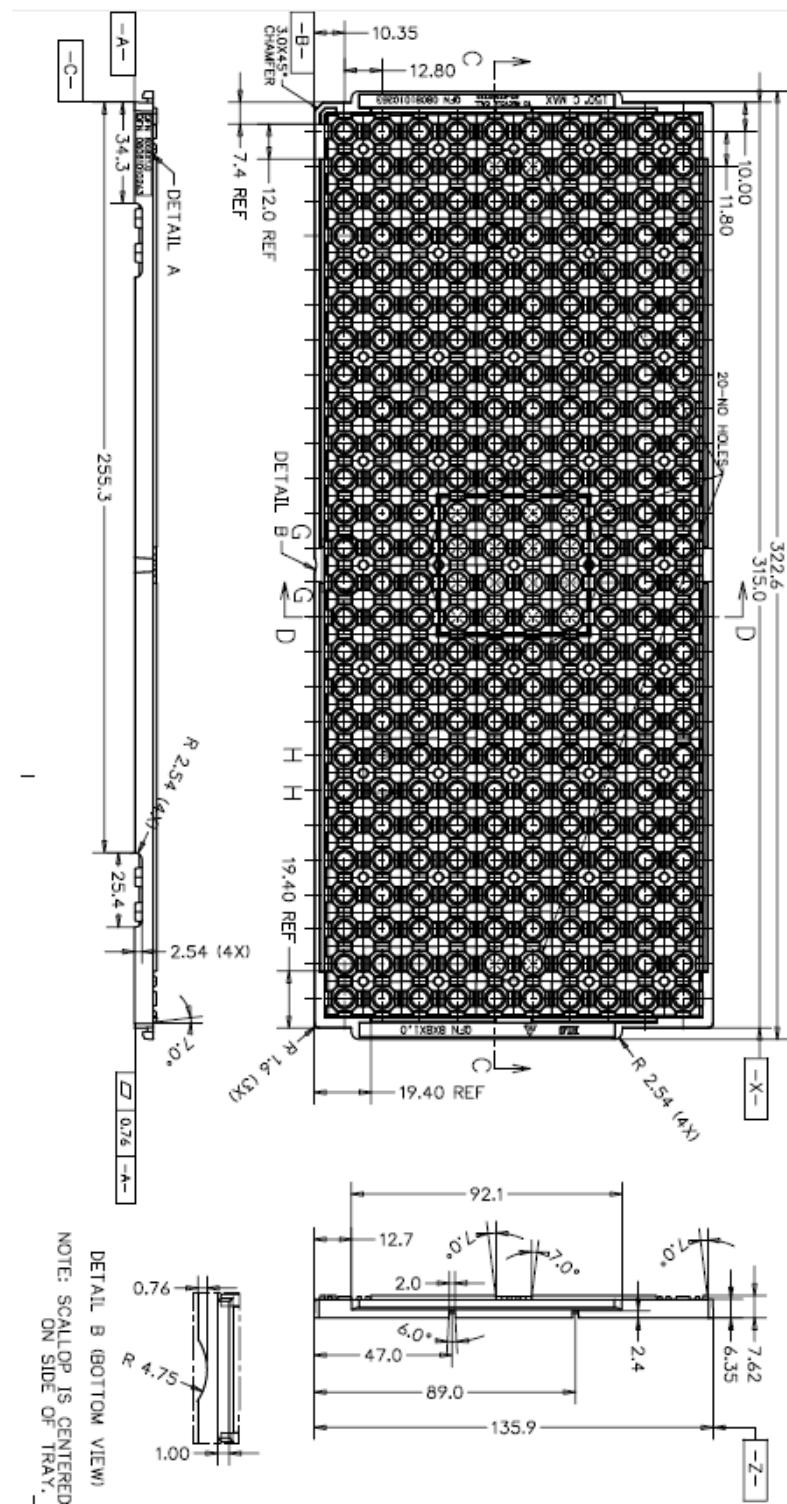


Figure 22.1 – FT232HQ Tray Dimensions

23 FT232HQ Tray Dimensions – Side View

DETAIL B
SCALE 15:1

CRITERION FOR PACKAGE & TRAY COMPATIBILITY

1. A, F > ZERO ACCEPT
2. B > A ACCEPT
3. G > F ACCEPT
4. C > E ACCEPT
5. H > ZERO ACCEPT

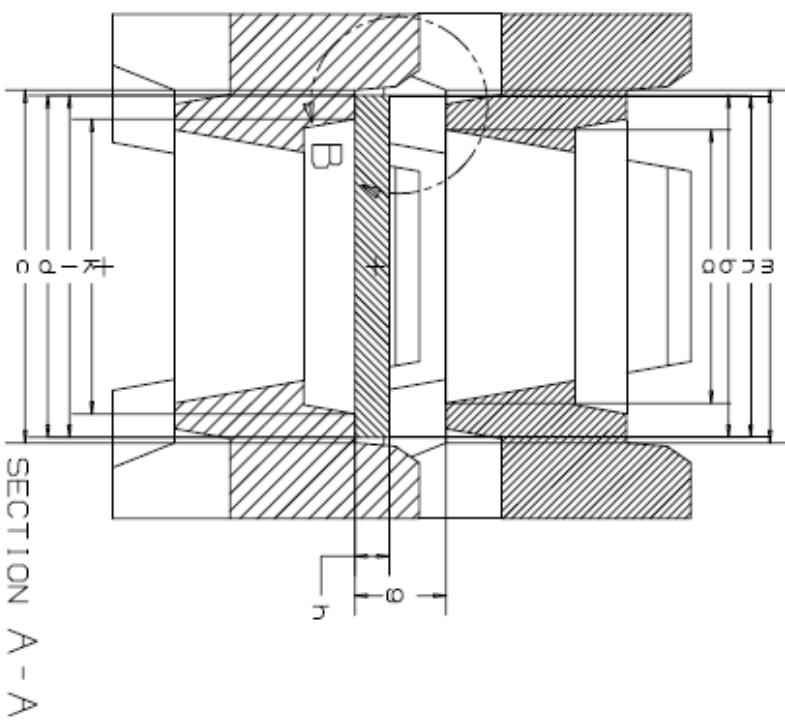
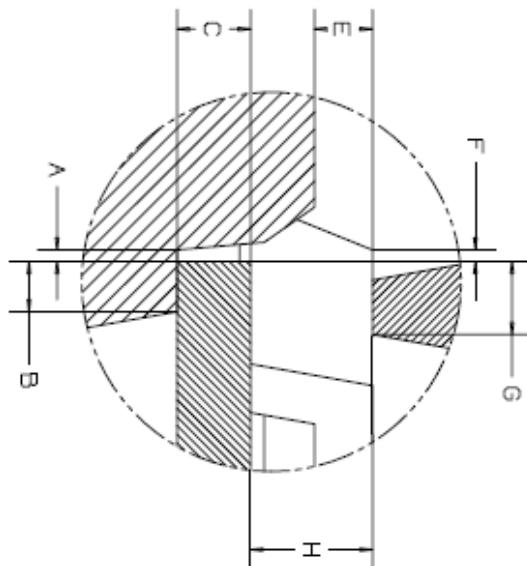
TYPICAL CONDITION
TRAY - NOMINAL
PKG - NOMINAL

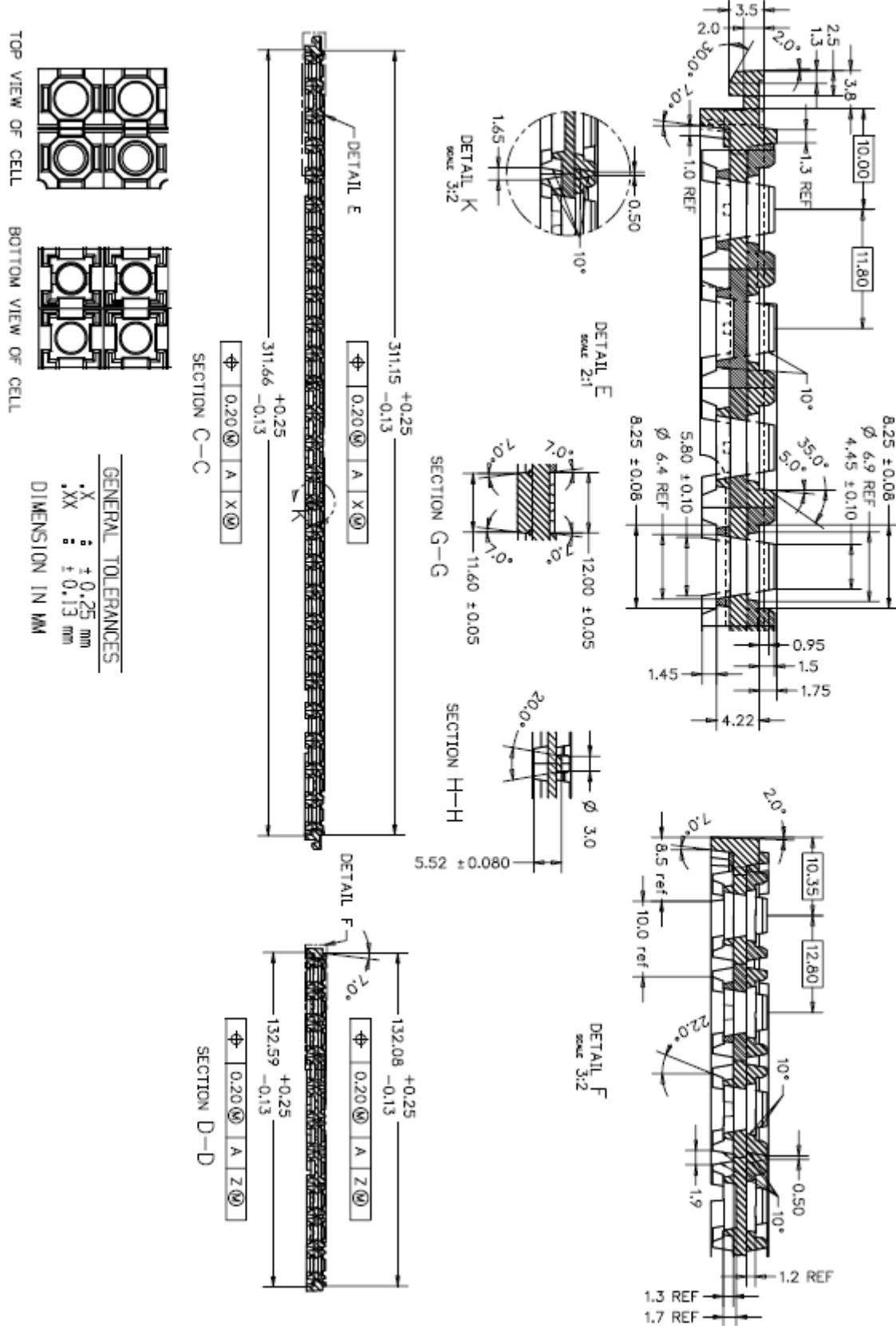
| TRAY | c | k | i | m | a | g |
|-------|-------|---|---|-------|-------|-------|
| 8.250 | 6.900 | | | 8.250 | 6.400 | 2.130 |
| d | i | | j | n | b | h |

GENERAL TOLERANCES

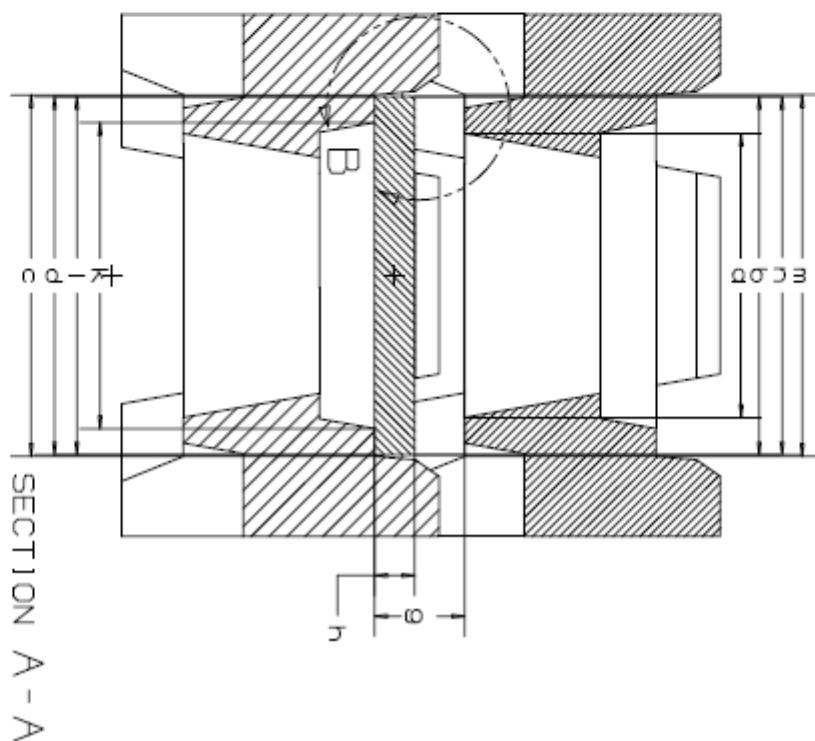
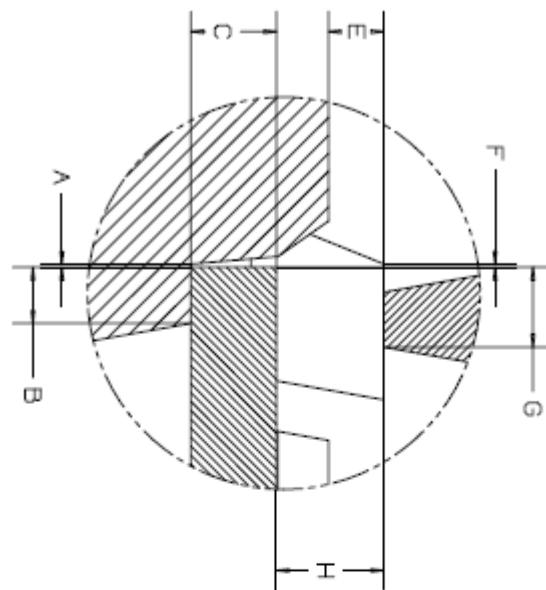
| PKG | A | B | C | D | E | F | G | H |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 8.000 | 8.000 | - | | 8.000 | 8.000 | 0.800 | | |
| GAP | 0.125 | 0.950 | 0.800 | - | 0.630 | 0.125 | 0.800 | 1.330 |

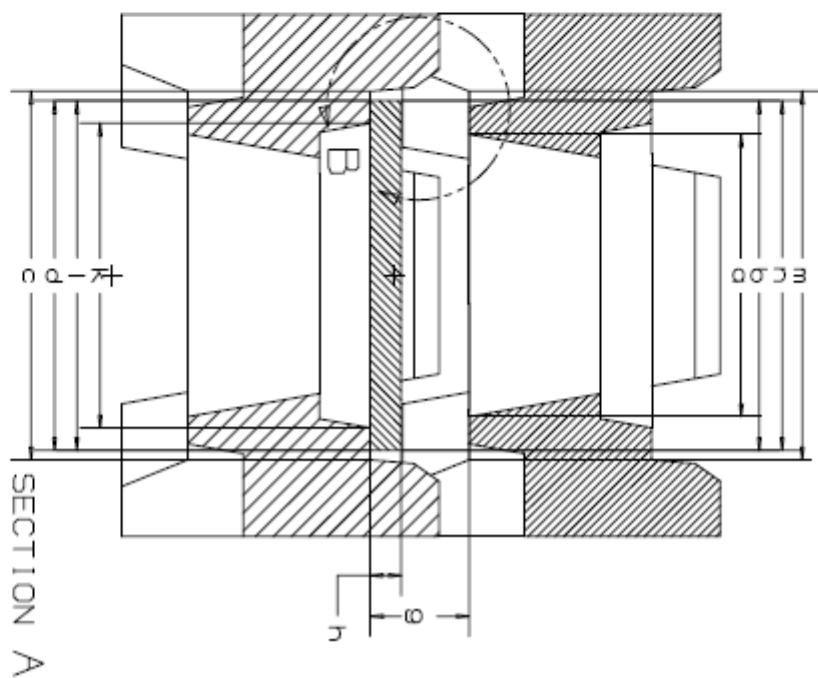
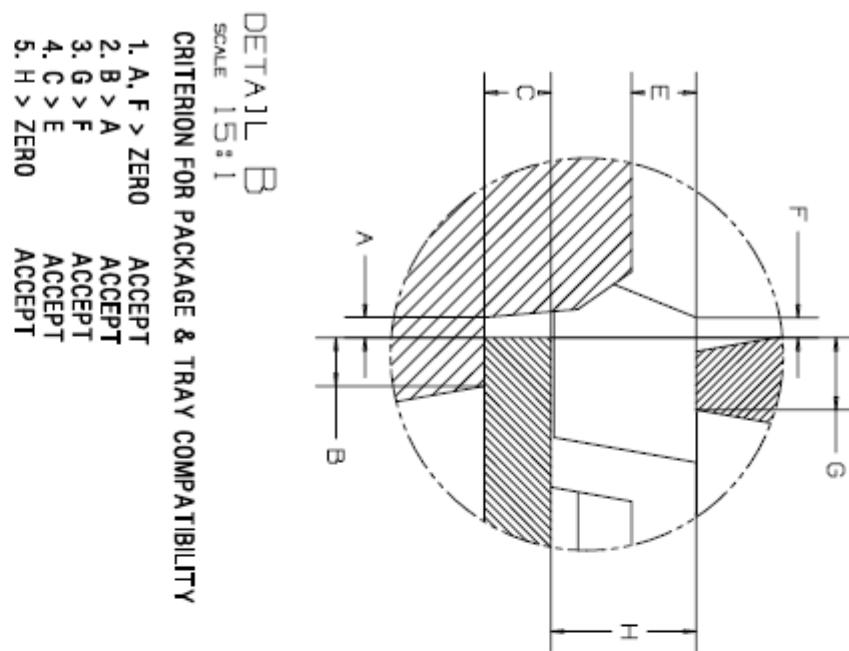
RESULT | PASS | PASS | PASS | - | PASS | PASS | PASS | PASS | PASS | DIMENSION IN MM

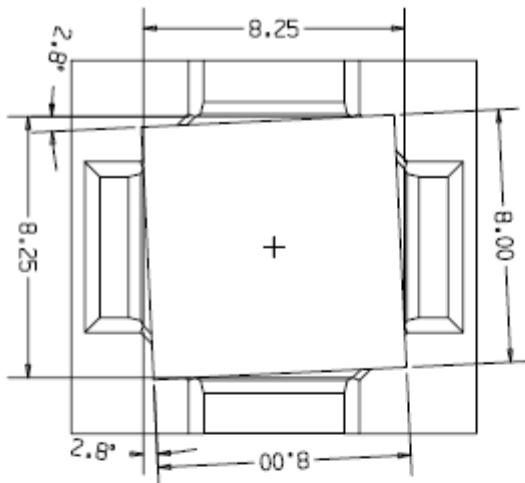




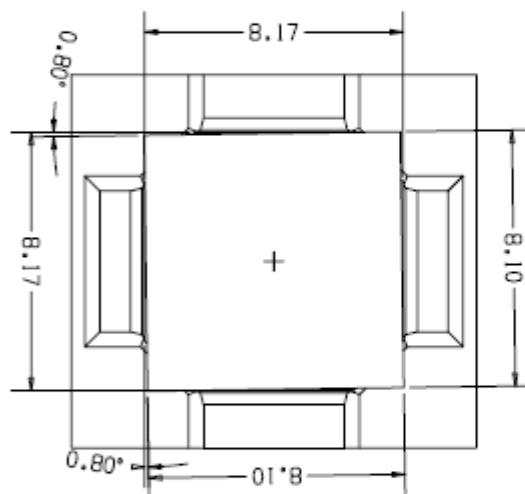
| WORST CONDITION (A) | | | | | | | |
|---------------------|-------|-------|-------|---------------|-------|-------|-------|
| TRAY - MINIMUM | | | | PKG - MAXIMUM | | | |
| GENERAL TOLERANCES | | | | | | | |
| c | k | i | m | a | g | | |
| 8.168 | 8.918 | | | 8.172 | 8.418 | 2.030 | |
| d | l | j | n | b | h | | |
| 8.100 | 8.100 | - | 8.100 | 8.100 | 0.900 | | |
| A | B | C | D | E | F | G | H |
| 0.034 | 0.091 | 0.900 | - | 0.480 | 0.036 | 0.841 | 1.130 |
| PASS | PASS | PASS | - | PASS | PASS | PASS | PASS |
| DIMENSION IN MM | | | | | | | |
| X | ; | ± | 0.25 | mm | | | |
| ,XX | ; | ± | 0.13 | mm | | | |



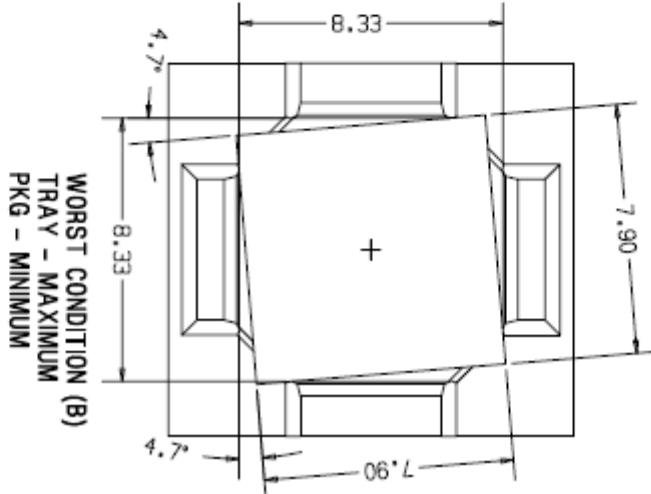




MAXIMUM ROTATING = 2.8°



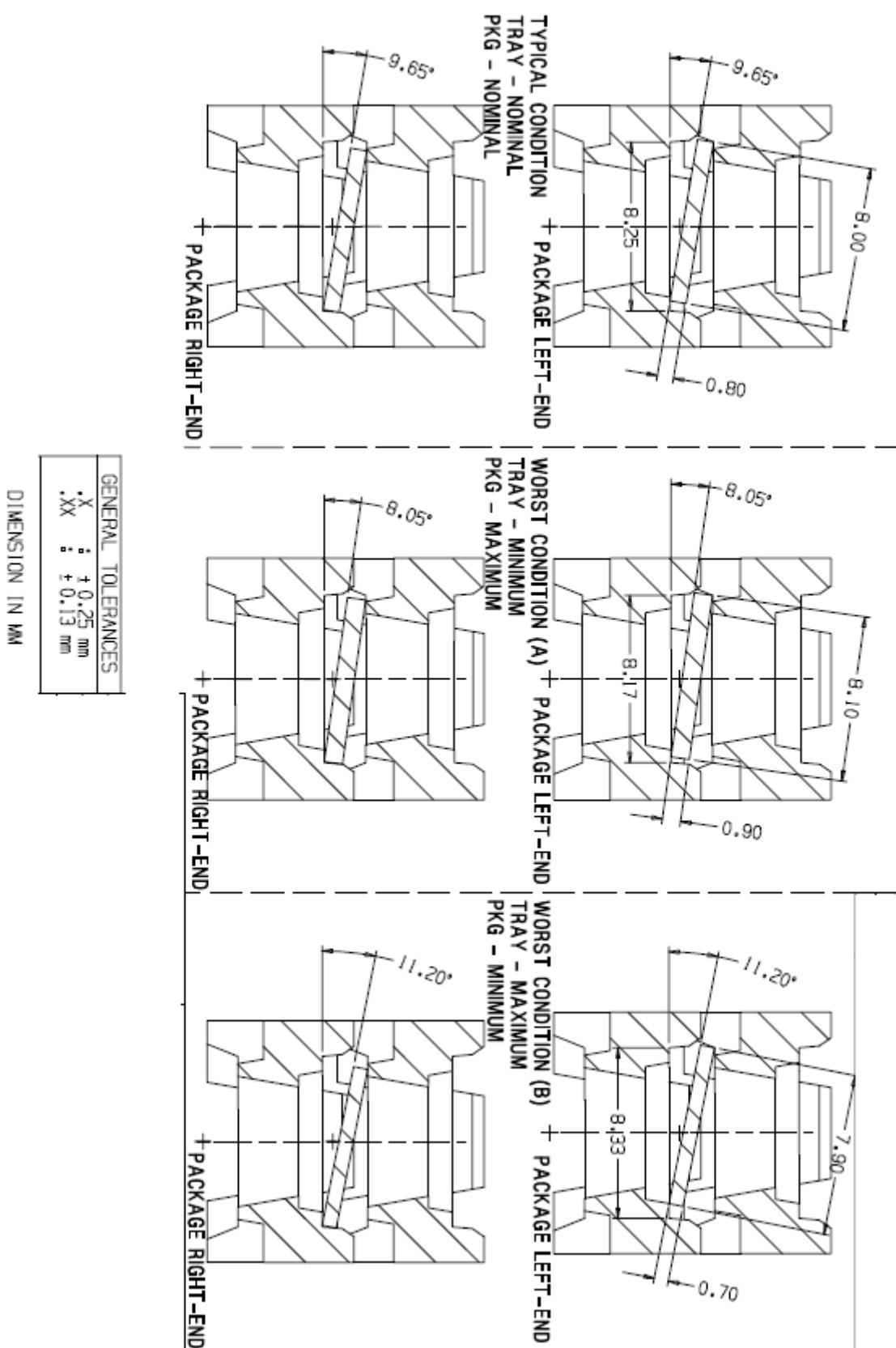
MAXIMUM ROTATING = 0.80°



MAXIMUM ROTATING = 4.70°

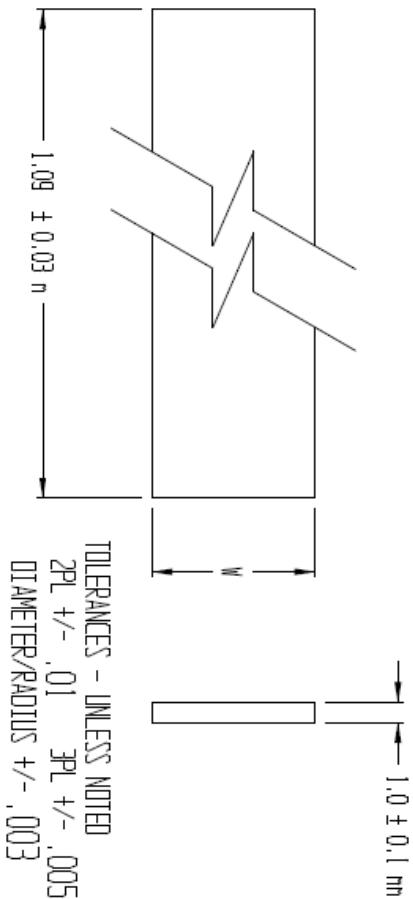
| GENERAL TOLERANCES | |
|--------------------|-----------|
| XX | ± 0.25 mm |
| XX | + 0.13 mm |

DIMENSION IN MM


Figure 23.1 – FT232HQ Tray Dimensions Side View

24 FT232HL and FT232HQ Protective Belt

| PART NUMBER | TAPE WIDTH | "W" | |
|-------------|------------|--------------------|--|
| PH10908UC | 8 | 8.3 ± 0.7~0.0 mm | |
| PH10912UC | 12 | 12.3 ± 0.7~0.0 mm | |
| PH10916UC | 16 | 16.3 ± 0.7~0.0 mm | |
| PH10924UC | 24 | 24.3 ± 0.7~0.0 mm | |
| PH10932UC | 32 | 32.3 ± 0.7~0.0 mm | |
| PH10944UC | 44 | 44.3 ± 0.7~0.0 mm | |
| PH10956UC | 56 | 56.3 ± 0.7~0.0 mm | |
| PH10972UC | 72 | 72.3 ± 0.7~0.0 mm | |
| PH10988UC | 88 | 88.3 ± 0.7~0.0 mm | |
| PH109104UC | 104 | 104.3 ± 0.7~0.0 mm | |
| PH109120UC | 120 | 120.3 ± 0.7~0.0 mm | |
| PH109136UC | 136 | 136.3 ± 0.7~0.0 mm | |
| PH109152UC | 152 | 152.3 ± 0.7~0.0 mm | |
| PH109168UC | 168 | 168.3 ± 0.7~0.0 mm | |
| PH109184UC | 184 | 184.3 ± 0.7~0.0 mm | |
| PH109200UC | 200 | 200.3 ± 0.7~0.0 mm | |


 NOTES:
 1. SURFACE RESISTIVITY $\leq 10^7$ OHMS PER SQUARE.
 2. ULR - BLACK

TOLERANCES - UNLESS NOTED
 $2PL \pm .01$ $3PL \pm .005$
 $DIA\text{METER/RADIUS} \pm .003$

