

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. PACKAGING: PACKAGE FLEXES IN TRAYS OR INDIVIDUALLY FOR EASY REMOVAL.
2. DIMENSIONS DESIGNATED WITH THE  $\textcircled{\text{FAI}}$  SYMBOL SHALL BE FIRST ARTICLE INSPECTION DIMENSIONS. THREE SAMPLE PARTS MUST BE FULLY INSPECTED. FAI REPORT MUST BE VALIDATED AND APPROVED BY APPLE INC. SQE.
3. TOLERANCES DESIGNATED WITH THE  $\textcircled{\text{SPC}}$  SYMBOL SHALL BE PRODUCED WITH STATISTICAL TOLERANCE PROCESS CONTROLS. IN ORDER TO USE THE TOLERANCE ON A FEATURE, THE STATISTICAL PROCESS (CP, CPK, ETC) OF THE PART MUST BE VALIDATED AND APPROVED BY APPLE INC. SQE.
4. ALL HOMOGENOUS MATERIALS MUST COMPLY WITH THE FOLLOWING ENVIRONMENTAL SPECIFICATIONS:  
- APPLE INC. REGULATED SUBSTANCES SPECIFICATIONS 069-0135
5. ALL FLEX, STIFFENER, AND COMPONENT MATERIALS MUST COMPLY WITH APPLE INC. PRODUCT SAFETY SPECIFICATION 062-9728.
6. FLEX THICKNESS: 0.232  $\pm$  0.030 MM (4 LAYER), 0.180  $\pm$  0.030 MM (3 LAYER WITH SILVER SHIELD) AND 0.173  $\pm$  0.030 MM (3 LAYER WITHOUT SILVER SHIELD)  $\textcircled{\text{FAI 260}}$
7. ODB++ IS MASTER DATA FOR LPI, COVERLAY, AND EXPOSED CU SPECIFICATIONS.
8. FLEXIBILITY: MUST SURVIVE 25 CYCLES OF BENDING FROM FLAT TO BENT STATE TO FLAT WITH NO LOSS OF SIGNAL INTEGRITY.
9. WEIGHT TO BE MEASURED AND REPORTED IN FAI REPORT.

10. EXPOSED COPPER FOR GROUND  
NO CONTAMINATION OR ENCAPSULANT OVERFLOW ALLOWED: 100% INSPECTION REQUIRED.

11. ENCAPSULATE COMPONENTS COMPLETELY WITH PANACOL 631591LV  
MAX FLOWAGE BEYOND COMPONENT: 0.55 MM  
MAX ENCAPSULATION HEIGHT WITH COMPONENT: 1.00 MM (UNLESS OTHERWISE NOTED)  $\textcircled{\text{FAI 125}}$   
ENCAPSULANT NOT TO OVERHANG FLEX EDGE.

12. COMPONENTS SHOWN ARE ONLY FOR REFERENCE AND NOT REFLECT ACTUAL COMPONENT PLACEMENT.

13. APPLY 2D BARCODE AT INDICATED LOCATION.  
- BARCODE FORMAT PLEASE REFER TO APPLE INC. LABEL SPEC: 081-2110-B.  
- BARCODE APPLICATION: MUST BE REMOVED AWAY FROM PARTS DURING FINAL ASSEMBLY PROCESS  
- COLOR: BLACK BACKGROUND WITH WHITE MARKINGS  
- BARCODE QUALITY: MUST MEET GRADE "C" OR BETTER FOR BARCODE VERIFIER ACCORDING TO ISO/IEC 15415  
- LABEL MUST HAVE STRONG ABRASION RESISTENCE CAPABILITY ACCORDING TO U969 & CSA TEST STANDARD.

14. INKJET: PART INFORMATION, INCLUDING APPLE INC. P/N AND REV, DATE CODE, VENDOR, SHOULD BE SPECIFIED  
PART AND VENDOR INFORMATION SHOULD NOT BE VISIBLE FROM TOP VIEW AFTER INSTALLATION.

15. ALL TOOLING, FIXTURING AND OTHER UNIQUE ITEMS THAT ARE USED TO CREATE OR INSPECT THIS PART ARE THE PROPERTY OF APPLE INC. AND SHALL BE PERMANENTLY MARKED WITH APPLE INC. NAME AND APPROPRIATE APPLE INC. PART NUMBER.

16. THE DESIGN OF ALL TOOLING OR FIXTURING SHALL BE APPROVED BY THE APPROPRIATE APPLE INC. ENGINEER PRIOR TO TOOL OR FIXTURE FABRICATION.

17. CONDUCTIVE ADHESIVE MATERIAL: TESA 60262  
THICKNESS: 0.050  $\pm$  0.010MM  $\textcircled{\text{FAI 126}}$

18. PRE-BENDS:  
CRITICAL BENDS FOR FINAL ASSEMBLY. REFER TO APPLE INC. FLEX SQE DOCUMENTS FOR FIXTURE CONTROL AND DIMENSIONAL MEASUREMENT. SEND BENDING FIXTURE DESIGN FOR REVIEW AND APPROVAL BY APPLE INC. PD, DFM, & SQE TEAMS.

19. MATERIAL: C7701 (Cu/Zn/Ni) ALLOY 16.5-19.5% Ni  
HARDNESS: H OR EH  
SUS THICKNESS: 0.100  $\pm$  0.010 MM  $\textcircled{\text{FAI 266}}$   
FINISH: AS-STAMPED, NO PLATING  
UN-PLATED FINISH SHALL BE CONFIRMED VIA CHEMICAL ANALYSIS

ATTACH WITH CONDUCTIVE ADHESIVE, TOYO TSC200-60GD, 0.060MM THICK  
BOARD-BOARD CONNECTOR STIFFENER MUST BE ELECTRICALLY CONNECTED TO GROUND.

