

Apple Bluetooth Module
EUT: Model A1115

Apple File No. 2040C
IC: 579C-A1115

Antenna Model Number	Antenna Connector	Maximum Gain (dBi)
A1067	u.fl	+2.4
613-5956	u.fl	-2.6

Antenna	Max Gain dBi	Weight	High	Width	Deep
A1067	2.4	2.23 Grams	30.2 mm	8.4 mm	8.4mm

D

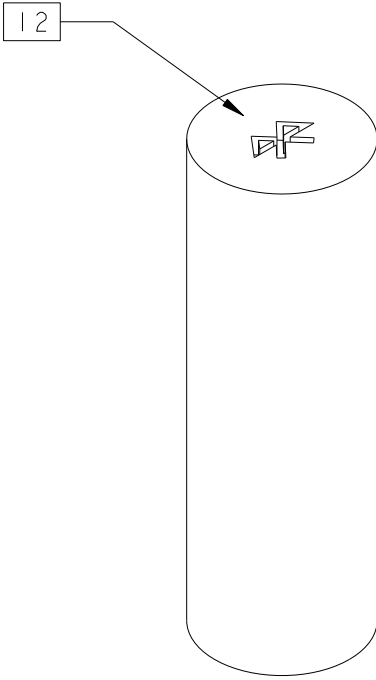
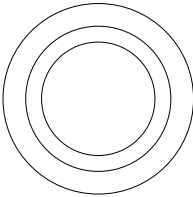
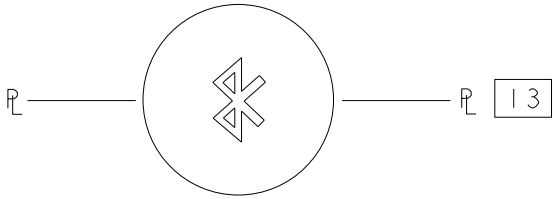
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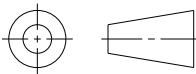
A

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- NOTES: UNLESS OTHERWISE SPECIFIED
1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M 1994.
 2. ALL GEOMETRY IS TO BE DERIVED FROM THE CAD DATABASE. CRITICAL-TO-FUNCTION DIMENSIONS CALLED OUT ON THIS DRAWING ARE FOR INSPECTION PURPOSES.
 3. MATERIAL: TPB, KRAIBURG TC6MAC OR APPLE APPROVED EQUIVALENT COLOR: MOON GRAY 3 PER APPLE 912-0390.
 4. TEXTURE: SPI-D2 ON VISIBLE SURFACES
 5. PARTING LINE MISMATCH NOT TO EXCEED 0.13mm.
 6. MOLD DESIGN TO MINIMIZE EJECTION PIN MARKS, GATE BLUSH, FLOW LINES, AND WELD MARKS. MOLD CONSTRUCTION TO CONFORM TO GOOD MOLDING INDUSTRY PRACTICES AS STATED IN THE CURRENT EDITION OF "STANDARDS AND PRACTICES OF PLASTIC" CUSTOM MOLDERS" BY THE SOCIETY OF THE PLASTIC INDUSTRY.
 7. TOOL DESIGN MUST BE REVIEWED BY APPLE COMPUTER TOOLING ENGINEERING PRIOR TO FABRICATION.
 8. MOLD TO BE PROPERTY OF APPLE COMPUTER AND SHALL BE MARKED WITH APPLE'S NAME, APPROPRIATE PART NUMBER, AND DATE.
 9. GATE VESTIGE OR TRIM NOT TO EXCEED 0.13mm.
 10. APPEARANCE SURFACES TO CONFORM TO APPLE COSMETIC SPECIFICATION 062-2006. THE COSMETIC GRADE FOR THE EXTERNAL SURFACES TO BE DEFINED AS 10-1B.
 11. PART TO BE FREE OF MOLD RELEASE ON APPEARANCE SURFACES.
- 12 NO PARTING LINE ON ICON SURFACE.
- 13 ORIENT PARTING LINE TO ICON AS SHOWN.



REV	RFA #	DESCRIPTION OF REVISION	ENG APPD	DATE
01	267162	INITIAL PLOT	RAP	MAY08,03
02	275890	ADDED PARTING LINE & NOTE 13	RAP	MAY16,03

DIMENSIONS ARE IN MILLIMETERS TOLERANCES (UNLESS OTHERWISE SPECIFIED) 0 - 2 ± 0.05 2 - 10 ± 0.08 10 - 50 ± 0.10 50 - 100 ± 0.15 100 - 200 ± 0.20 > 200 ± 0.30 ANGLES ± 0.5° DO NOT SCALE DRAWING		METRIC		Apple Computer, Inc.	
DRAWN RAP		DATE MAY08,03		NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE COMPUTER, 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	
		DESIGN RAP		DATE MAY08,03	
PRO/B CAD MODEL 815-7532		BLUETOOTH OVERMOLD APPLE COMPUTER			
SCALE 3.000					
THIRD ANGLE PROJECTION		SIZE		DRAWING NO	
		B		815-7532	
				02	
				SHEET OF	