Figure 24.1 – FT232HL and FT232HQ Protective Belt

25 VNC1L - A - Reel Vendor Part No. RD33008SW

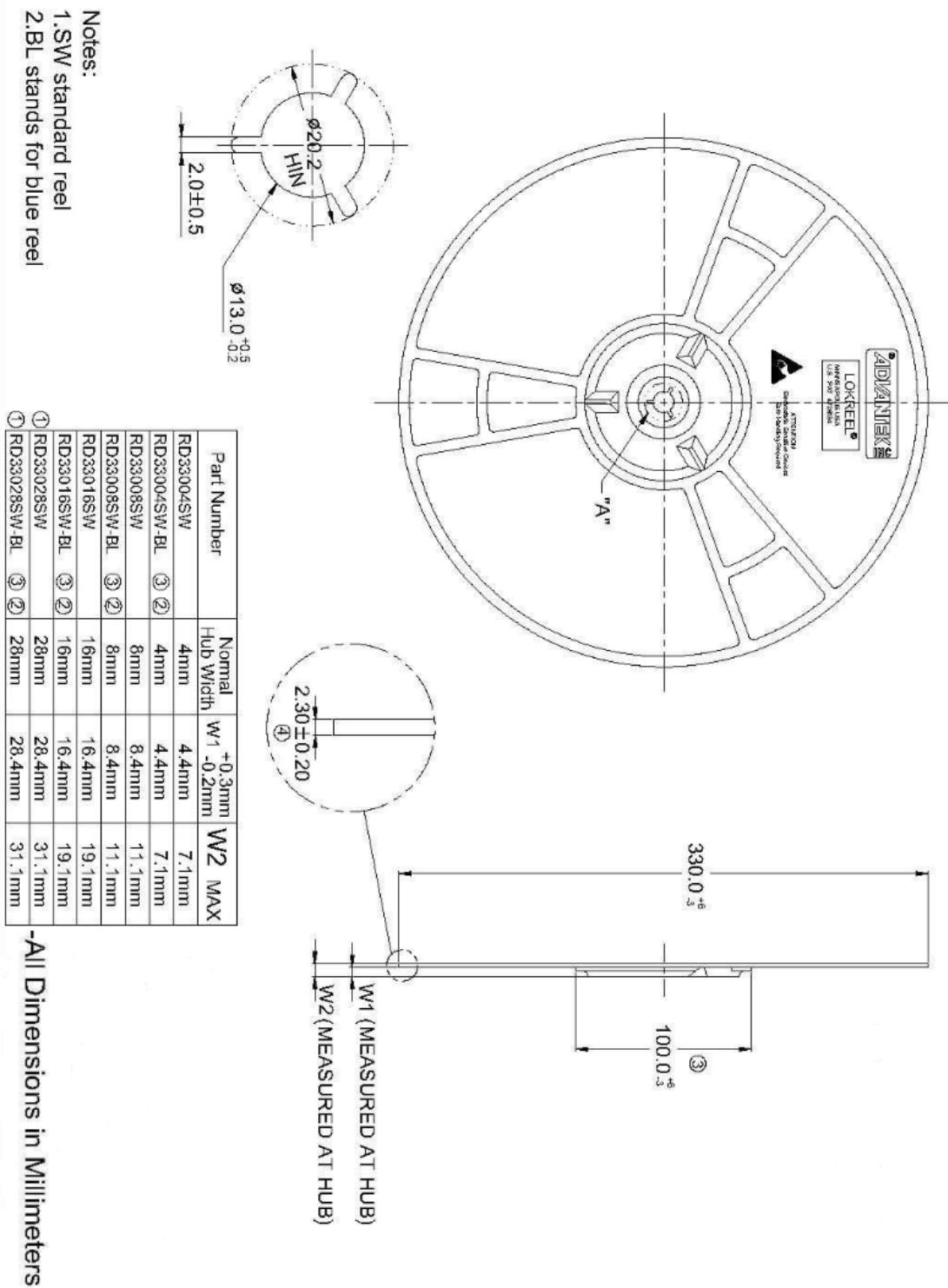


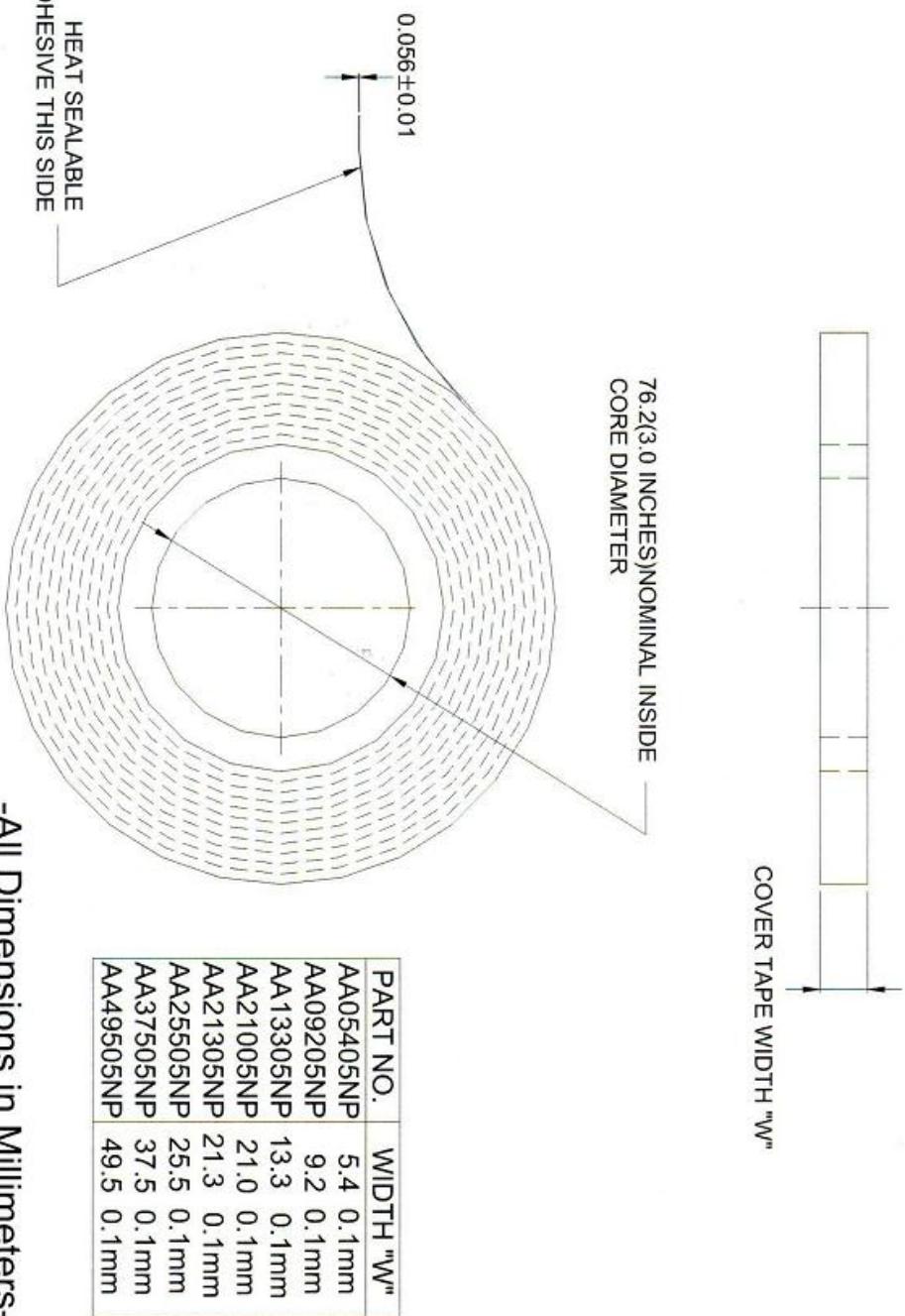
Figure 25.1 – VNC1L – A – Reel Vendor Part No. RD33008SW

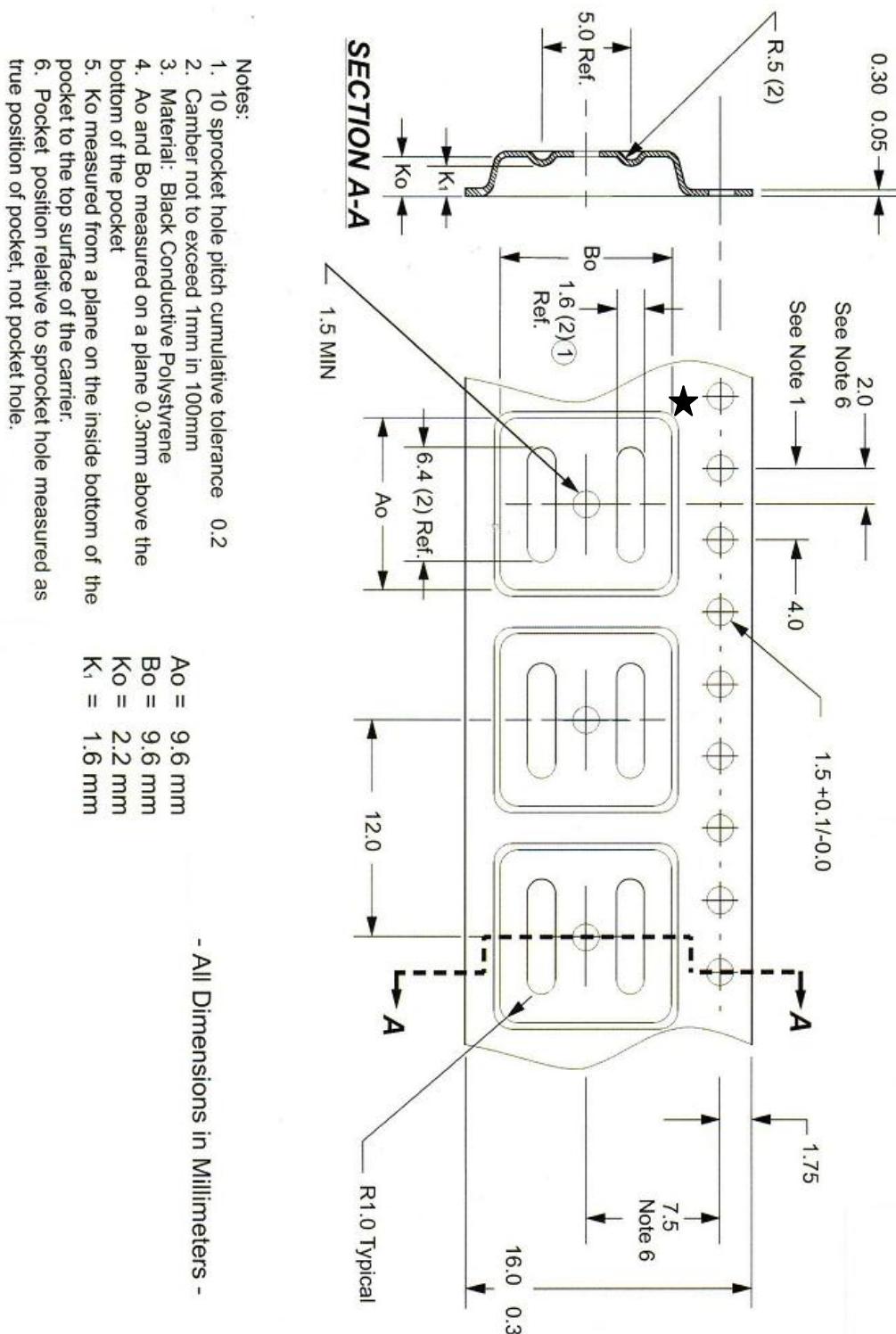
26 VNC1L - A - Cover Tape Vendor Part No. AA13305NP

NOTE:

1. REEL TO CONTAIN 300 METERS OF SPICE FREE MATERIAL.
2. MATERIAL: POLYESTER FILM WITH ANTISTATIC COATING AND ADHESIVE COATING.
3. COLOR: TRANSPARENT,NATURAL.

-All Dimensions in Millimeters-


Figure 26.1 – VNC1L – A – Cover Tape Vendor Part No. AA13305NP

27 VNC1L - A - Carrier Tape Vendor Part No. Q07X07-A

Figure 27.1 – VNC1L – A – Carrier Tape Vendor Part No. Q07X07-A

28 VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48 and QFN-64 , FT311D-LQFP Reel Dimensions

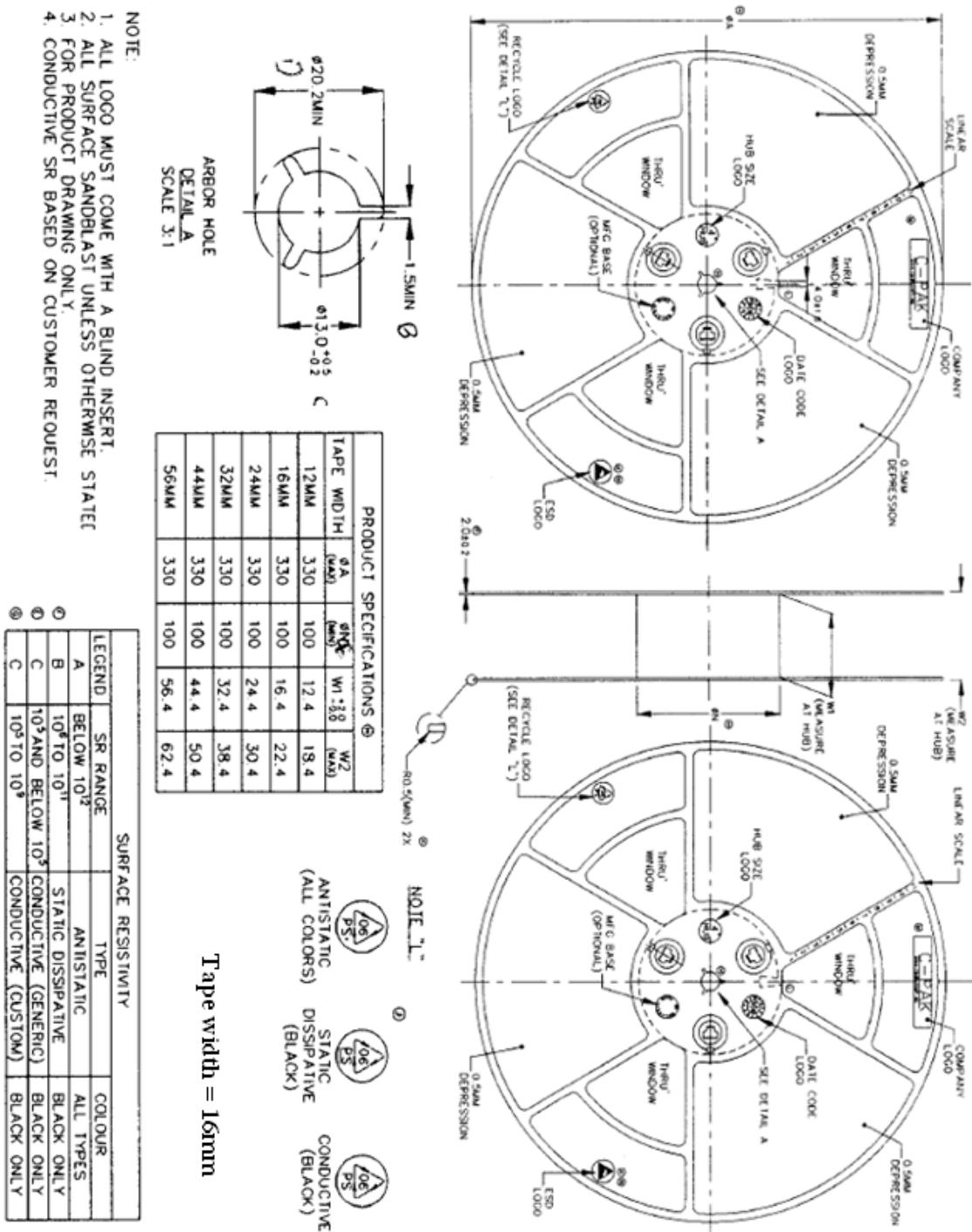


Figure 28.1 – VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48 and QFN-64 , FT311D-LQFP Reel Dimensions

29 VNC2 – LQFP-32 VNC2 – LQFP-48, FT311D – LQFP Cover Tape

Dimensions

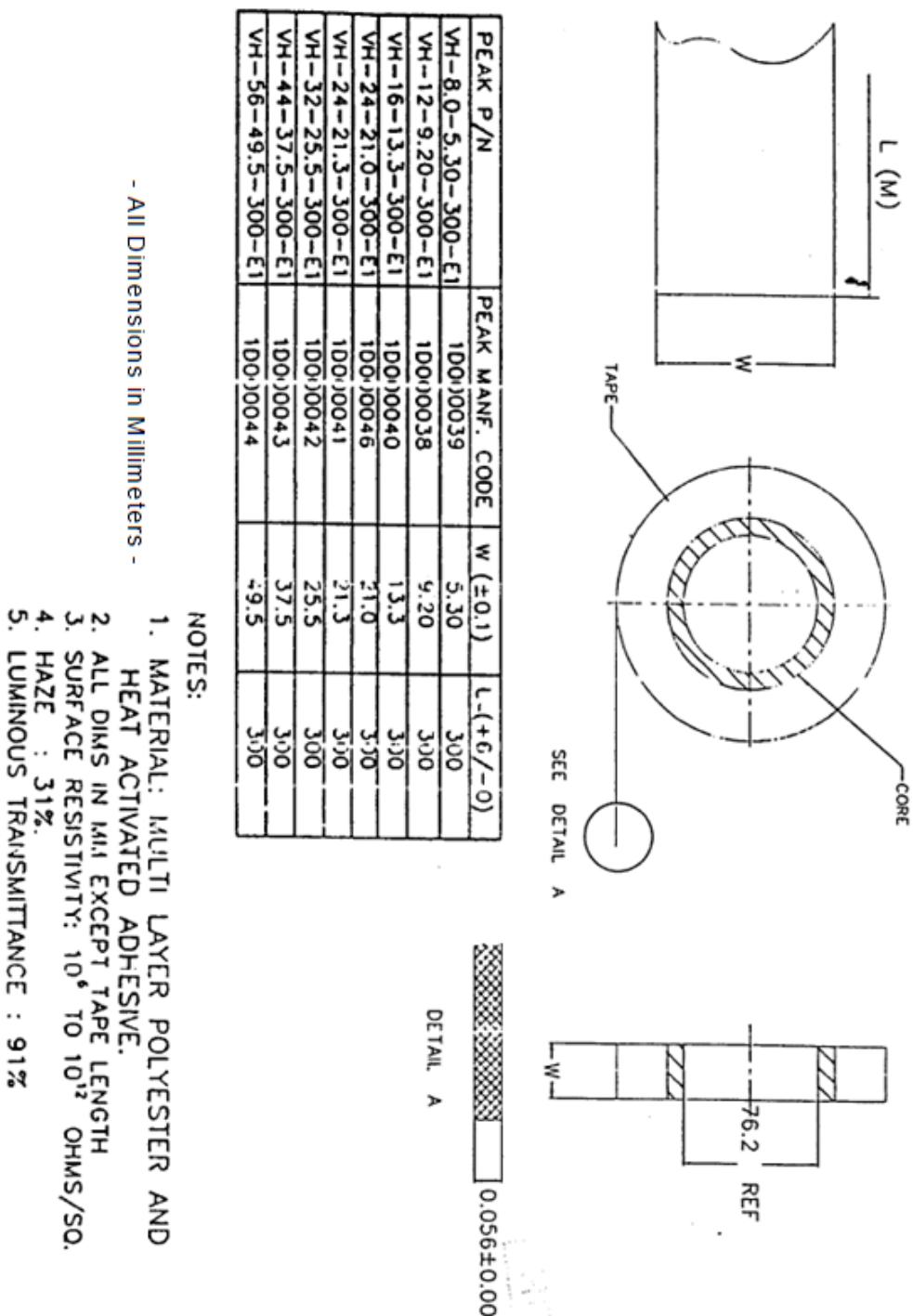


Figure 29.1 VNC2 – LQFP-32 VNC2 – LQFP-48, FT311D – LQFP Cover Tape Dimensions

30 VNC2 –LQFP-64, QFN-32, QFN-48, QFN-64, FT311D-QFN Cover Tape Dimensions

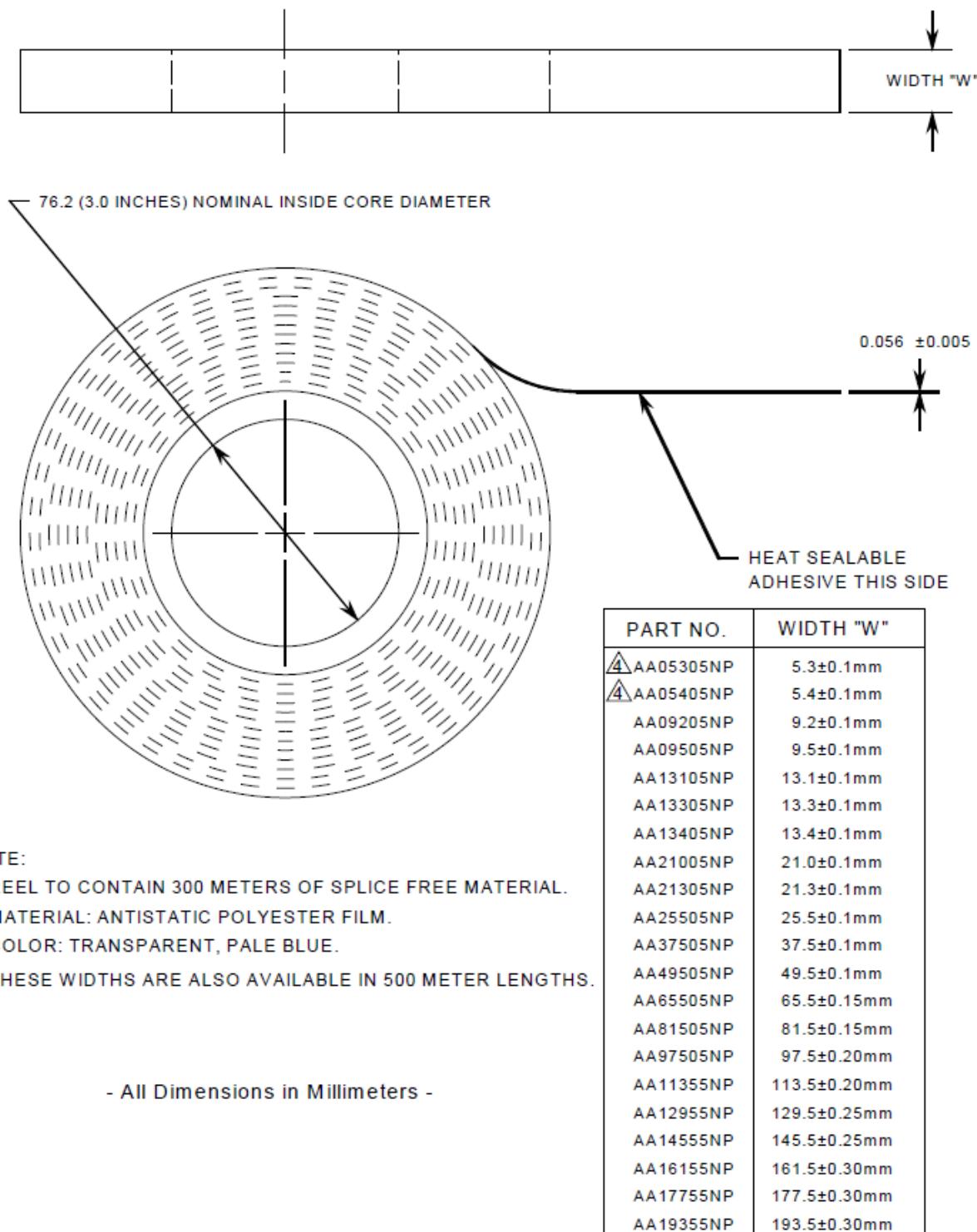


Figure 30.1 VNC2 –LQFP-64, QFN-32, QFN-48, QFN-64, FT311D-QFN Cover Tape Dimensions

31 VNC2 – LQFP-32, VNC2 – LQFP-48, FT311D – LQFP Carrier Tape

Dimensions

- Notes:
1. 10 sprocket hole pitch cumulative tolerance ± 0.2
 2. Camber not to exceed 1mm in 100mm
 3. Material: Black Conductive Advantek Polystyrene
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

★ Pin 1 Identifier

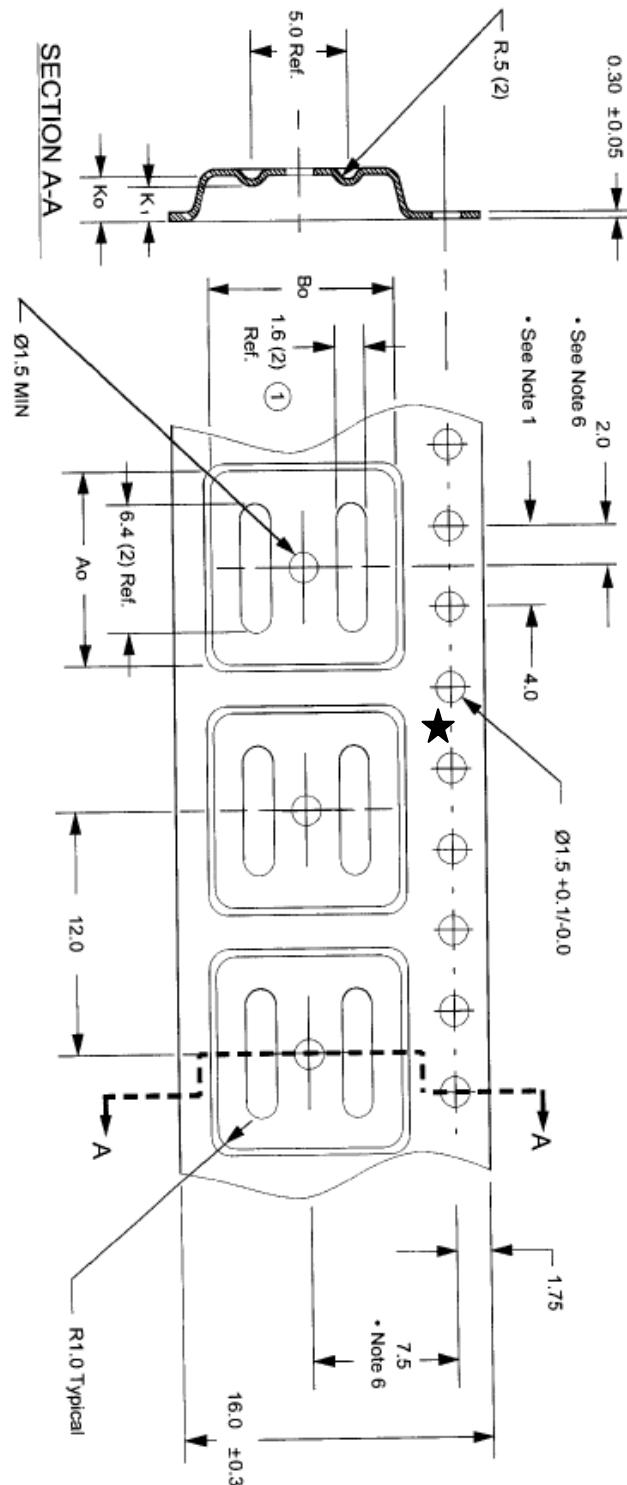


Figure 31.1 VNC2 – LQFP-32, VNC2 – LQFP-48, FT311D – LQFP Carrier Tape Dimensions

