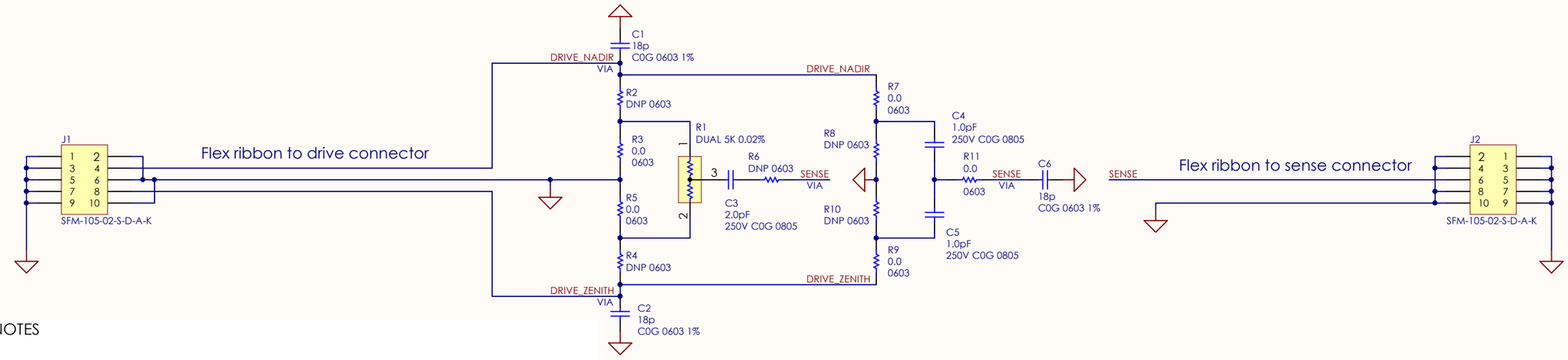
REVISION HISTORY

LTR	DESCRIPTION	CLASS	DWN	ENGR	SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES.
A	INITIAL RELEASE	E			



NOTES

1. Place R's and C's shown on rigid PCB, with flex ribbons coming out of both ends of same length as flex ribbons for use with blocks.
2. Use Rogers 4350B material under the component layer of the rigid PCB.
3. Place vias from top to sense or drive flex signal layer at nodes marked "VIA", except
4. Place grounded copper pour on top layer. Copper pour will provide part of guard rings.
5. Place grounded guard ring around R1-3, thread guard trace under C3. This plus the copper pour will also form a guard around R6 and its via.
6. Place grounded guard ring around R11 and its via by threading guard traces under C4, C5, C6. These traces will connect copper pour to copper pour.
7. Where sense and drive traces coexist in the flex signal layer, place grounded,
wide, guard traces or shapes between them.
8. Install odd numbered jumpers for capacitive divider.
9. Install even numbered jumpers for resistive divider.


SH1
SMS-405F


SH2
SMS-405C

10398540	TMT
NEXT ASSEMBLY	USED ON
APPLICATION	

MATERIAL:

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

LINEAR TOLERANCES:

.XX ± .03
.XXX ± .010

ANGULAR TOLERANCE: ± 0.5°

SURFACE ROUGHNESS (MICROMETERS) √

DO NOT SCALE DRAWING
INTERPRET DIMENSIONING AND TOLERANCING PER ASME Y14.5-2009
INTERPRET DWG PER ASME Y14.100

CONTRACT NO _____

APPD_____DATE_____

DWN	C. Shelton
ENGR	C. Shelton

SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES.

JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CA 91109

SCHEMATIC DIAGRAM, EDGE SENSOR TEST CONNECTOR FLEX

SIZE	CAGE CODE		REV
B	23835	10398539	A

SCALE: NONE	UNCLASSIFIED	SHEET 1 OF 1

REV 09/2016

ALTIUM GENERATED

JPL_B_SH1

REVISION HISTORY					
LTR	DESCRIPTION	CLASS	DWN	ENGR	SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES
A	INITIAL RELEASE	E			

NOTES: UNLESS OTHERWISE SPECIFIED

1. THE FINISHED PRINTED WIRING BOARD SHALL MEET THE REQUIREMENTS OF IPC-A-600-X (LATEST REVISION).
2. THIS DOCUMENT AND RELATED ARTWORK ARE COMPUTER GENERATED. ALL MODIFICATIONS ARE TO BE PERFORMED TO THE ORIGINAL DATABASE ON FILE IN SECTION 383.
3. THIS IS A REDUCED DIMENSION DRAWING. ADDITIONAL DIMENSIONS NEEDED TO DEFINE THE TRUE PROFILES OF THIS PART SHALL BE OBTAINED FROM THE MASTER CAD MODEL DATABASE NAMED 10369692-A.ZIP. DIMENSIONS AND TOLERANCES SHALL BE INTERPRETED PER ASME Y14.5M.

