Array Mount

Cryogenic mount for Raytheon 1024 x 1024 InSb

5.1 Array Mount - **Cryogenic mount for Raytheon 1024 x 1024 InSb**

5.1.1 Overview

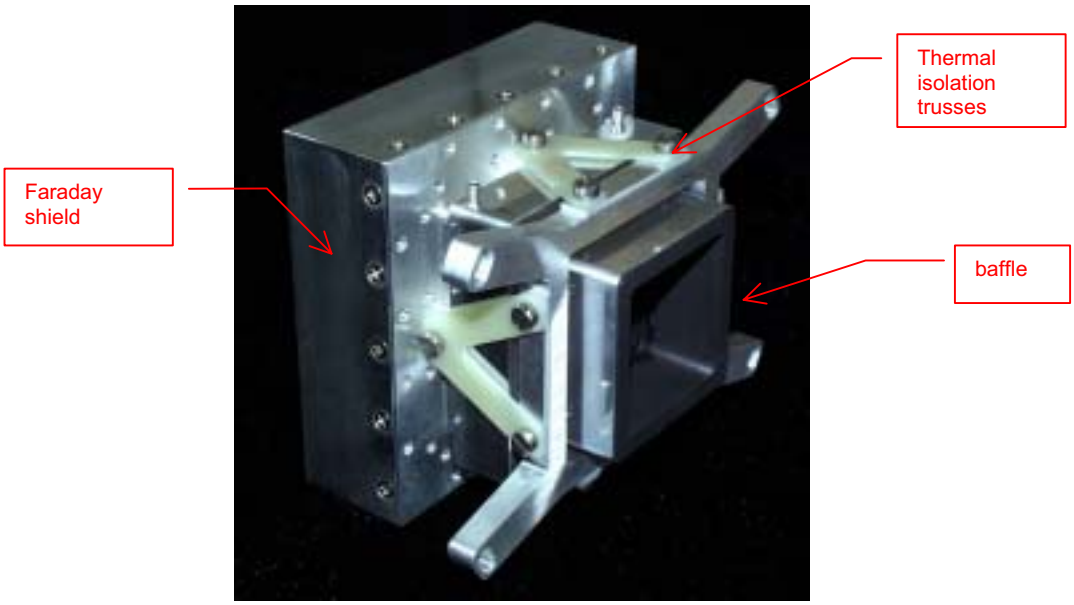
The array mount is a mechanical and electronic assembly that provides for cryogenic thermal control, isolation, array signal configuration and array signal contacts for the Raytheon 1024 x 1024 InSb array.

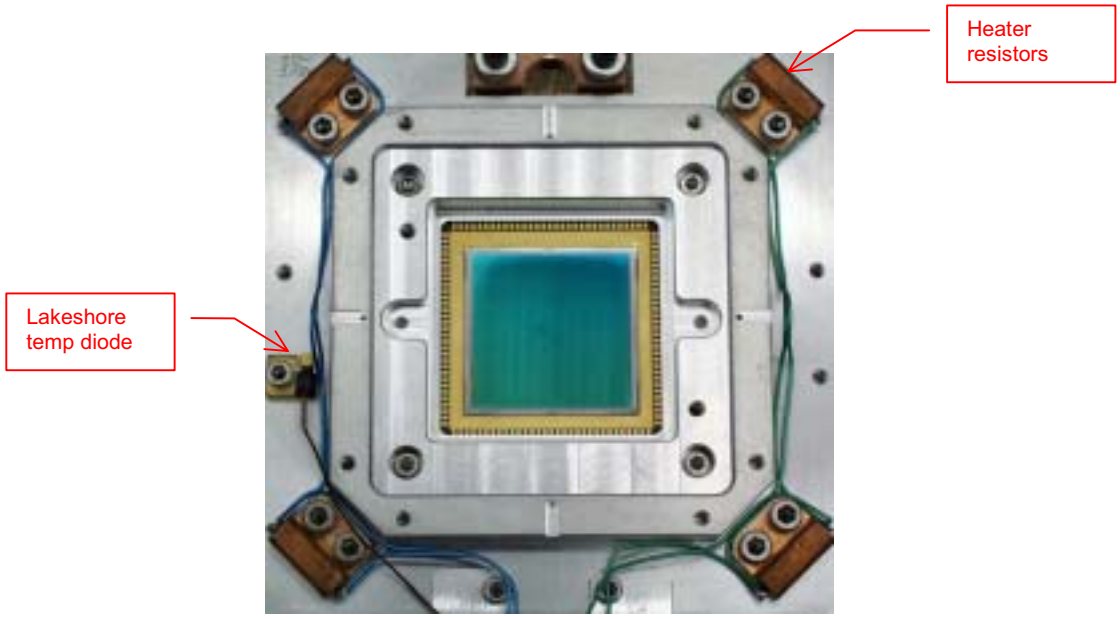
5.1.1.1 Technical Specifications Array Mount

- 4 Heater resistors
- Lakeshore temperature sensor
- Mount light tight to <.1 e/s dark current
- Enclosed Faraday shield
- Low temperature baffle
- Cryo-ribbon cable connections
- Array socket and fanout PCB
- Array signal configuration PCB