32 VNC2 – LQFP-64 Carrier Tape Dimensions

★ Pin 1 Identifier

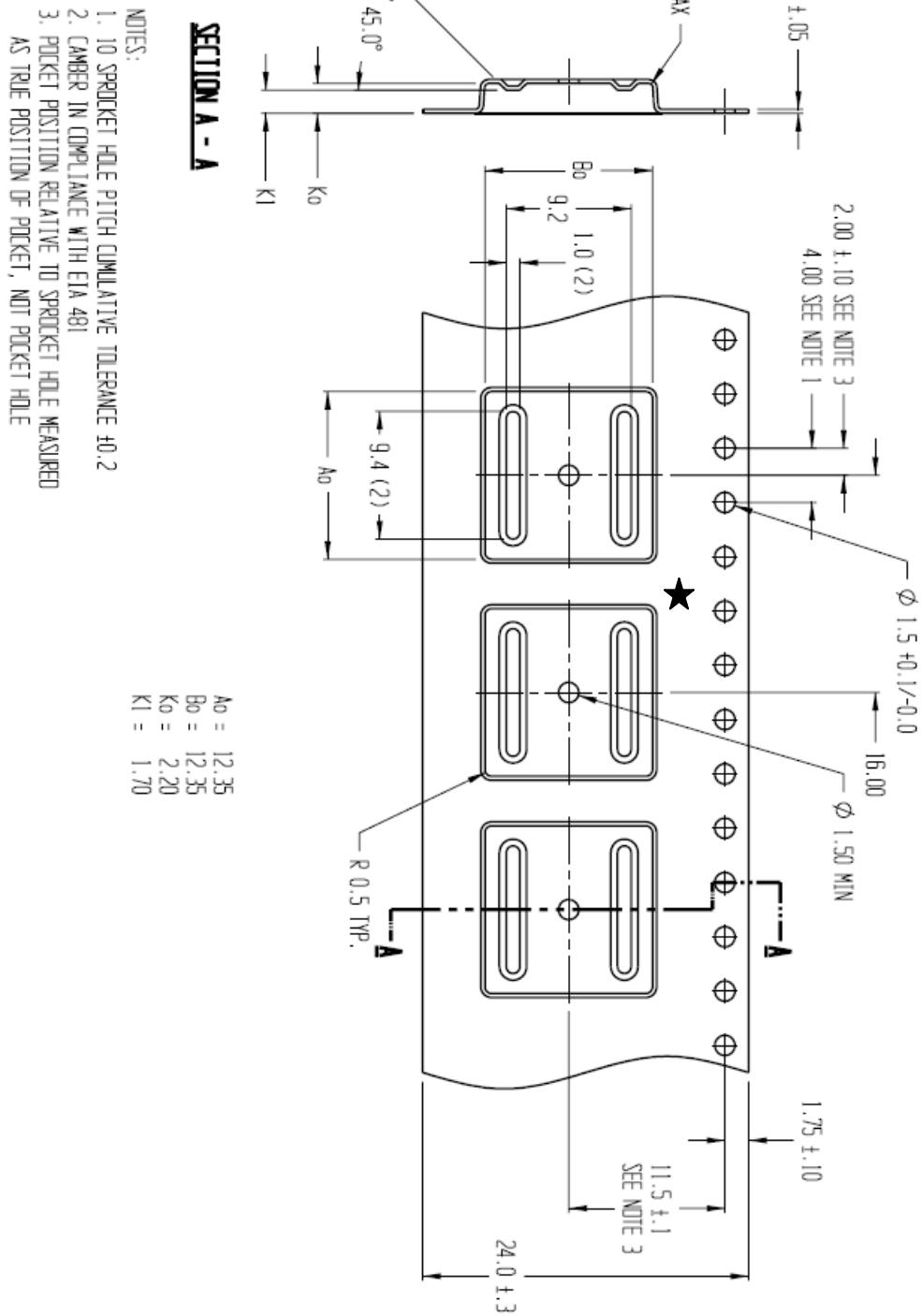


Figure 32.1 VNC2 – LQFP-64 Carrier Tape Dimensions

33 VNC2 – QFN-32, FT311D-QFN Carrier Tape Dimensions

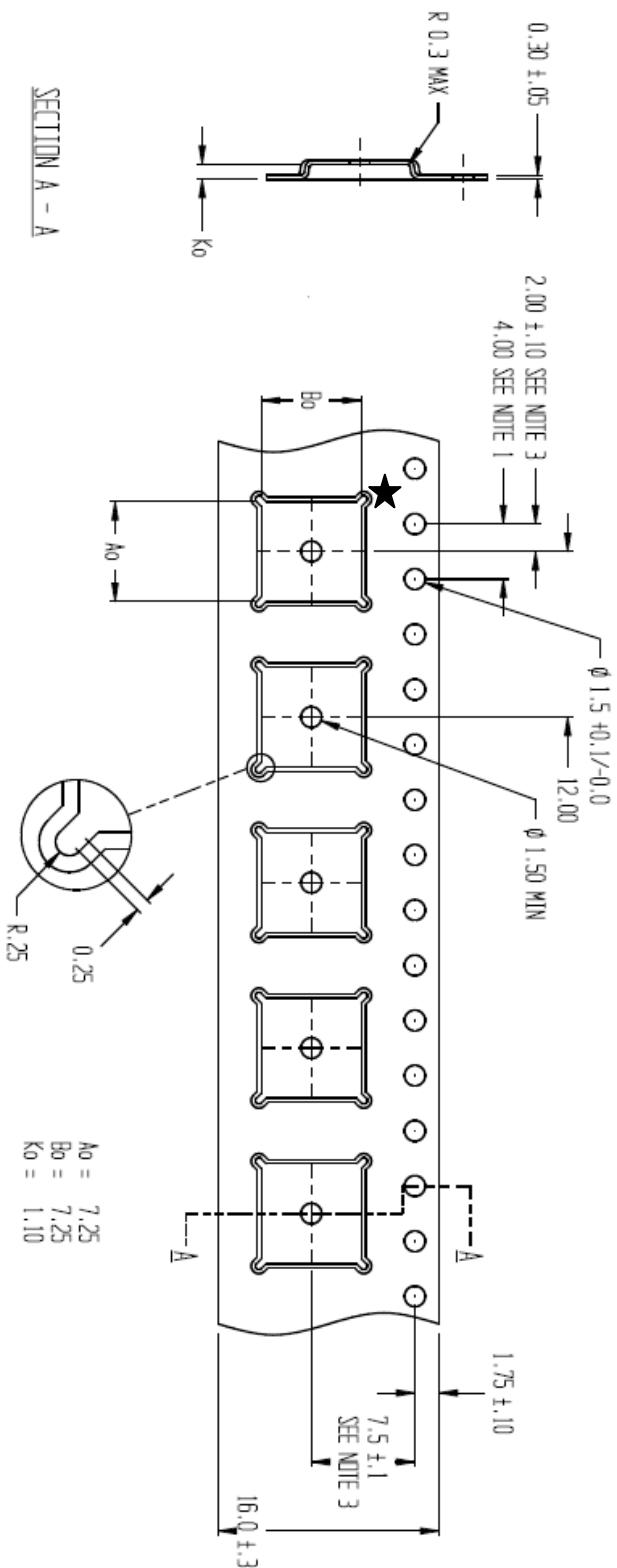


Figure 33.1 VNC2 – QFN-32, FT311D-QFN Carrier Tape Dimensions

34 VNC2 – QFN-48 and QFN-64 Carrier Tape Dimensions

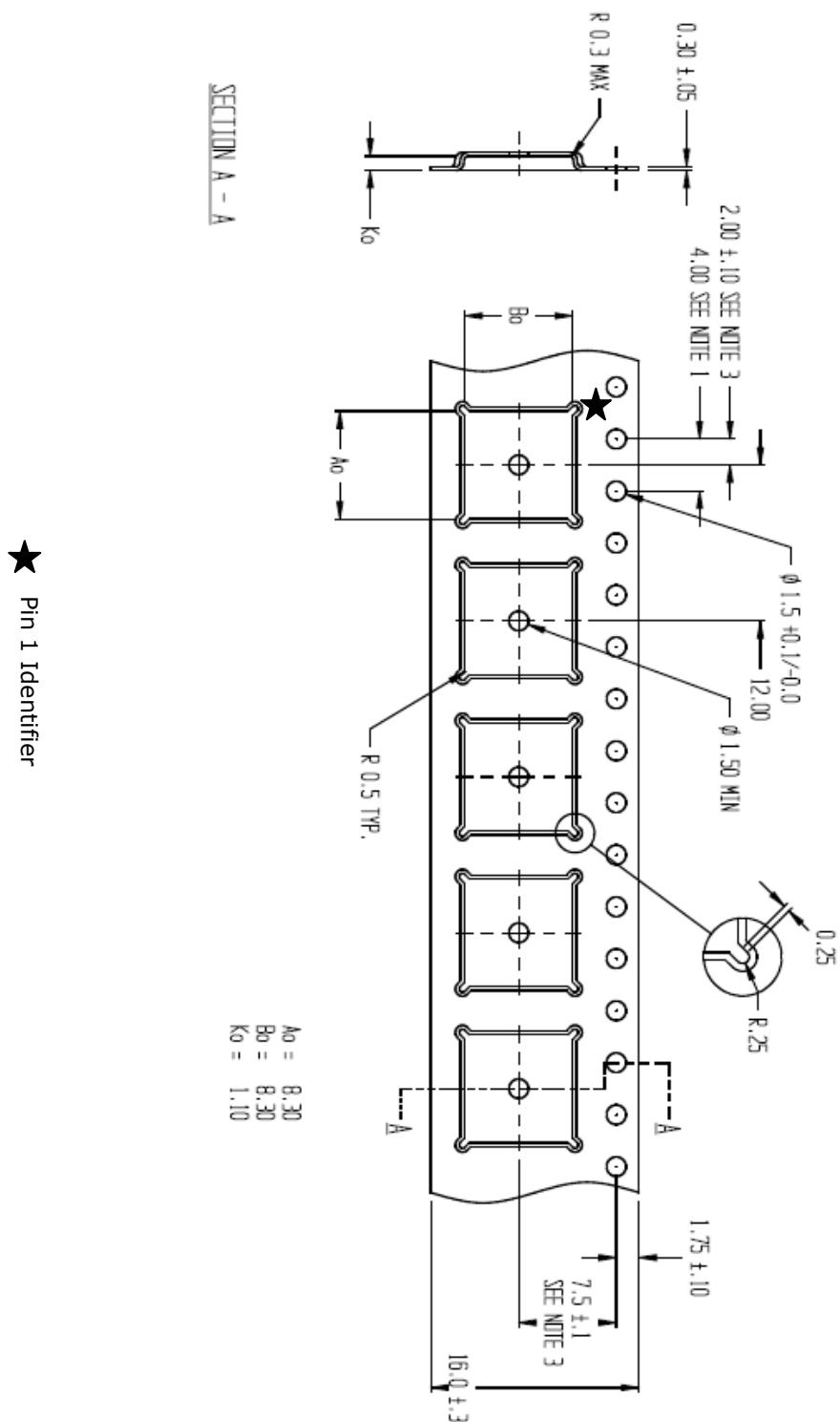


Figure 34.1 VNC2 – QFN-48 and QFN-64 Carrier Tape Dimensions

35 VNC2 – LQFP-32 VNC2 – LQFP-48 and FT311D QFN Tray Dimensions

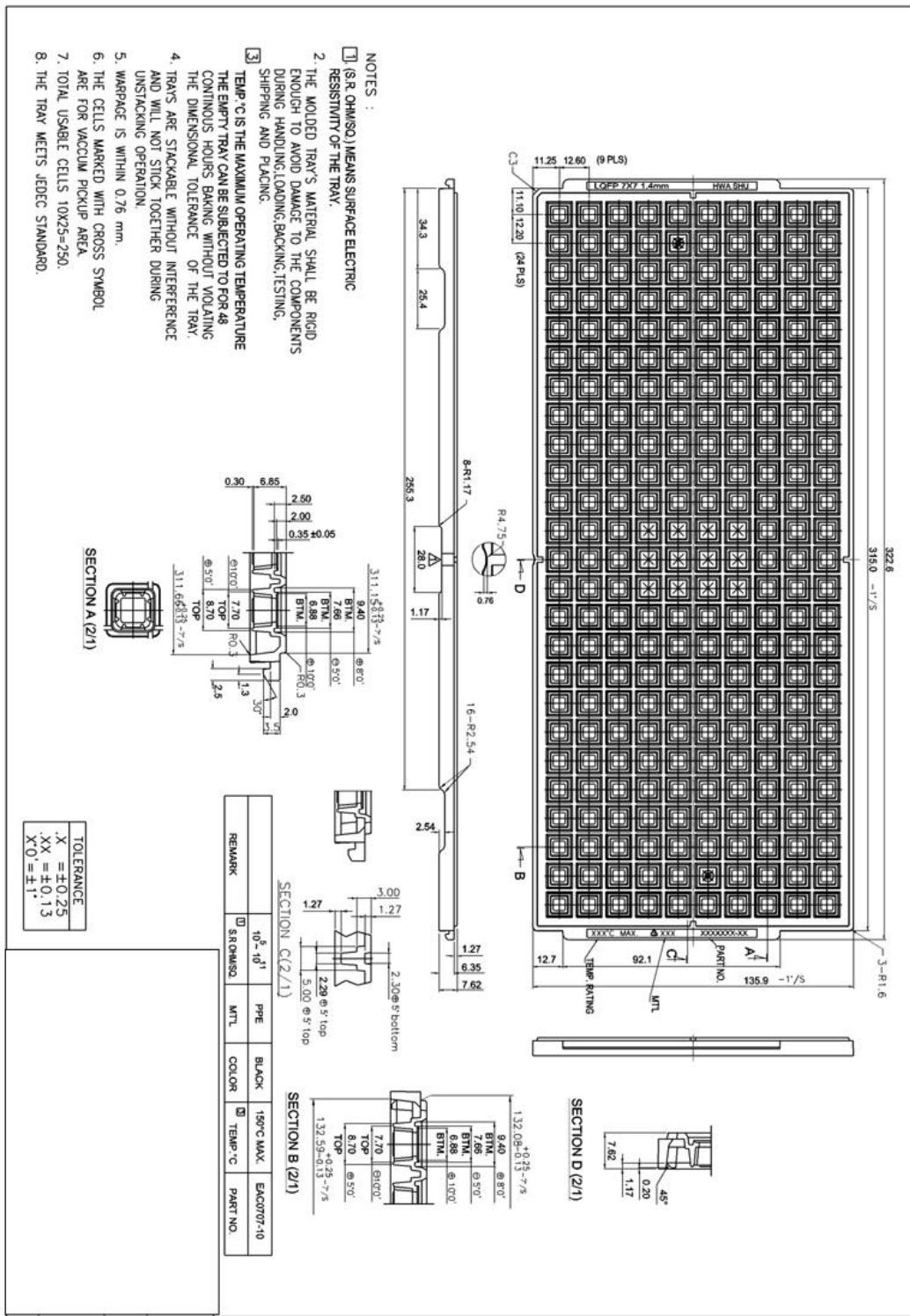
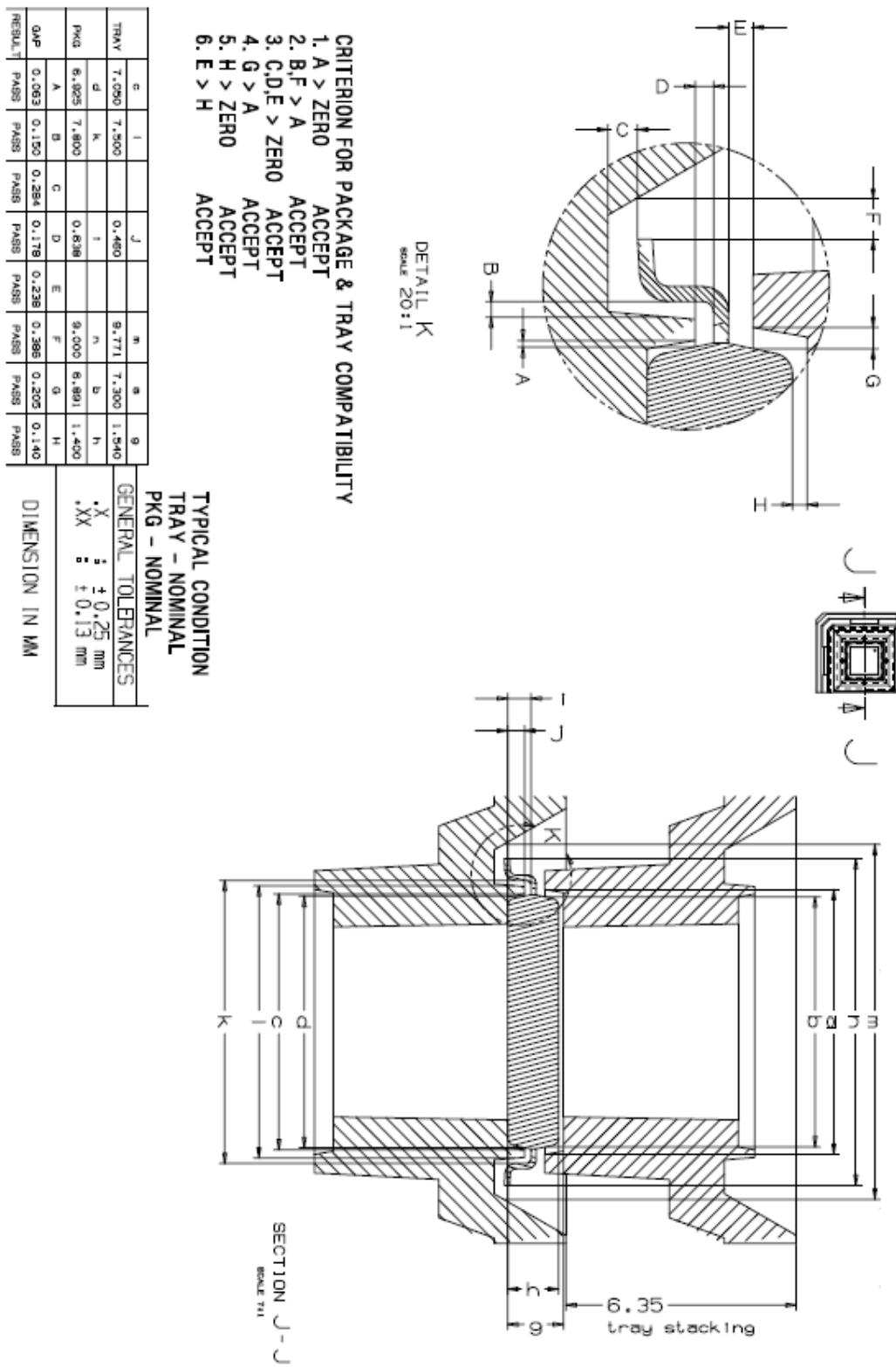
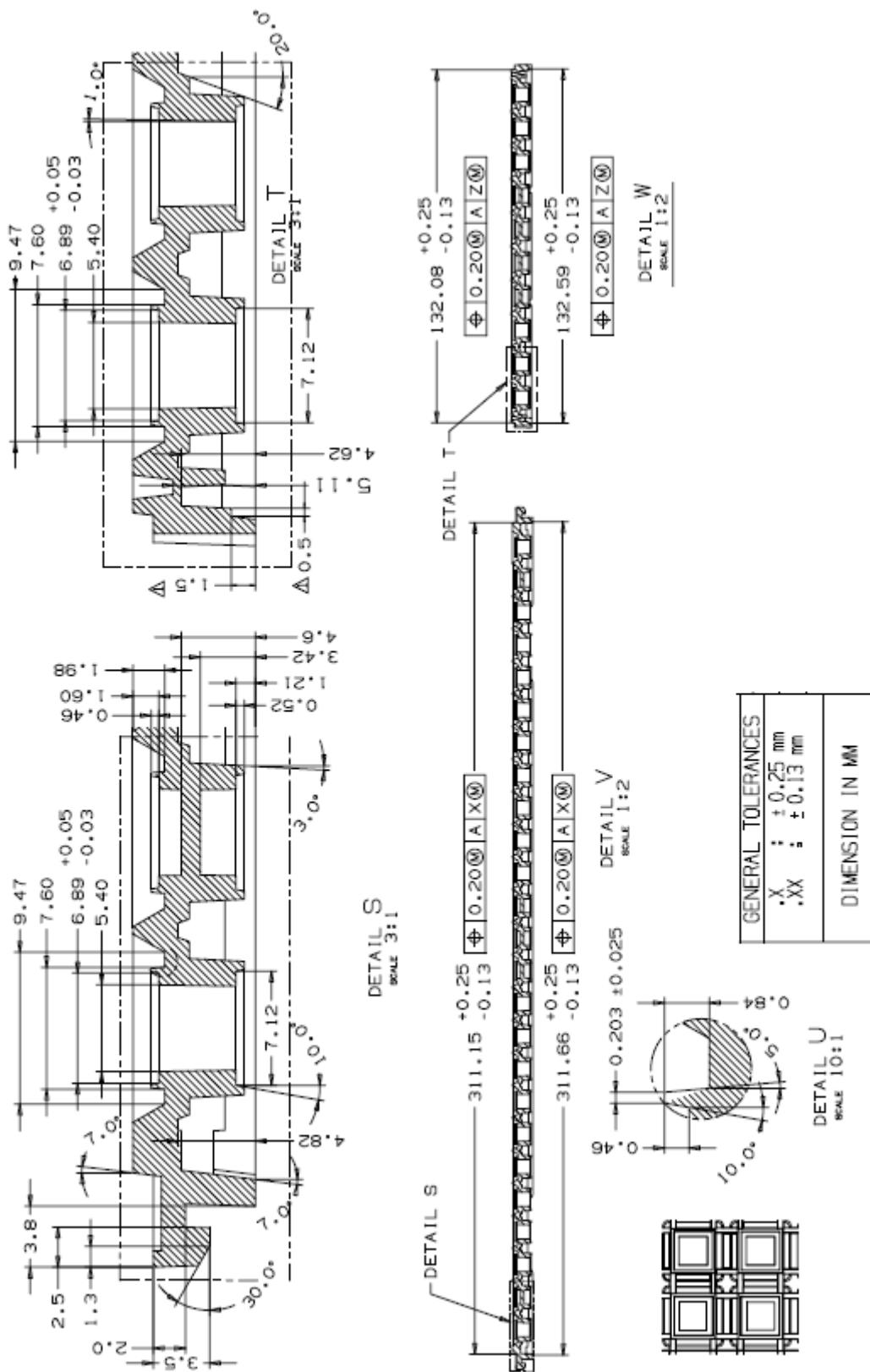


Figure 35.1 VNC2 – LQFP-32 VNC2 – LQFP-48 and FT311D QFN Tray Dimensions

36 VNC2 – LQFP-32, VNC2 – LQFP-48 and FT311D LQFP Tray

Dimensions – Side View

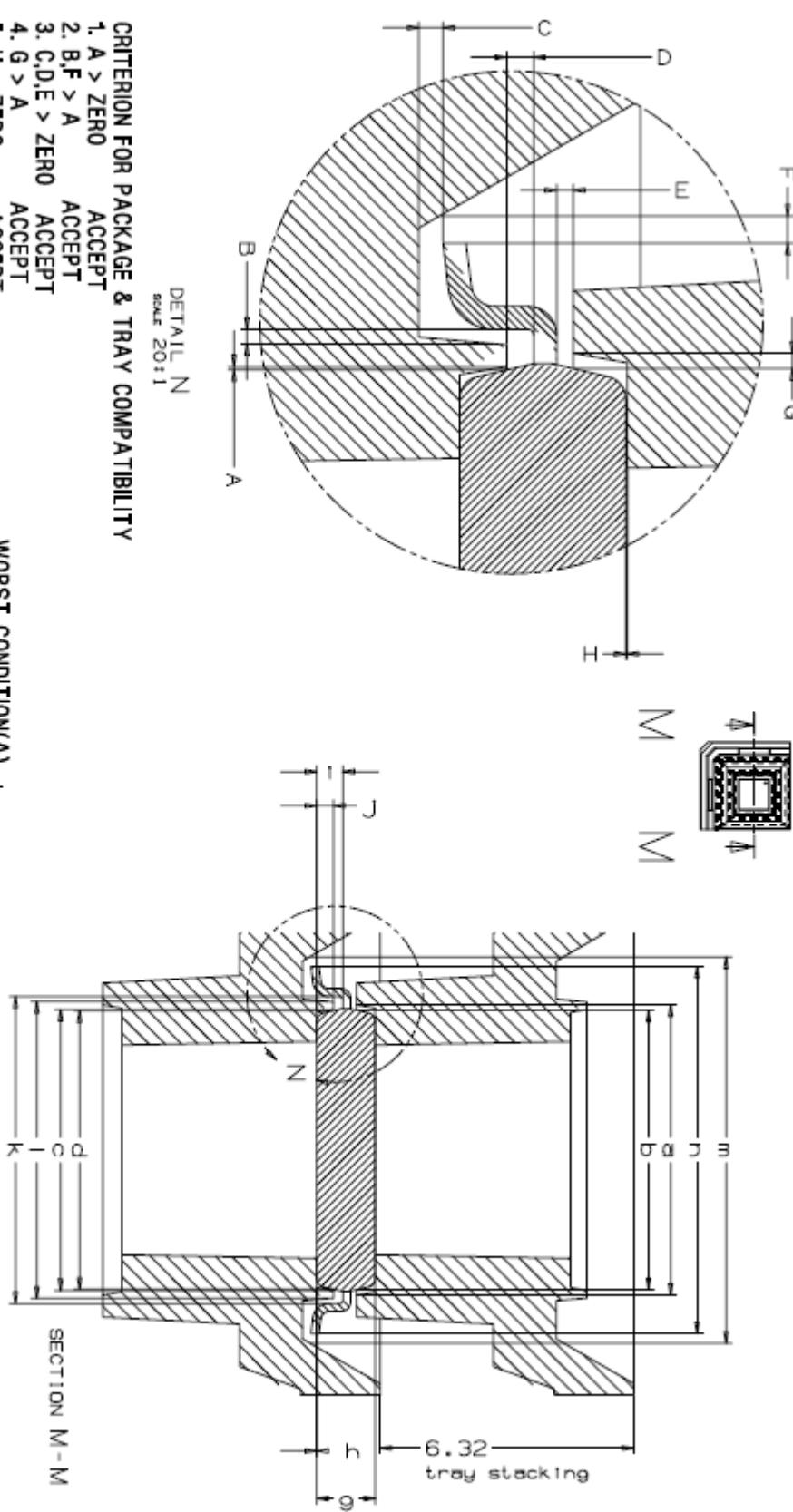




| | c | i | j | m | n | o | g |
|--------|--------|-------|-------|-------|-------|-------|-------|
| TRAY | 7.0002 | 7.398 | 0.410 | 9.628 | 7.222 | 1.460 | |
| d | | | i | | n | b | |
| k | | | | | | h | |
| PKG | 6.941 | 7.650 | 0.645 | 9.150 | 8.085 | 1.450 | |
| A | B | C | D | E | F | G | H |
| GAP | 0.030 | 0.126 | 0.235 | 0.145 | 0.239 | 0.136 | 0.010 |
| RESULT | PASS | PASS | PASS | PASS | PASS | PASS | PASS |

- CRITERION FOR PACKAGE & TRAY COMPATIBILITY**
1. A > ZERO ACCEPT
 2. B,F > A ACCEPT
 3. C,D,E > ZERO ACCEPT
 4. G > A ACCEPT
 5. H > ZERO ACCEPT
 6. E > H ACCEPT

**WORST CONDITION(A)
TRAY - MINIMUM
PKG - MAXIMUM**



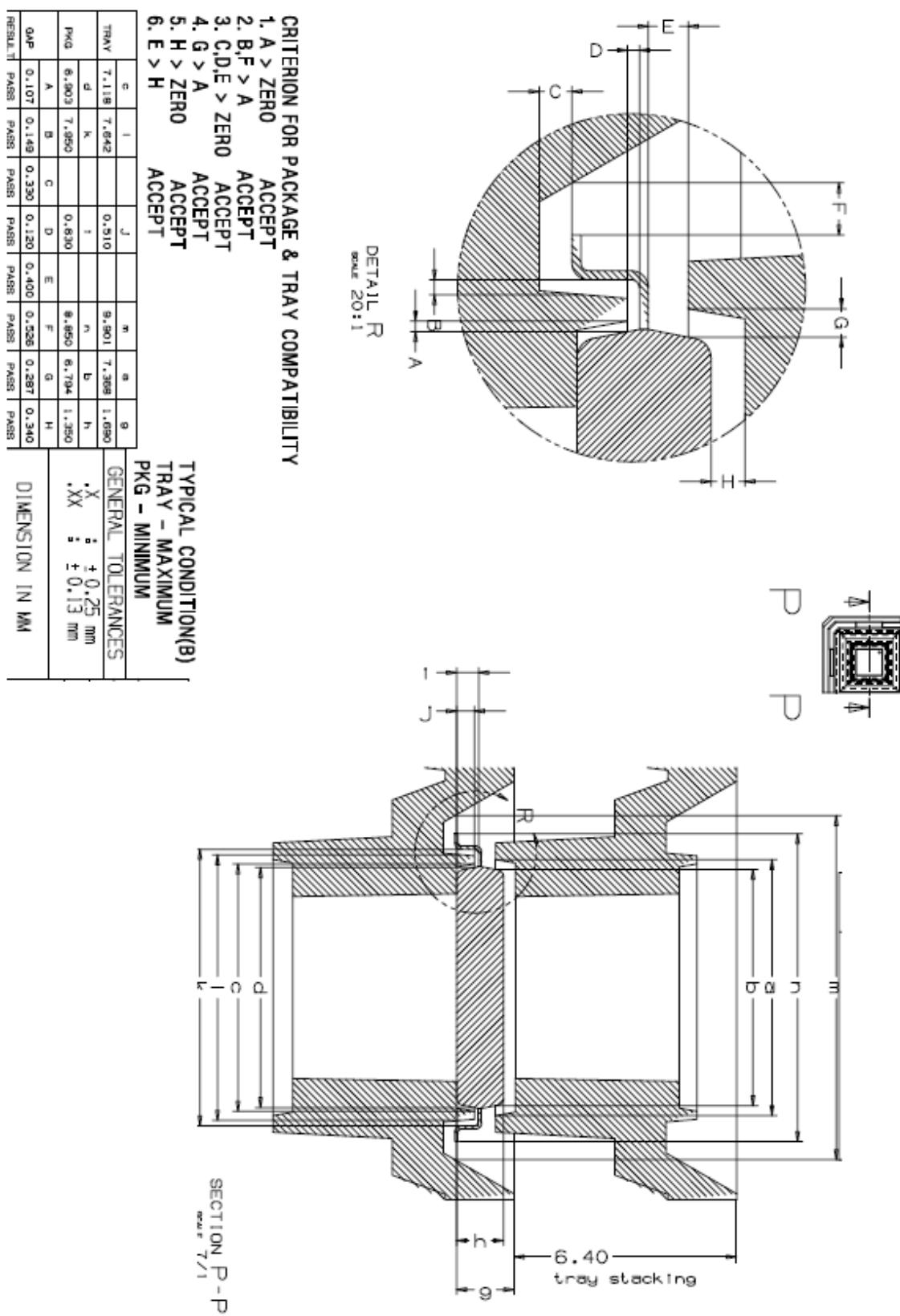


Figure 36.1 VNC2 – LQFP-32, VNC2 – LQFP-48 and FT311D LQFP Tray Dimensions – Side View