D

C

B

A

4

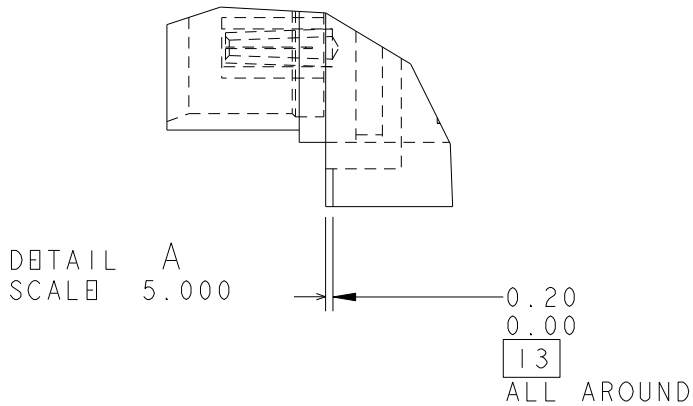
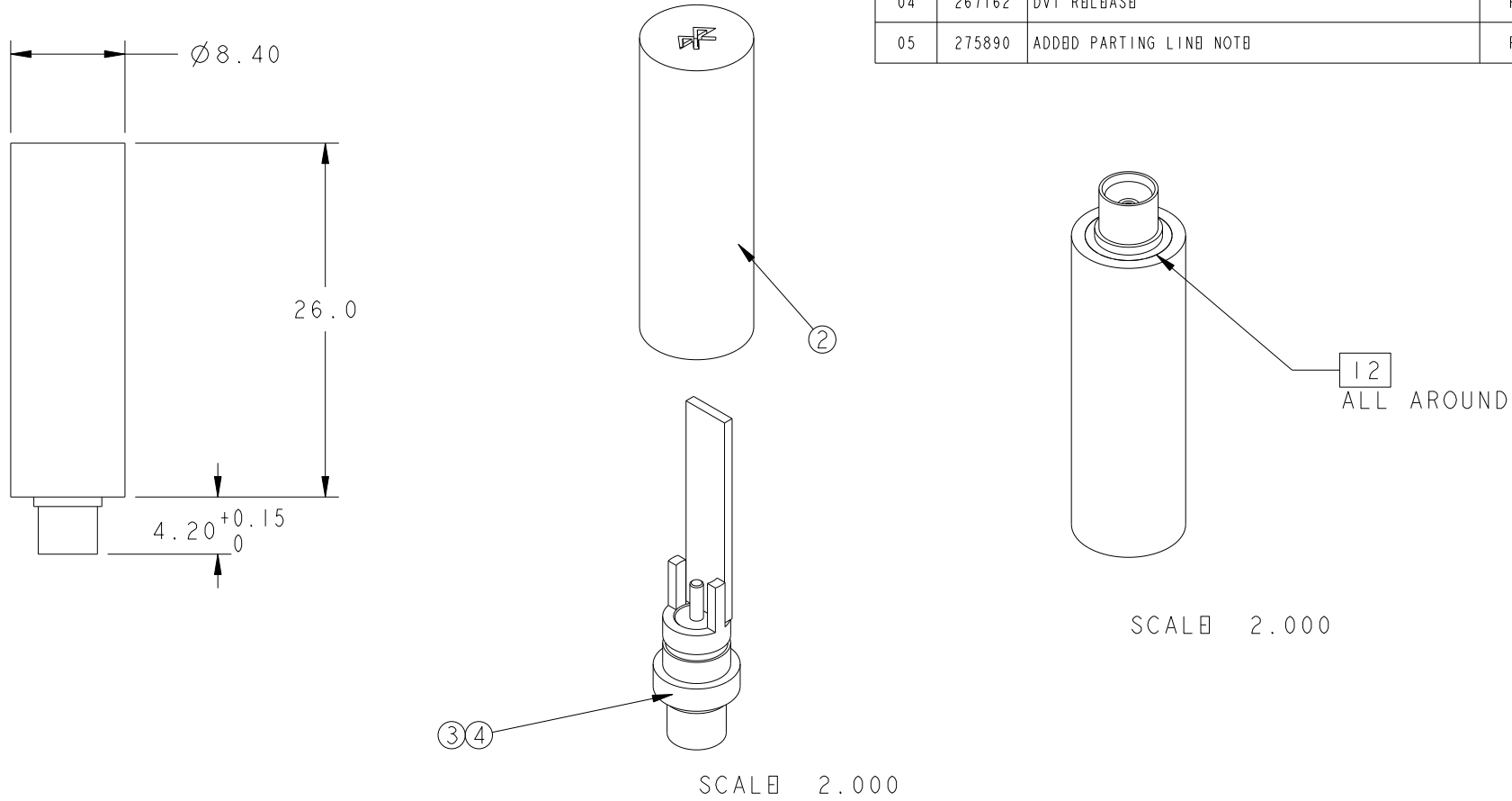
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2

1

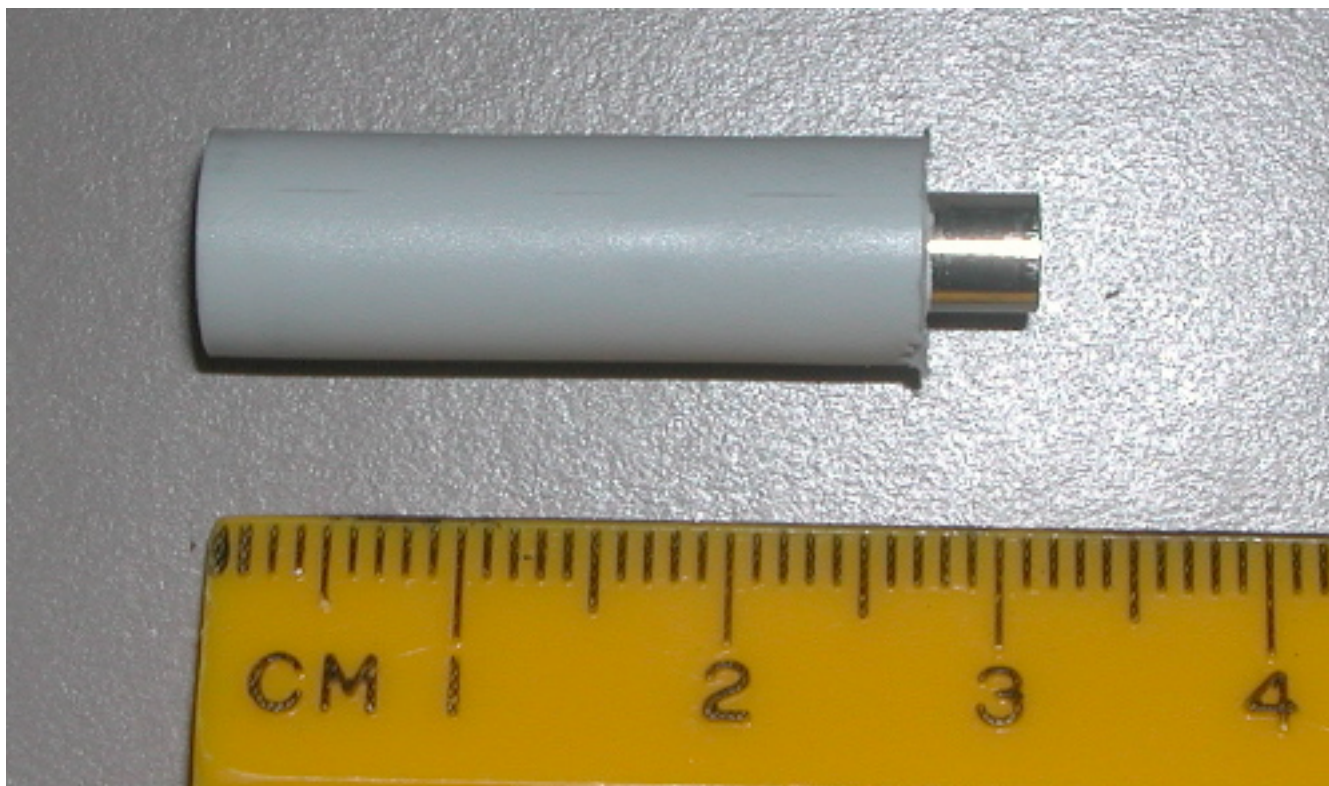
NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M 1994.
2. ALL GEOMETRY IS TO BE DERIVED FROM THE CAD DATABASE. CRITICAL-TO-FUNCTION DIMENSIONS CALLED OUT ON THIS DRAWING ARE FOR INSPECTION PURPOSES.
3. MATERIAL: REFER TO PART DRAWINGS.
4. TEXTURE: REFER TO PART DRAWINGS.
5. PARTING LINE MISMATCH NOT TO EXCEED 0.13mm.
6. MOLD DESIGN TO MINIMIZE EJECTION PIN MARKS, GATE BLUSH, FLOW LINES, AND WELD MARKS. MOLD CONSTRUCTION TO CONFORM TO GOOD MOLDING INDUSTRY PRACTICES AS STATED IN THE CURRENT EDITION OF "STANDARDS AND PRACTICES OF PLASTIC" CUSTOM MOLDERS" BY THE SOCIETY OF THE PLASTIC INDUSTRY.
7. TOOL DESIGN MUST BE REVIEWED BY APPLE COMPUTER TOOLING ENGINEERING PRIOR TO FABRICATION.
8. MOLD TO BE PROPERTY OF APPLE COMPUTER AND SHALL BE MARKED WITH APPLE'S NAME, APPROPRIATE PART NUMBER, AND DATE.
9. GATE VESTIGE OR TRIM NOT TO EXCEED 0.13mm.
10. APPEARANCE SURFACES TO CONFORM TO APPLE COSMETIC SPECIFICATION 062-2006. THE COSMETIC GRADE FOR THE EXTERNAL SURFACES TO BE DEFINED AS 10-2D.
11. PART TO BE FREE OF MOLD RELEASE ON APPEARANCE SURFACES.
- 12 NO FLASH ALLOWED.
- 13 OVERMOLD MAY BE FLUSH TO 0.2mm UNDERFLUSH WITH COLLAR.
- 14 ORIENT PARTING LINE TO ICON AS SHOWN.