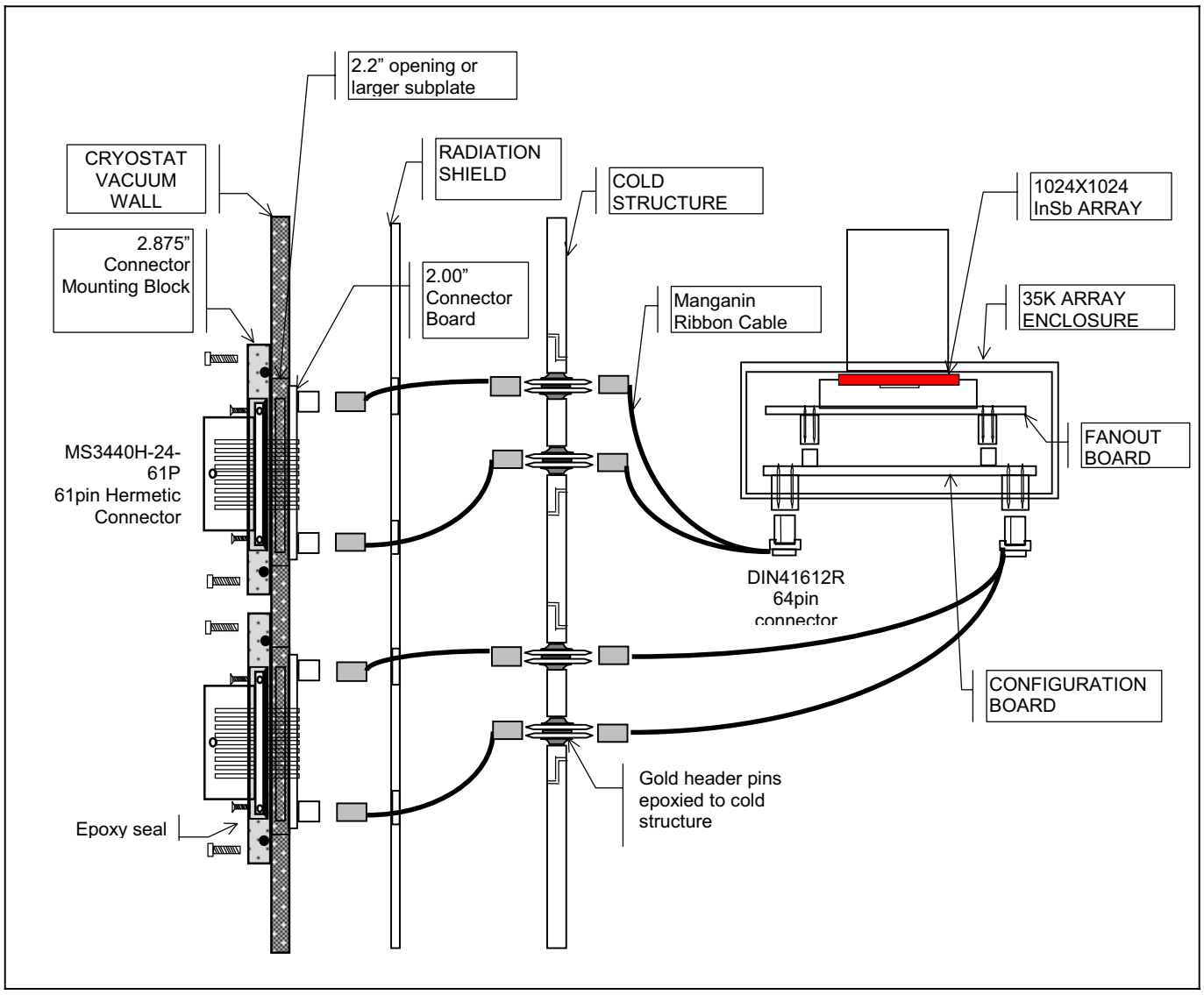
Mechancial Specifications
- Dimensions

5.1.1.3 Array Mount photos





5.1.1.4 Block Diagram Array Mount and Cyostat Cabling



5.1.1.5 Functional Description - Array Mount

5.1.5.1 Mechanical mount

Mechanical portion of the array mount provides the a physical location for the array and socket that holds it, a way to thermally clamp the device, and a electronic Faraday shield for the fanout and configuration electronics. A Yamaichi (IC51-124—410) LCC socket (see that following drawings) is epoxied into the front panel and the array fanout PCB is soldered onto the socket pins, creating a light tight barrier behind the array.

5.1.5.2 Array Fanout Board 700-150-01

The array fanout board takes the 124 pins from the Yamaichi socket and fans them out to four 0.05 inch pitch dual row headers. It aslo has 10 or 2Mohm electrostatic discharge protection resistors on all signals except the array outputs. See section 5.2.2 for more detailed information on the PCB.