37 VNC2 – LQFP-64 Tray Dimensions

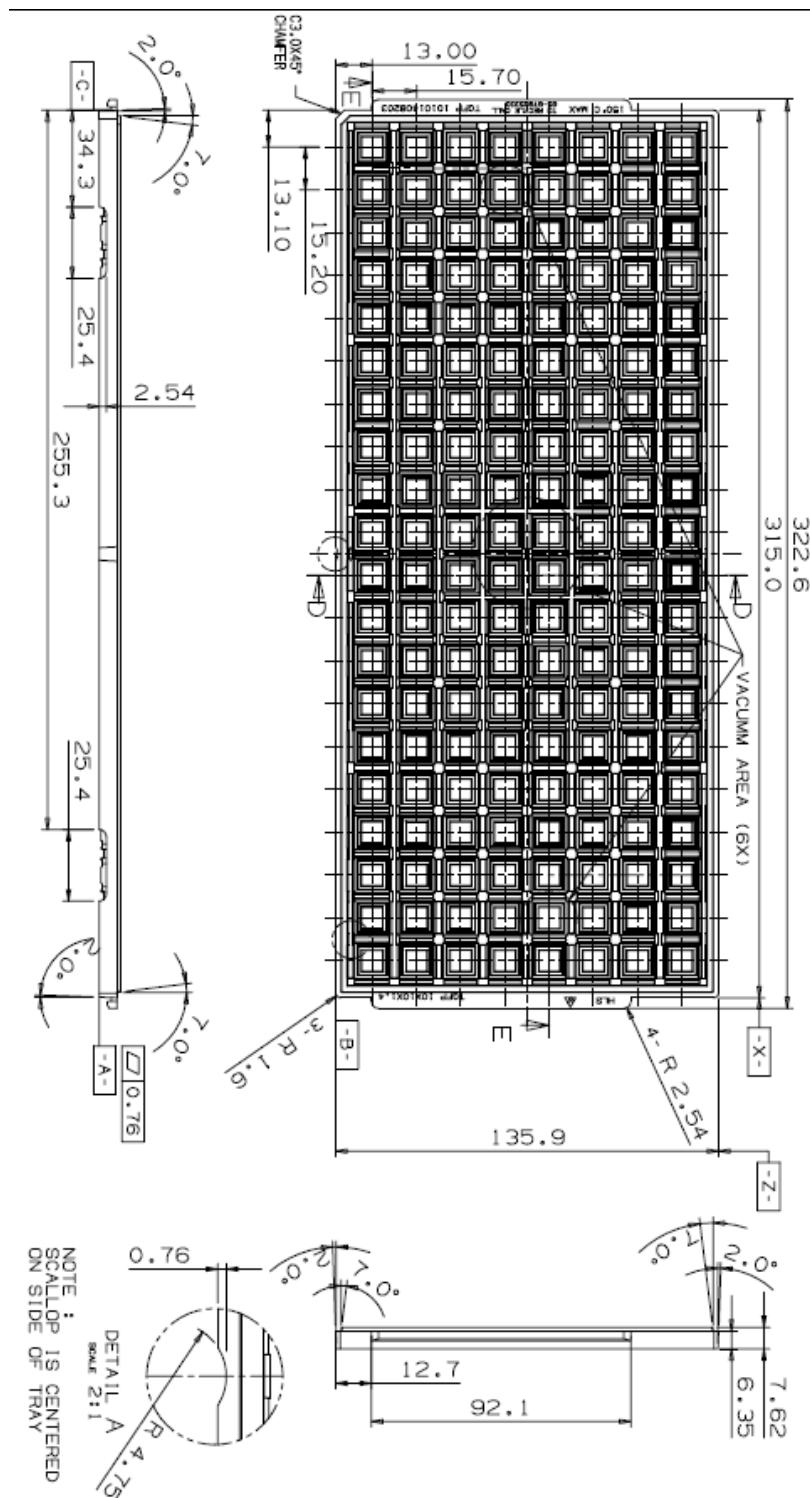
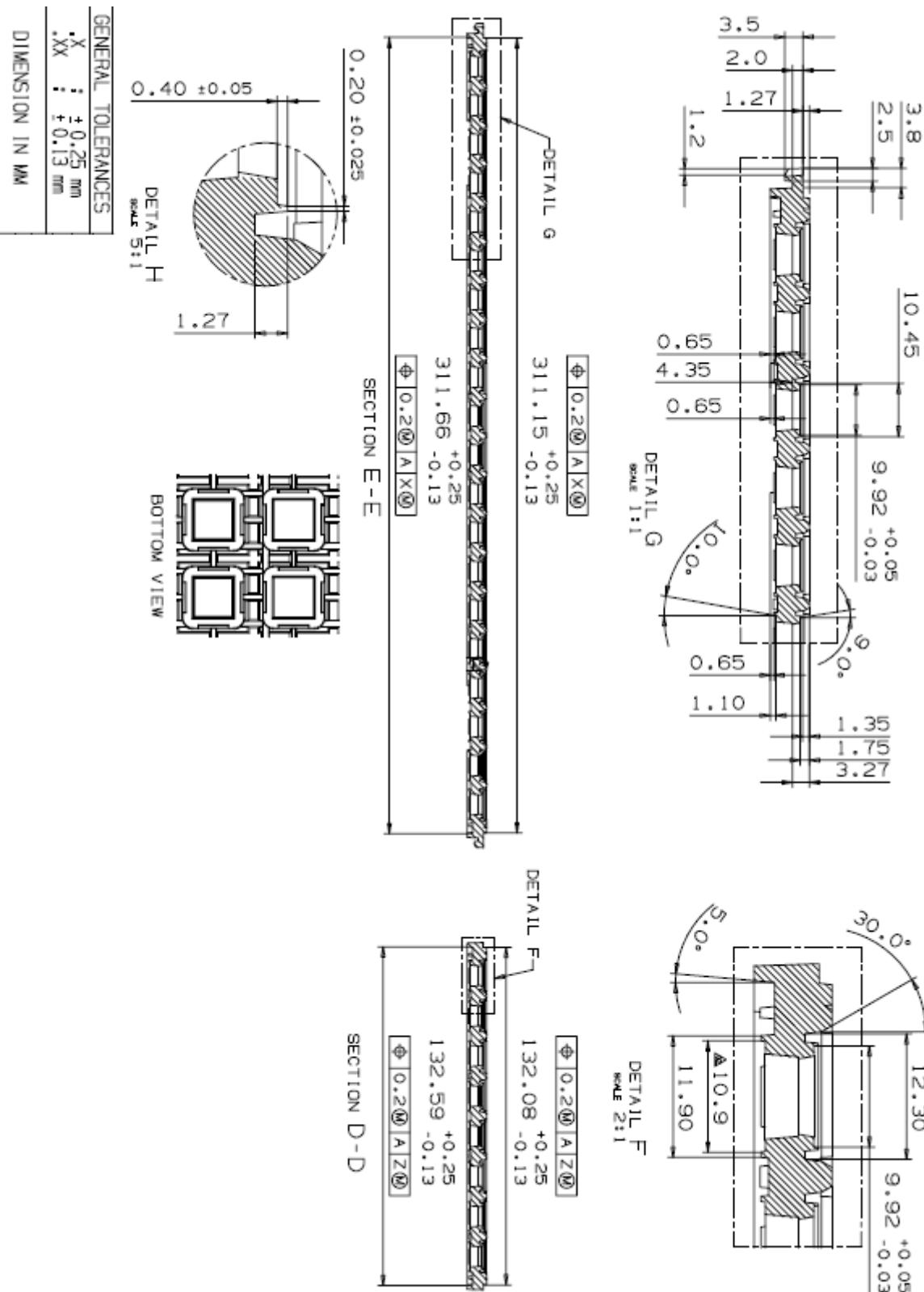
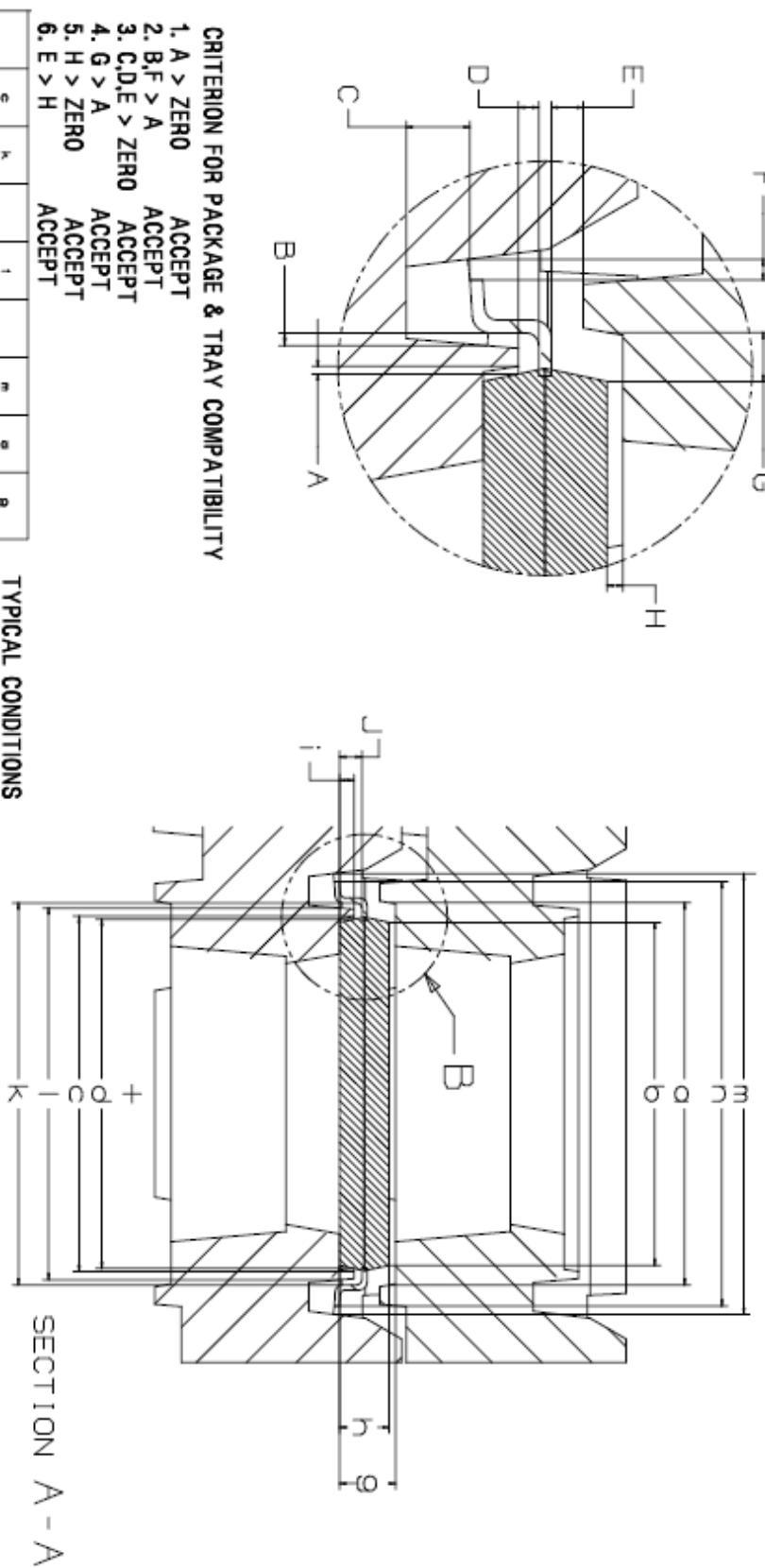


Figure 37.1 VNC2 – LQFP-64 Tray Dimensions

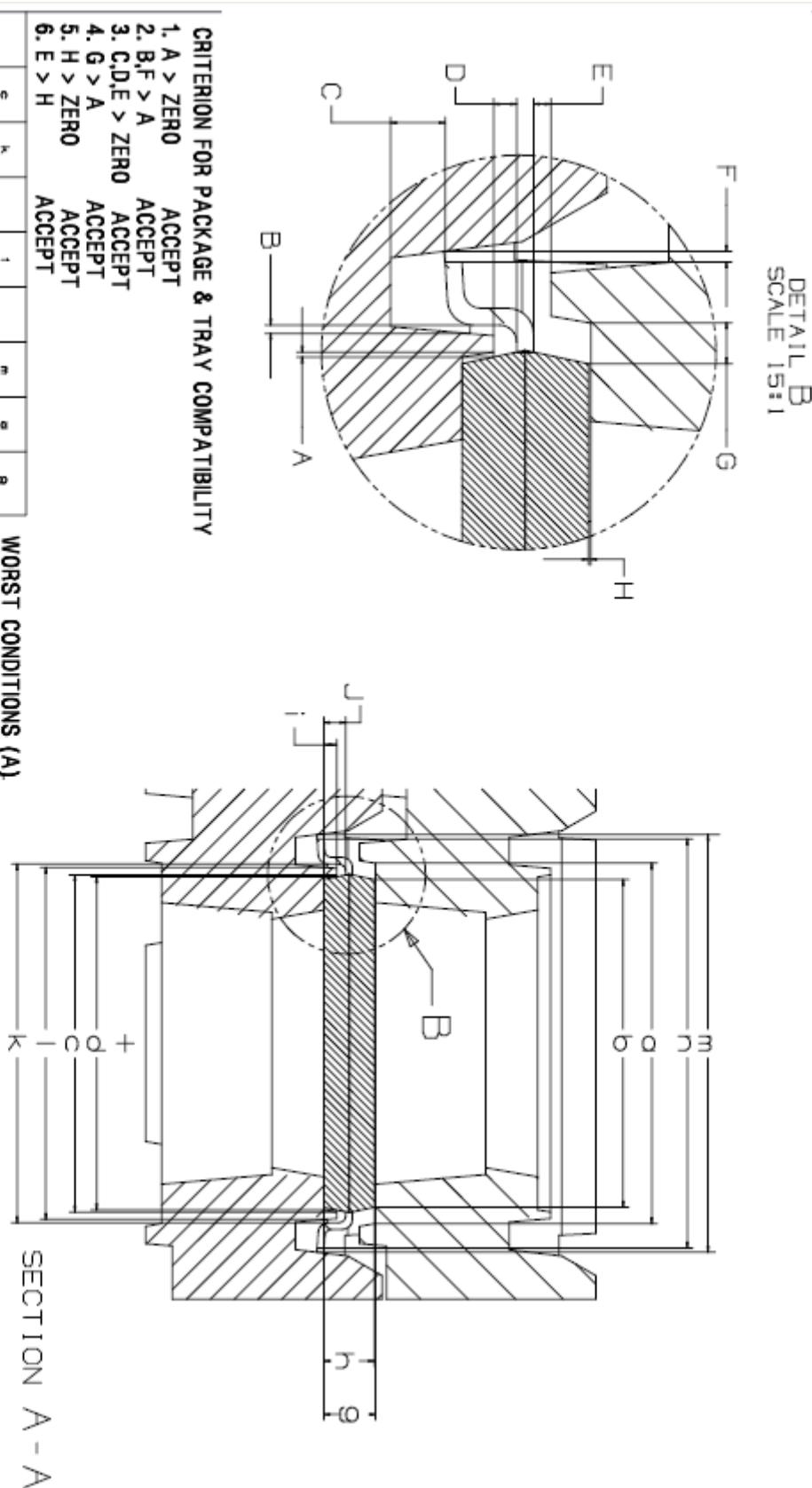
38 VNC2 – LQFP-64 Tray Dimensions – Side View

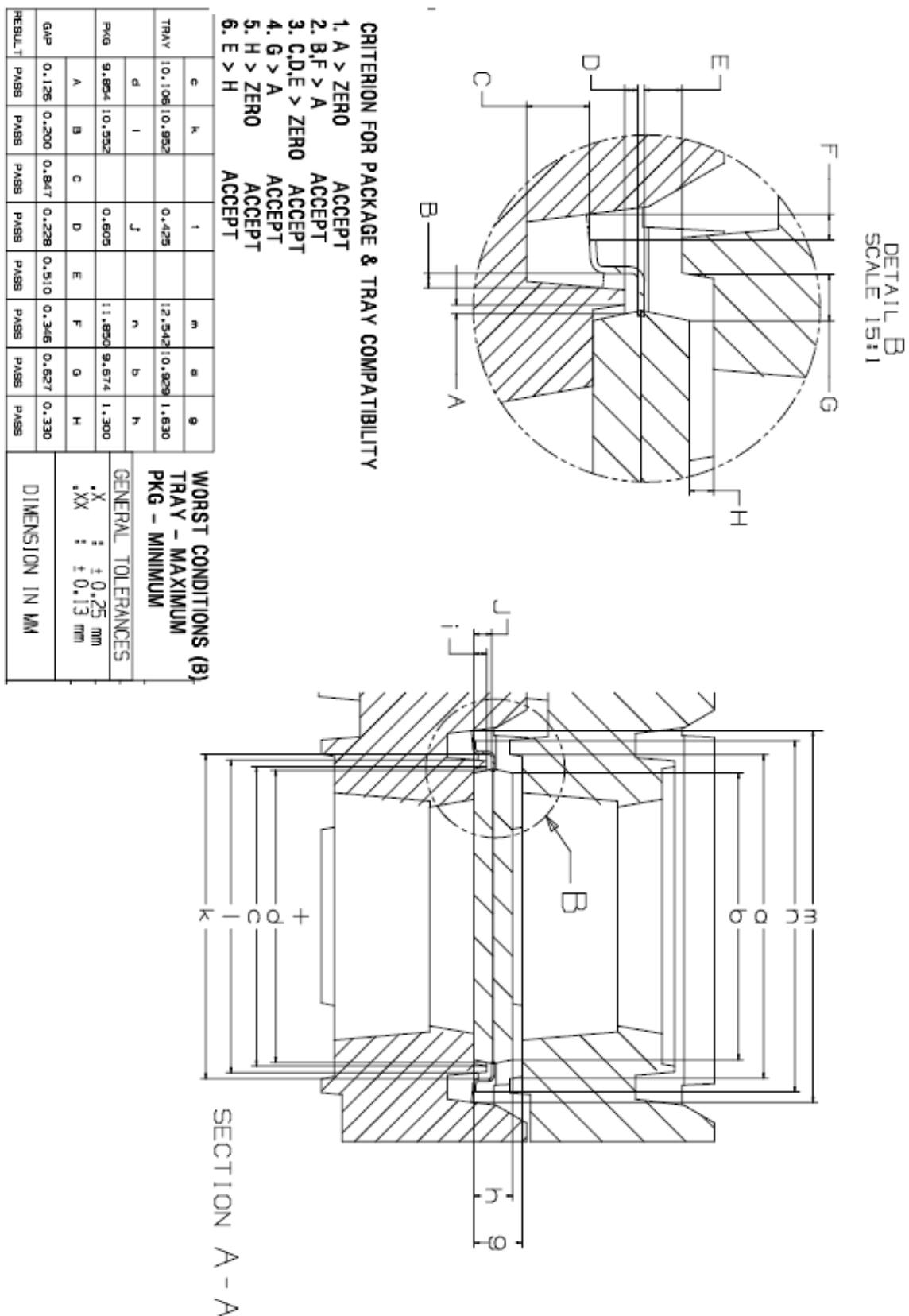


| CRITERION FOR PACKAGE & TRAY COMPATIBILITY | | | | | | |
|--------------------------------------------|--------------|--------|--|--|--|--|
| 1. | A > ZERO | ACCEPT | | | | |
| 2. | B,F > A | ACCEPT | | | | |
| 3. | C,D,E > ZERO | ACCEPT | | | | |
| 4. | G > A | ACCEPT | | | | |
| 5. | H > ZERO | ACCEPT | | | | |
| 6. | E > H | ACCEPT | | | | |



| CRITERION FOR PACKAGE & TRAY COMPATIBILITY | | | | | | | |
|--------------------------------------------|--------------|--------|--|--|--|--|--|
| 1. | A > ZERO | ACCEPT | | | | | |
| 2. | B/F > A | ACCEPT | | | | | |
| 3. | C/D/E > ZERO | ACCEPT | | | | | |
| 4. | G > A | ACCEPT | | | | | |
| 5. | H > ZERO | ACCEPT | | | | | |
| 6. | E > H | ACCEPT | | | | | |