TOTAL THICKNESS (STIFFENER +ADHESIVE) AFTER ATTACH 0.143MM  $\pm$  0.020 MM  $\textcircled{\text{FAI 267}}$

MAGNETIC PERMEABILITY OF FINAL PART SHALL NOT EXCEED 1.2 $\mu$   
TEST WITH A SEVEREN LO-MU MAGNETIC PERMEABILITY INDICATOR  $\textcircled{\text{FAI 128}}$   
(GO/NO-GO TYPE INDICATOR) PER 099-10531

20. CONDUCTIVE FOAM PS-1323, UNCOMPRESSED THICKNESS: 0.50 MM  $\pm$  0.10MM  $\textcircled{\text{FAI 132}}$

21. LOW TACK RELEASE LINER: 0.036 - 0.050 MM THICK, COLOR: TRANSPARENT BLUE

22. NON-CONDUCTIVE SPACER MATERIAL: FR4  $\textcircled{\text{FAI 245}}$   
THICKNESS: 0.10  $\pm$  0.020 MM

23. NON-CONDUCTIVE ADHESIVE MATERIAL: TESA 61385  
THICKNESS: 0.150  $\pm$  0.015MM  $\textcircled{\text{FAI 134}}$

24. ADHESIVE: 3M 467, THICKNESS: 0.060 MM  $\pm$  0.010 MM  $\textcircled{\text{FAI 130}}$

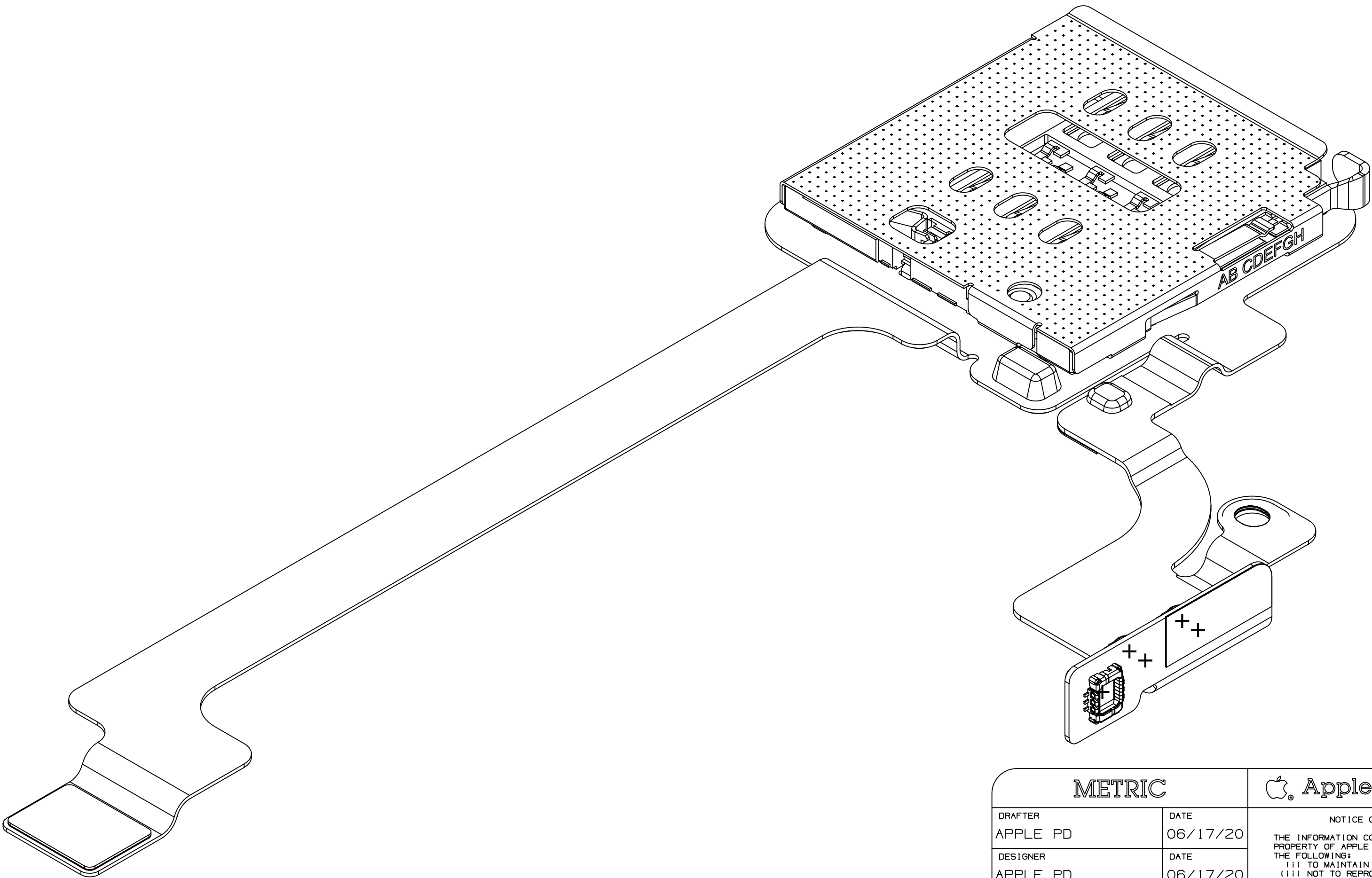
25. NON-CONDUCTIVE PSA: TESA 61375, THICKNESS: 0.125  $\pm$  0.015 MM  $\textcircled{\text{FAI 131}}$

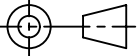

26. NON-CONDUCTIVE PSA: TESA 68742, THICKNESS: 0.050  $\pm$  0.005 MM  $\textcircled{\text{FAI 150}}$

27. STIFFENER MATERIAL: PI, (0.075) MM THICK  
EDGES SHALL BE COINCIDENT WITH FLEX OUTLINE UNLESS OTHERWISE SPECIFIED.  
TOTAL THICKNESS (STIFFENER + ADHESIVE) AFTER ATTACH: 0.100  $\pm$  0.010 MM  $\textcircled{\text{FAI 162}}$