5.1.5.3 Configuration Board 700-151-00

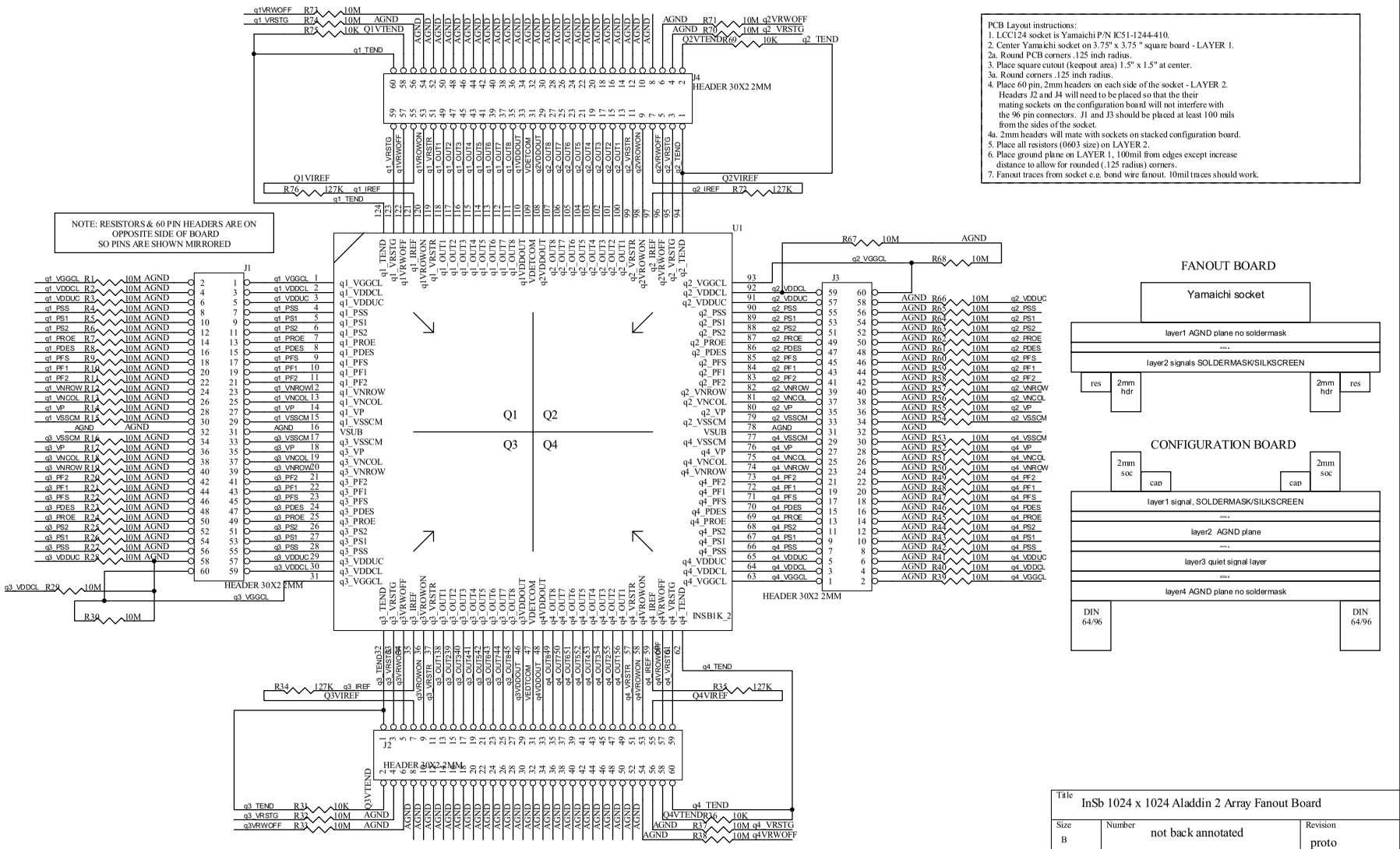
A configuration board plugs directly into the 0.05 inch pitch connectors of the Fanout board. The 700-151-00 version joins the clock and bias lines for quadrants 1 and 2 (Top) and quadrants 3 and 4 (Bottom) reducing the wire count. All of the resulting signals (including the unbussed outputs) are fed through two 64 pin DIN connectors. See section 5.2.3 for more detailed information on the PCB.