△4 MATERIAL: 1 OZ COPPER CLAD, DOUBLE SIDED, 0.422 mm THICK HYDROCARBON/CERAMIC/WOVEN GLASS LAMINATE PER IPC-4103A/L11A3-0422-C1/C1

△5 MATERIAL: 1 OZ COPPER CLAD, DOUBLE SIDED, 0.38 mm THICK EPOXY/WOVEN GLASS LAMINATE PER IPC-4101/L 26-0450-C1/C1

△6 MATERIAL: 0.135 mm THICK EPOXY/WOVEN GLASS PREPEG PER IPC-4101/P 26-E2116 TW RE VC

△7 MATERIAL: 1 OZ COPPER CLAD, DOUBLE SIDED, .003 IN. THICK POLYIMIDE LAMINATE PER IPC-4204/11-E1E3Z CU-W7-HS/HS

△8 MATERIAL: 1 OZ COPPER CLAD, SINGLE SIDED, .002 IN. THICK POLYIMIDE LAMINATE PER IPC-4204/11-E1E2Z CU-W7-HS/0

△9 MATERIAL: NON-SUPPORTED POLYIMIDE FILM, ADHESIVE ONE SIDE PER IPC-4203/1-E1E1M1/0

△10 MATERIAL: NON-SUPPORTED ADHESIVE FILM (THICKNESS AND QUANTITY AS REQUIRED) PER IPC-4203/18-0000MX

11. FOIL LAMINATION MAY BE APPLIED AS AN ALTERNATE COSTRUCTION ON OUTER LAYERS.
12. FABRICATE AND INSPECT PRINTED WIRING BOARD PER IPC-6013B, CLASS 2, TYPE 4.

△13 APPLY SOLDER MASK, ITEM 9, TO TOP AND BOTTOM OVER BARE COPPER, COMPONENT PADS TO BE FREE FROM BLEEDING OR MISREGISTRATION.

14. AFTER APPLICATION OF SOLDER MASK, PLATE ALL EXPOSED COPPER WITH ENIG PER IPC-6013.

△15 LEGEND OVER SOLDER MASK ON BOTH SIDES OF PWB USING HYSOL M-SERIES/CATALYST 20/A WHITE EPOXY INK, ITEM 10. LEGEND MARKING SHALL NOT BE NEARER THAN .005 INCH TO ANY PAD. CHARACTER HEIGHT SHALL BE .030 INCH MINIMUM.

16. ELECTRICAL TEST: CONTINUITY SHORT AND OPEN TESTING ON ALL AVAILABLE EXPOSED TERMINAL PADS USING IPC-D-356A NETLIST DATA. CONTINUITY TEST SHALL BE AT 5 OHMS MAX. SHORTS TESTING SHALL BE PERFORMED AT 200V. MINIMUM ISOLATION OF 100M OHMS.
17. REGISTRATION OF ALL PRINTED WIRING ELEMENTS AFTER LAMINATION SHALL BE WITHIN 0.076 mm OF THE TRUE POSITION.
18. ALL COPPER FEATURE SIZES OF THE FINISHED PRINTED WIRING FLEXPRINT SHALL BE WITHIN ±10% OF THE SIZE INDICATED BY THE MASTER PATTERN ARTWORK.
19. ALL UNDIMENSIONED HOLES SHALL BE LOCATED WITHIN 0.12 RADIUS OF THE POSITION INDICATED BY THE MASTER PATTERN ARTWORK.
20. BOW AND TWIST OF RIGID SECTIONS SHALL NOT EXCEED 0.75% WHEN MEASURED DIAGONALLY.