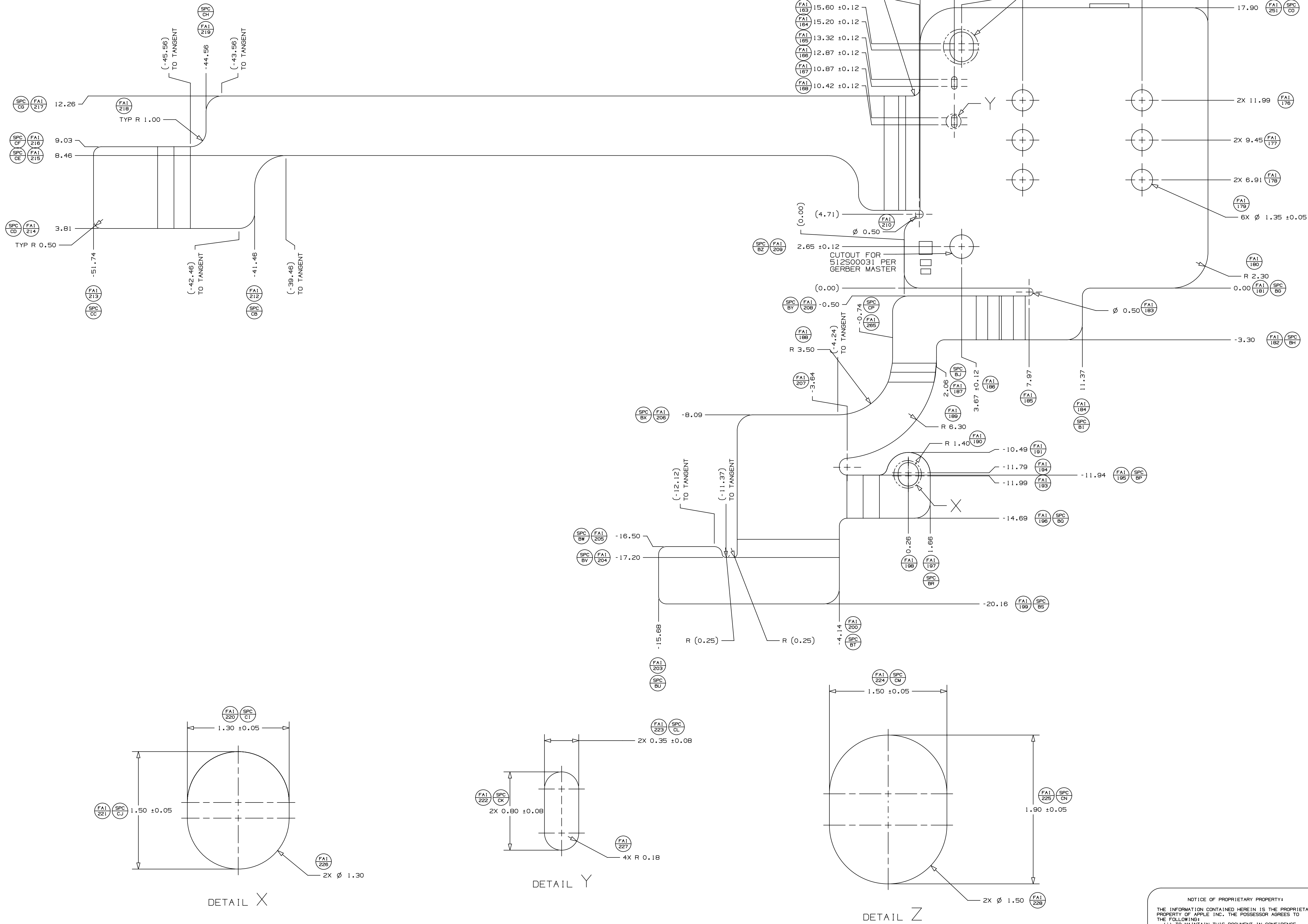
28. CONDUCTIVE PSA: PS-1352, THICKNESS: 0.300  $\pm$  0.050 MM  $\textcircled{\text{FAI 252}}$

29. NON-CONDUCTIVE PSA: TESA 51983, THICKNESS: 0.030  $\pm$  0.005 MM  $\textcircled{\text{FAI 268}}$



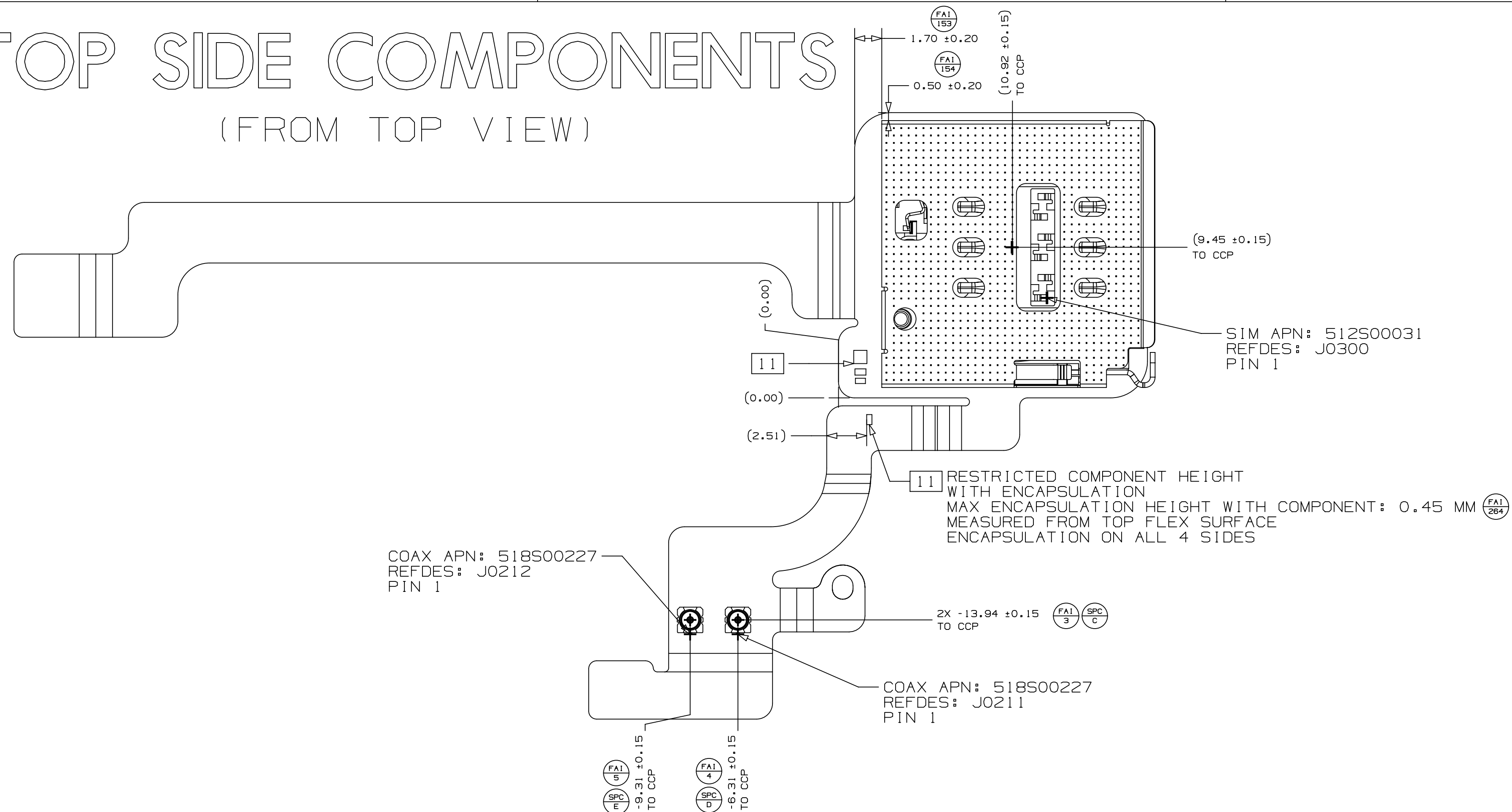
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DRAFTER APPLE PD	DATE 06/17/20	NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE INC. THE POSSESSOR AGREES TO THE FOLLOWING: (i) TO MAINTAIN THIS DOCUMENT IN CONFIDENCE (ii) NOT TO REPRODUCE OR COPY IT (iii) NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART (iv) ALL RIGHTS RESERVED	
DESIGNER APPLE PD	DATE 06/17/20	TITLE  MCO, SIM BANJO B, CAP, FLEX, NYN, X1908	
DIMENSIONS ARE IN MILLIMETERS TOLERANCES  X.X ±0.2  X.XX ±0.10  X.XXX ±0.050  ANGLES ±0.5°  DO NOT SCALE DRAWINGS		DRAWING NUMBER  056-12504	REV.  A
THIRD ANGLE PROJECTION 		SCALE  NONE	SHT 1 OF 10
		SIZE 	