Figure 38.1 VNC2 – LQFP-64 Tray Dimensions – Side View

39 VNC2 – QFN-32 and FT311D QFN Tray Dimensions

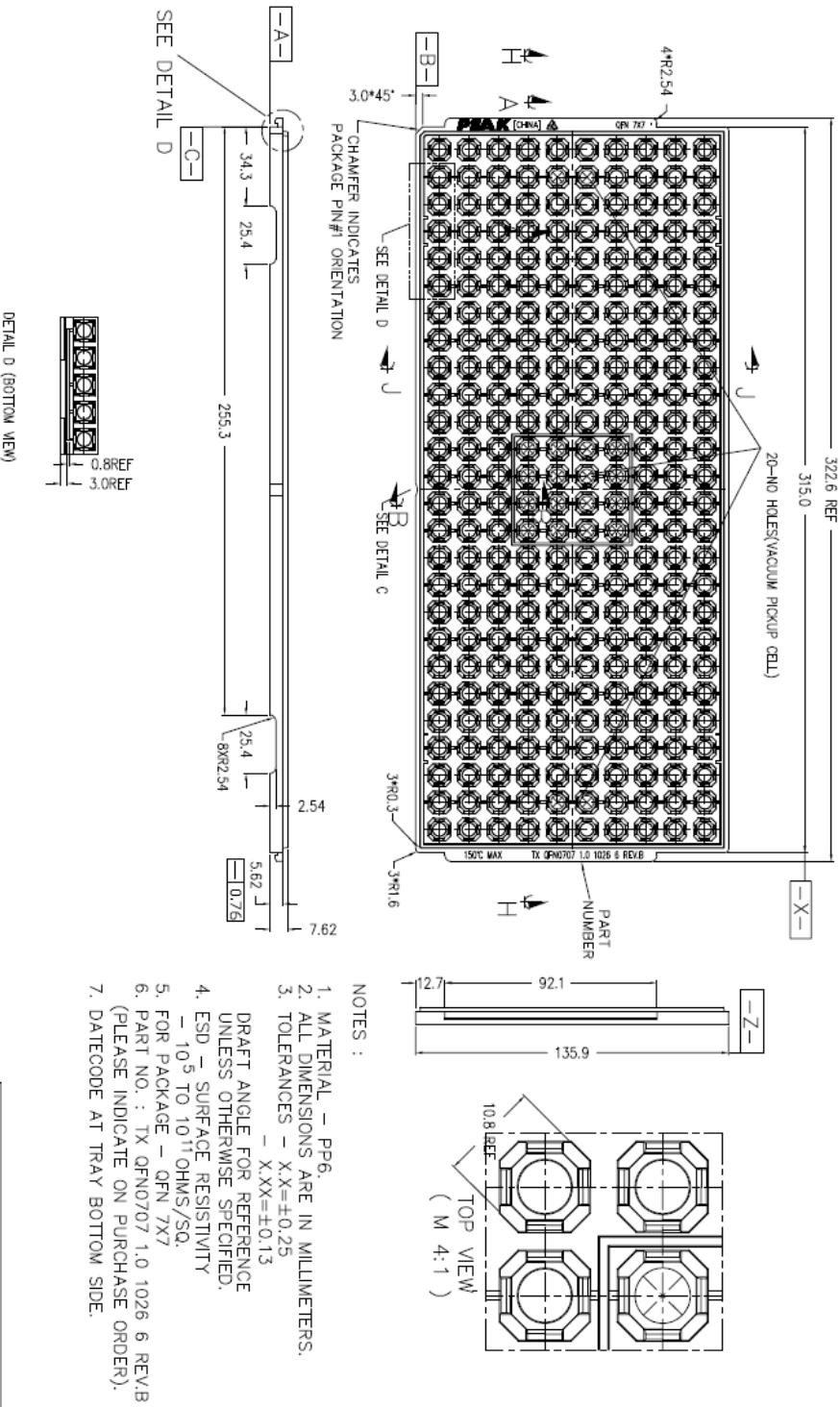


Figure 39.1 VNC2 – QFN-32 and FT311D QFN Tray Dimensions

40 VNC2 – QFN-48 and QFN-64 Tray Dimensions

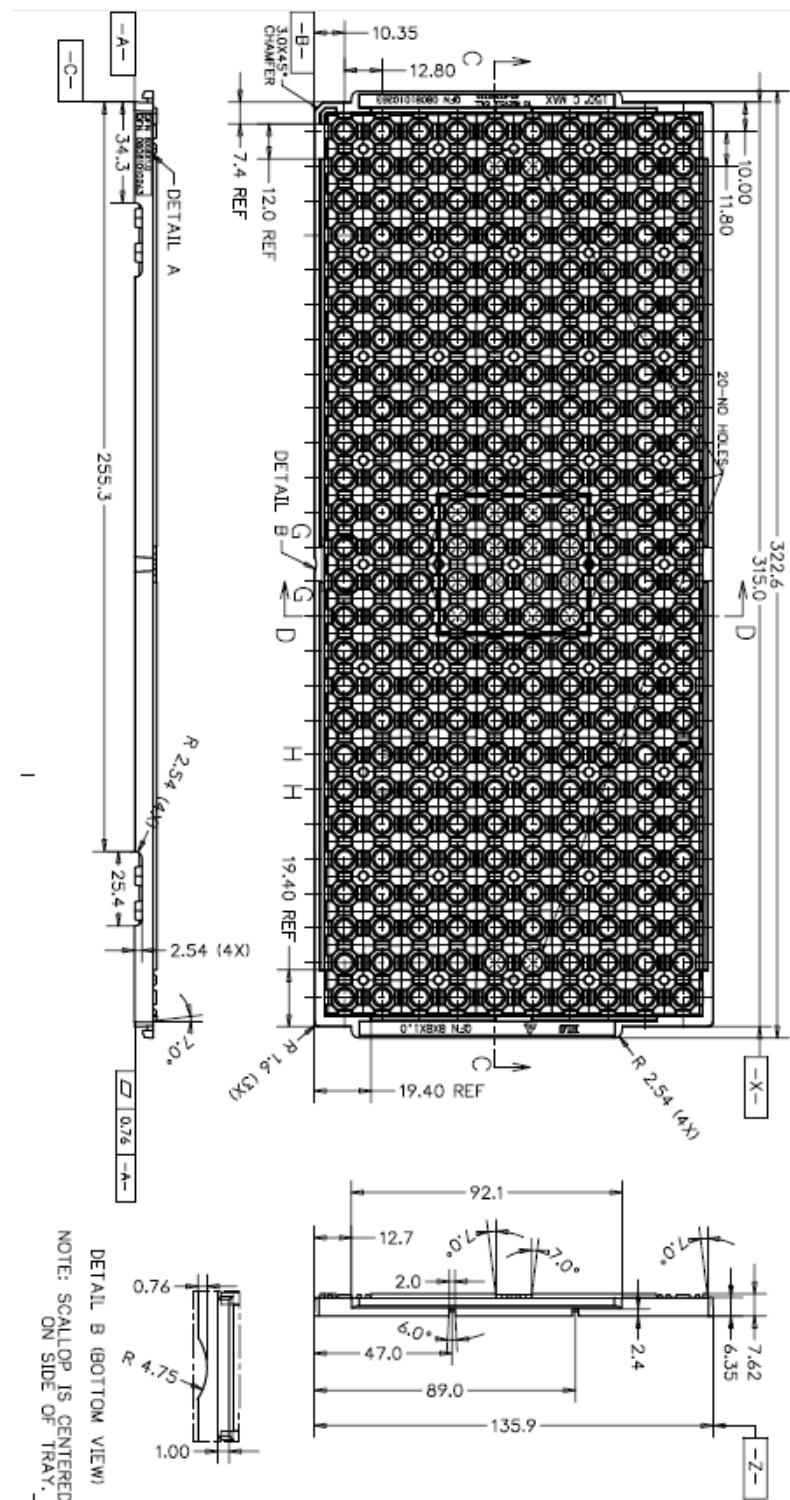


Figure 40.1 VNC2 - QFN-48 and QFN-64 Tray Dimensions

41 VNC2 – QFN-48 and QFN-64 Tray Dimensions – Side View

DETAIL B
SCALE 15:1

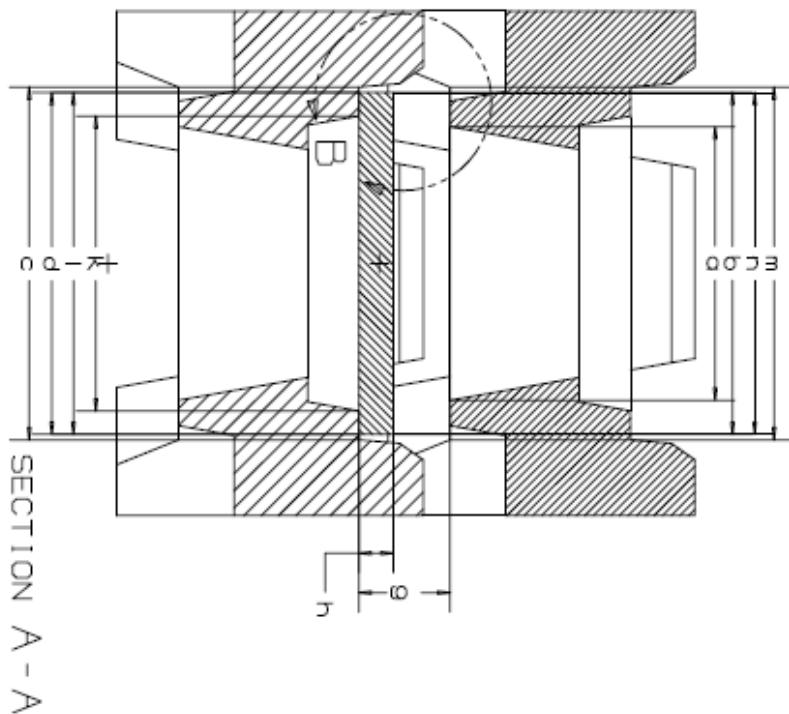
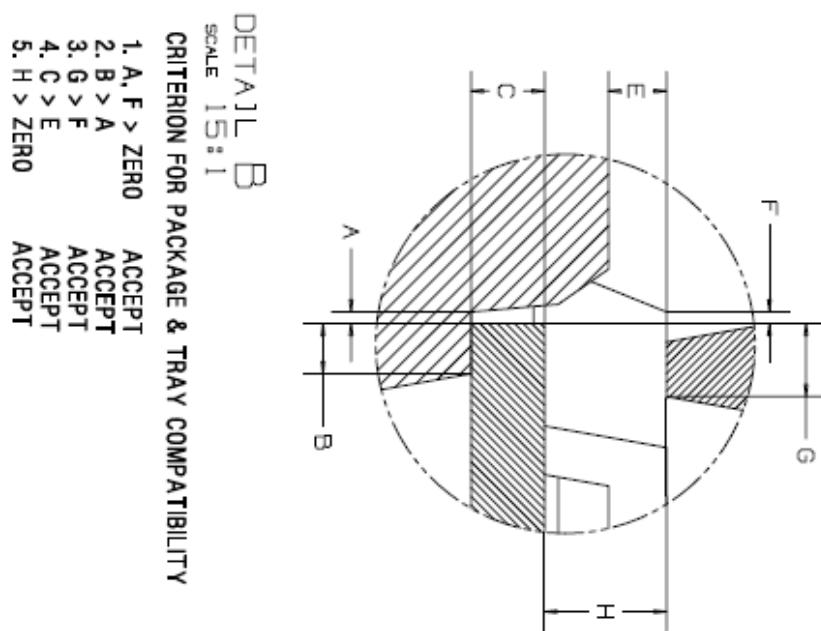
| CRITERION FOR PACKAGE & TRAY COMPATIBILITY | | | | | | | |
|--------------------------------------------|--------|---|--|--|--|--|--|
| 1. A, F > ZERO | ACCEPT | A | | | | | |
| 2. B > A | ACCEPT | B | | | | | |
| 3. G > F | ACCEPT | C | | | | | |
| 4. C > E | ACCEPT | E | | | | | |
| 5. H > ZERO | ACCEPT | F | | | | | |

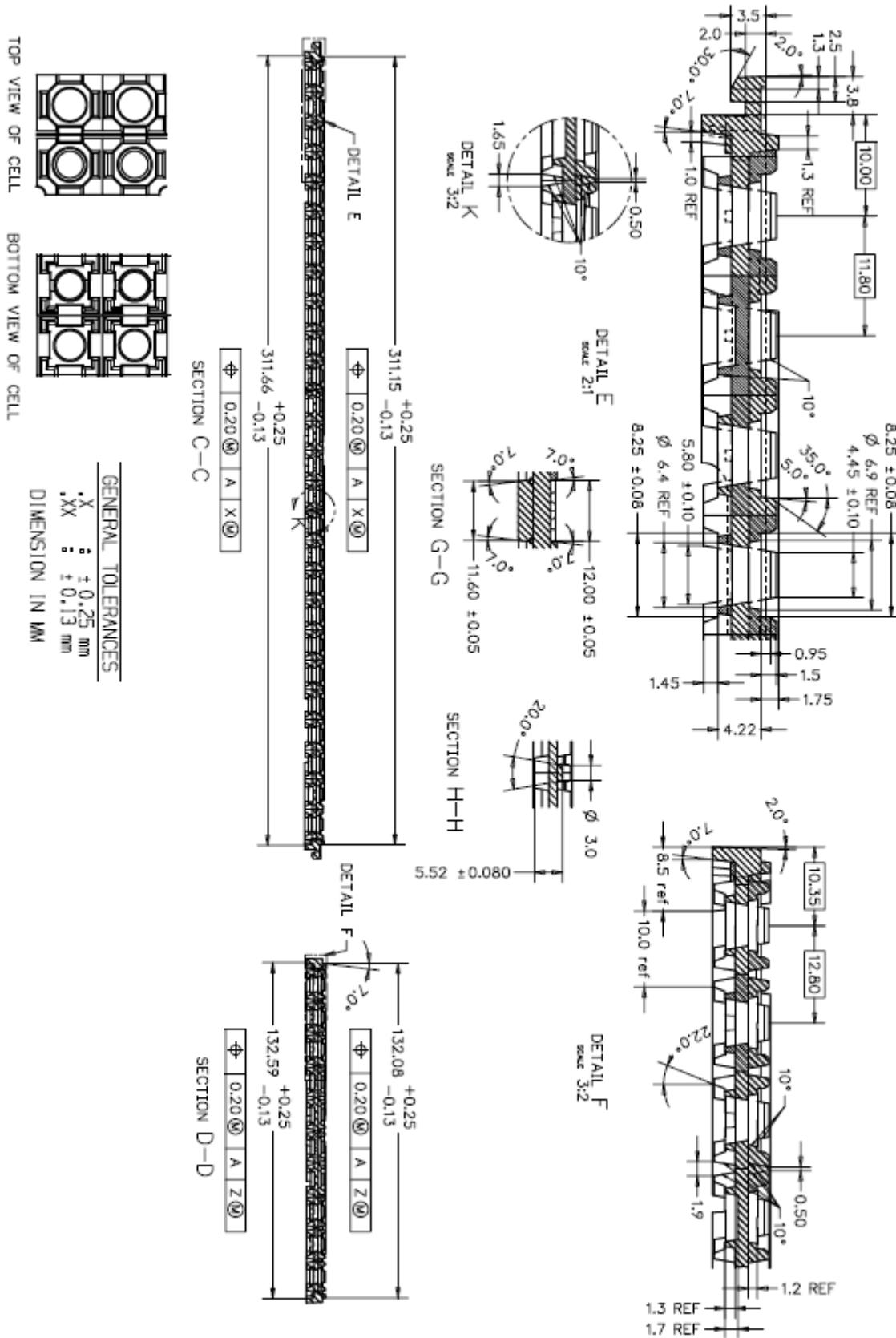
TYPICAL CONDITION
TRAY – NOMINAL
PKG – NOMINAL

GENERAL TOLERANCES

| TRAY | 8.250 | 6.900 | | | 8.250 | 6.400 | 2.130 |
|------|-------|-------|-------|---|-------|-------|-------|
| d | — | — | J | — | n | b | h |
| PKG | 8.000 | 8.000 | | — | 8.000 | 8.000 | 0.800 |
| A | B | C | D | E | F | G | H |
| GAP | 0.125 | 0.950 | 0.800 | — | 0.630 | 0.125 | 0.800 |
| | | | | | | | 1.330 |

DIMENSION IN MM





DETAIL L B
SCALE 15:1

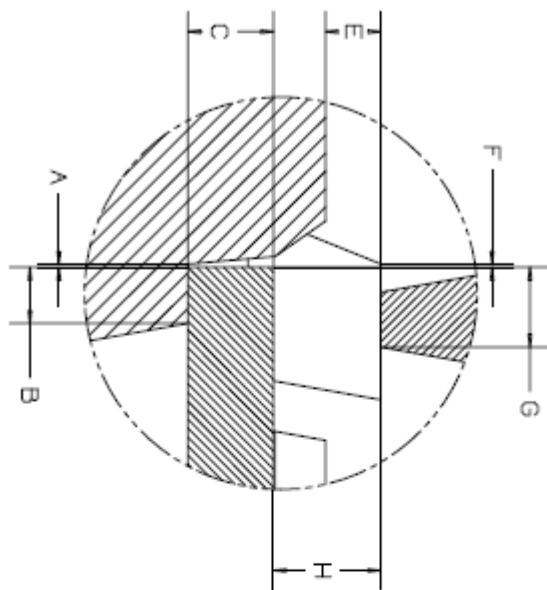
| CRITERION FOR PACKAGE & TRAY COMPATIBILITY | | | | | | | |
|--------------------------------------------|-------------|--------|--|--|--|--|--|
| 1. | A, F > ZERO | ACCEPT | | | | | |
| 2. | B > A | ACCEPT | | | | | |
| 3. | G > F | ACCEPT | | | | | |
| 4. | C > E | ACCEPT | | | | | |
| 5. | H > ZERO | ACCEPT | | | | | |

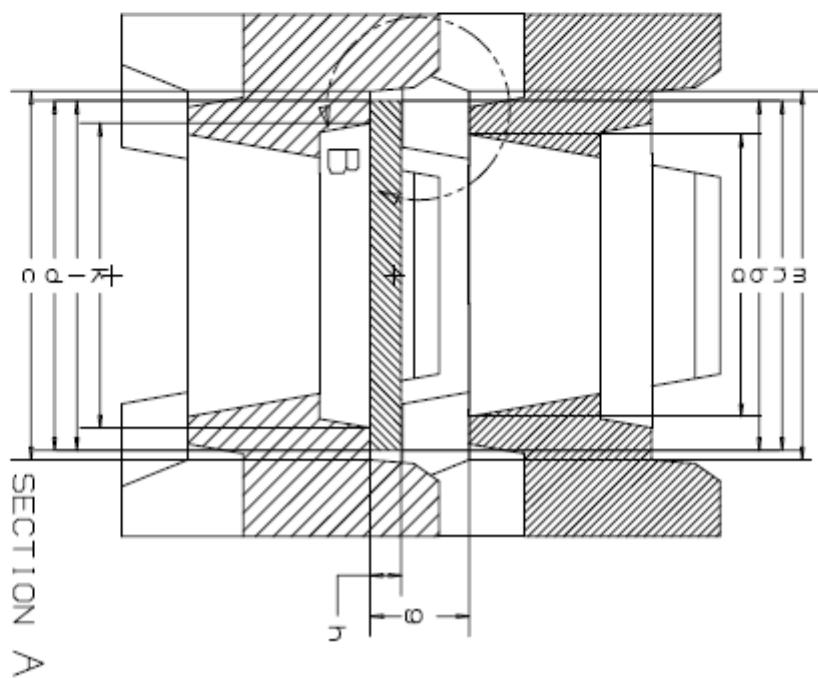
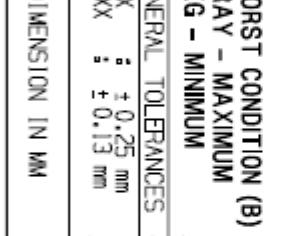
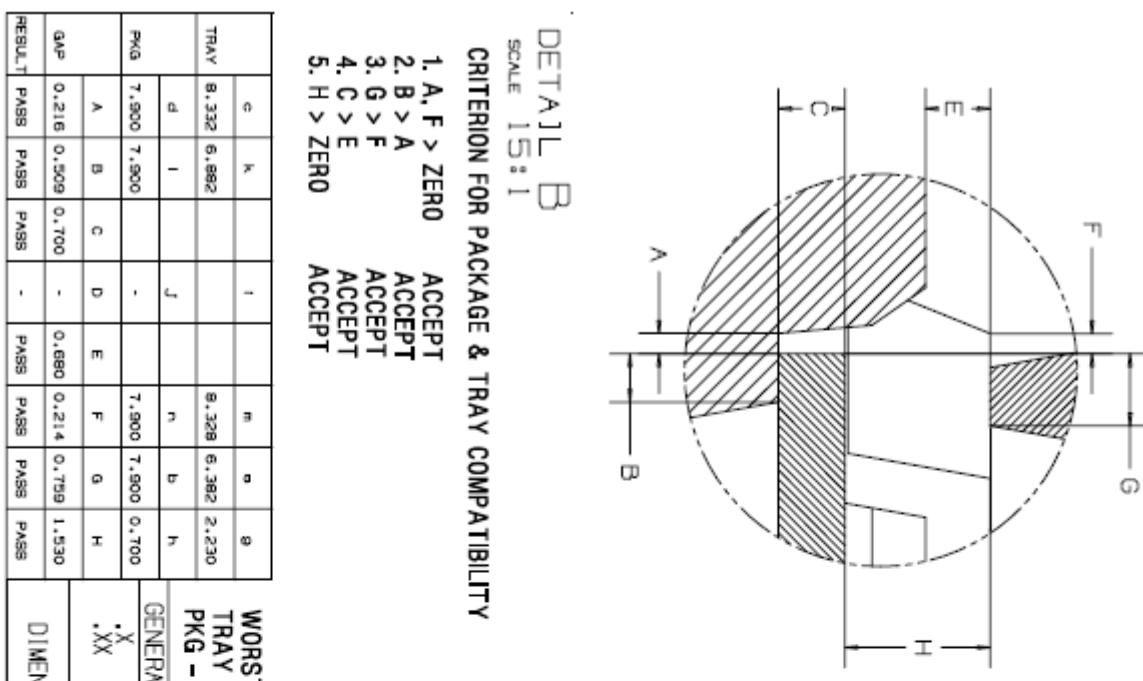
WORST CONDITION (A)
 TRAY - MINIMUM
 PKG - MAXIMUM

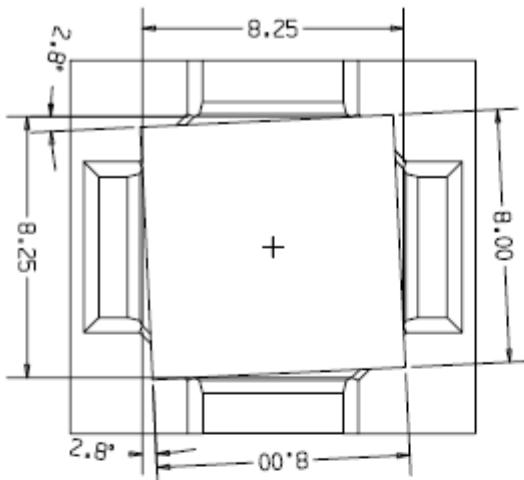
GENERAL TOLERANCES

| RESULT | PASS | PASS | PASS | PASS | PASS | PASS | PASS |
|--------|-------|-------|-------|------|-------|-------|-------|
| TRAY | 8.168 | 6.918 | | | 8.172 | 6.418 | 2.030 |
| PKG | 8.100 | 8.100 | - | | 8.100 | 8.100 | 0.900 |
| GAP | 0.034 | 0.591 | 0.900 | - | 0.580 | 0.036 | 0.841 |
| | | | | | | | 1.130 |

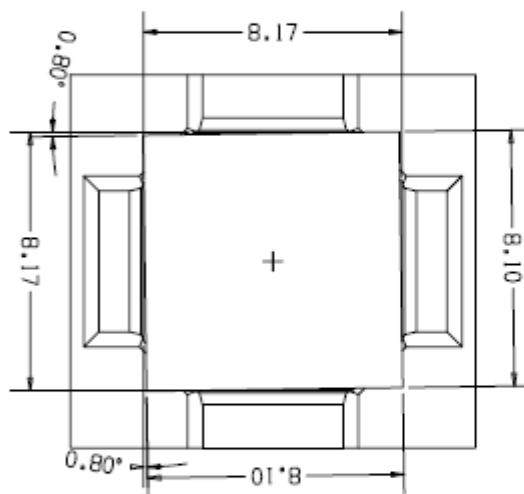
DIMENSION IN MM



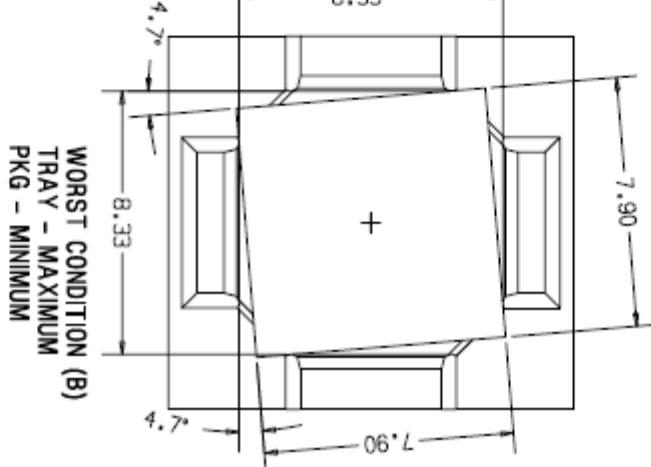




MAXIMUM ROTATING = 2.8°



MAXIMUM ROTATING = 0.80°



MAXIMUM ROTATING = 4.70°

| GENERAL TOLERANCES | |
|--------------------|-----------|
| XX | ± 0.25 mm |
| XX | + 0.13 mm |

DIMENSION IN MM

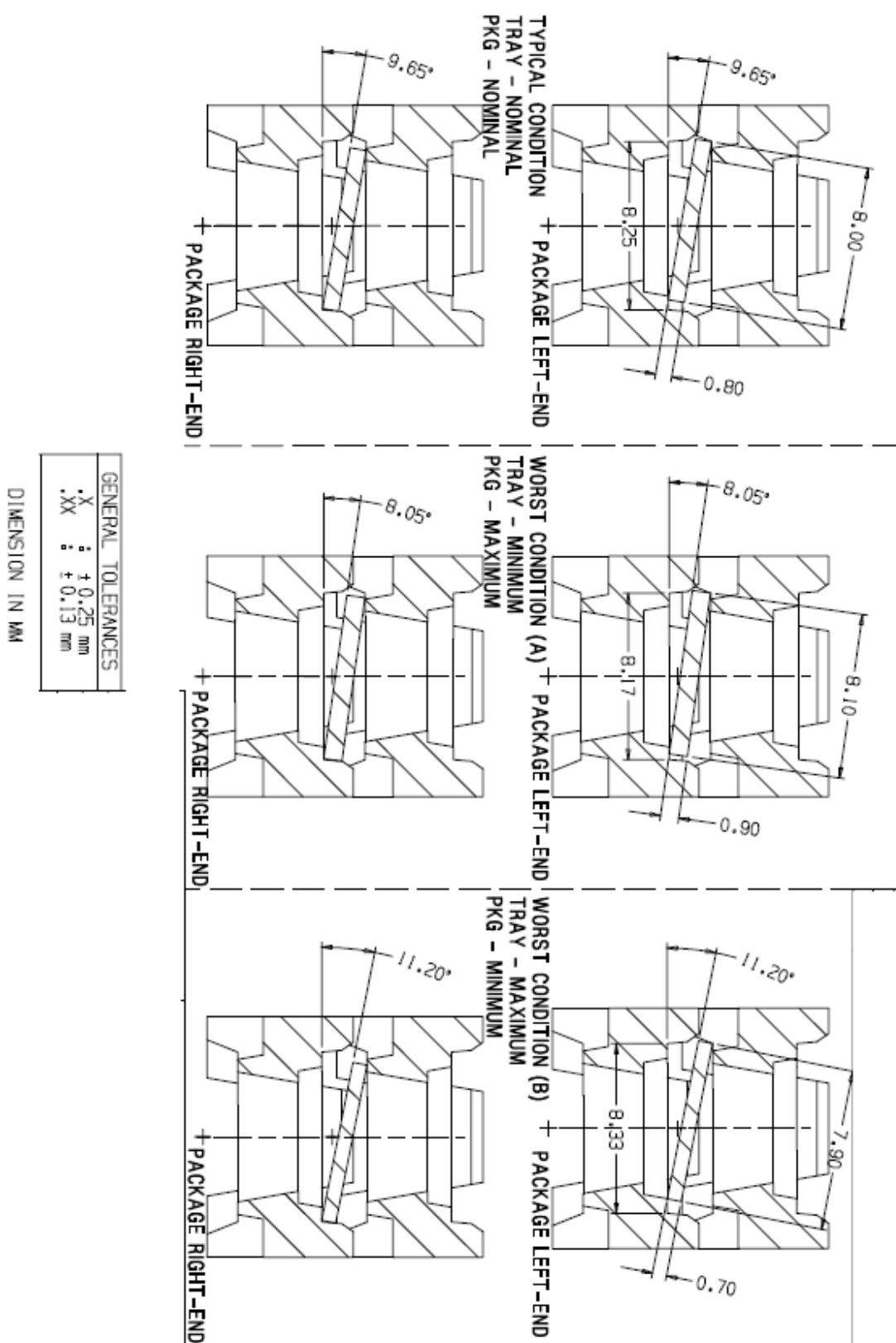


Figure 41.1 VNC2 – QFN-48 and QFN-64 Tray Dimensions – Side View

42 VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48, QFN-64 and FT311D-LQFP, FT311D-QFN Protective Belt

| PART NUMBER | TAPE WIDTH | "W" |
|-------------|------------|---------------------|
| PA10908UC | 8 | 8.3 ± 0.7/-0.0 mm |
| PA10912UC | 12 | 12.3 ± 0.7/-0.0 mm |
| PA10916UC | 16 | 16.3 ± 0.7/-0.0 mm |
| PA10924UC | 24 | 24.3 ± 0.7/-0.0 mm |
| PA10932UC | 32 | 32.3 ± 0.7/-0.0 mm |
| PA10944UC | 44 | 44.3 ± 0.7/-0.0 mm |
| PA10956UC | 56 | 56.3 ± 0.7/-0.0 mm |
| PA10972UC | 72 | 72.3 ± 0.7/-0.0 mm |
| PA10988UC | 88 | 88.3 ± 0.7/-0.0 mm |
| PA109104UC | 104 | 104.3 ± 0.7/-0.0 mm |
| PA109120UC | 120 | 120.3 ± 0.7/-0.0 mm |
| PA109136UC | 136 | 136.3 ± 0.7/-0.0 mm |
| PA109152UC | 152 | 152.3 ± 0.7/-0.0 mm |
| PA109168UC | 168 | 168.3 ± 0.7/-0.0 mm |
| PA109184UC | 184 | 184.3 ± 0.7/-0.0 mm |
| PA109200UC | 200 | 200.3 ± 0.7/-0.0 mm |

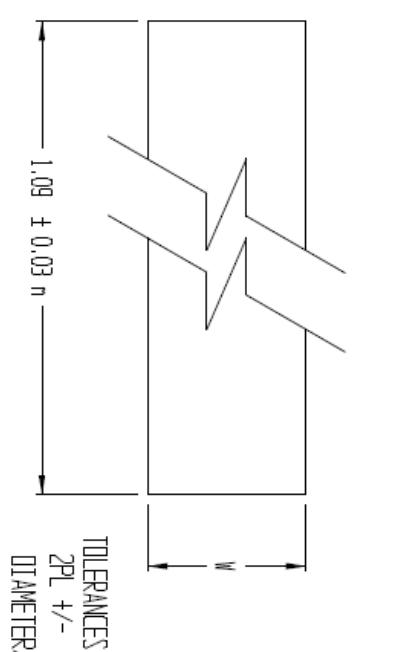

NOTES
 1. SURFACE RESISTIVITY $\leq 10^7$ OHMS PER SQUARE.
 2. COLOR - BLACK

Figure 42.1 VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48, QFN-64 and FT311D-LQFP, FT311D-QFN Protective Belt