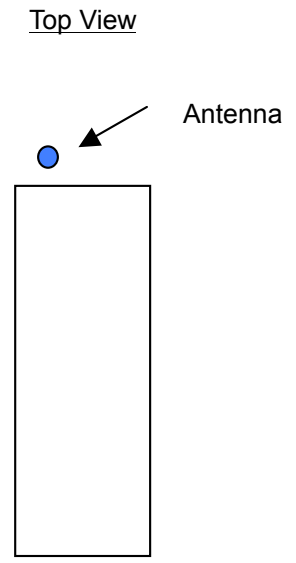
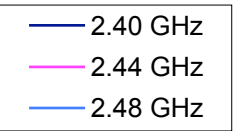
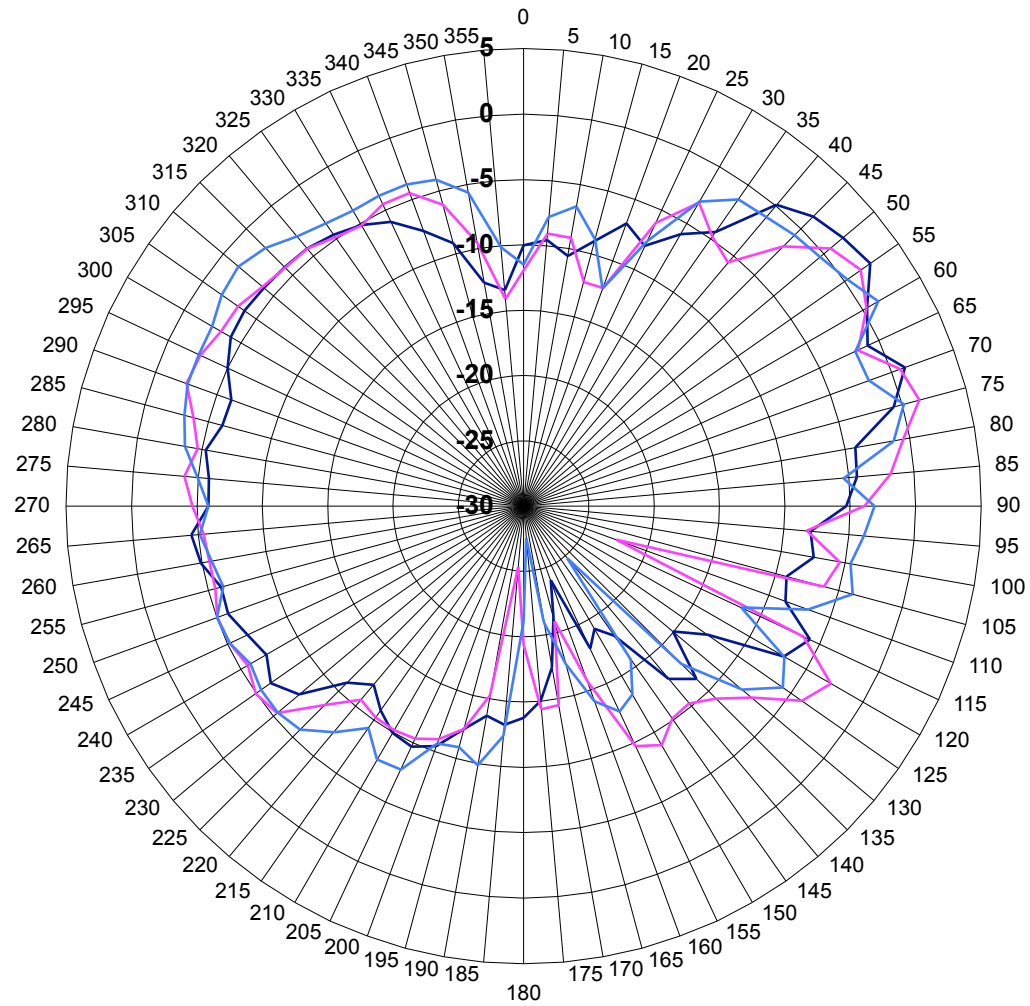
DIMENSIONS ARE IN MILLIMETERS		TOLERANCES (UNLESS OTHERWISE SPECIFIED)	
0 - 2	± 0.05	2 - 10	± 0.08
10 - 50	± 0.10	50 - 100	± 0.15
100 - 200	± 0.20	> 200	± 0.30
ANGLES ± 0.5°		DO NOT SCALE DRAWING	