△21 MARK IN LOCATION SHOWN WITH 1.0 MINIMUM HIGH CHARACTERS THE DASH NUMBER and SERIAL NUMBER "NXXXXX" (WHERE N IS A VENDOR DESIGNATION LETTER ASSIGNED BY TMT AND XXXXX IS A UNIQUE 5 DIGIT SERIAL NUMBER FOR EACH PART. THE VENDOR DESIGNATION AND THE STARTING SERIAL NUMBER SHALL BE IN ACCORDANCE WITH THE VALUES PROVIDED IN THE PURCHASE ORDER)

QTY REQD	-1 ITEM NO	REF DES	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	MATERIAL OR NOTE
	AR 9			HYSOL, SERIES M. CATALYST 20/A	INK, WHITE EPOXY	IPC-4781	15
	AR 8			LPI, SM P41	SOLDERMASK, PROBIMER 52	IPC-SM-840 CL A	13
	AR 7				ACRYLIC ADHESIVE FILM NON-SUPPORTED		10
	AR 6				POLYIMIDE FILM ACRYLIC ADHESIVE ONE SIDE		9
	AR 5				POLYIMIDE FILM CU CLAD 1/2 OZ.		8
	AR 4				POLYIMIDE FILM CU CLAD 1/2 OZ. / 1/2 OZ.		7
	AR 3				GLASS BASE EPOXY RESIN PREPREG, B-STAGE		6
	AR 2				GLASS BASE EPOXY RESIN CU CLAD 1 OZ / 1 OZ		5
	AR 1			L 26-0400-C1/C1	GLASS BASE HYDROCARBON RESIN (CERAMIC FILLER)CU CLAD 1 OZ / 1 OZ	ROGERS 4350B	4

PARTS LIST

10398541	TMT
NEXT ASSEMBLY	USED ON
APPLICATION	

MATERIAL: MATERIAL PER SPECIFICATION

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

LINEAR TOLERANCES: .XX ± .03 .XXX ± .010

ANGULAR TOLLERANCE: ± 0.5°

SURFACE ROUGHNESS (MICROMETERS)