FLEX OUTLINE



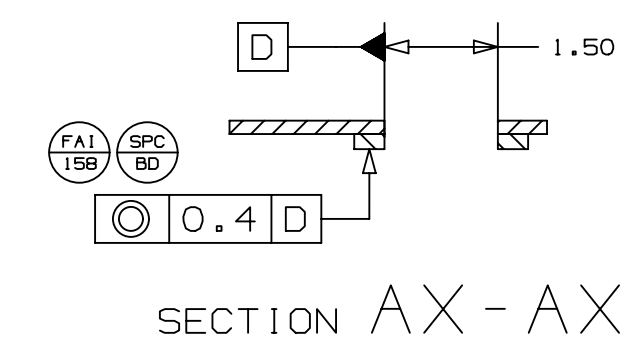
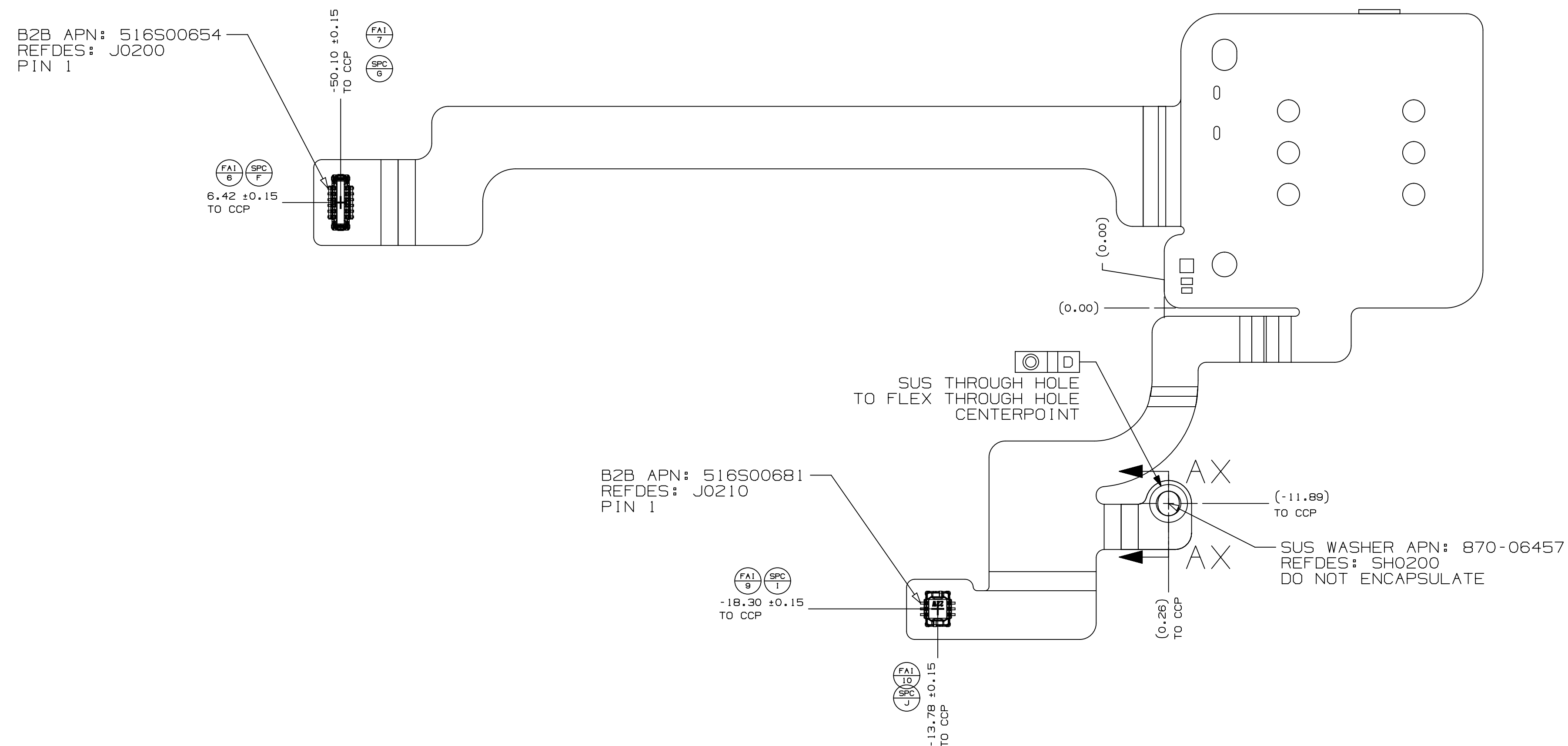
# TOP SIDE COMPONENTS