METRIC		Apple Computer, Inc.	
DRAWN	RAP	DATE	MAY05,03
DESIGN	RAP	DATE	MAY05,03
PRO/B CAD MODEL		603-3045	
SCALE		2.000	
THIRD ANGLE PROJECTION		SIZE	
		DRAWING NO	
		603-3045	
		REV	
		05	
		SHEET	
		OF	
		1	





Antenna Model A1067



Antenna Model A1067 External Antenna Patterns

	2.40 GHz	2.44 GHz	2.48 GHz
0	-10.03835	-11.96459	-11.50357
5	-9.581989	-9.073917	-7.824733
10	-10.56911	-9.153512	-6.713154
15	-8.97483	-12.24115	-8.855391
20	-7.0126	-12.26909	-12.3047
25	-8.070571	-6.109953	-7.655806
30	-5.98765	-3.219242	-3.099052
35	-4.442096	-4.817008	-1.382272
40	0.068991	-5.702644	-1.130784
45	1.312484	-1.892037	-0.727012
50	1.894401	0.678379	-0.389715
55	2.407361	1.49217	0.235784
60	0.351263	0.249352	1.348399
65	-0.957357	-1.761153	-2.001771
70	1.029846	0.619867	-1.87875
75	-0.687545	1.323981	0.11924
80	-4.21222	-0.517146	-1.25682
85	-4.426505	-1.828809	-5.423966
90	-5.335782	-3.921887	-3.162481
95	-7.970073	-8.24368	-3.909829
100	-7.468774	-5.460427	-4.632046
105	-9.210662	-6.214457	-3.92628
110	-8.69893	-22.43459	-6.887175
115	-5.864391	-6.397224	-11.63765
120	-7.020487	-2.879235	-6.965231
125	-12.84016	-4.020503	-5.811191
130	-15.12087	-7.201662	-8.193522
135	-11.33686	-9.134813	-12.9073
140	-12.75895	-10.31507	-24.79316
145	-17.89182	-10.17635	-15.69919
150	-19.14675	-8.902322	-13.36676
155	-17.95664	-9.734718	-12.676
160	-23.9593	-15.71826	-14.09567
165	-21.2269	-20.87837	-17.50182
170	-17.41839	-14.52719	-20.96475
175	-15.0544	-14.41536	-27.55443
180	-13.7949	-19.38175	-21.18683
185	-13.19544	-25.34015	-12.34466
190	-13.71149	-15.31614	-9.875537
195	-12.33462	-12.32299	-10.88894
200	-10.45525	-11.01351	-10.65839
205	-9.666121	-10.35955	-7.783642
210	-9.989364	-10.19938	-7.586488
215	-10.97002	-10.25099	-9.265891
220	-12.16197	-10.65322	-7.44247
225	-10.90546	-8.497857	-5.794559
230	-7.597901	-5.418791	-5.447239

235	-6.397491	-4.999994	-5.473012
240	-7.283841	-5.653408	-5.895178
245	-6.725956	-5.199237	-5.200245
250	-5.934934	-5.075652	-5.045162
255	-6.059343	-5.594752	-6.222062
260	-4.968338	-5.59208	-5.783324
265	-4.513696	-5.458217	-5.144912
270	-5.905113	-4.668907	-5.878783
275	-5.840154	-3.993609	-5.006478
280	-5.311859	-4.724874	-3.686656
285	-6.142645	-3.850901	-3.169656
290	-6.205733	-2.551008	-2.664163
295	-5.031802	-2.724442	-2.596477
300	-4.153899	-3.285694	-2.498547
305	-3.934139	-3.379647	-1.797635
310	-4.042771	-3.88967	-1.520907
315	-4.197103	-4.230342	-2.055883
320	-4.241681	-4.280611	-3.057732
325	-4.650069	-4.918765	-3.609169
330	-5.180167	-5.247031	-3.884972
335	-6.029757	-4.508855	-3.807353
340	-7.616574	-4.519939	-3.819561
345	-9.187682	-6.148097	-4.13117
350	-12.66112	-9.523358	-5.643975
355	-13.41011	-14.13005	-10.14502

Max	2.407361	1.49217	1.348399
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Apple Antenna 613-5956

NOTES (UNLESS OTHERWISE SPECIFIED):

- THREE DIMENSIONAL CAD GEOMETRY PROVIDED BY APPLE SHALL BE USED FOR CREATION OF THIS PART OR ASSEMBLY. DRAWING SHALL BE USED TO IDENTIFY CRITICAL TOLERANCES AND REFERENCE FEATURES. DIMENSIONS ON DRAWING SHALL BE USED AS REFERENCE ONLY UNLESS OTHERWISE SPECIFIED ON DRAWING.
- ALL DIMENSIONS AND TOLERANCES APPLY PER ASME Y14.5M, 1994. IT IS EXPECTED THAT THE SUPPLIER UNDERSTAND AND COMPLY WITH ALL TOLERANCES AS DESCRIBED IN THIS STANDARD AND APPLIED TO THIS DRAWING.
- ALL DIMENSIONS THAT LOCATE GEOMETRICALLY TOLERANCE FEATURES (PROFILE AND POSITION CHARACTERISTICS) ARE CONSIDERED BASIC AS DEFINED IN THE ASME Y14.5M, 1994 STANDARD.
- ON PARTS SUBJECT TO FREE STATE VARIATION, ALL GEOMETRIC TOLERANCES APPLY WHEN THE PART IS RESTRAINED ACCORDING TO FUNCTIONAL MATING CONDITIONS AS DEFINED BY THE FEATURE CONTROL FRAME (DATUM'S A, B, AND C). SEE APPLE SUPPLIER QUALITY ENGINEER(SQE) FOR APPROVAL/ CLARIFICATION ON INDIVIDUAL PARTS.
- WHEN DATUMS ARE SPECIFIED ON A DRAWING, DIMENSIONS ARE RELATED TO DATUM A (AS THE PRIMARY DATUM), DATUM B (SECONDARY), AND DATUM C (TERTIARY).
- PERFECT ORIENTATION AND/OR PERFECT LOCATION AT MMC REQUIRED FOR THE INTERRELATIONSHIP OF ALL DATUM FEATURES OF SIZE, UNLESS OTHERWISE SPECIFIED ON DRAWING.
- UNLESS OTHERWISE SPECIFIED, ALL SURFACES TO BE WITHIN A SURFACE PROFILE TOLERANCE OF $\sqrt{.30}$ A B C
- TOLERANCES DESIGNATED WITH THE 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 SQE.
- ALL TOOLING, FIXTURING AND OTHER UNIQUE ITEMS THAT ARE USED TO CREATE THIS PART ARE THE PROPERTY OF APPLE COMPUTER AND SHALL BE PERMANENTLY MARKED WITH APPLE'S NAME AND APPROPRIATE APPLE PART NUMBER.
- THE DESIGN OF ALL TOOLING OR FIXTURING REQUIRED FOR THE MANUFACTURING OR VERIFICATION OF THE PART SHALL BE APPROVED BY THE APPROPRIATE APPLE COMPUTER ENGINEER PRIOR TO TOOL OR FIXTURE FABRICATION.