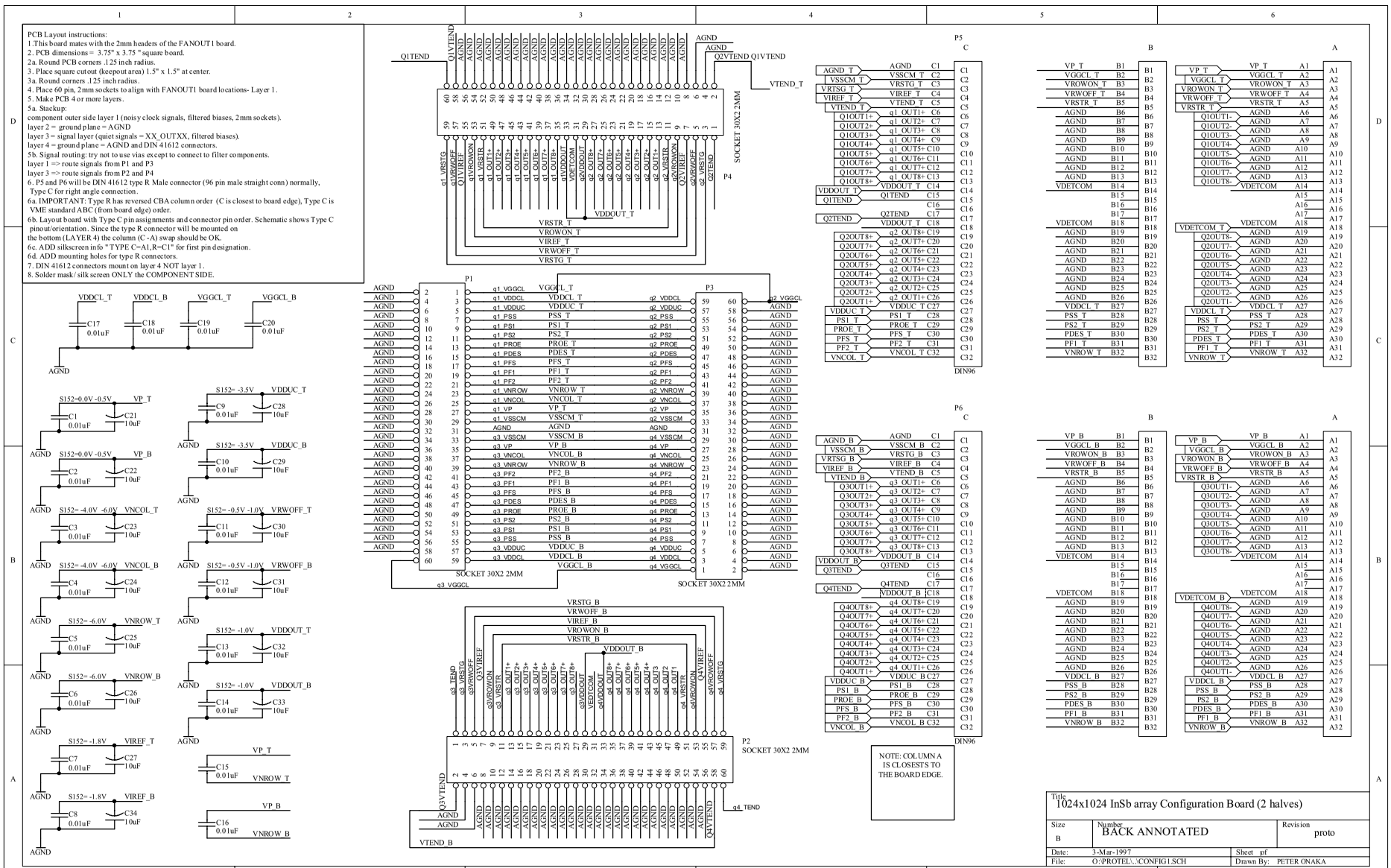
5.1.5.4 Heater Resistors

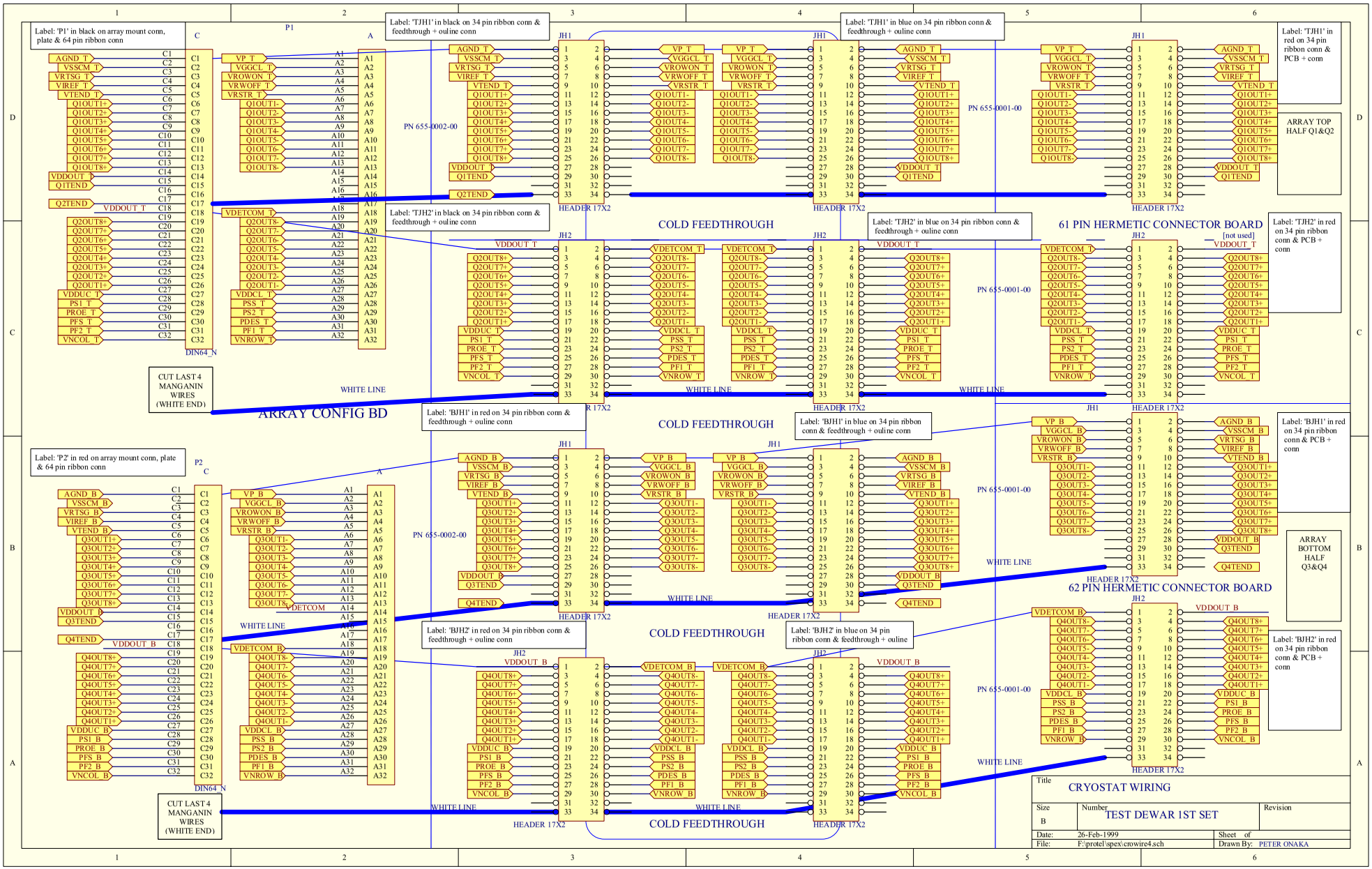
Four 100 ohm resistors are epoxied into copper mounts that are screwed into the fron plate of the array mount. Two resistors are wired in parallel, forming two 50 ohm loads. These resistors are eventually connected to the Lakeshore 300 temperature controller's heater output and are used to control the temperature of the entire assembly.