(FROM TOP VIEW)



# BOTTOM SIDE COMPONENTS

(FROM TOP VIEW)



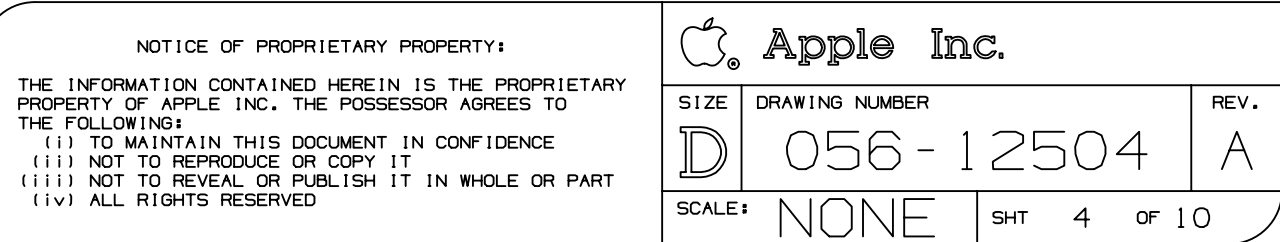
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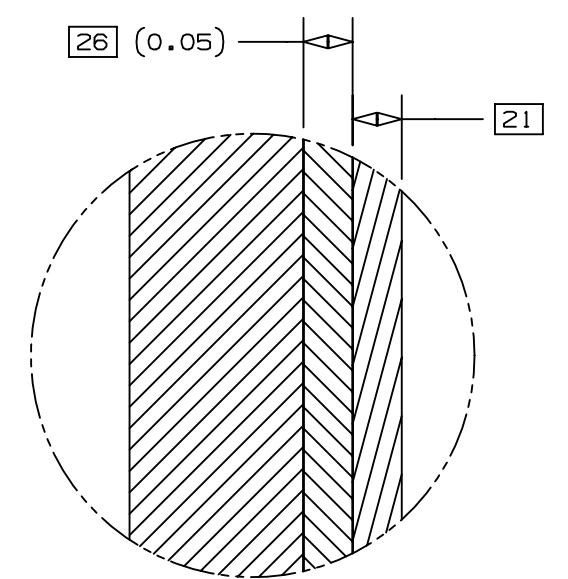
SIZE	DRAWING NUMBER	REV.
D	056-12504	A
SCALE:	NONE	SHT 3 OF 10

## 1



## 1

STIFFENER & ADHESIVE PLACEMENT TOLERANCE IS 0.20  
UNLESS OTHERWISE NOTED

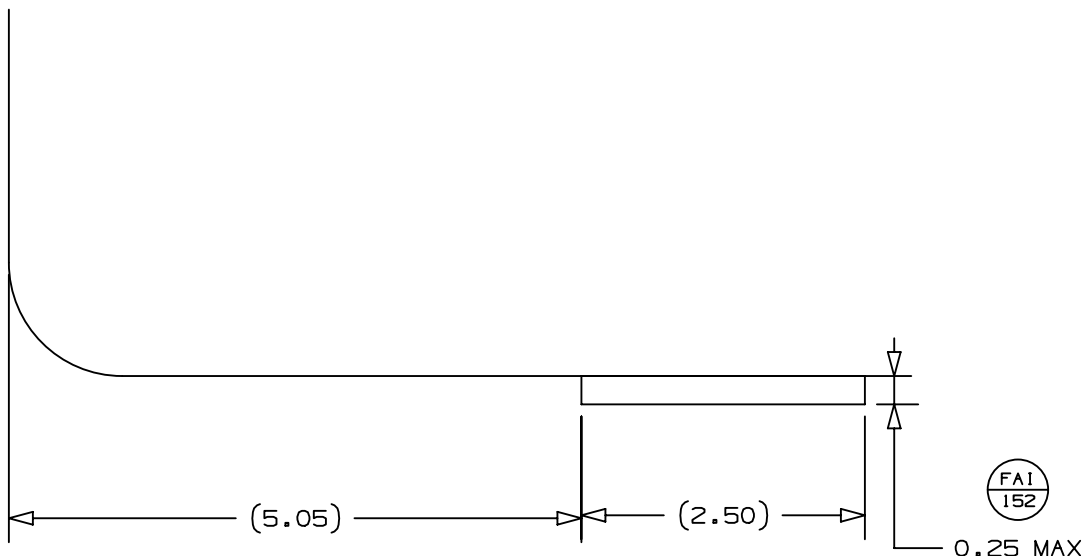
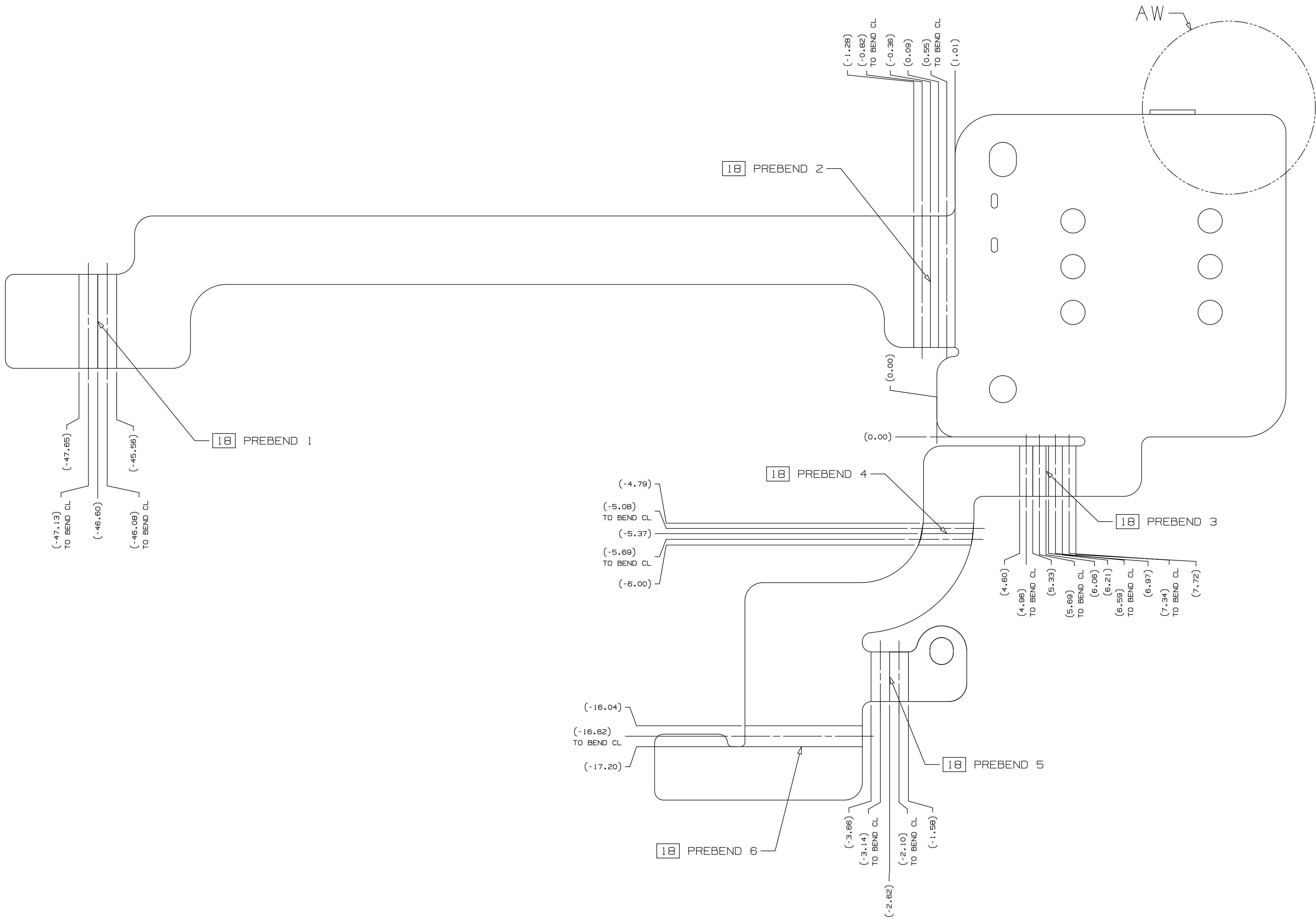