DO NOT SCALE DRAWING
INTERPRET DIMENTIONING AND TOLERANCING PER ASME Y14.5-2009
INTERPRET DWG PER ASME Y14.100

CONTRACT NO

APPD DATE

DWN D PALMER

ENGR C SHELTON

SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES

JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CA 91109

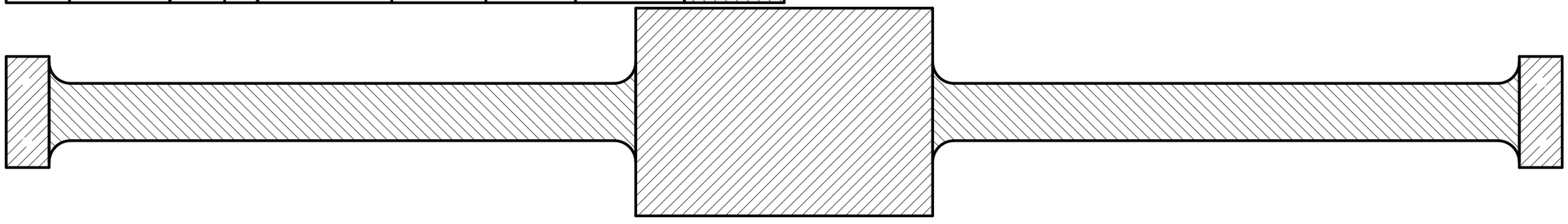
FABRICATION, EDGE SENSOR TEST CONNECTOR PRINTED WIRING BOARD

SIZE	CAGE CODE		REV
C	23835	10398540	A
SCALE: 2/1	UNCLASSIFIED	SHEET 1 OF 3	

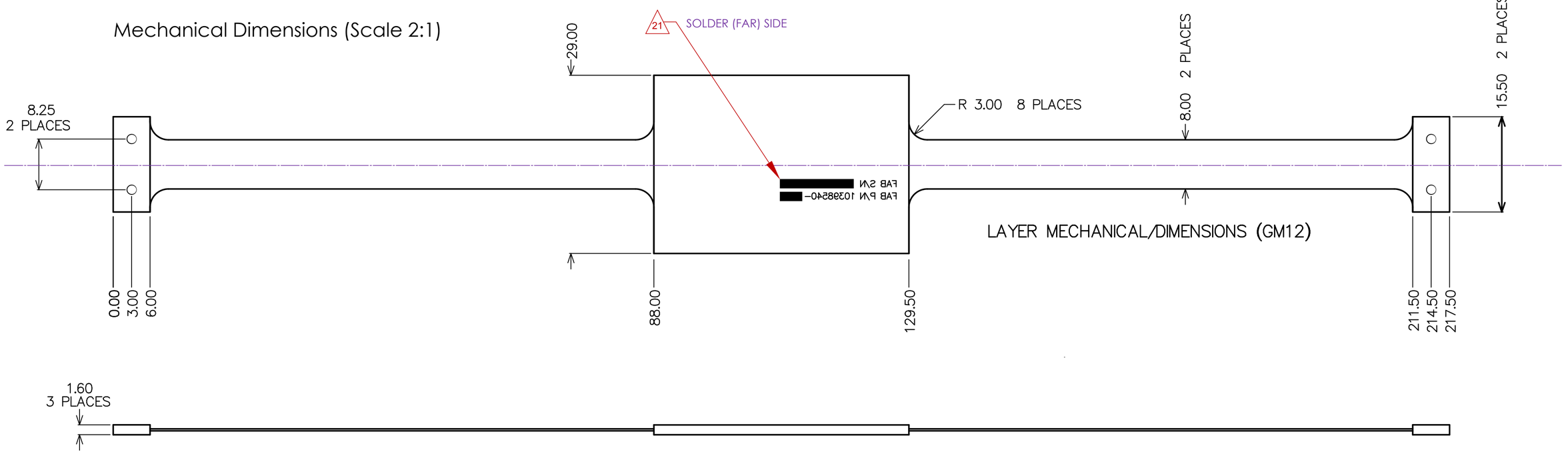
ALTIUM GENERATED

REV 09/2017

Layer	Name	Material	Thickness	Constant	Rigid Stack	Flex Stack
1	Flex Coverlay Top	Polyimide/Adhesive	0.050mm	3.5		
2	Top Overlay					
3	Top Solder	Solder Resist	0.012mm	3.5		
4	Component Side	Copper	0.065mm			
5	Dielectric 1	Rogers 4350B	0.338mm	4.8		
6	Ground Plane	Copper	0.035mm			
7	Dielectric 11	FR-4	0.226mm	4.2		
8	Flex Shield Top	Copper	0.018mm			
9	Dielectric 6	Polyimide	0.050mm	3.5		
10	Dielectric 10	Acrylic Adhesive	0.032mm	3.78		
11	Diff Pair	Copper	0.018mm			
12	Dielectric 9	Polyimide	0.075mm	3.5		
13	Flex Shield Bot	Copper	0.018mm			
14	Dielectric 12	FR-4	0.226mm	4.2		
15	Power Plane	Copper	0.035mm			
16	Dielectric 4	FR-4	0.338mm	4.2		
17	Solder Side	Copper	0.065mm			
18	Bottom Solder	Solder Resist	0.012mm	3.5		
19	Bottom Overlay					
20	Flex Coverlay Bot	Polyimide/Adhesive	0.050mm	3.5		



Mechanical Dimensions (Scale 2:1)



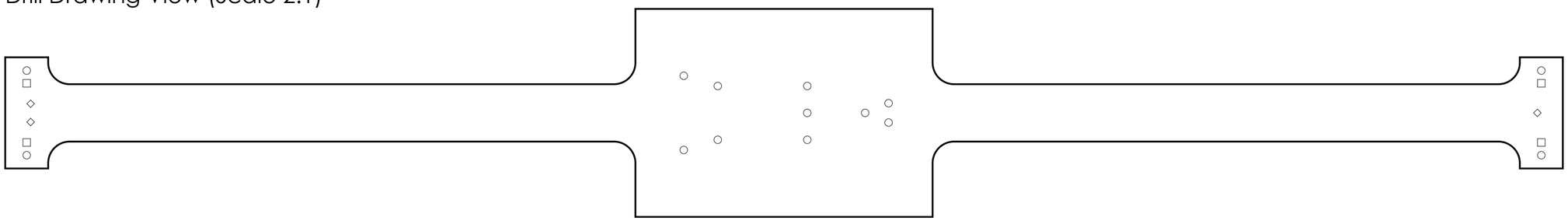
LAYER MECHANICAL/DIMENSIONS (GM12)

