



ARXTRON
TECHNOLOGIES INC.

High DB Count “Panelization” Solution



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Extending our solutions to meet your needs

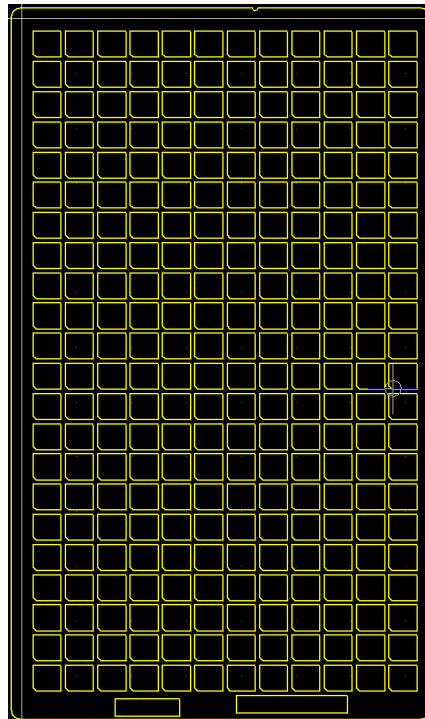


Overview

- ◆ **Introduction**
- ◆ **“Panelization” limit – issue at hand**
- ◆ **Proposed solution**
- ◆ **Test development**
- ◆ **Fixture design**
- ◆ **Debug**
- ◆ **Release to Production**
 - ◆ **Testplan**
 - ◆ **Graphics**
 - ◆ **Reporting**
 - ◆ **Datalogging**
 - ◆ **Test time and throughput multiplier**

“Panelization: limit – issue at hand

- ◆ **Medalist Paneltest limit = 256**






Proposed Solution

Development and debug

- ◆ Expand panel into a single board
- ◆ Make it look like a panel

Release to Production

- ◆ Use Paneltest testplan flow
 - ◆ Make it behave and look like a panel (as much as possible)
- 

Test Development

◆ Board (Scripted away)

C1 → 1%C1 2%C1 3%C1300%C1

"C1" 2.2n 10 10 f PN"PARTNUMBER" "FAILURE MESSAGE"; → "1%C1" 2.2n 10 10 f PN"PARTNUMBER" "FAILURE MESSAGE";
"2%C1" 2.2n 10 10 f PN"PARTNUMBER" "FAILURE MESSAGE";
"3%C1" 2.2n 10 10 f PN"PARTNUMBER" "FAILURE MESSAGE";
"4%C1" 2.2n 10 10 f PN"PARTNUMBER" "FAILURE MESSAGE";
"5%C1" 2.2n 10 10 f PN"PARTNUMBER" "FAILURE MESSAGE";

NET1 → 1%NET1 2%NET1 3%NET1 ..300%NET1

CONNECTIONS	→	CONNECTIONS
"NET1"		"1%NET1"
"C1".1		"1%C1".1
"TP1".1;		"1%TP1".1;
		"2%NET1"
		"2%C1".1
		"2%TP1".1;

CONNECTIONS	→	CONNECTIONS
"GND"		"GND"
"C1".2		"1%C1".2
"TP2".1;		"1%TP2".1;
		"2%C1".2
		"2%TP2".1;

Test Development

◆ Board_xy (Scripted away)

XY → XY+XYOFFSET1 XY+XYOFFSET2

OTHER

→

OTHER

ALTERNATES

2756, -121260 C1.1 NO_MANUAL;

2756, -119685 TP1.1 NO_MANUAL;

ALTERNATES

2756 + XOFFSET1, -121260 + YOFFSET1 "1%C1".1 NO_MANUAL;

2756 + XOFFSET1, -119685 + YOFFSET1 "1%TP1".1 NO_MANUAL;

2756 + XOFFSET2, -121260 + YOFFSET2 "2%C1".1 NO_MANUAL;

2756 + XOFFSET2, -119685 + YOFFSET2 "2%TP1".1 NO_MANUAL;

C1 SIDE; → 1%C1 SIDE; 2%C1 SIDE

DEVICES

→

DEVICES

C1 BOTTOM;

"1%C1" BOTTOM;

"2%C1" BOTTOM;

- **DON'T FORGET TO CAPTURE TESTJET OUTLINE AFTER EXPANSION**



Test Development

- ◆ **Config**

Add “*enable paneltest*”