11 MARK PART WITH CONTRASTING INK APPROXIMATELY WHERE INDICATED WITH APPLE P/N 603-6382, REVISION LEVEL, VENDOR ID, DATE CODE, AND COUNTRY OF ORIGIN
DO NOT USE LABEL TO MARK PART.

12 CABLE:
HITACHI UPI745, 32AWG OR
FOXCONN 703-3208-211
JACKET MAX OUTER DIAMETER 1.13MM
COLOR: BLACK

13 BLUETOOTH ANTENNA
MATERIAL: PHOSPHOR BRONZE, NICKEL PLATED, 0.30 MM THICK
FINISH: NONE

14 BLUETOOTH CONN
HIROSE U.FL-LP-5016-A-(L) OR
FOXCONN SGX0003-00

15 CABLE/SHEETMETAL ASSEMBLY TO BE TESTED FOR CONTINUITY.VSWR TEST
PREFERRED BUT NOT REQUIRED.

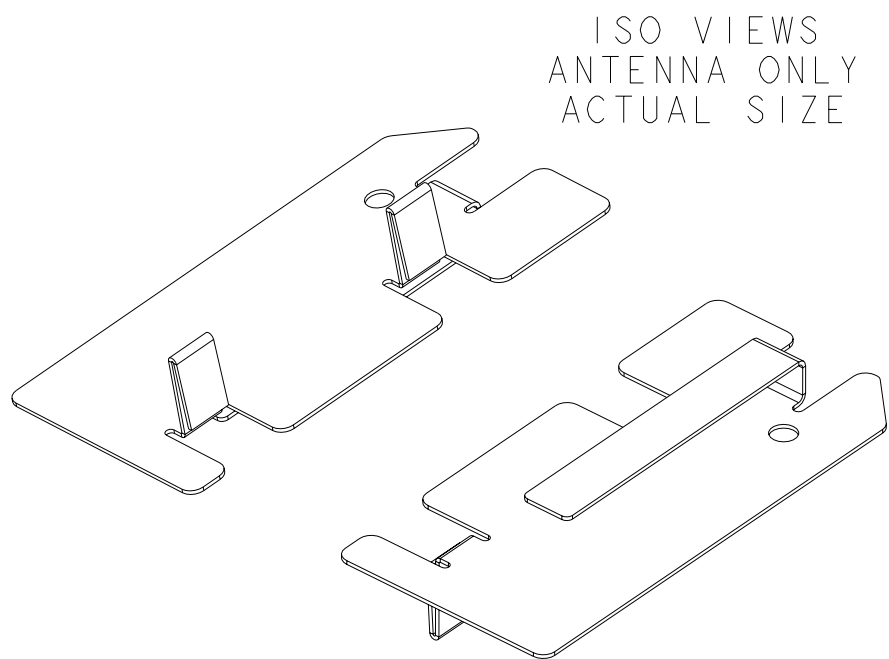
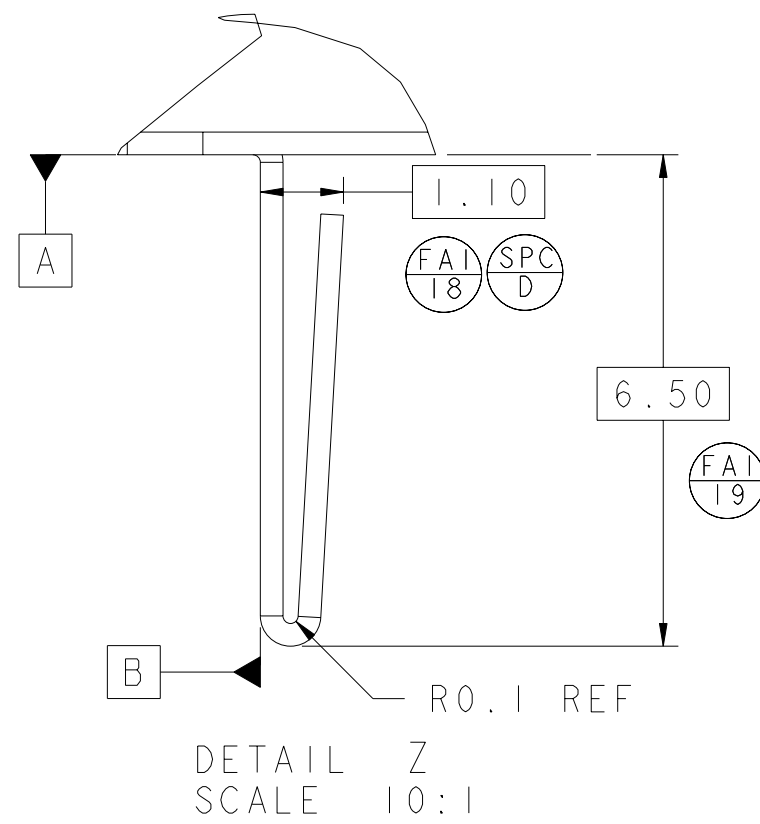
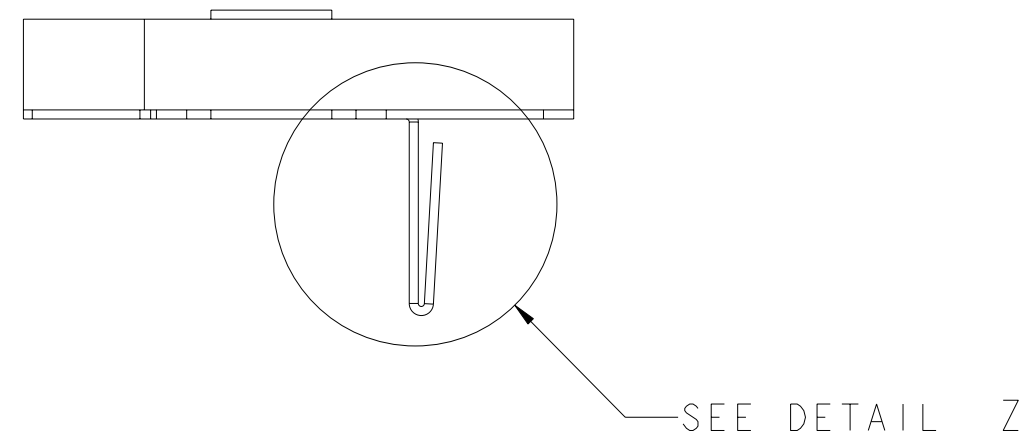
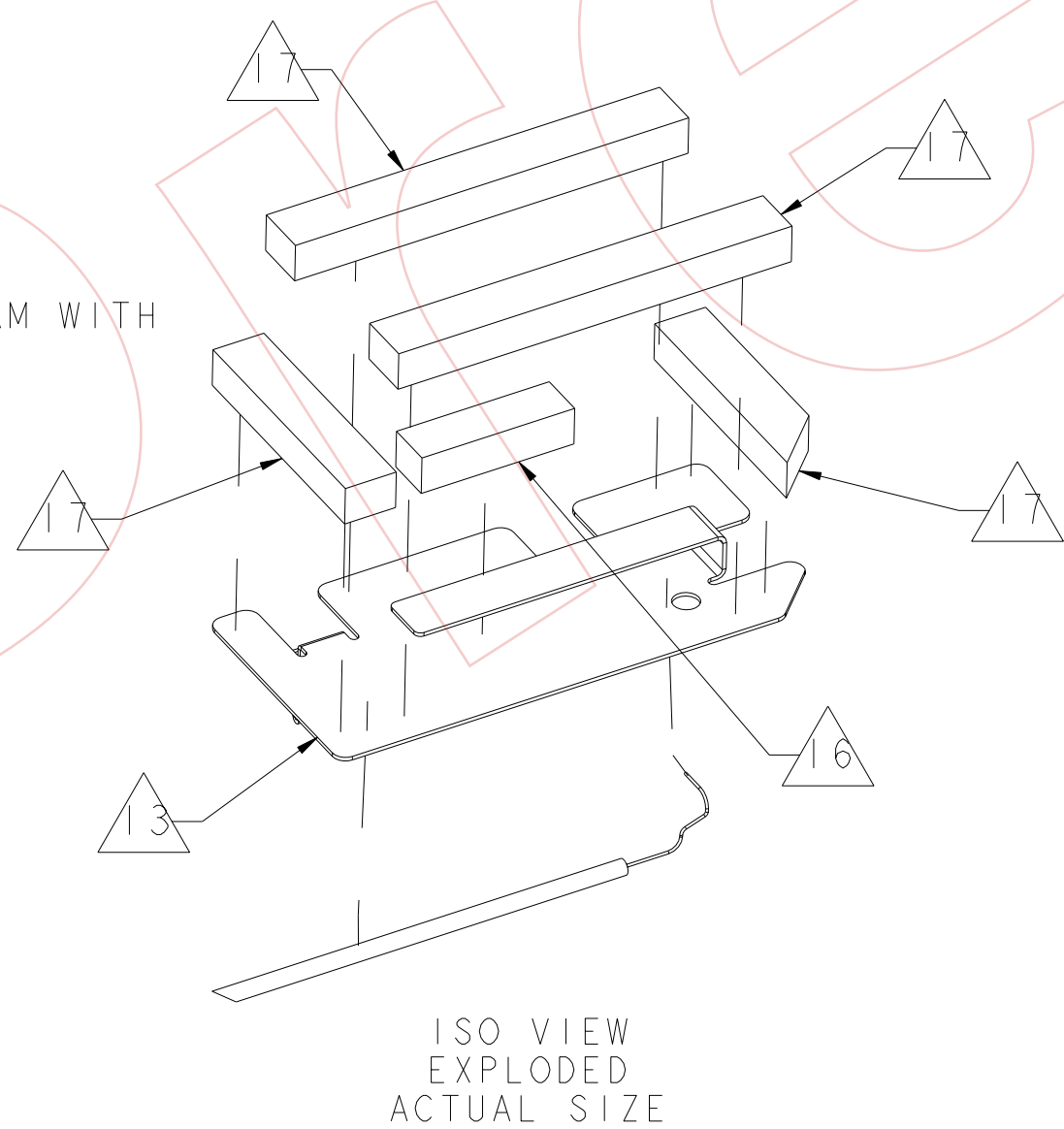
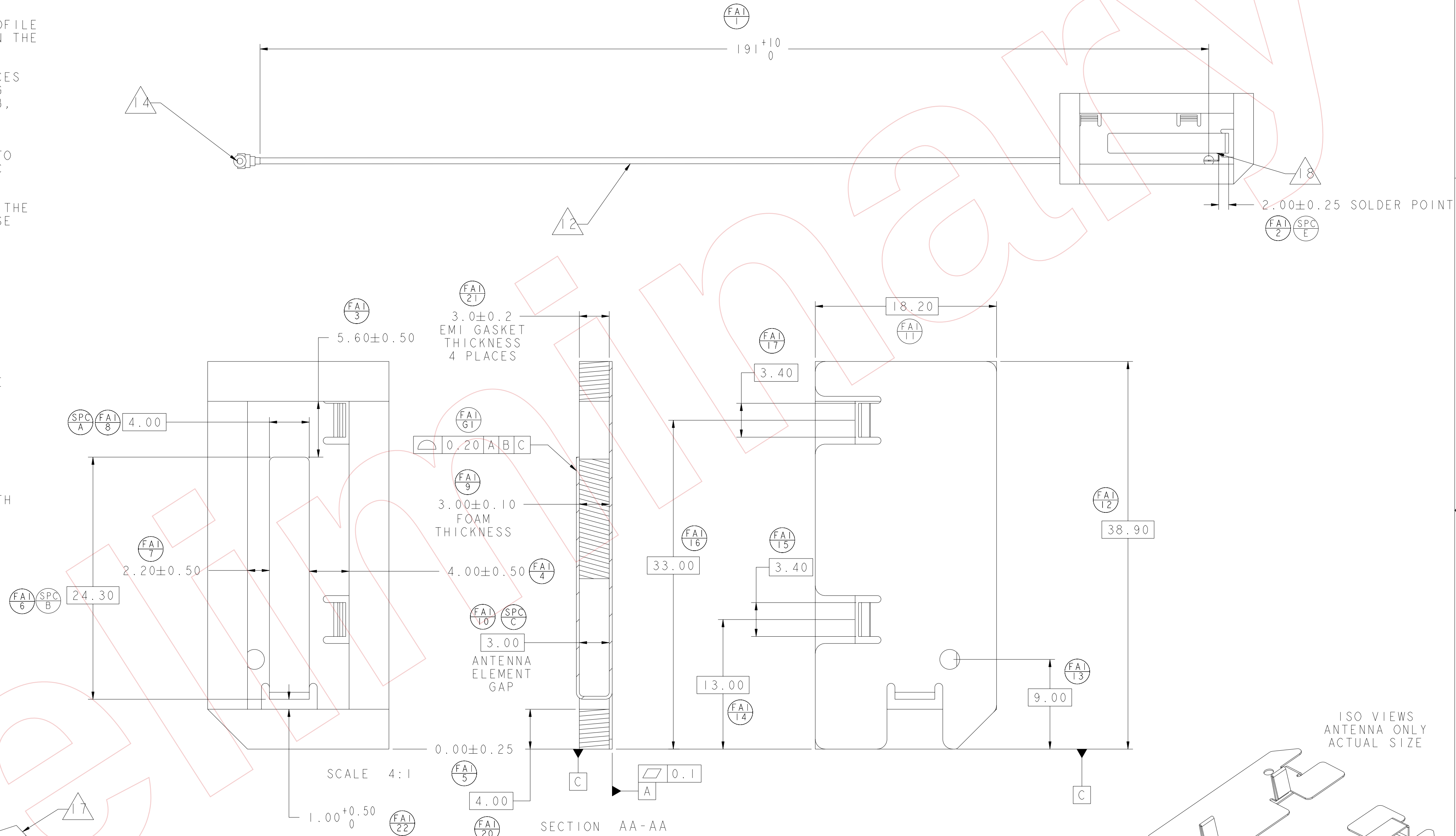
16 MATERIAL: EVA FOAM
THICKNESS: 3.0 MM
DENSITY: 0.95 g/cm³
TO BE ADHERED TO SHEET METAL