5.1.5.5 Lakeshore temperature diode

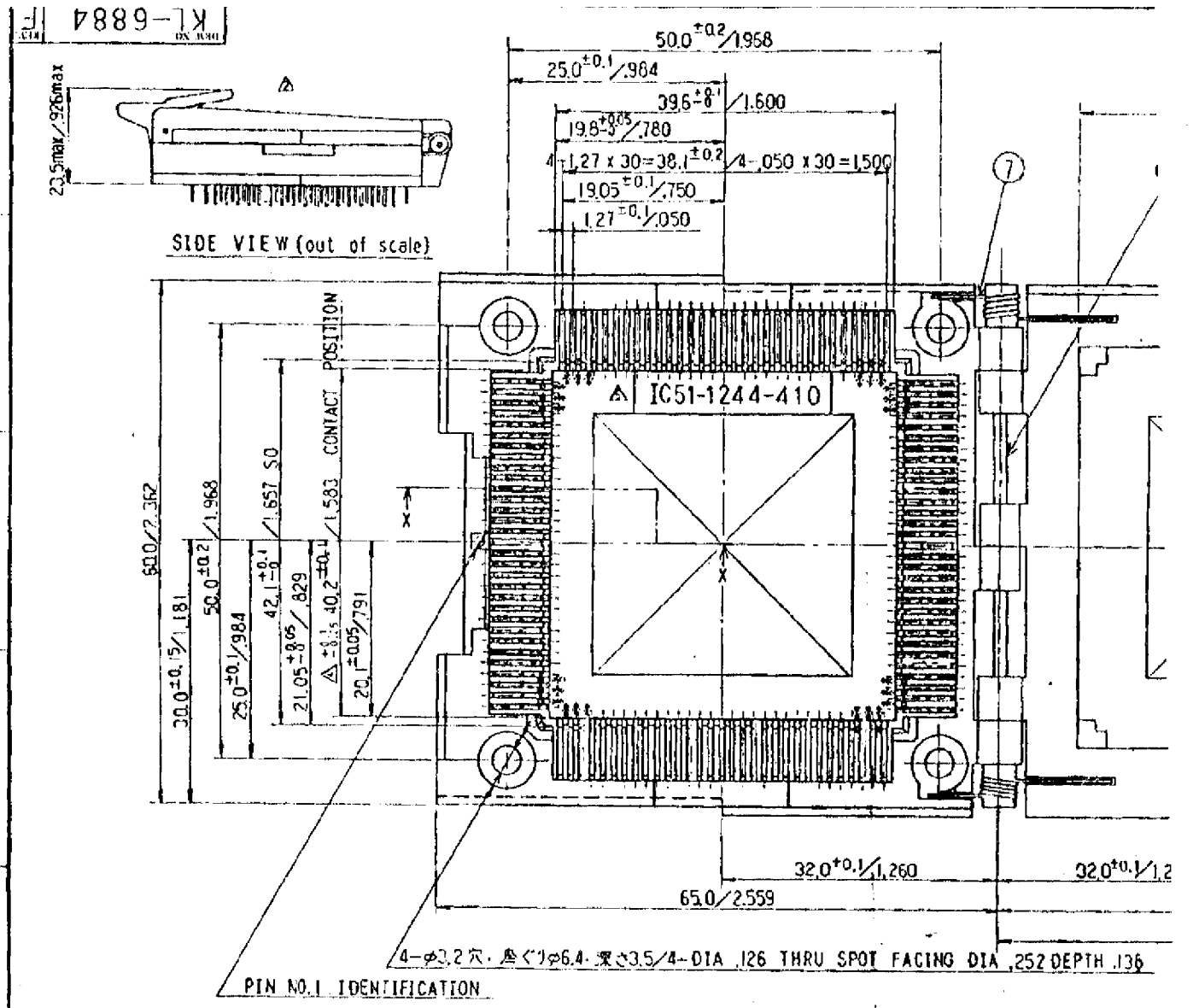
A calibrated Lakeshore Si doide is also mounted to the front plate of the mount and provides thermal sense ponit for the temperature controller.