43 FT200XD Reel Dimensions

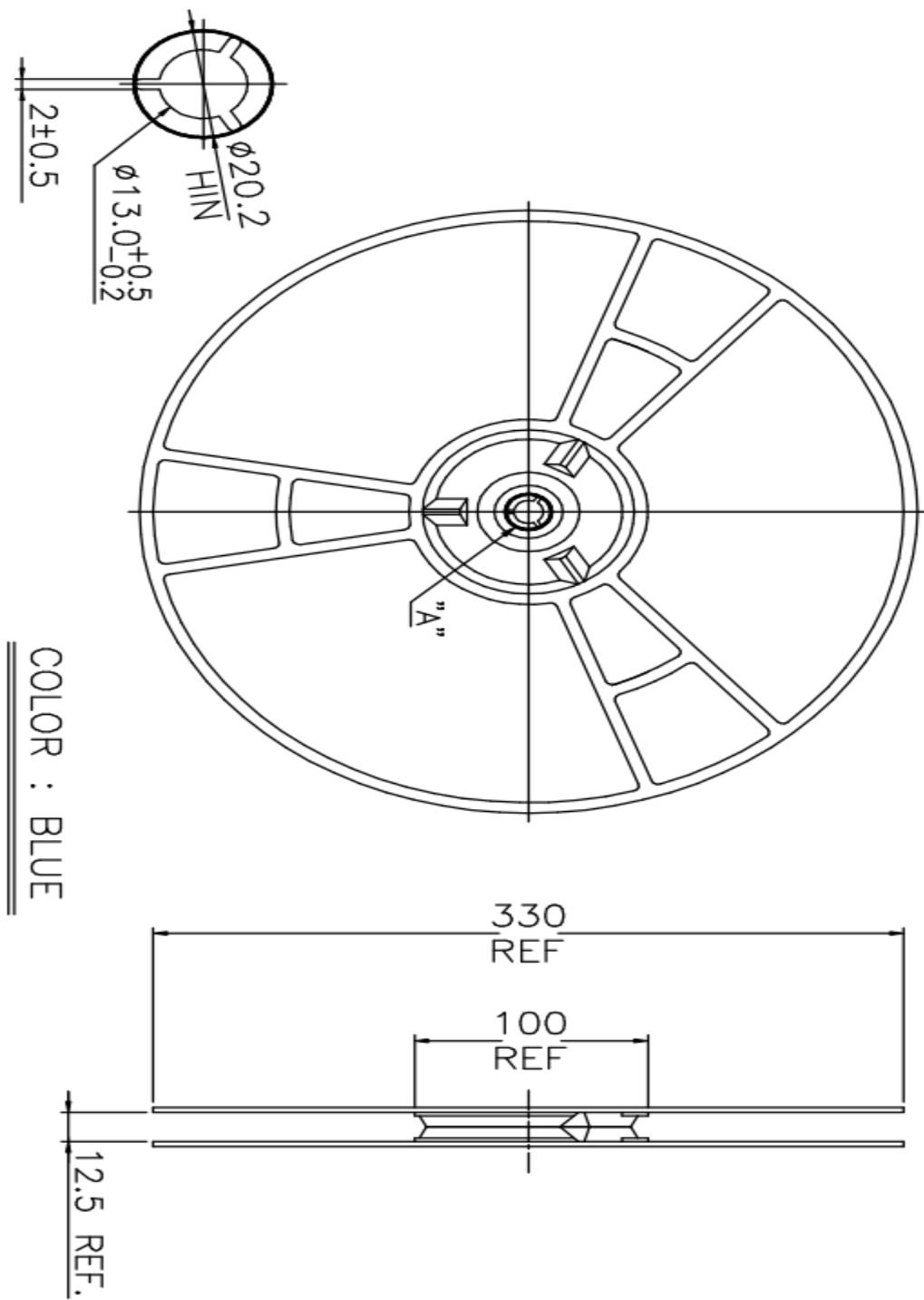


Figure 43.1 FT200XD Reel Dimensions

44 FT200XD Tape Dimensions

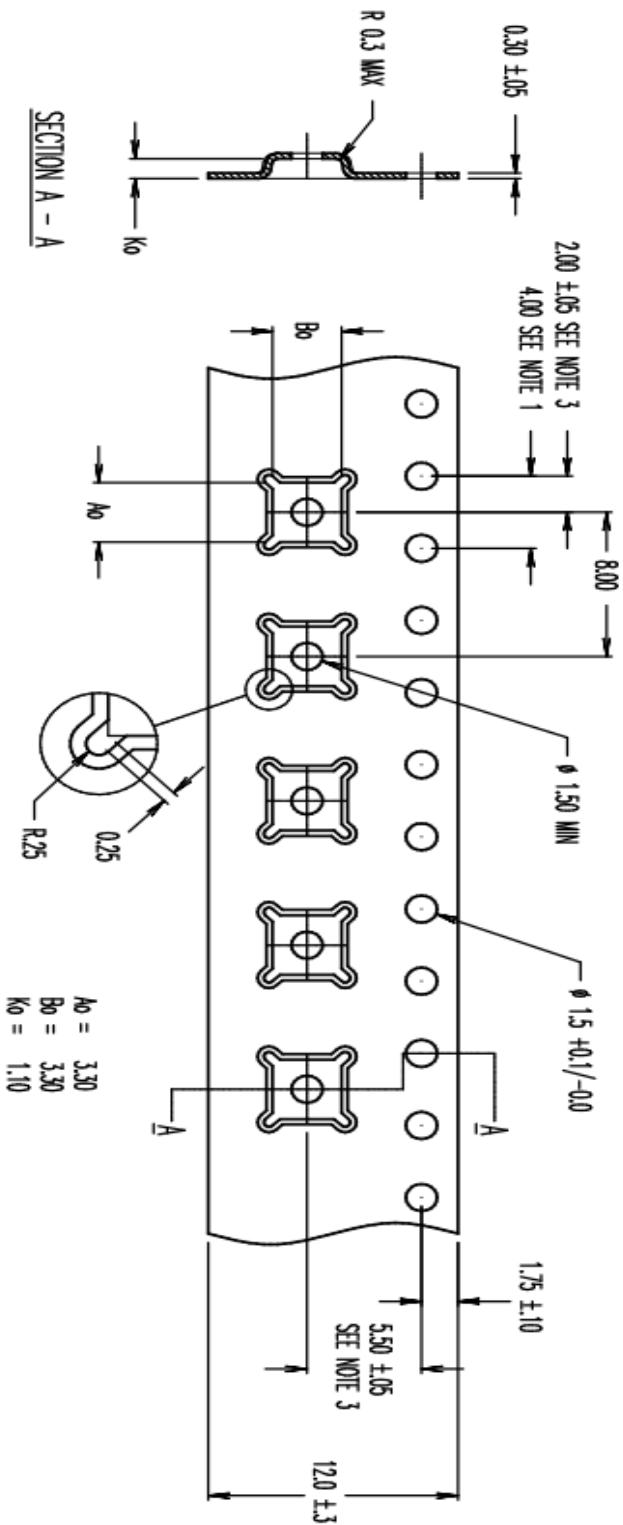


Figure 44.1 FT200XD Tape Dimensions

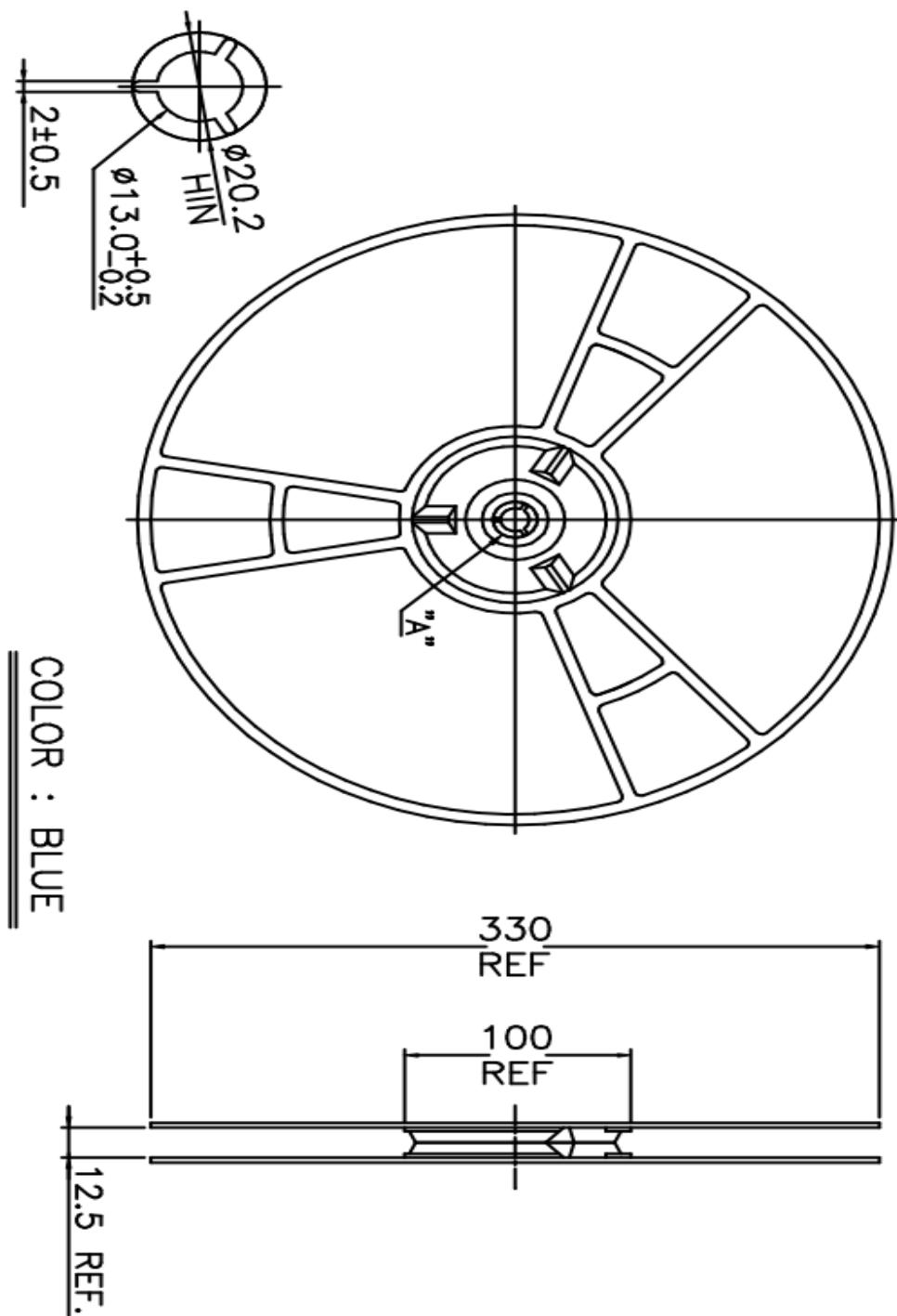
45 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN
Reel Dimensions


Figure 45.1 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN Reel Dimensions

46 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN

Tape Dimensions

- Notes:
1. 10 sprocket hole pitch cumulative tolerance ± 0.2
 2. Camber not to exceed 1mm in 100mm.
 3. Material: Black Advantek Polystyrene.
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

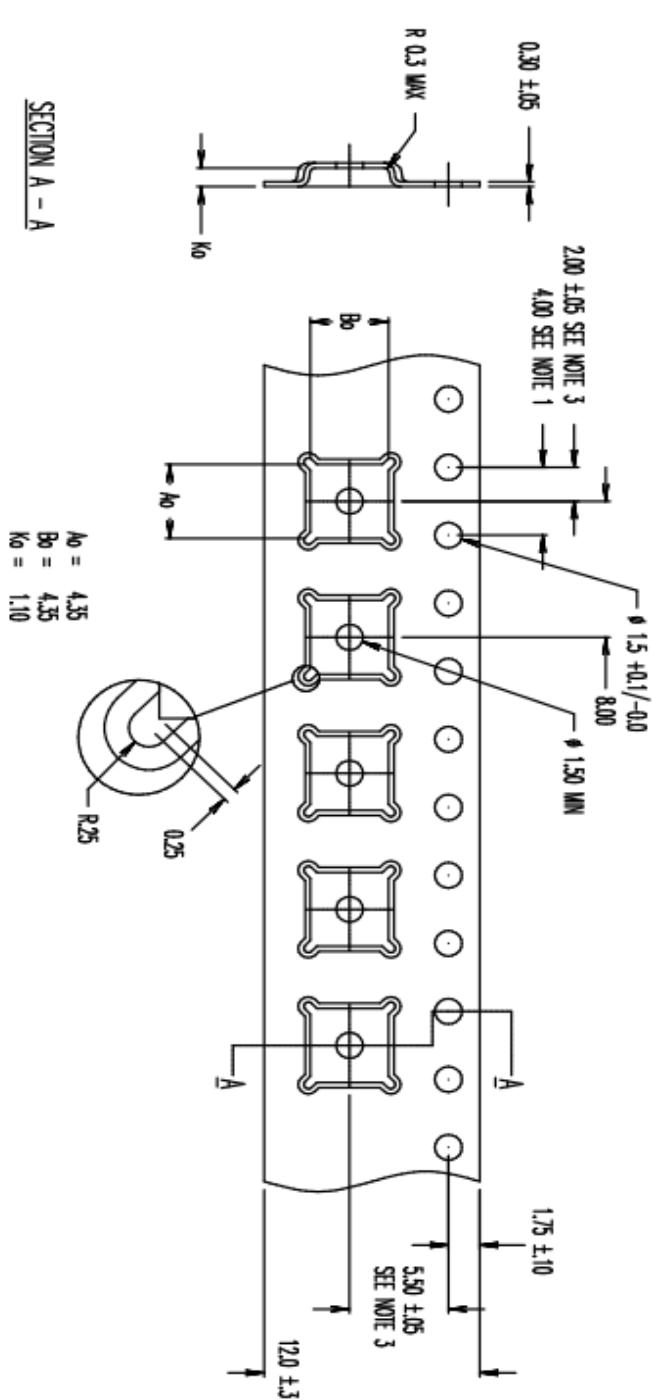


Figure 46.1 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN Tape Dimensions

47 FT201XQ, FT220XQ, FT230XQ SSOP Reel Dimensions

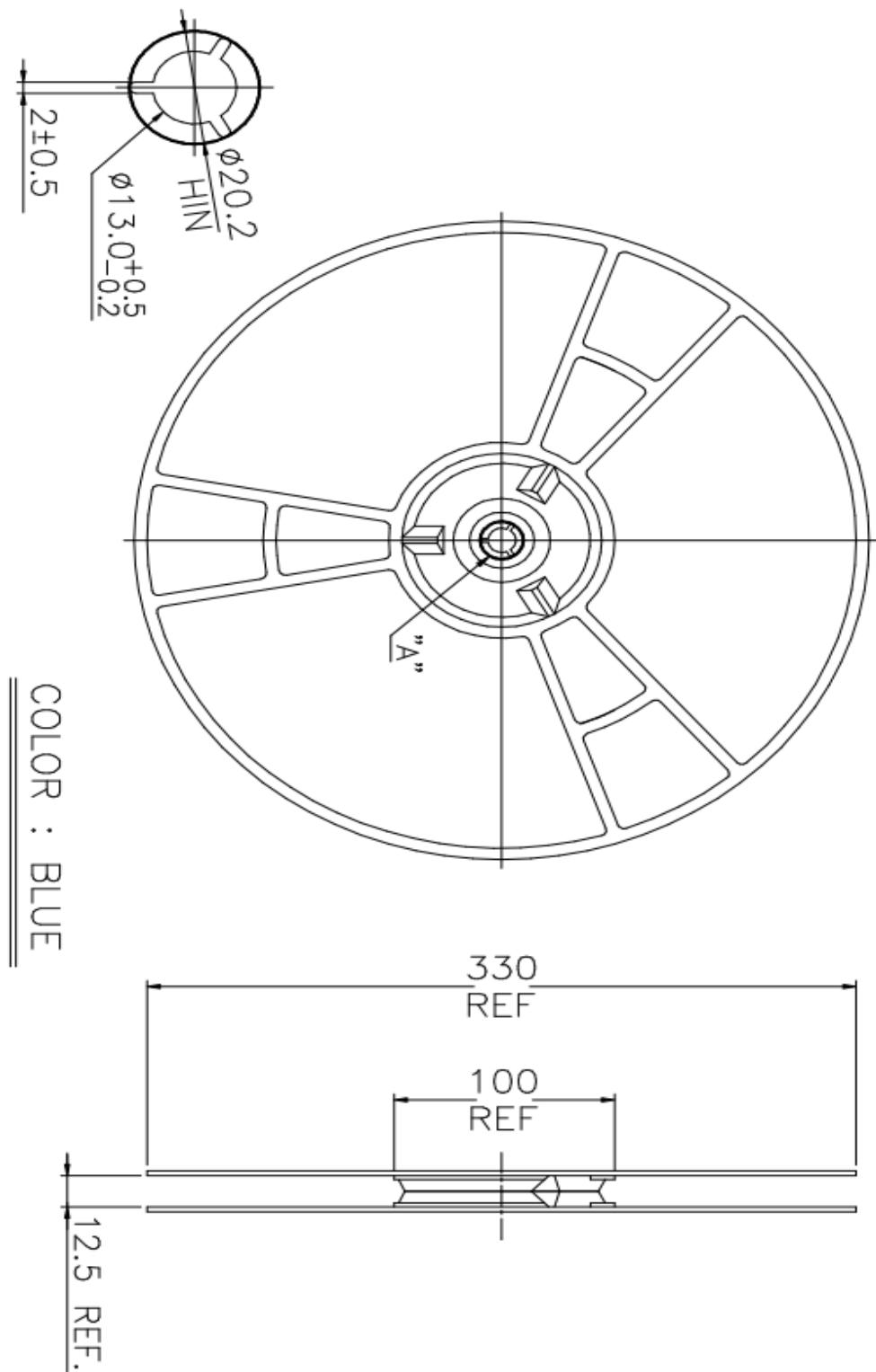


Figure 47.1 FT201XQ, FT220XQ, FT230XQ SSOP Reel Dimensions

48 FT201XQ, FT220XQ, FT230XQ SSOP Tape Dimensions

Notes:

1. 10 sprocket hole pitch cumulative tolerance \pm 0.2mm
 2. Camber not to exceed 1mm in 100mm.
 3. Material: Anti-Static Black Advantek Polystyrene.
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

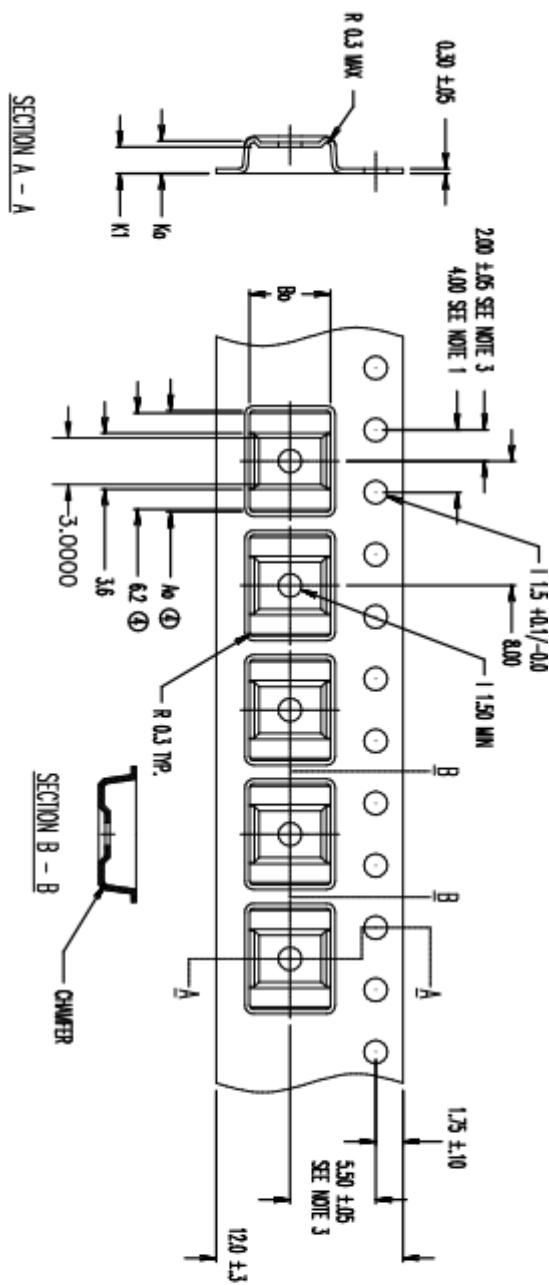


Figure 48.1 FT201XQ, FT220XQ, FT230XQ SSOP Tape Dimensions

49 FT221XQ, FT231XQ, FT240XQ SSOP Reel Dimensions

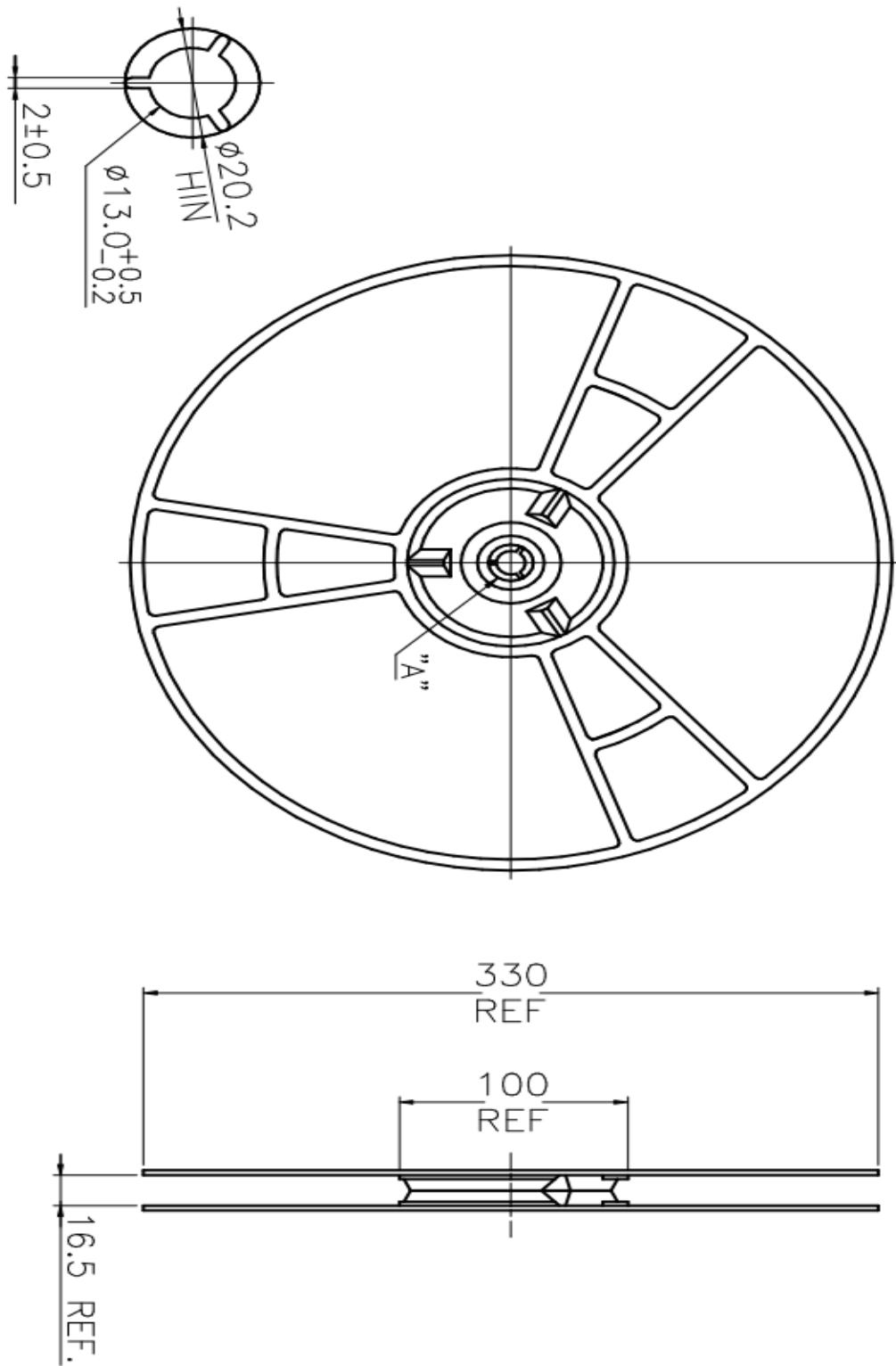


Figure 49.1 FT221XQ, FT231XQ, FT240XQ SSOP Reel Dimensions

50 FT221XQ, FT231XQ, FT240XQ SSOP Tape Dimensions

- Notes:
1. 10 sprocket hole pitch cumulative tolerance ± 0.2
 2. Camber not to exceed 1mm in 100mm.
 3. Material: Black Advantek Polystyrene.
 4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
 5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
 6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

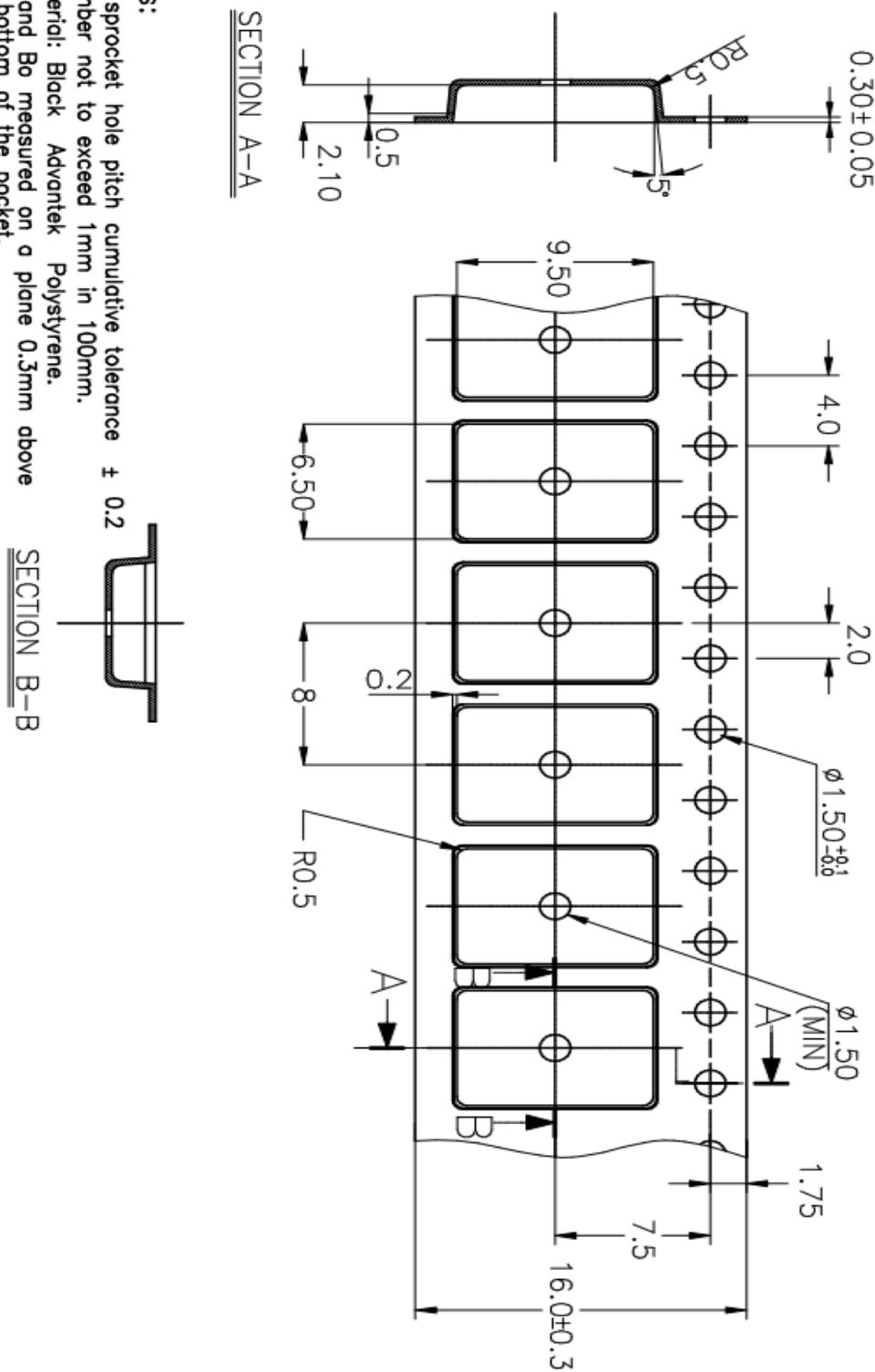


Figure 50.1 FT221XQ, FT231XQ, FT240XQ SSOP Tape Dimensions

51 FT120T, FT122T TSSOP Reel Dimensions

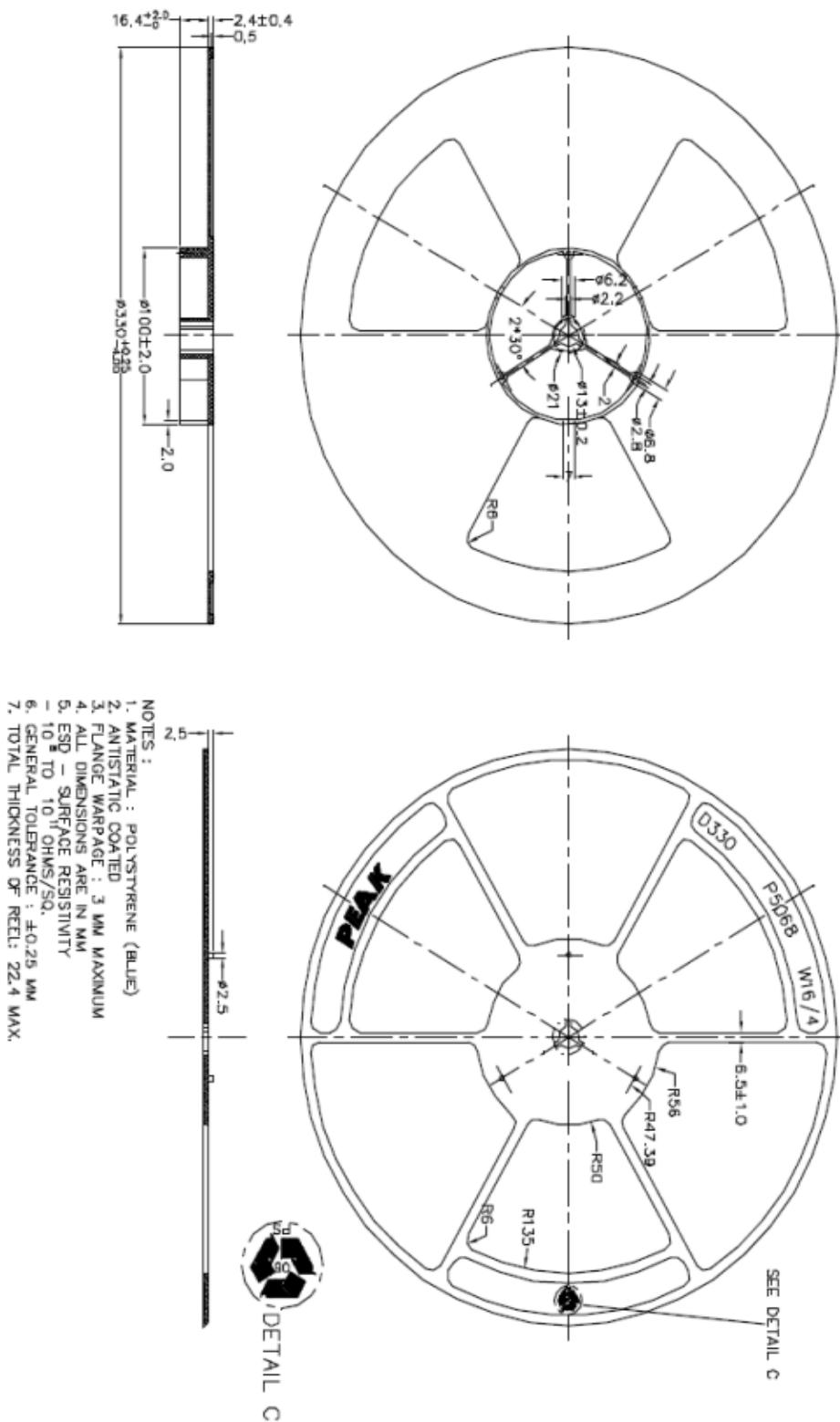


Figure 51.1 FT120T, FT122T TSSOP Reel Dimensions

52 FT120T, FT122T TSSOP Tape Dimensions

| | | |
|----|-------|--------|
| A0 | 6.80 | +/-0.1 |
| B0 | 10.20 | +/-0.1 |
| K0 | 1.60 | +/-0.1 |
| K1 | 1.20 | +/-0.1 |
| F | 7.50 | +/-0.1 |
| P1 | 8.00 | +/-0.1 |
| W | 16.00 | +/-0.3 |