DETAIL AT

SIZE D	DRAWING NUMBER 056-12504	REV. A
SCALE: NONE	SHT 5 OF 10	

# BEND AREAS

(FLAT, VIEWED FROM TOP VIEW)



DETAIL AW

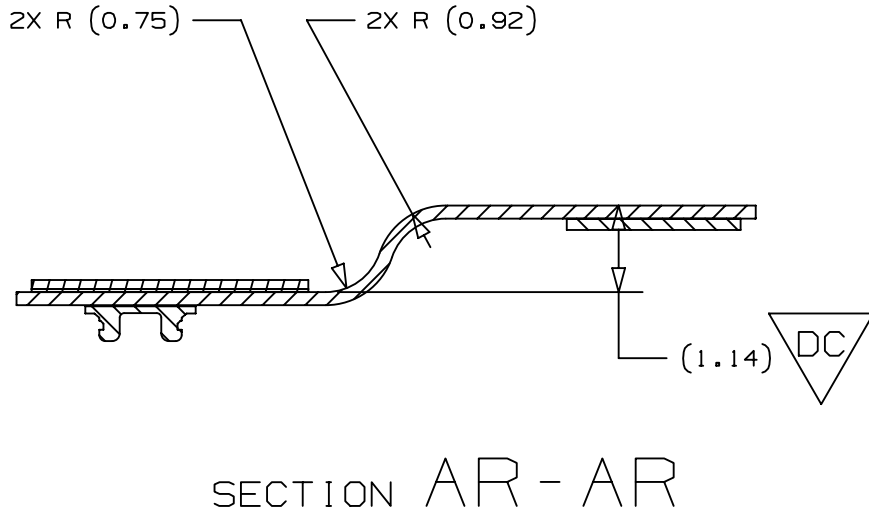
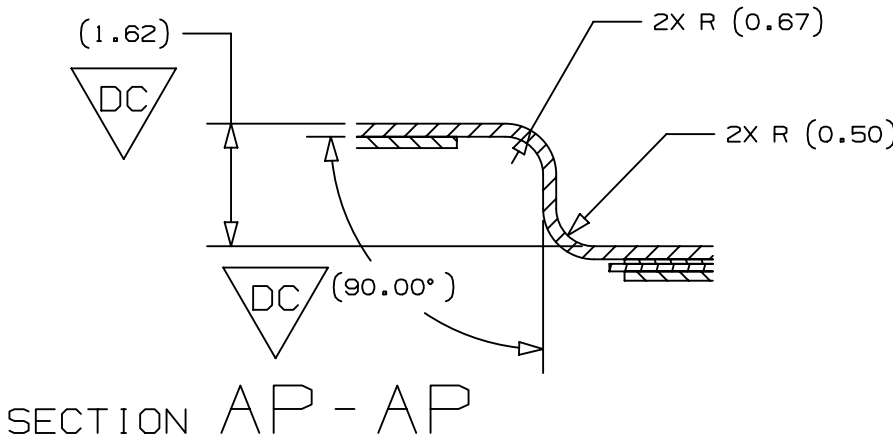