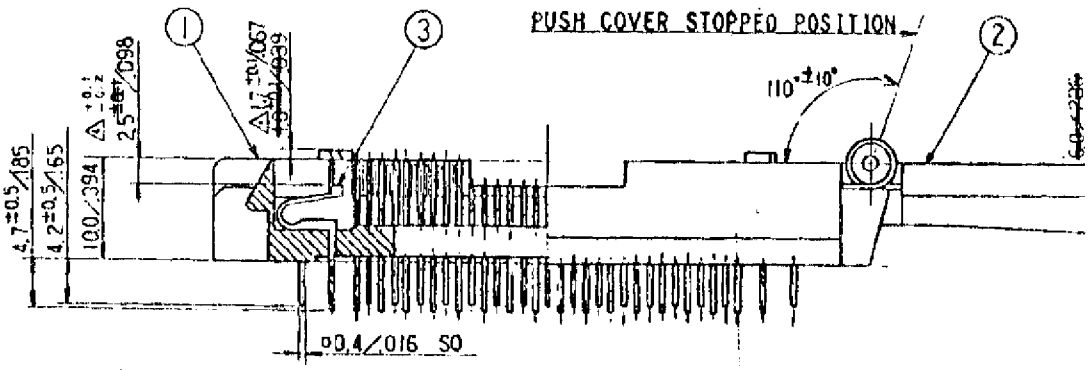

PCB Layout instructions:
1. LCC124 socket is Yamaichi P/N IC51-1244-410.
2. Center Yamaichi socket on 3.75" x 3.75 " square board - LAYER 1.
2a. Round PCB corners .125 inch radius.
3. Place square cutout (keepout area) 1.5" x 1.5" at center.
3a. Round corners .125 inch radius.
4. Place 60 pin, 2mm headers on each side of the socket - LAYER 2.
Headers J2 and J4 will need to be placed so that the their
mating sockets on the configuration board will not interfere with
the 96 pin connectors. J1 and J3 should be placed at least 100 mils
from the sides of the socket.
4a. 2mm headers will mate with sockets on stacked configuration board.
5. Place all resistors (0603 size) on LAYER 2.
6. Place ground plane on LAYER 1, 100mil from edges except increase
distance to allow for rounded (.125 radius) corners.
7. Fanout traces from socket e.g. bond wire fanout. 10mil traces should work.
NOTE: RESISTORS & 60 PIN HEADERS ARE ON
OPPOSITE SIDE OF BOARD
SO PINS ARE SHOWN MIRRORED
FANOUT BOARD
Yamaichi socket
layer1 AGND plane no soldermask
layer2 signals SOLDERMASK/SILKSCREEN
CONFIGURATION BOARD
layer1 signal, SOLDERMASK/SILKSCREEN
layer2 AGND plane
layer3 quiet signal layer
layer4 AGND plane no soldermask
HEADER 30X2 2MM
INSB1K_2
Q1VIREF
Q2VIREF
Q3VIREF
Q4VIREF
Title
InSb 1024 x 1024 Aladdin 2 Array Fanout Board
Size
B
Number
not back annotated
Revision
proto
Date:
26-Nov-1999
Sheet of 2 of x
File:
G:\protel\spex\fanout-150\700-150_Fanout.ddb
Drawn By:
Peter Onaka


PCB Layout instructions:
1.This board mates with the 2mm headers of the FANOUT1 board.
2. PCB dimensions = 3.75" x 3.75 " square board.
2a. Round PCB corners .125 inch radius.
3 . Place square cutout (keepout area) 1.5" x 1.5" at center.
3a. Round corners .125 inch radius.
4. Place 60 pin, 2mm sockets to align with FANOUT1 board locations- Layer 1.
5. Make PCB 4 or more layers.
5a. Stackup:
component outer side layer 1 (noisy clock signals, filtered biases, 2mm sockets).
layer 2 = ground plane = AGND
layer 3 = signal layer (quiet signals = XX_OUTXX, filtered biases).
layer 4 = ground plane = AGND and DIN 41612 connectors.
5b. Signal routing: try not to use vias except to connect to filter components.
layer 1 => route signals from P1 and P3
layer 3 => route signals from P2 and P4
6. P5 and P6 will be DIN 41612 type R Male connector (96 pin male straight conn) normally,
Type C for right angle connection.
6a. IMPORTANT: Type R has reversed CBA column order (C is closest to board edge), Type C is
VME standard ABC (from board edge) order.
6b. Layout board with Type C pin assignments and connector pin order. Schematic shows Type C
pinout/orientation. Since the type R connector will be mounted on
the bottom (LAYER 4) the column (C -A) swap should be OK.
6c. ADD silkscreen info " TYPE C=A1,R=C1" for first pin designation.
6d. ADD mounting holes for type R connectors.
7. DIN 41612 connectors mount on layer 4 NOT layer 1.
8. Solder mask/ silk screen ONLY the COMPONENT SIDE.
P1
SOCKET 30X2 2MM
P2
SOCKET 30X2 2MM
P3
SOCKET 30X2 2MM
P4
SOCKET 30X2 2MM
P5
DIN96
P6
DIN96
NOTE: COLUMN A IS CLOSESTS TO THE BOARD EDGE.
Title
1024x1024 InSb array Configuration Board (2 halves)
Size
B
Number
BACK ANNOTATED
Revision
proto
Date: 3-Mar-1997
Sheet pf
File: O:\PROTEL\..\CONFIG1.SCH
Drawn By: PETER ONAKA