17 EMI GASKET
MATERIAL: CONDUCTIVE FABRIC OVER FOAM WITH
CONDUCTIVE ADHESIVE

18 SOLDER POINT
CABLE TO BE SOLDERED ONTO
UNDERSIDE OF ANTENNA ELEMENT.

19. MINIMUM FLAMMABILITY RATING FOR
ALL FOAMS AND GASKETS: UL-94-HF2

REV	RFA #	DESCRIPTION OF REVISION	ENG APPD	DATE
A	353141	INCREASED LENGTH OF LELEMENT TO 24.3 mm. CENTER CONDUCTOR LOCATION CHANGED TO 2.0 mm ADDED FAI 22 TO CONTROL GAP	J.C.	11/29/04
B	355522	CLARIFIED CONDUCTIVE ADHESIVE REQUIREMENT	J.C.	12/07/04
C	364929	ADDED COUNTRY OF ORIGIN	J.C.	01/07/05

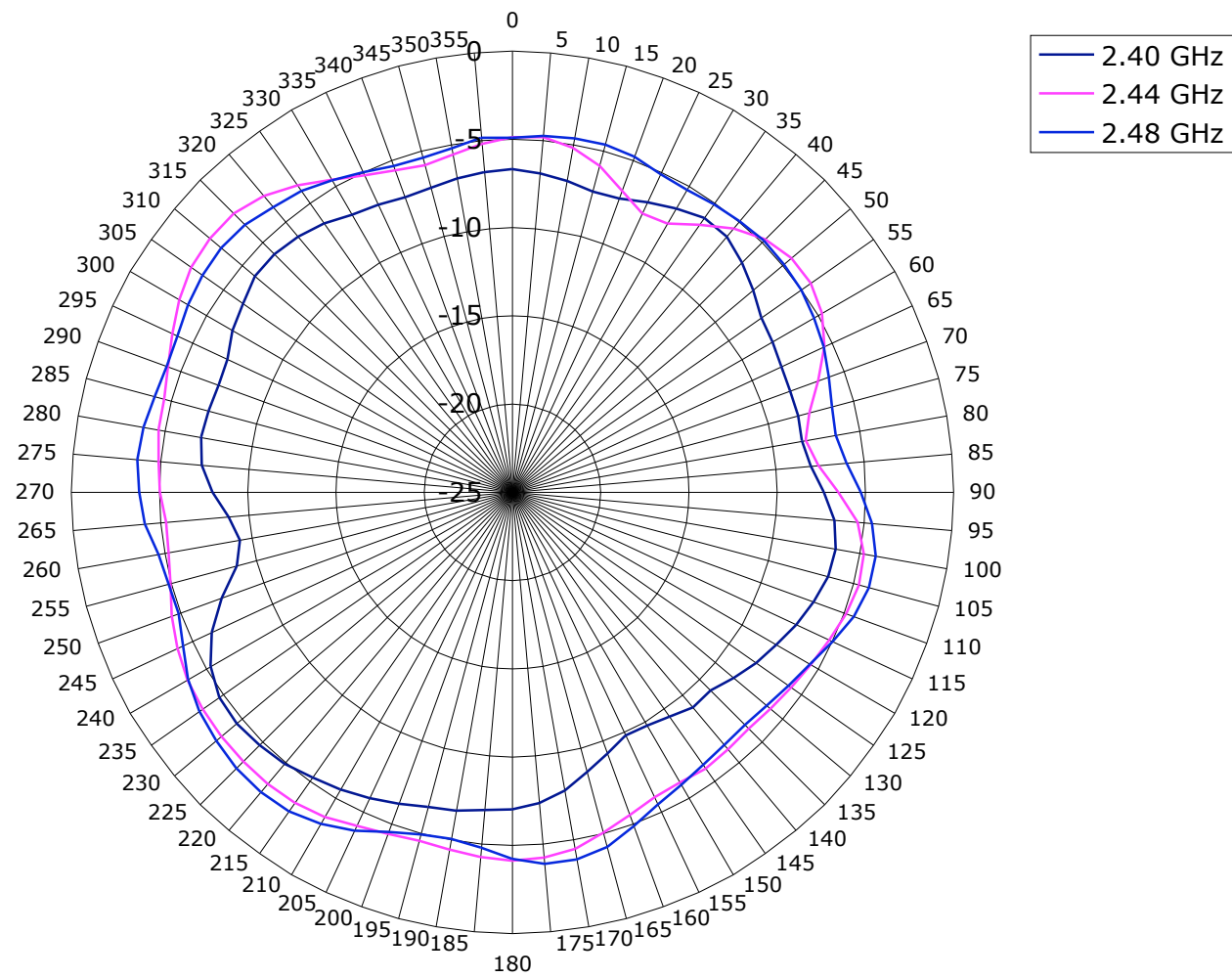


METRIC		Apple Computer, Inc.	
DRAWN	G.LOWE	DATE	6/23/04
DESIGN	G.LOWE	DATE	6/20/04
PRO/E CAD MODEL	613-5956	NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE COMPUTER, INC. THE POSSESSOR AGREES TO THE FOLLOWING: (1) TO MAINTAIN THIS DOCUMENT IN CONFIDENCE (2) NOT TO REPRODUCE OR COPY IT (3) NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART (4) ALL RIGHTS RESERVED	
SCALE	2:1	THIRD ANGLE PROJECTION	
DIMENSIONS ARE IN MILLIMETERS		SIZE	
DO NOT SCALE DRAWING		DRAWING NO	
		613-5956	
		REV	
		C	
		SHEET 1 OF 1	

BLUETOOTH, FLAT,
ANTENNA ASSY, Q88

SIZE
DRAWING NO
613-5956
REV
C
SHEET 1 OF 1

Apple Antenna Model 613-5956



Apple Antenna Model 613-5956

AVE -5.6
MAX -4.6 -2.6 -2.8

	2.40 GHz	2.44 GHz	2.48 GHz
0	-6.7014164	-4.90515286	-4.93892392
5	-6.86408897	-4.82798288	-4.76859386
10	-7.08590703	-5.20456064	-4.63254419
15	-7.36810278	-5.87312788	-4.61275242
20	-7.29146863	-6.80368928	-4.78497275
25	-6.89485507	-7.58035176	-5.09664709
30	-6.45121064	-7.43202148	-5.20980649
35	-6.02774887	-6.51879192	-5.09137624
40	-6.08157986	-5.49404215	-4.96080562
45	-6.58582089	-4.75516055	-4.83804379
50	-7.21581475	-4.35394675	-4.918796
55	-7.77618152	-4.34943561	-5.00384803
60	-7.97756725	-4.72643105	-5.23859244
65	-8.15744504	-5.47194108	-5.53648372
70	-8.24313227	-6.54263969	-5.936715
75	-8.22909162	-7.5378898	-6.23469969
80	-8.32006926	-8.11547761	-6.38410771
85	-8.00878107	-7.58262785	-5.99466225
90	-7.33364896	-6.52408457	-5.26284483
95	-6.68086684	-5.34692796	-4.52725921
100	-6.39759877	-4.74010767	-4.0615366
105	-6.46625887	-4.62779201	-4.07464984
110	-6.79862702	-4.85727347	-4.4051611
115	-7.22463071	-5.17040177	-4.9472354
120	-7.72762482	-5.44406701	-5.49012016
125	-8.11027345	-5.69492196	-5.88317387
130	-8.63192622	-5.8892856	-6.18680467
135	-9.08767451	-6.05097239	-6.34399191
140	-9.07841696	-5.9515274	-6.29673708
145	-9.47445833	-5.88425322	-6.14053116
150	-9.7012145	-5.99595513	-5.84291876
155	-9.78797282	-5.93022772	-5.4468539
160	-9.22187337	-5.53772454	-4.84694753
165	-8.56618173	-5.03965943	-4.18028628
170	-7.84017431	-4.48491581	-3.86736644
175	-7.31349581	-4.21116956	-3.87332989
180	-7.02887351	-4.1171992	-4.23417647
185	-6.92912215	-4.25829451	-4.79073089
190	-6.66973236	-4.44504588	-5.04984011
195	-6.52696511	-4.54534515	-4.94245209
200	-6.21764298	-4.38276175	-4.51478901
205	-5.8904938	-4.16172948	-3.81919029
210	-5.51827576	-3.7526712	-3.28635852
215	-5.25709424	-3.5077901	-2.95729493

220	-4.93286844	-3.43736411	-2.83626321
225	-4.72063928	-3.43607085	-2.89200022
230	-4.59824089	-3.48151278	-3.08858956
235	-4.75532267	-3.5751081	-3.32909237
240	-5.28945072	-3.76993002	-3.80833009
245	-6.22061934	-4.06315992	-4.42327874
250	-7.47093291	-4.4796335	-4.89174896
255	-8.81622669	-4.95876721	-4.87483112
260	-9.31516641	-5.25315526	-4.65055992
265	-8.86637619	-5.32854586	-4.09960944
270	-8.01941083	-5.02992181	-3.87416542
275	-7.33652603	-4.87673139	-3.67386201
280	-7.09076689	-4.64928625	-3.79618806
285	-7.18174281	-4.56316593	-4.03926863
290	-7.3115456	-4.25030957	-4.20122208
295	-7.19140106	-3.77258641	-4.09188063
300	-6.70850756	-3.24080977	-3.80713768
305	-6.36531802	-2.80447502	-3.57912935
310	-5.97744839	-2.6442398	-3.46140064
315	-5.9090337	-2.6981607	-3.58882104
320	-6.13377421	-3.12958957	-3.92775699
325	-6.41429086	-3.80583166	-4.18002769
330	-6.84446998	-4.56948031	-4.60140047
335	-7.04925919	-5.22271732	-4.99514024
340	-7.24088196	-5.5861334	-5.3371083
345	-7.15186625	-5.84545191	-5.38950186
350	-6.95483793	-5.61882285	-5.24943314
355	-6.79356395	-5.21259226	-4.87215561