EDGE SENSOR TEST CONNECTOR
10398540–102 REV A
JPL D.P. 11/29/2017

SIZE	CAGE CODE		REV
C	23835	10398540	A
SCALE: 2/1	UNCLASSIFIED	SHEET 2 OF 3	

ALTIUM GENERATED
REV 09/2017

Drill Drawing View (Scale 2:1)



Drill Table

Symbol	Count	Hole Size	Plated	Hole Tolerance
◇	3	0.20mm	Plated	None
○	14	0.38mm	Plated	None
□	4	1.40mm	Non-Plated	None
	21 Total			

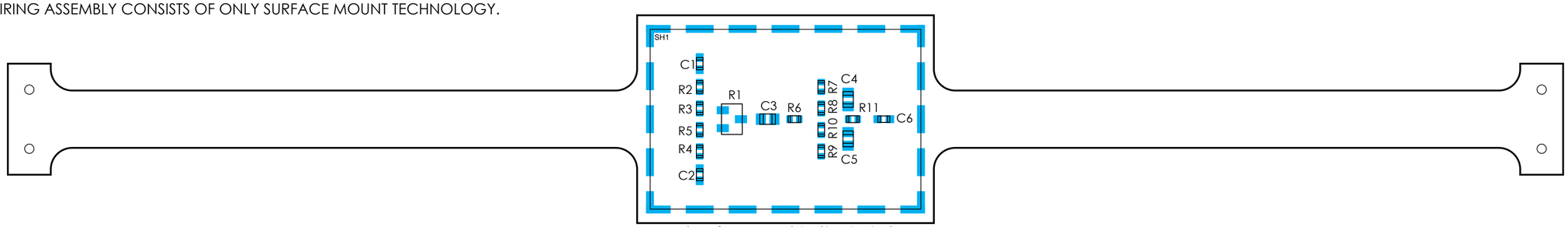
SIZE	CAGE CODE		REV
C	23835	10398540	A
SCALE: 2/1	UNCLASSIFIED	SHEET 3 OF 3	

ACTUM GENERATED
REV 09/2017

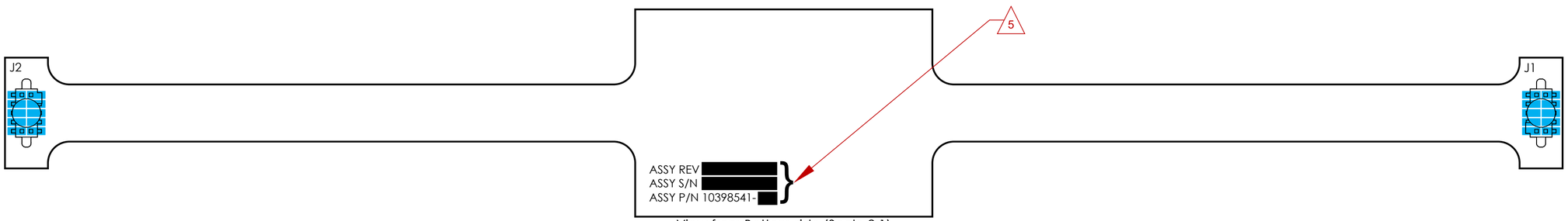
REVISION HISTORY					
LTR	DESCRIPTION	CLASS	DWN	ENGR	SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES
A	INITIAL RELEASE	X			

NOTES - UNLESS OTHERWISE SPECIFIED:

1. WORKMANSHIP STANDARDS AND ACCEPTABILITY REQUIREMENTS SHALL MEET IPC-A-610 (LATEST VERSION).
2. THIS DOCUMENT AND RELATED ARTWORK ARE COMPUTER GENERATED. CHANGES ARE TO BE PERFORMED ON THE ORIGINAL DATABASE IN SECTION 383.
3. SOLDER COMPONENTS USING LEAD-FREE SOLDER, ITEM 3.
4. CLEAN SOLDER FLUX FROM BOARD SO THAT THERE IS NO DISCERNABLE RESIDUE.
5. MARK OR INKSTAMP IN LOCATION SHOWN WITH 1.0 MINIMUM HIGH CHARACTERS, THE DASH NUMBER, REVISION LETTER, AND SERIAL NUMBER, "NXXXXX" (WHERE N IS A VENDOR DESIGNATION LETTER ASSIGNED BY TMT AND XXXXX IS A UNIQUE 5 DIGIT SERIAL NUMBER FOR EACH PART. THE VENDOR DESIGNATION AND THE STARTING SERIAL NUMBER SHALL BE IN ACCORDANCE WITH THE VALUES PROVIDED IN THE PURCHASE ORDER), USING INK, ITEM 2. CHARACTERS TO BE 1 mm HIGH MINIMUM.
6. FOR ELECTRONICS PARTS LIST SEE PL10398541.
7. FOR SCHEMATIC DIAGRAM SEE JPL DRAWING 10398539.
8. THIS PRINTED WIRING ASSEMBLY CONSISTS OF ONLY SURFACE MOUNT TECHNOLOGY.