Label: 'P1' in black on array mount conn, plate & 64 pin ribbon conn
Label: 'TJH1' in black on 34 pin ribbon conn & feedthrough + ouline conn
Label: 'TJH1' in blue on 34 pin ribbon conn & feedthrough + ouline conn
Label: 'TJH1' in red on 34 pin ribbon conn & PCB + conn
ARRAY TOP HALF Q1&Q2
PN 655-0002-00
PN 655-0001-00
DIN64_N
HEADER 17X2
COLD FEEDTHROUGH
61 PIN HERMETIC CONNECTOR BOARD
[not used]
Label: 'TJH2' in black on 34 pin ribbon conn & feedthrough + ouline conn
Label: 'TJH2' in blue on 34 pin ribbon conn & feedthrough + ouline conn
Label: 'TJH2' in red on 34 pin ribbon conn & PCB + conn
CUT LAST 4 MANGANIN WIRES (WHITE END)
WHITE LINE
ARRAY CONFIG BD
Label: 'BJH1' in red on 34 pin ribbon conn & feedthrough + ouline conn
Label: 'BJH1' in blue on 34 pin ribbon conn & feedthrough + ouline conn
Label: 'BJH1' in red on 34 pin ribbon conn & PCB + conn
ARRAY BOTTOM HALF Q3&Q4
62 PIN HERMETIC CONNECTOR BOARD
Label: 'P2' in red on array mount conn, plate & 64 pin ribbon conn
Label: 'BJH2' in red on 34 pin ribbon conn & feedthrough + ouline conn
Label: 'BJH2' in blue on 34 pin ribbon conn & feedthrough + ouline
Label: 'BJH2' in red on 34 pin ribbon conn & PCB + conn
CRYOSTAT WIRING
TEST DEWAR 1ST SET
Size B
Number
Revision
Date: 26-Feb-1999
Sheet of
File: F:\protel\spex\crowire4.sch
Drawn By: PETER ONAKA