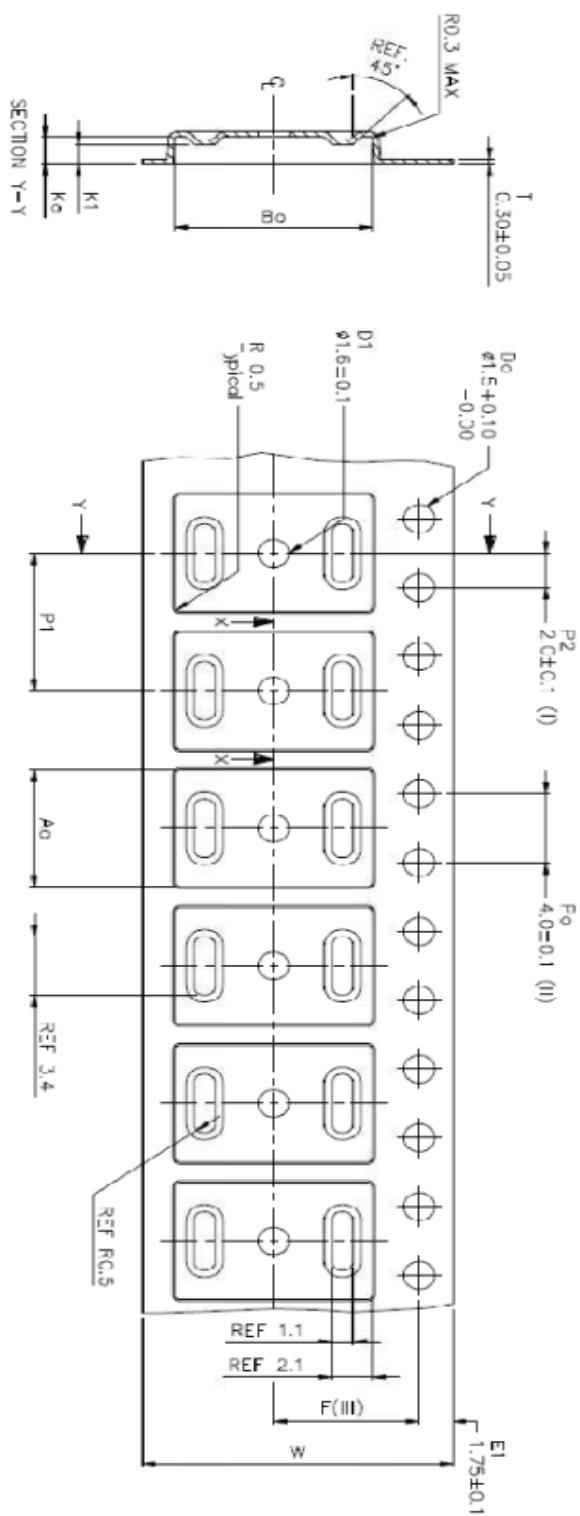
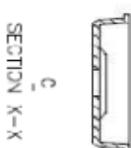
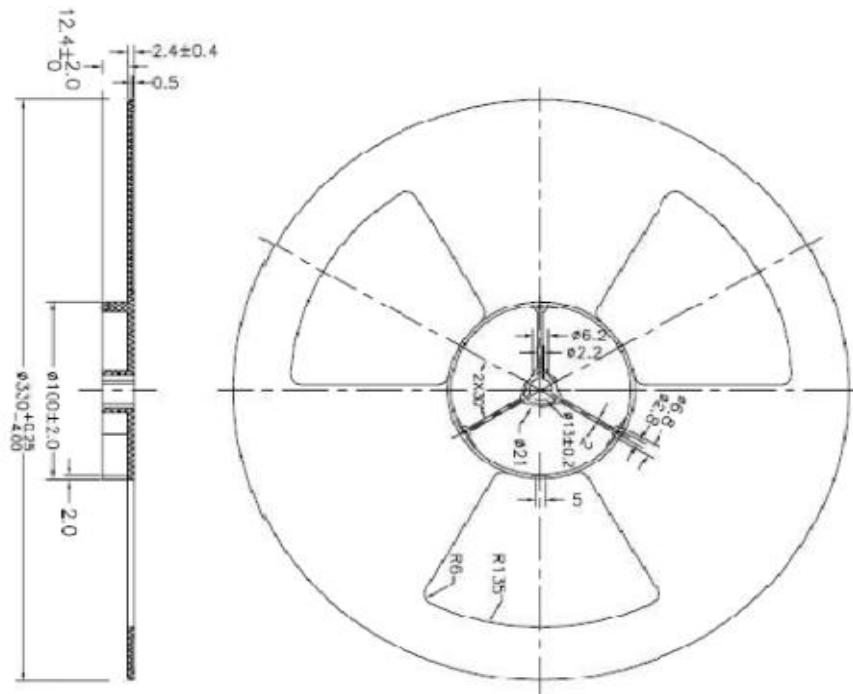


Figure 52.1 FT120T, FT122T TSSOP Tape Dimensions

- (i) Measured from centreline of sprocket hole to centreline of pocket.
 (ii) Cumulative clearance of 10 sprocket holes is ± 0.20 .
 (iii) Measured from centreline of sprocket hole to centreline of pocket.
 (iv) Other material available.
 (v) Typical S.R. of form type Max 10^9 CM/SQ

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

53 FT121T, FT120Q, FT121Q, FT122Q Reel Dimensions



NOTES :

1. MATERIAL : POLYSTYRENE (BLUE)
2. ANTISTATIC COATED
3. FLANGE WARPAGE : 3 MM MAXIMUM
4. ALL DIMENSIONS ARE IN MM
5. ESD = SURFACE RESISTIVITY
10⁸ TO 10⁹ OHM/SQ.
6. GENERAL TOLERANCE : ± 0.25 MM
7. TOTAL THICKNESS OF REEL: 18.4 MAX.

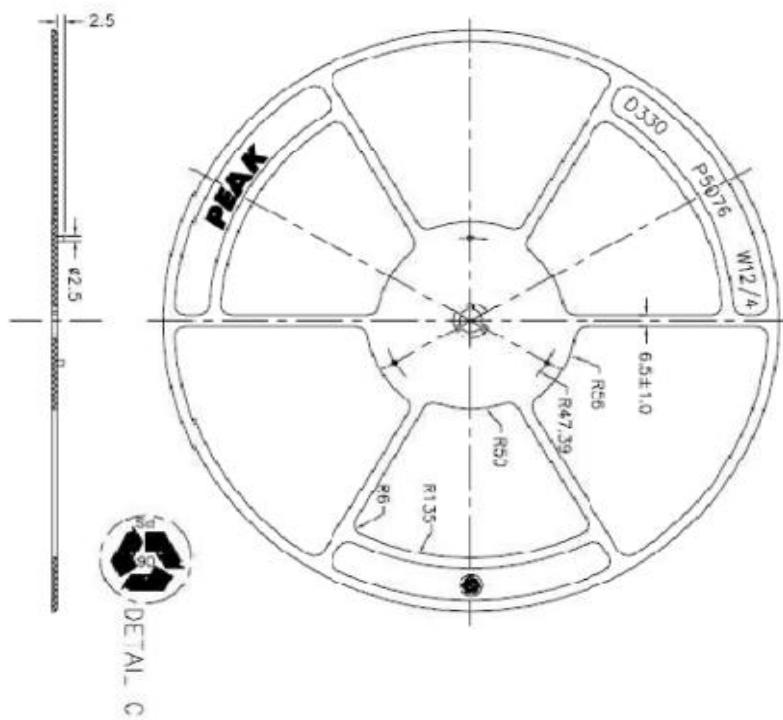
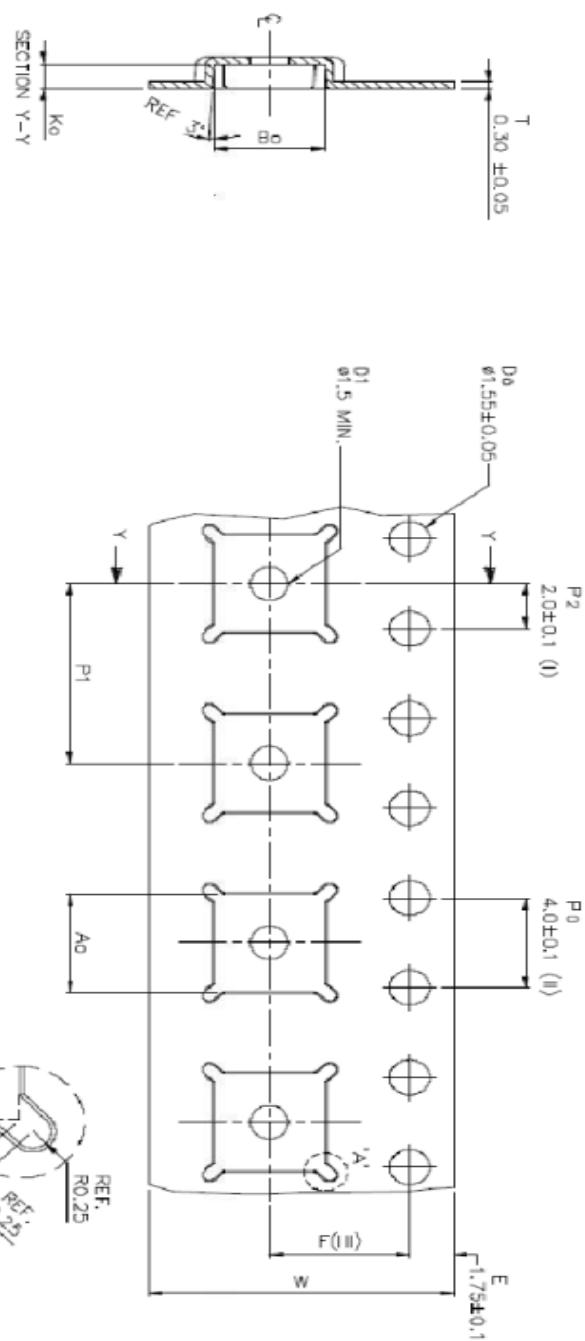


Figure 53.1 FT121T, FT120Q, FT121Q, FT122Q Reel Dimensions

54 FT120Q, FT122Q QFN Tape Dimensions

| | |
|----------------|---------------|
| A ₀ | 4.35 +/− 0.1 |
| B ₀ | 4.35 +/− 0.1 |
| K ₀ | 1.10 +/− 0.1 |
| F | 5.50 +/− 0.1 |
| P ₁ | 8.00 +/− 0.1 |
| W | 12.00 +/− 0.3 |

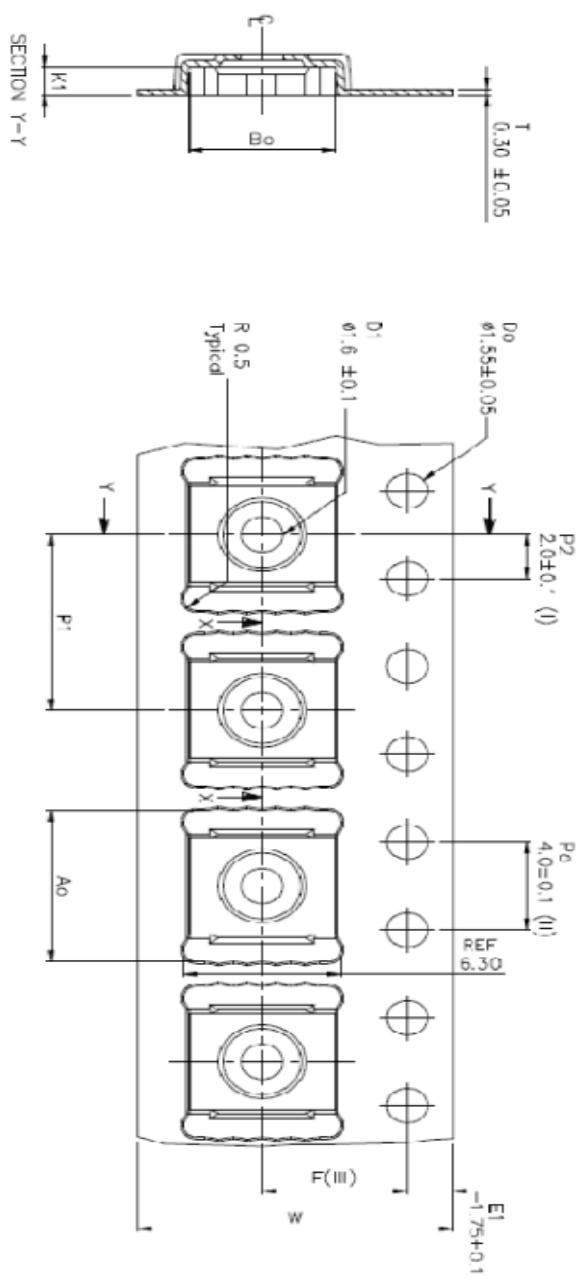


- (i) Measured from centreline of sprocket hole to centreline of pocket.
 - (ii) Cumulative tolerance of 10 sprocket holes is ± 0.20 .
 - (iii) Measured from centreline of sprocket hole to centreline of pocket.
 - (iv) Other material available.
- ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

Figure 54.1 FT120Q, FT122Q QFN Tape Dimensions

55 FT121T TSSOP Tape Dimensions

| | |
|----------------|---------------|
| A ₀ | 6.90 +/− 0.1 |
| B _C | 5.60 +/− 0.1 |
| K _C | 1.60 +/− 0.1 |
| K ₁ | 1.30 +/− 0.1 |
| F | 5.50 +/− 0.1 |
| P ₁ | 8.00 +/− 0.1 |
| W | 12.00 +/− 0.3 |



ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

Figure 55.1 FT121T TSSOP Tape Dimensions

56 FT121Q QFN Tape Dimensions

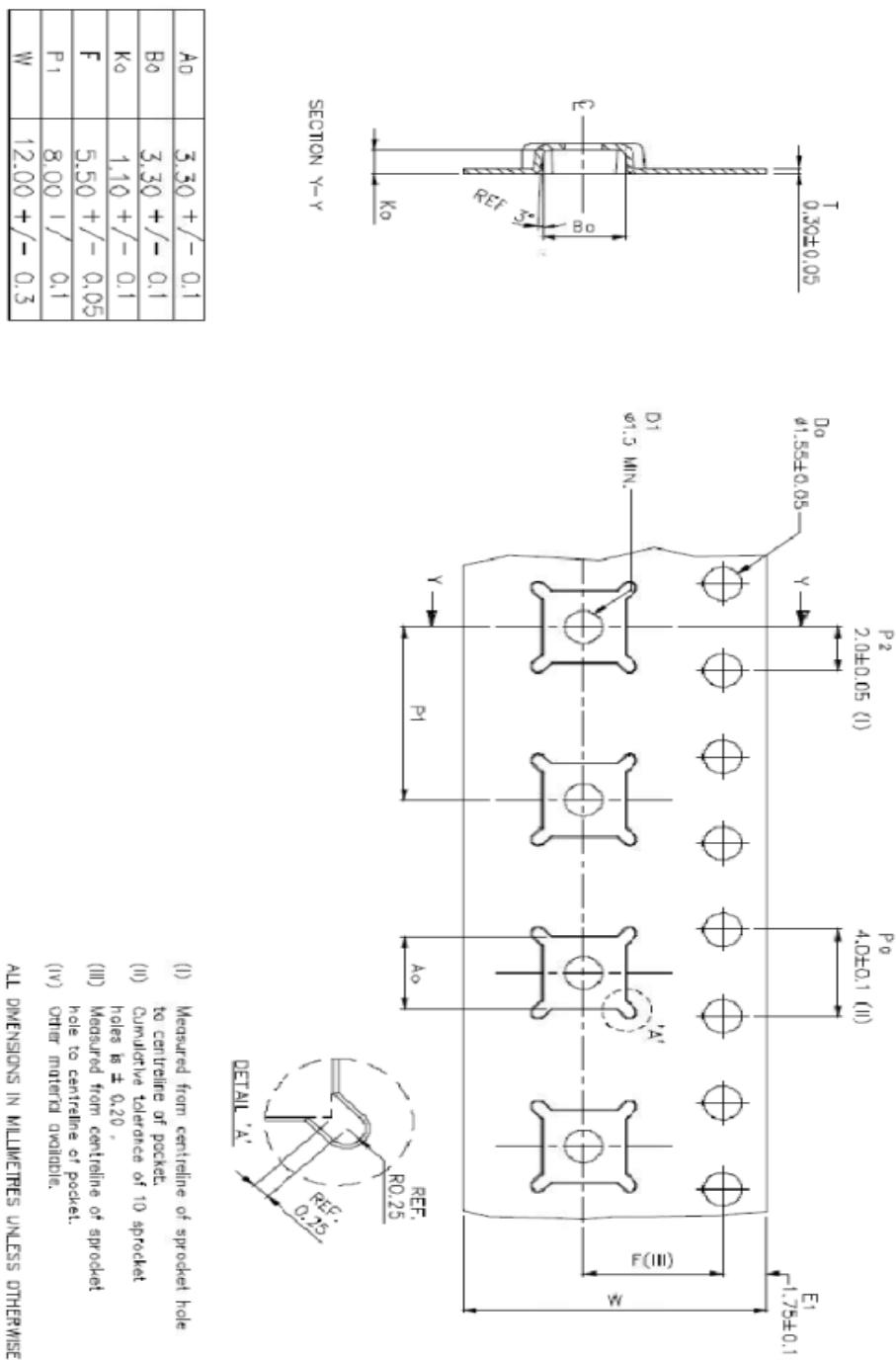


Figure 56.1 FT121Q QFN Tape Dimensions

57 FT201XS, FT220XS, FT230XS, FT240XS Reel Dimensions

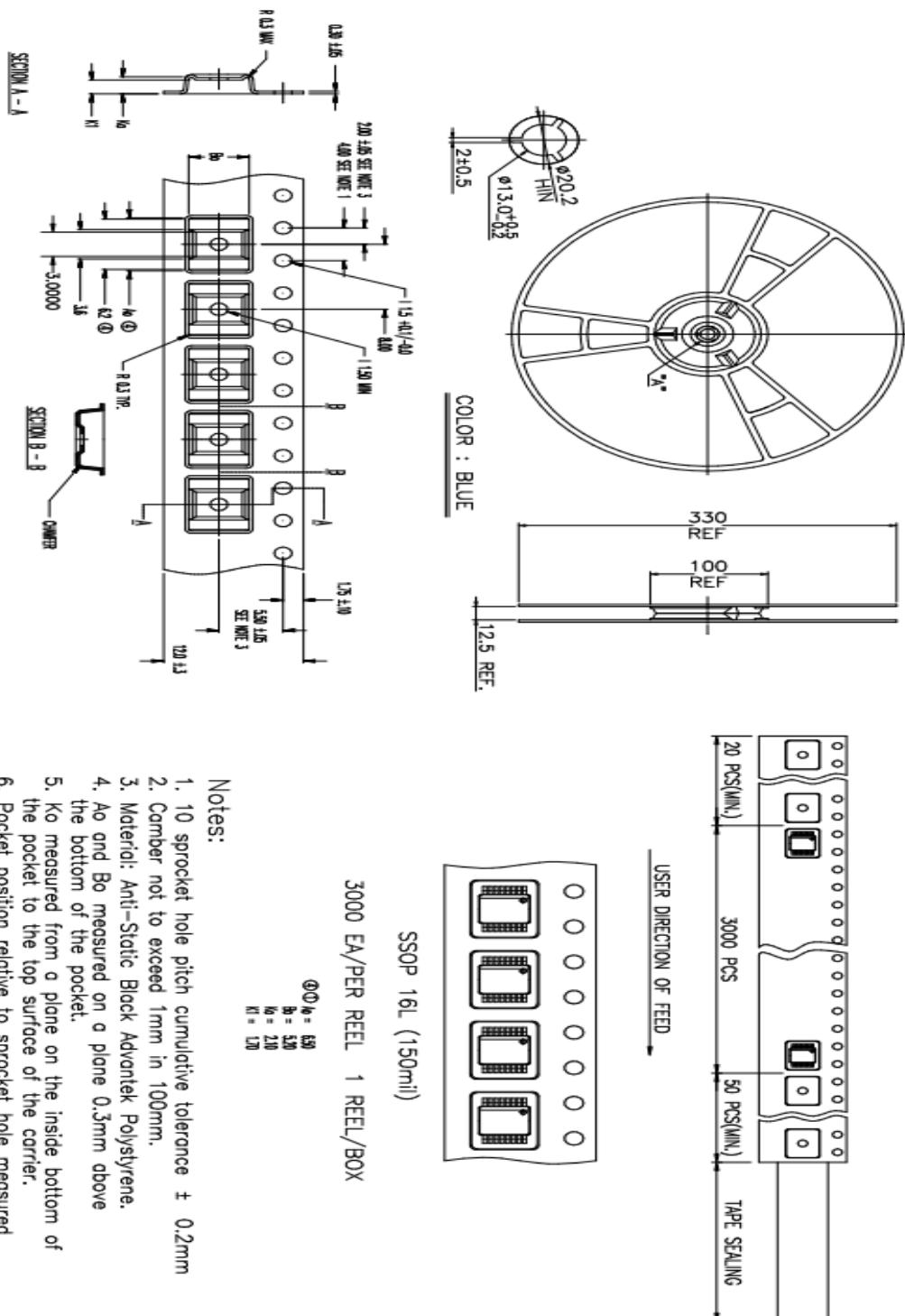


Figure 57.1 FT201XS, FT220XS, FT230XS, FT240XS Reel Dimensions

58 FT221XS, FT231XS Reel Dimensions

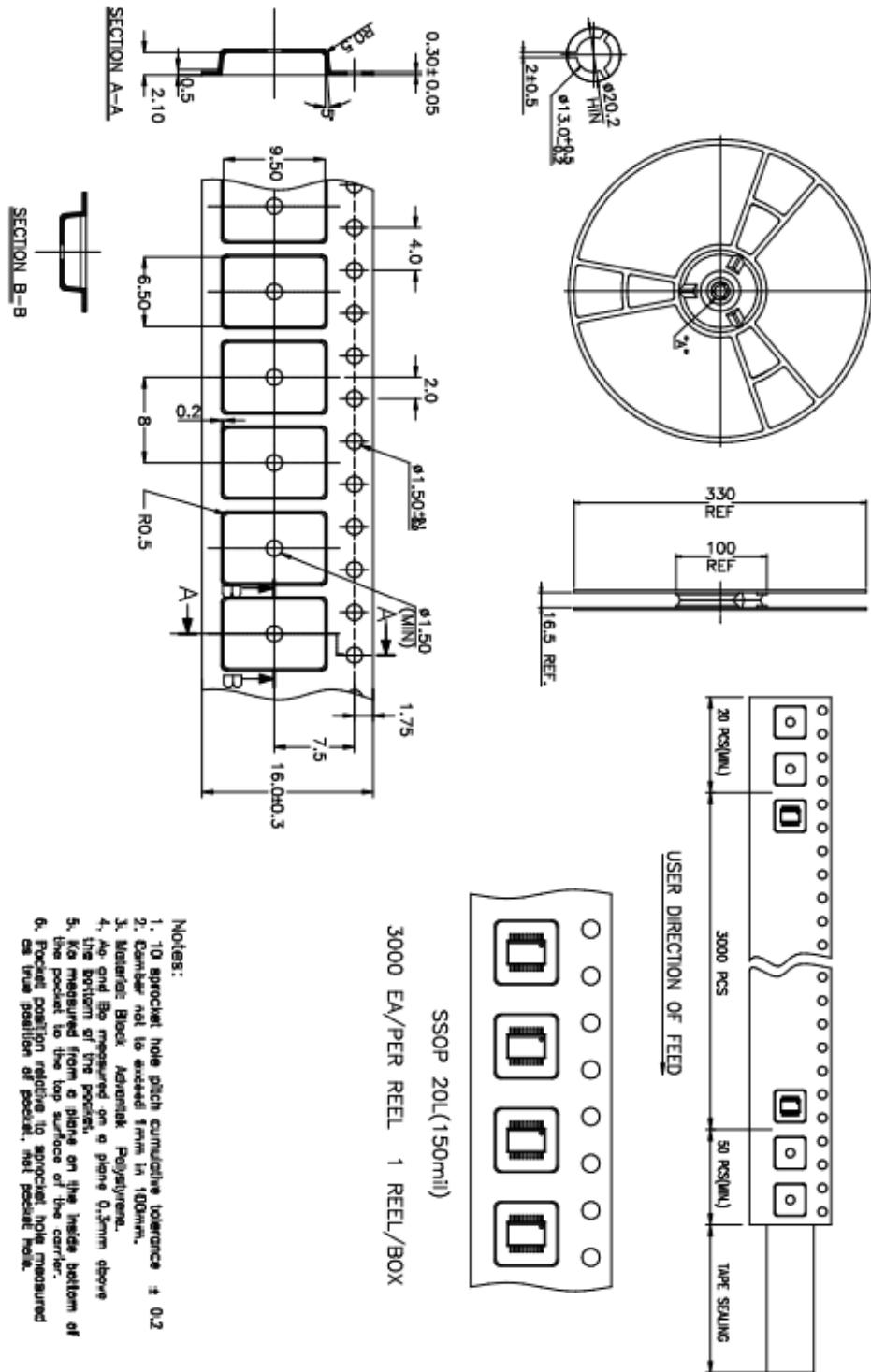


Figure 58.1 FT221XS, FT231XS Reel Dimensions

59 FT313H-QFN Reel Dimensions

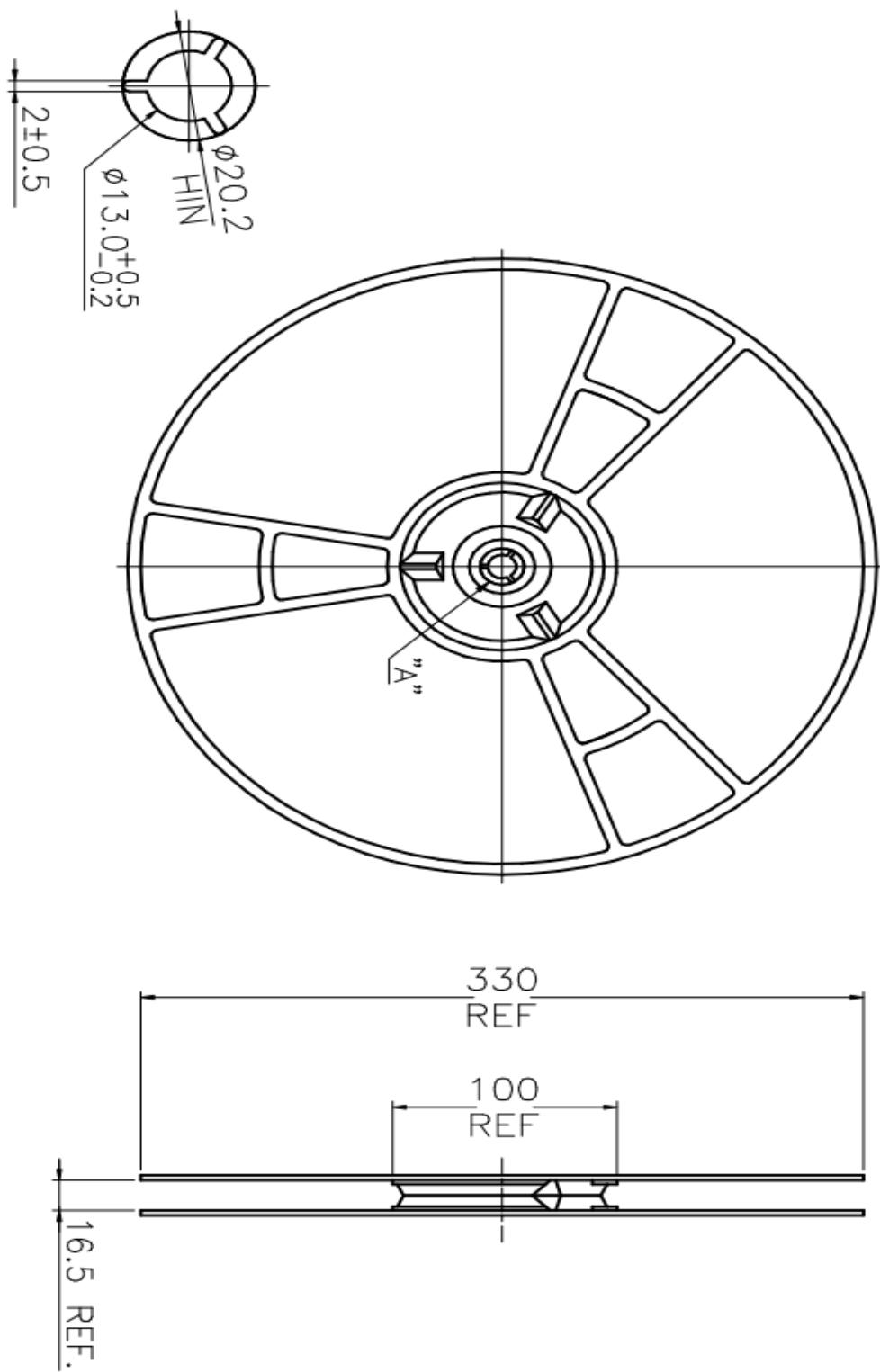


Figure 59.1 FT313H-QFN Reel Dimensions

60 FT313H-QFN Tape Dimensions

Notes:

1. 10 sprocket hole pitch cumulative tolerance ± 0.2
2. Camber not to exceed 1mm in 100mm.
3. Material: Block Advantek Polystyrene.
4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

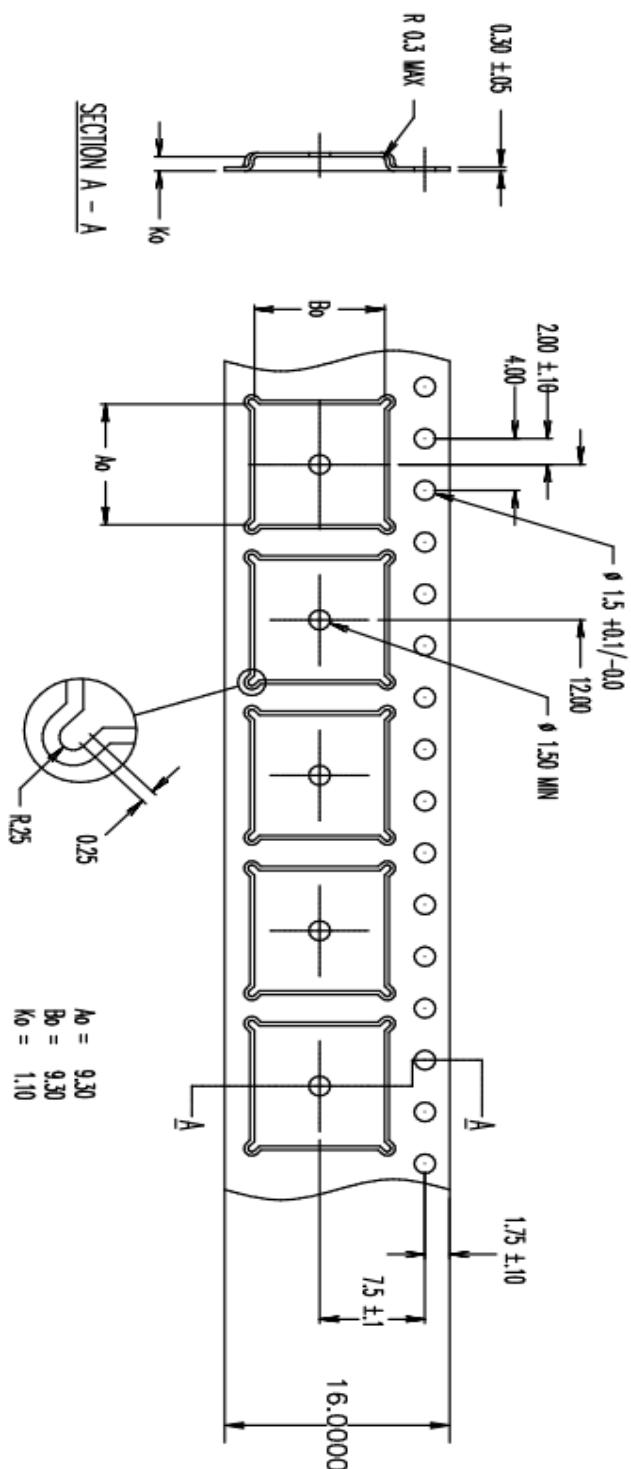


Figure 60.1 FT313H-QFN Tape Dimensions

61 FT313H-LQFP Reel Dimensions

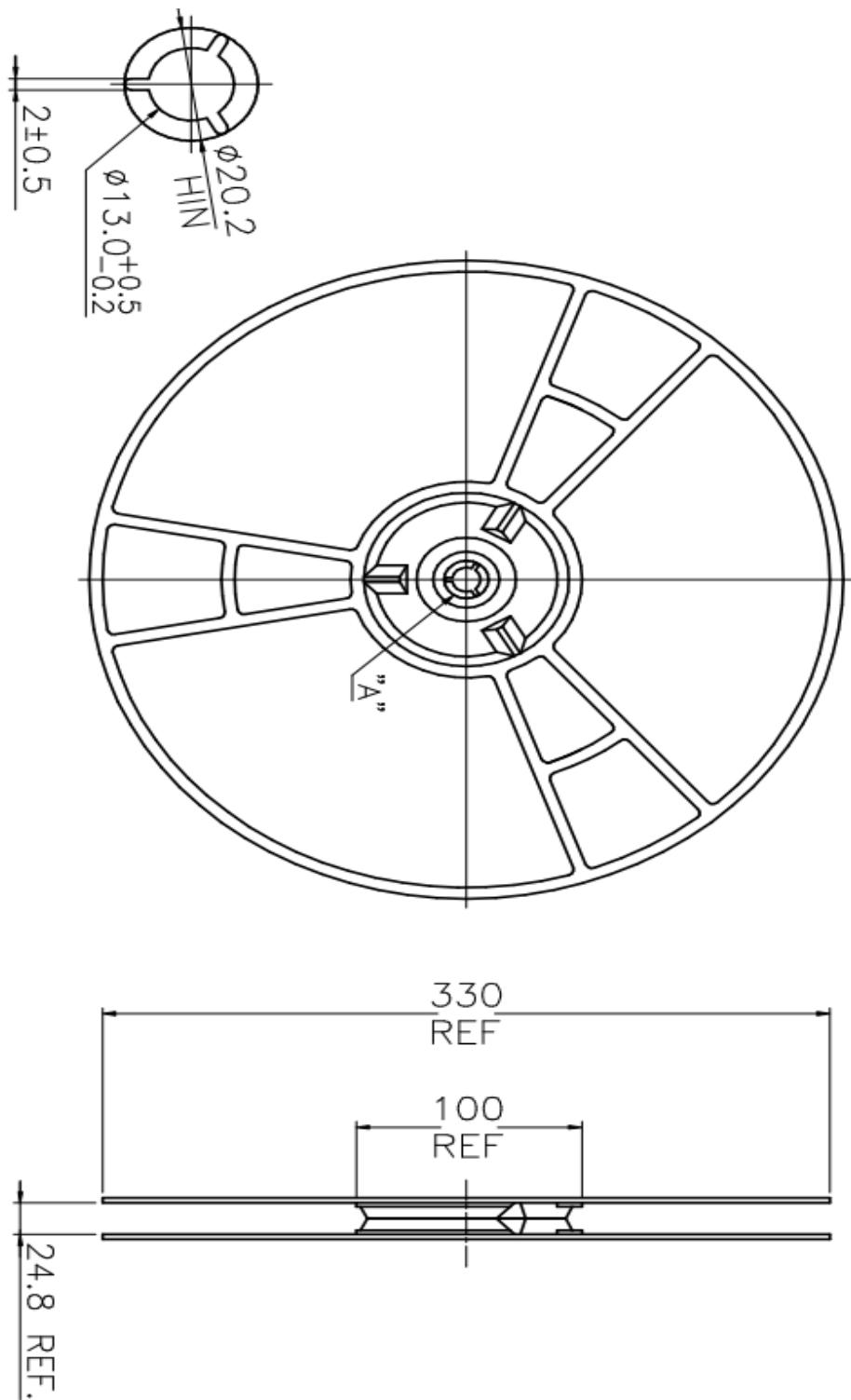


Figure 61.1 FT313H-LQFP Reel Dimensions

62 FT313H-LQFP Tape Dimensions

- NOTES:
1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ± 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
 4. COVER TAPE WIDTH : 21.3 ± 0.1

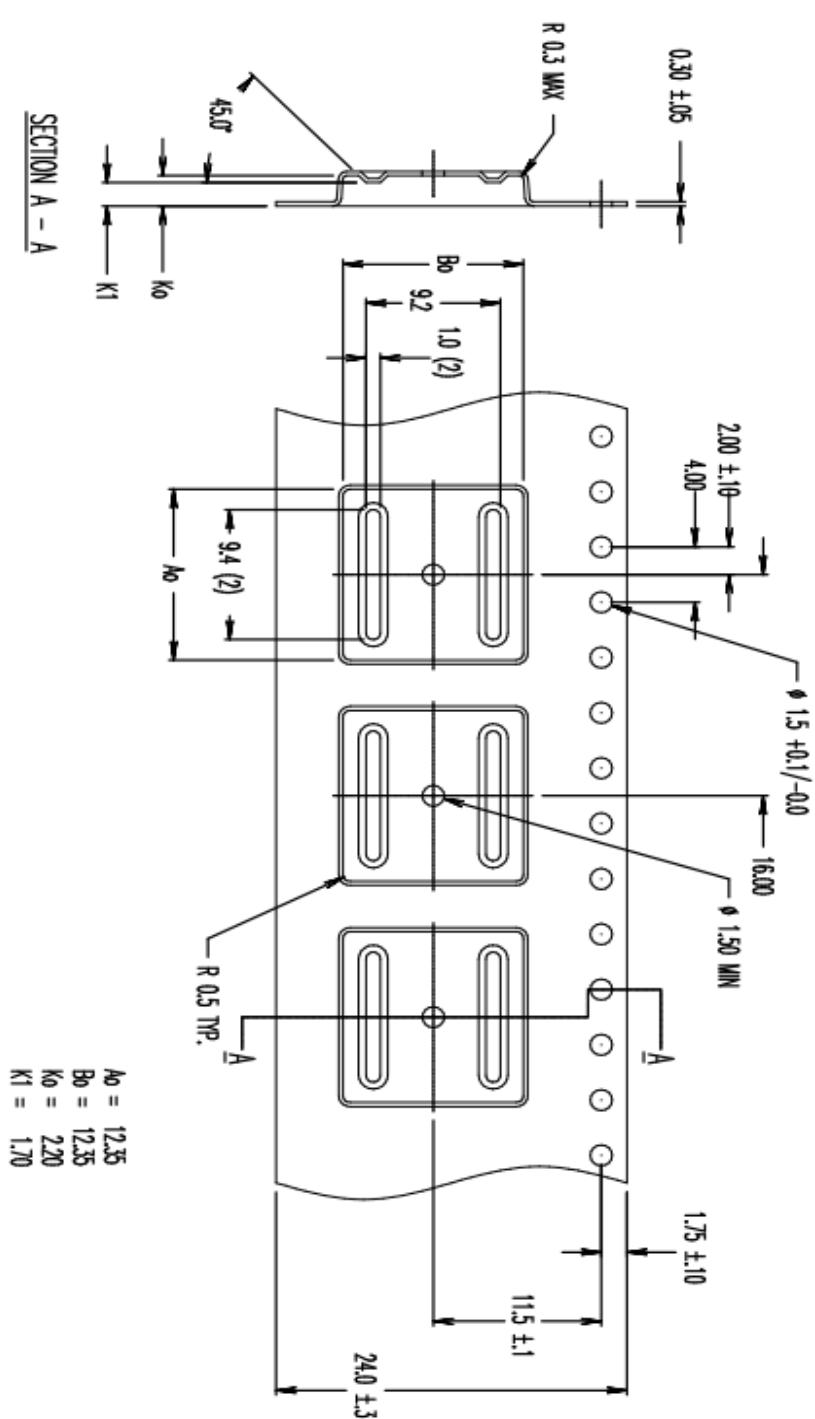


Figure 62.1 FT313H-LQFP Tape Dimensions

63 FT313H-TQFP Reel Dimensions

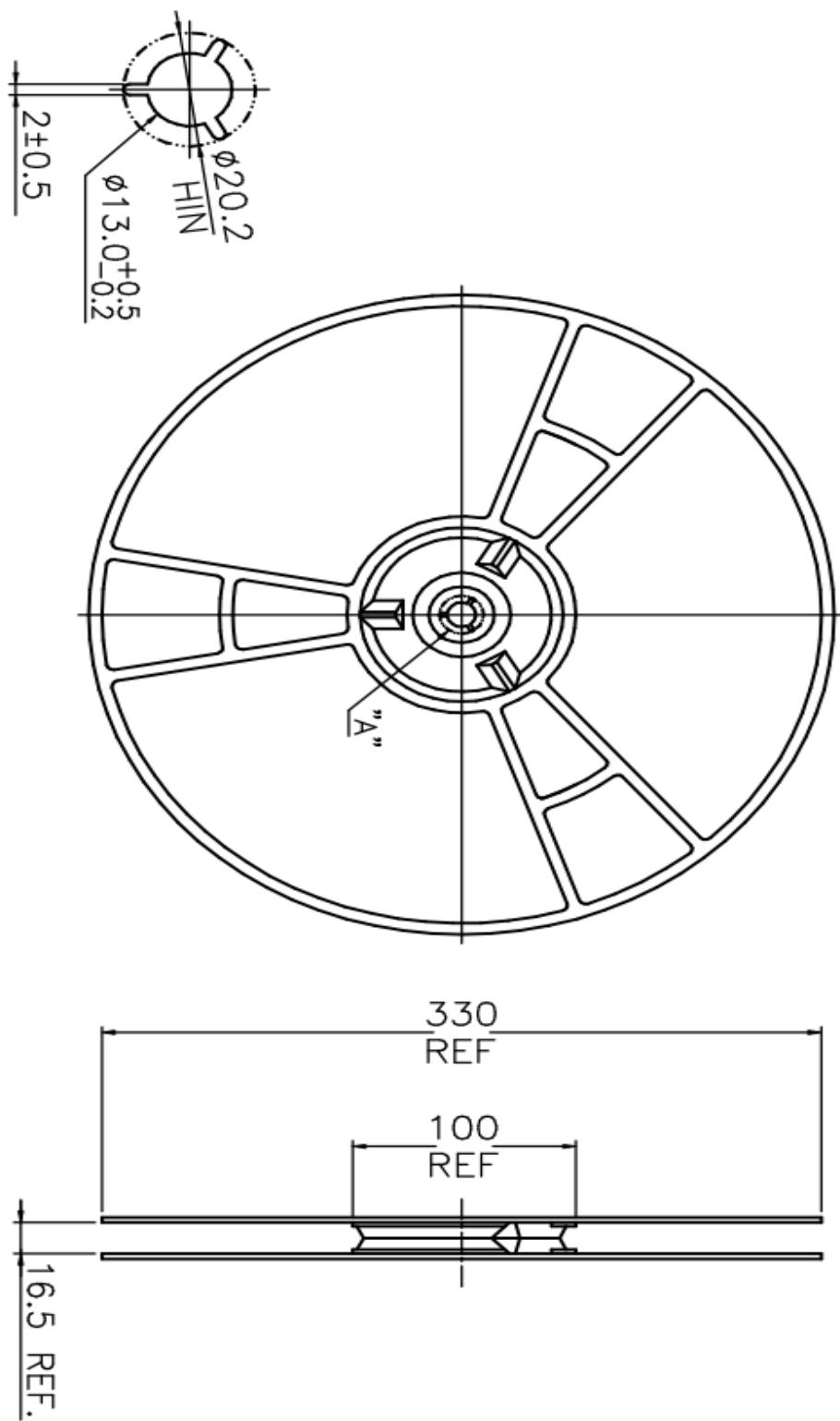


Figure 63.1 FT313H-TQFP Reel Dimensions

64 FT313H-TQFP Tape Dimensions

- NOTES:
1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ± 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
 4. COVER TAPE WIDTH : 13.3 ± 0.1

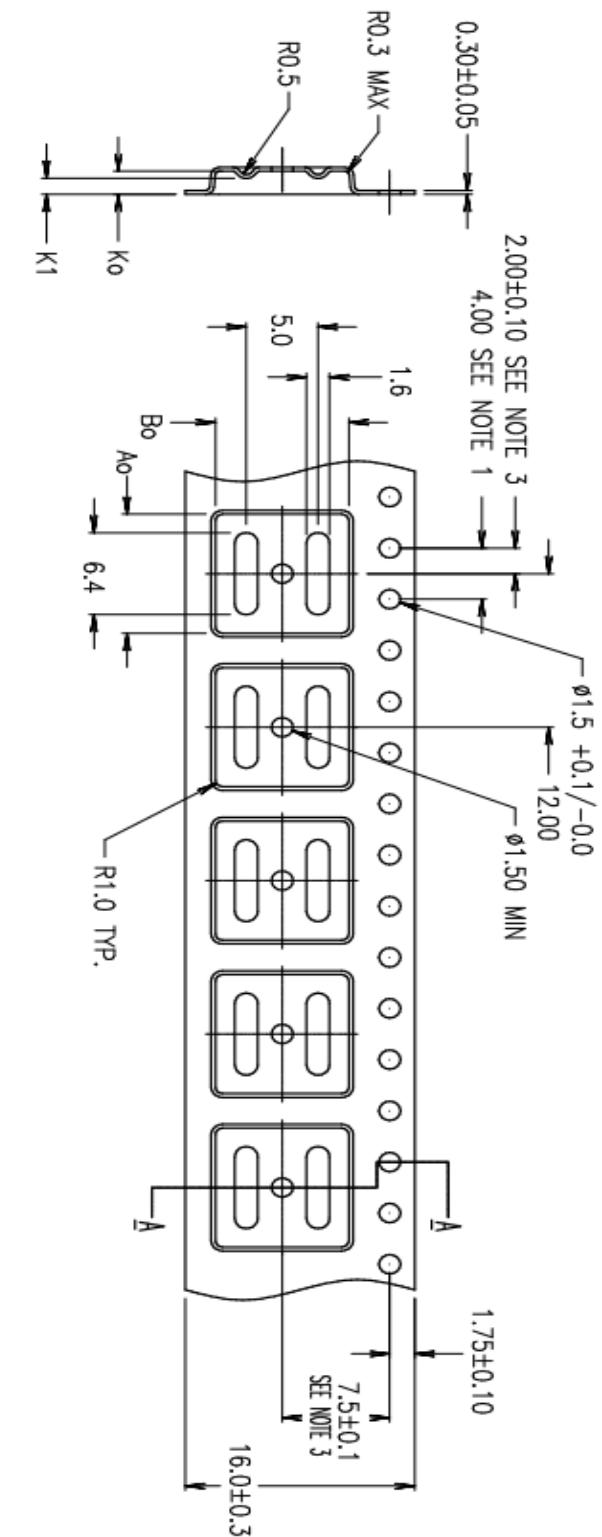


Figure 64.1 FT313H-TQFP Tape Dimensions

65 Contact Information

Head Office – Glasgow, UK

Future Technology Devices International Limited
Unit 1, 2 Seaward Place
Centurion Business Park
Glasgow G41 1HH
United Kingdom
Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-mail (Sales) sales1@ftdichip.com
E-mail (Support) support1@ftdichip.com
E-mail (General Enquiries) admin1@ftdichip.com

Web Site URL <http://www.ftdichip.com>
Web Shop URL <http://www.ftdichip.com>

Branch Office – Taipei, Taiwan

2F, No. 516, Sec. 1, NeiHu Road
Taipei 114
Taiwan , R.O.C.
Tel: +886 (0) 2 8791 3570
Fax: +886 (0) 2 8791 3576

E-mail (Sales) tw.sales1@ftdichip.com
E-mail (Support) tw.support1@ftdichip.com
E-mail (General Enquiries) tw.admin1@ftdichip.com

Branch Office – Hillsboro, Oregon, USA

7130 SW Fir Loop
Tigard, OR 97223
USA
Tel: +1 (503) 547 0988
Fax: +1 (503) 547 0987

E-Mail (Sales) us.sales@ftdichip.com
E-Mail (Support) us.support@ftdichip.com
E-Mail (General Enquiries) us.admin@ftdichip.com

Branch Office – Shanghai, China

Room 1103, No. 666 West Huaihai Road,
Changning District
Shanghai, 200052
China
Tel: +86 21 62351596
Fax: +86 21 62351595

E-mail (Sales) cn.sales@ftdichip.com
E-mail (Support) cn.support@ftdichip.com
E-mail (General Enquiries) cn.admin@ftdichip.com

Distributor and Sales Representatives

Please visit the Sales Network page of the FTDI Web site for the contact details of our distributor(s) and sales representative(s) in your country.

Legal Disclaimer:

System and equipment manufacturers and designers are responsible to ensure that their systems, and any Future Technology Devices International Ltd (FTDI) devices incorporated in their systems, meet all applicable safety, regulatory and system-level performance requirements. All application-related information in this document (including application descriptions, suggested FTDI devices and other materials) is provided for reference only. While FTDI has taken care to assure it is accurate, this information is subject to customer confirmation, and FTDI disclaims all liability for system designs and for any applications assistance provided by FTDI. Use of FTDI devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold harmless FTDI from any and all damages, claims, suits or expense resulting from such use. This document is subject to change without notice. No freedom to use patents or other intellectual property rights is implied by the publication of this document. Neither the whole nor any part of the information contained in, or the product described in this document, may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder. Future Technology Devices International Ltd, Unit 1, 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH, United Kingdom. Scotland Registered Company Number: SC136640

Appendix A – List of Figures and Tables

List of Figures

| | |
|----------------------------------------------------------------------------------------------------------------------|-----------|
| Figure 3.1 – FT232BL, FT245BL and FT2232D Tape Dimensions | 7 |
| Figure 4.1 – FT232BL, FT245BL and FT2232D Reel Dimensions | 8 |
| Figure 5.1 – FT232BQ and FT245BQ Tape Dimensions | 9 |
| Figure 6.1 – FT232BQ and FT245BQ Reel Dimensions..... | 10 |
| Figure 7.1 – FT232RL and FT245RL Tape Dimensions | 11 |
| Figure 8.1 – FT232RL and FT245RL Reel Dimensions..... | 12 |
| Figure 9.1 – FT232RQ and FT245RQ Tape Dimensions | 13 |
| Figure 10.1 – FT232RQ and FT245RQ Reel Dimensions..... | 14 |
| Figure 11.1 – FT2232HL and FT4232HL Tape Dimensions..... | 15 |
| Figure 12.1 – FT2232HL and FT4232HL Reel Dimensions | 16 |
| Figure 13.1 – FT2232HQ and FT4232HQ Tape Dimensions..... | 17 |
| Figure 14.1 – FT2232HQ and FT4232HQ Reel Dimensions | 18 |
| Figure 15.1 – FT232HL and FT232HQ Reel Dimensions..... | 19 |
| Figure 16.1 – FT232HL Cover Tape Dimensions | 20 |
| Figure 17.1 – FT232HQ Cover Tape Dimensions..... | 21 |
| Figure 18.1 – FT232HL Carrier Tape Dimensions | 22 |
| Figure 19.1 – FT232HQ Carrier Tape Dimensions..... | 23 |
| Figure 20.1 – FT232HL Tray Dimensions..... | 24 |
| Figure 21.1 – FT232HL Tray Dimensions Side View | 28 |
| Figure 22.1 – FT232HQ Tray Dimensions | 29 |
| Figure 23.1 – FT232HQ Tray Dimensions Side View | 35 |
| Figure 24.1 – FT232HL and FT232HQ Protective Belt..... | 36 |
| Figure 25.1 – VNC1L – A – Reel Vendor Part No. RD33008SW | 37 |
| Figure 26.1 – VNC1L – A – Cover Tape Vendor Part No. AA13305NP | 38 |
| Figure 27.1 – VNC1L – A – Carrier Tape Vendor Part No. Q07X07-A | 39 |
| Figure 28.1 – VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48 and QFN-64 , FT311D–LQFP Reel Dimensions | 40 |
| Figure 29.1 VNC2 – LQFP-32 VNC2 – LQFP-48, FT311D – LQFP Cover Tape Dimensions | 41 |
| Figure 30.1 VNC2 –LQFP-64, QFN-32, QFN-48, QFN-64, FT311D-QFN Cover Tape Dimensions | 42 |
| Figure 31.1 VNC2 – LQFP-32, VNC2 – LQFP-48, FT311D – LQFP Carrier Tape Dimensions | 43 |
| Figure 32.1 VNC2 – LQFP-64 Carrier Tape Dimensions | 44 |
| Figure 33.1 VNC2 – QFN-32, FT311D-QFN Carrier Tape Dimensions | 45 |
| Figure 34.1 VNC2 – QFN-48 and QFN-64 Carrier Tape Dimensions | 46 |
| Figure 36.1 VNC2 – LQFP-32, VNC2 – LQFP-48 and FT311D LQFP Tray Dimensions – Side View | 51 |
| Figure 37.1 VNC2 – LQFP-64 Tray Dimensions..... | 52 |
| Figure 38.1 VNC2 – LQFP-64 Tray Dimensions – Side View..... | 56 |

| | |
|-------------------------------------------------------------------------------------------------------------------------------|-----------|
| Figure 39.1 VNC2 – QFN-32 and FT311D QFN Tray Dimensions | 57 |
| Figure 40.1 VNC2 - QFN-48 and QFN-64 Tray Dimensions | 58 |
| Figure 41.1 VNC2 – QFN-48 and QFN-64 Tray Dimensions – Side View..... | 64 |
| Figure 42.1 VNC2 – LQFP-32, LQFP-48, LQFP-64, QFN-32, QFN-48, QFN-64 and FT311D-LQFP, FT311D-QFN Protective Belt | 65 |
| Figure 43.1 FT200XD Reel Dimensions | 66 |
| Figure 44.1 FT200XD Tape Dimensions..... | 67 |
| Figure 45.1 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN Reel Dimensions | 68 |
| Figure 46.1 FT201XQ, FT220XQ, FT221XQ, FT230XQ, FT231XQ, FT240XQ QFN Tape Dimensions | 69 |
| Figure 47.1 FT201XQ, FT220XQ, FT230XQ SSOP Reel Dimensions | 70 |
| Figure 48.1 FT201XQ, FT220XQ, FT230XQ SSOP Tape Dimensions | 71 |
| Figure 50.1 FT221XQ, FT231XQ, FT240XQ SSOP Tape Dimensions | 73 |
| Figure 51.1 FT120T, FT122T TSSOP Reel Dimensions | 74 |
| Figure 52.1 FT120T, FT122T TSSOP Tape Dimensions..... | 75 |
| Figure 53.1 FT121T, FT120Q, FT121Q, FT122Q Reel Dimensions | 76 |
| Figure 54.1 FT120Q, FT122Q QFN Tape Dimensions | 77 |
| Figure 55.1 FT121T TSSOP Tape Dimensions | 78 |
| Figure 56.1 FT121Q QFN Tape Dimensions | 79 |
| Figure 57.1 FT201XS, FT220XS, FT230XS, FT240XS Reel Dimensions..... | 80 |
| Figure 58.1 FT221XS, FT231XS Reel Dimensions | 81 |
| Figure 59.1 FT313H-QFN Reel Dimensions..... | 82 |
| Figure 60.1 FT313H-QFN Tape Dimensions | 83 |
| Figure 61.1 FT313H-LQFP Reel Dimensions | 84 |
| Figure 62.1 FT313H-LQFP Tape Dimensions | 85 |
| Figure 63.1 FT313H-TQFP Reel Dimensions | 86 |
| Figure 64.1 FT313H-TQFP Tape Dimensions | 87 |

List of Tables

| | |
|--------------------------------------------------|----------|
| Table 2.1 – Tape and Reel Quantities..... | 5 |
| Table 2.2 – Tube/Tray Quantities | 6 |

Appendix B – Revision History

Document Title: **FTDI Devices T&R Dimensions**
Document Reference No.: **FT_000154**
Clearance No.: **FTDI# 98**
Product Page: <http://www.ftdichip.com/Products/ICs.htm>
Document Feedback: [Send Feedback](#)

| | | |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Version draft | Draft for review | 17/07/09 |
| Version 1.0 | First Release – based on and supersedes AN232B-11 | 11/08/09 |
| Version 1.1 | Added the VNC2 tray and T&R dimensions drawings | 24/05/10 |
| Version 1.2 | Updated VNC2 tray dimensions drawings | 17/01/11 |
| Version 1.3 | Added pin 1 identifier to tapes | 17/02/11 |
| Version 1.4 | Added FT232H tape/reel /tray dimensions | 07/11/11 |
| Version 1.5 | Add Reel & Tape information of FTX series chips, FT12 series chips, FT311D and FT313H Updated contacts page Updated rev history feedback | 06/12/12 |