View from Top side (Scale 2:1)



View from Bottom side (Scale 2:1)

SEE SEPARATE PARTS LIST

-2 QTY REQD	-1	ITEM NO	REF DES	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	MATERIAL OR NOTE
	AR	3			Sn96.5/Ag3.0/Cu0.5	SOLDER, LEAD FREE	J-STD-005A	3
	AR	2			HYSOL, SERIES M CATALYST 20A	INK, WHITE EPOXY	IPC-4781	5
	1	1			10398540-1	FABRICATION, EDGE SENSOR TEST CONNECTOR PRINTED WIRING BRD.		REV A

PARTS LIST

NEXT ASSEMBLY	USED ON
APPLICATION	TMT

MATERIAL: MATERIAL PER SPECIFICATION

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

LINEAR TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR TOLLERANCE: ± 0.5°

SURFACE ROUGHNESS (MICROMETERS)

DO NOT SCALE DRAWING
INTERPRET DIMENTIONING AND TOLERANCING PER ASME Y14.5-2009
INTERPRET DWG PER ASME Y14.100

CONTRACT NO

APPD	DATE
DWN	D PALMER
ENGR	C SHELTON

SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES

JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CA 91109

ASSEMBLY, EDGE SENSOR TEST CONNECTOR PRINTED WIRING ASSEMBLY

SIZE	CAGE CODE		REV
C	23835	10398541	A

SCALE: 2/1	UNCLASSIFIED	SHEET 1 OF 1

ALTIUM GENERATED
REV 09/2017

PL10398541_B Edge Sensor Test Connector Board Parts List

Source Data From: test_connector.PrjPcb
Project: test_connector.PrjPcb
Report Date: 11/30/2017 3:21:46 PM
Print Date: 11/30/2017 4:15:19 PM

Item	Quantity	Designator	Description	Footprint	Manufacturer	ManufacturerPN	Supplier	SupplierPN
1.	3	C1, C2, C6	CAP CER 18PF 50V C0G/NP0 0603	CAPCP1608X09N	Murata	GRM1885C1H180FA01D	Digikey	490-9716-1-ND
2.	1	C3	CAP CER 2PF 250V C0G/NP0 0805	CAPCP2012X09N	American Technical Ceramics	600F2R0BT250XT	Digikey	1284-1042-1-ND
3.	2	C4, C5	CAP CER 1PF 250V C0G/NP0 0805	CAPCP2012X09N	American Technical Ceramics	600F1R0AT250XT	Digikey	1284-1026-1-ND
4.	2	J1, J2	CONN SOCKET HEADER 10POS 0.05IN	SFM-105-02-S-D-A-K	Samtec	SFM-105-02-S-D-A-K	Digikey	SAM11692-ND
5.	1	R1	RES NET 5K OHM 2 RES 1610	DSMZ	Vishay	Y4485V0002QT9R	Digikey	Y4485-5K/5KBCT-ND
6.	5	R3, R5, R7, R9, R11	RES SMD 0.0 OHM JUMPER 0603	RESC1608X06N	Panasonic	ERJ-3GEY0R00V	Digikey	P0.0GCT-ND
7.	0	R2, R4, R6, R8	DO NOT PLACE					
8.	1.	SH1	RF SHIELD FRAME, 1" X 1.5" X .235"	SMS-405F	Leader Tech, Inc.	SMS-405F	Digikey	1798-1215-1-ND
9.	1.	SH2	RF SHIELD COVER, 1.0X1.5X0.236, NON-VENTED		Leader Tech, Inc.	SMS-405C	Digikey	1798-1214-ND