try.tif

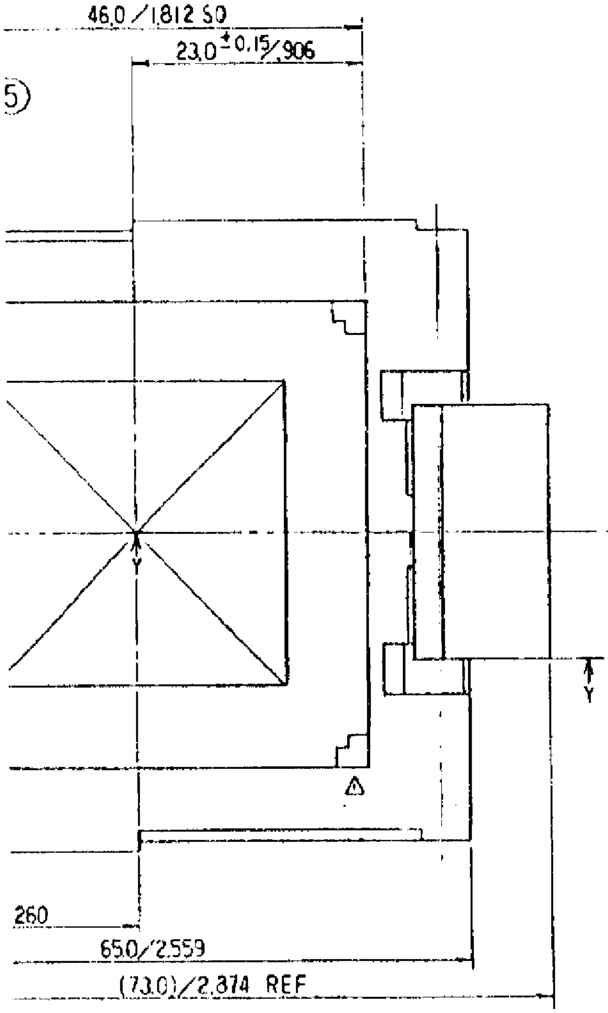




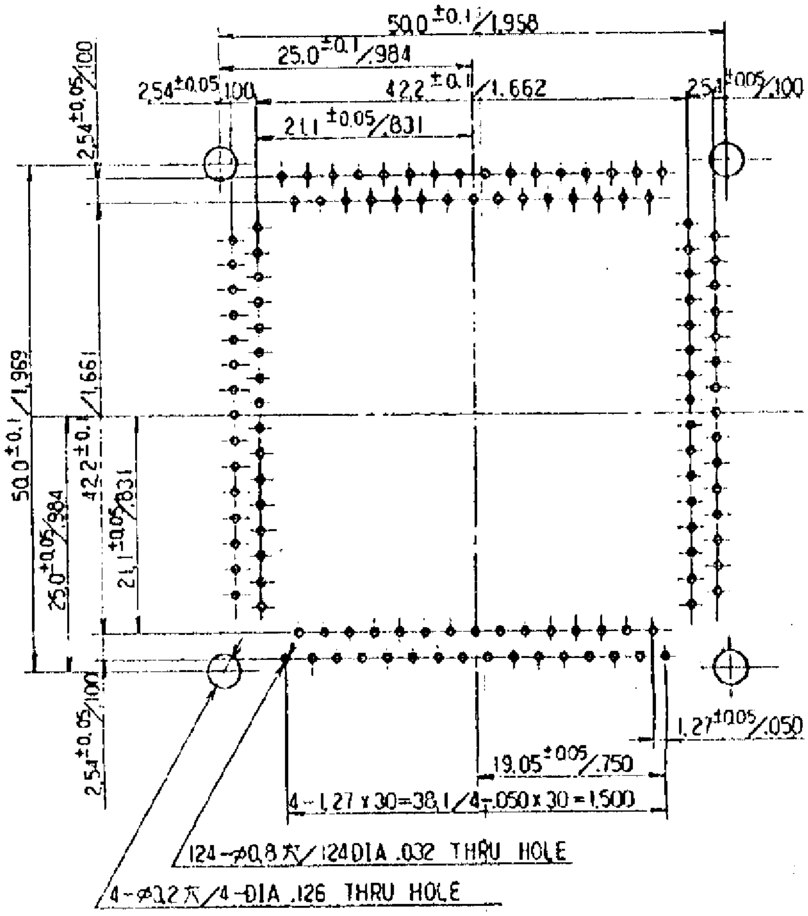
SECTION X-Y

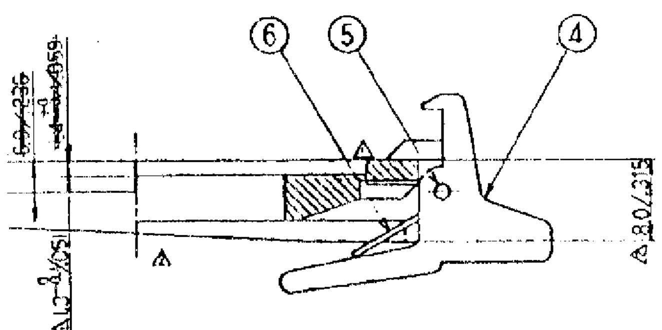
⚠	7	コイルばね COILED SPRING	1/1	MUSIC-WIRE SUS
	6	コイルばね COILED SPRING	1	MUSIC WIRE
⚠	5	シャフト M SHAFT-#18	2	BRASS
	4	ストッパー D9 LATCH	1	POLYETHERIMIDE GLASS F
	3	接触片 C/T 298-1 A/B	62/62	BERYLLIUM COPPER C1700R t0.4
	2	押え板 PUSH COVER	1	POLYETHERSULPHONE GLASS F
	1	絶縁基板 INSULATOR	1	POLYETHERSULPHONE GLASS F

記号x数 SYM.-QNT.	変更内容 REVISION DESCRIPTION	承認 APP.	担当 SIGN.	年・月・日 DATE	変更通知書番号 REV. NOTICE NO.
△.5	名称、形状、寸法 変更	[illegible]	[illegible]	98.8.13	98-0377
△.4	Design dimension & part changed	[illegible]	[illegible]	86.7.31	86-1019
△.1	Length of M-hole was changed	[illegible]	[illegible]	86.10.3	86-1265
△.2	TOLERANCE CHANGE	[illegible]	[illegible]	94.3.22	94-0422
△.1	RECRAWN	[illegible]	[illegible]	95.7.31	95-1742



CONTACT FIXED SCREW HOLE PATTERN (TOP VIEW)





SECTION Y-Y

性能：SPECIFICATIONS

1. 絶縁抵抗：INSULATION RESISTANCE.
   1000MΩ or more at 500V. DC.
2. 耐電圧：WITHSTAND VOLTAGE.
   700V. AC. for a minute.
3. 接触抵抗：CONTACT RESISTANCE.
   30mΩ or less at 10mA, 20mV.
4. 定格電流：RATED CURRENT.
   1A max.
5. 接触力：CONTACT FORCE.
   30~200g(0.295~1.966N) at moved distance of 0.2~1.1mm/.008~.0431N each individual contact.
6. 使用温度：OPERATION TEMPERATURE.
   −55°C ～ +170°C max.

NOTE

※ Making 24pieces partition walls are hight to surface for location.

適合ソケット Matching Device ... | 山一電機工業株式会社