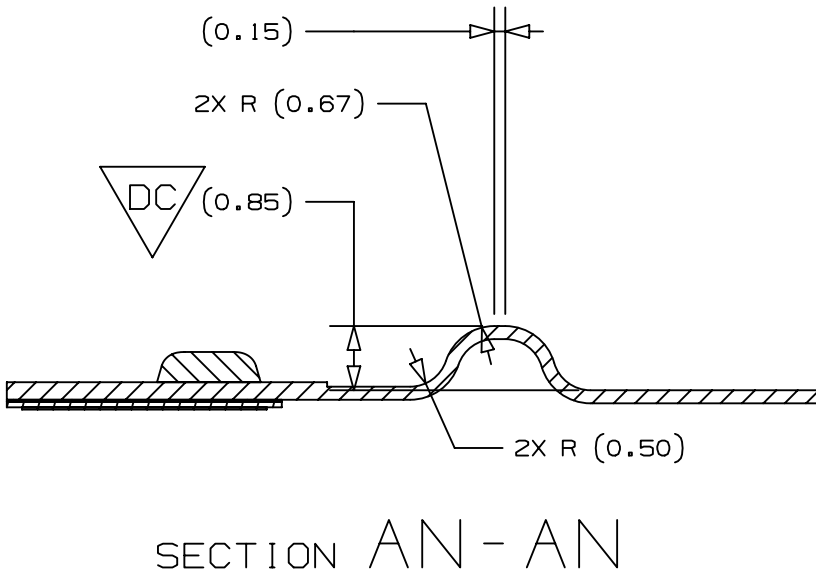
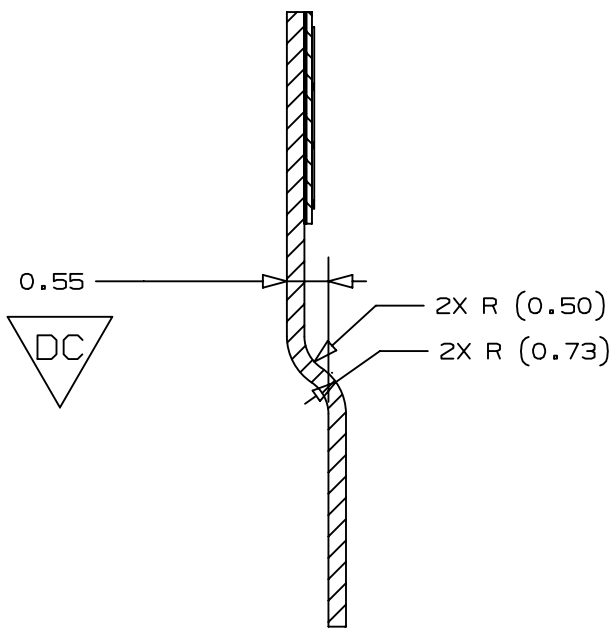
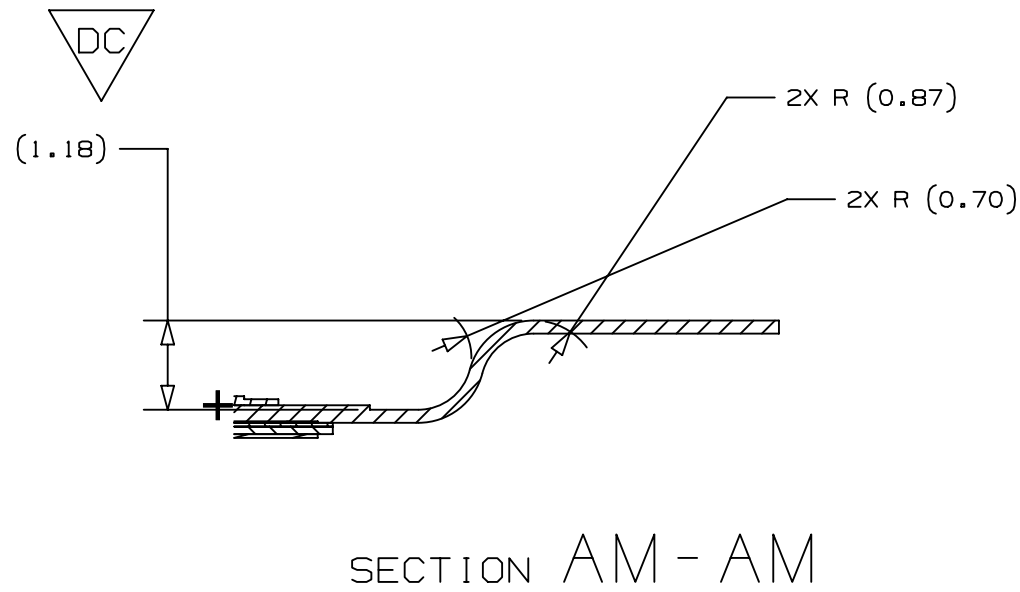
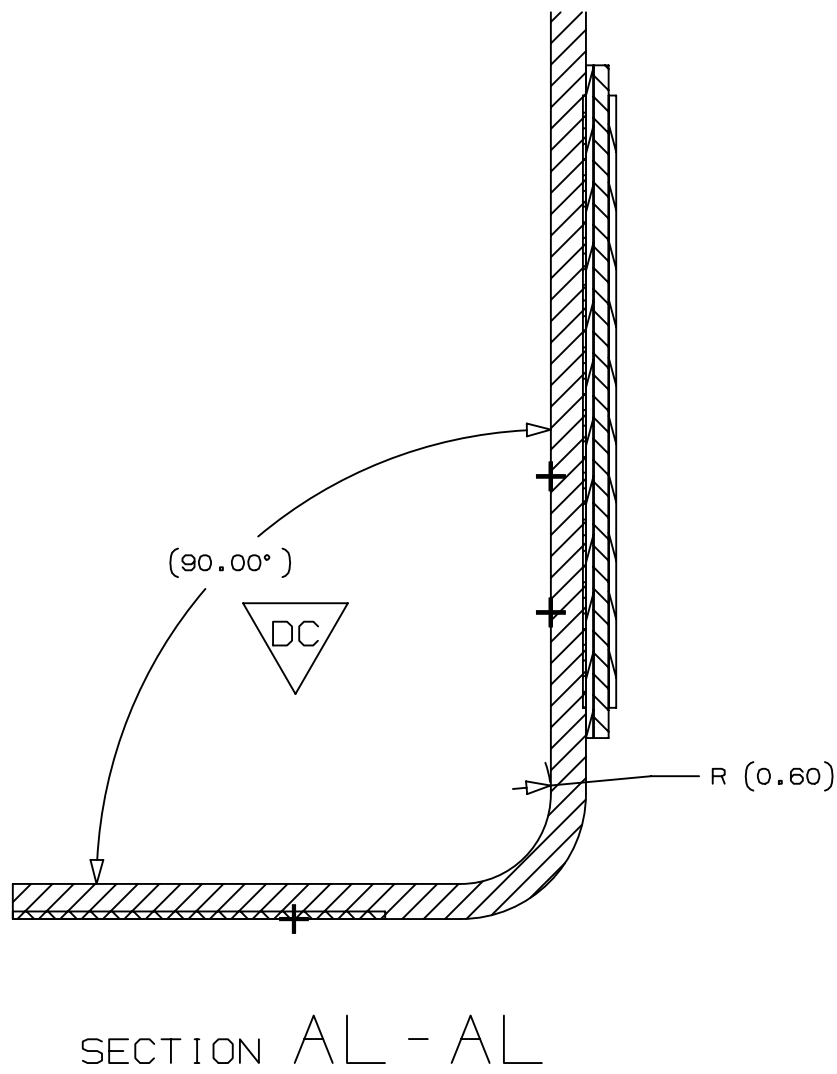
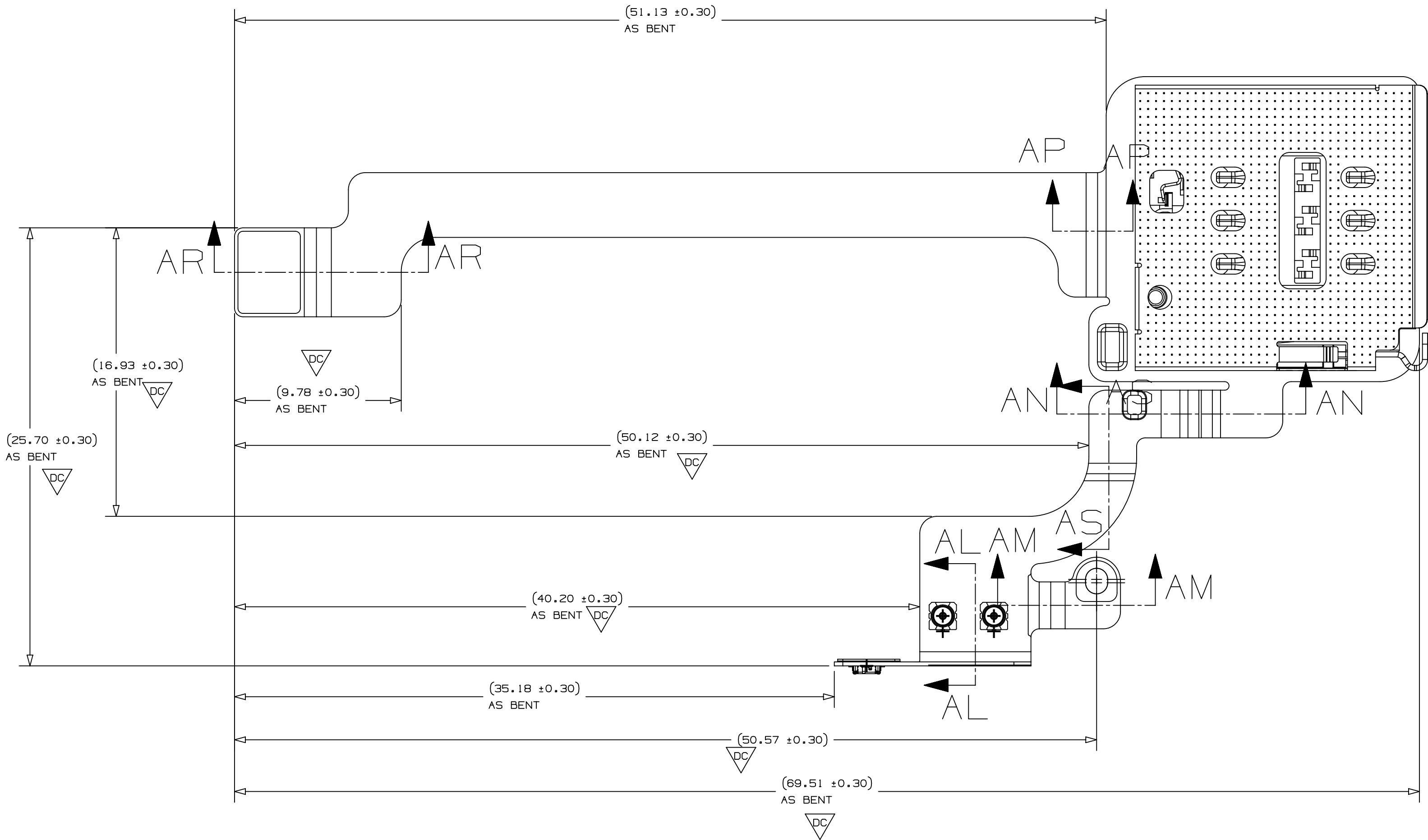
PRE-BENDS 18

(AS BENT, VIEWED FROM TOP VIEW)

FLEXES NEED 100%  $\Delta_{100\%}$  VISUAL CHECK TO ENSURE BENDING  
SHAPE IS IDENTICAL TO BENDING FITURE QUALIFICATION  
SAMPLES AT TIME ZERO (T0)

DIMENSIONS WITH DC  $\nabla$  SYMBOLS NEED SAMPLING

AS A PART OF FLEX VENDOR OQC  
MAY SHIP IN RELAXED STATE

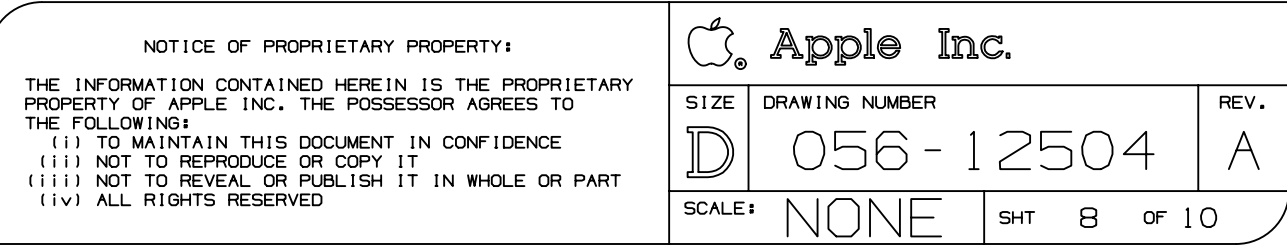


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D	056-12504	A
SCALE:	NONE	SHT 7 OF 10



AS VIEWED FROM TOP  
EXCEPT WHERE INDICATED, EXPOSED COPPER  
OFFSET FROM FLEX OUTLINE 0.20 MM





AS VIEWED FROM TOP  
EXCEPT WHERE INDICATED, EXPOSED COPPER  
OFFSET FROM FLEX OUTLINE 0.20 MM


$$= (-13.09)$$
 $(1.46)$ 

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THICKNESS REGIONS