- ◆ **Node libraries**

Create one library per DB

- ◆ **Ground for “powered” testing**

FIXED NODE OPTIONS

GND Family ALL is 0;

GND GROUND;


- ◆ **Test Generation**

Run IPG





Fixture design

- ◆ **Ground wiring (For powered testing)**
 - ◆ **Use ground plane**
 - ◆ **Connect all wired ground probes to ground plane**
 - ◆ **Identify all unwired ground probes**
 - ◆ **Connect all unwired ground probes to ground plane**
- 

Debug

Prepare files

◆ Pins and shorts

shorts



1%shorts

```
!!!! 9 0 1 1524595437 0000
!IPG: rev 08.40p Tue Apr 24 14:43:41 2018
threshold 8
settling delay 50.00u
!! Start of Section 1
short "1%$NET1" to "1%$NET2"
short "2%$NET1" to "2%$NET1"
short "3%$NET1" to "3%$NET1"
short "4%$NET1" to "4%$NET1"
short "5%$NET1" to "5%$NET1"
.
.
.
report phantoms
!! Start of Section 3
threshold 14
!! Start of Section 4
!! Start of Section 5
nodes "1%NET1"
nodes "2%NET1"
nodes "3%NET1"
nodes "4%NET1"
nodes "5%NET1"
.
.
.
.
```

```
!!!! 9 0 1 1524595437 0000
!IPG: rev 08.40p Tue Apr 24 14:43:41 2018
threshold 8
settling delay 50.00u
!! Start of Section 1
short "#%NET1" to "#%NET2"
report phantoms
!! Start of Section 3
threshold 14
!! Start of Section 4
!! Start of Section 5
nodes "#NET1"
```

- Link shorts and pins files 1% to 256%

Debug

Prepare files

◆ Pins and shorts

1%shorts



257%shorts

```
!!!! 9 0 1 1524595437 0000
!IPG: rev 08.40p Tue Apr 24 14:43:41 2018
threshold 8
settling delay 50.00u
!! Start of Section 1
short "#$NET1" to "#$NET2"
report phantoms
!! Start of Section 3
threshold 14
!! Start of Section 4
!! Start of Section 5
nodes "#$NET1"
```

```
!!!! 9 0 1 1524595437 0000
!IPG: rev 08.40p Tue Apr 24 14:43:41 2018
threshold 8
settling delay 50.00u
!! Start of Section 1
short "257#$NET1" to "257#$NET2"
report phantoms
!! Start of Section 3
threshold 14
!! Start of Section 4
!! Start of Section 5
nodes "257#$NET1"
```

- Modify pins and shorts files 257% onwards with DB number
- Compile all pins and shorts

Debug

Prepare files

- ◆ Test files (delete files 2% through 256%)

1%C1



1%C1

```
!!!! 2 0 1 1524457752 0000
! IPG: rev 08.40p Mon Apr 23 00:29:13 2018
! Common Lead Resistance 500m, Common Lead Inductance 1.00u
! Fixture: EXPRESS
disconnect all
connect s to "1%NET1"
connect i to "GND"
connect g to "1%NET2"; 1 to "1%NET2" ! 10 ! IPG recommended
capacitor 2.2n, 20.2, 70.7, fr1024, re4, wb, ar20.0m, sl, comp
! "1%c1" test.
! DUT: nominal 2.2n, plus tol 10.0 %, minus tol 10.0 %
! DUT: high 2.42n, low 1.98n
! TEST: high limit 2.644n, low limit 644.075p
! Capacitor compensation is used for this test.
! Tolerance Multiplier 5.00
! Remote Sensing is Allowed
```

```
!!!! 2 0 1 1524457752 0000
! IPG: rev 08.40p Mon Apr 23 00:29:13 2018
! Common Lead Resistance 500m, Common Lead Inductance 1.00u
! Fixture: EXPRESS
disconnect all
connect s to "%NET1"
connect i to "GND"
connect g to "%NET2"; 1 to "%NET2" ! 10 ! IPG recommended
capacitor 2.2n, 20.2, 70.7, fr1024, re4, wb, ar20.0m, sl, comp
! "1%c1" test.
! DUT: nominal 2.2n, plus tol 10.0 %, minus tol 10.0 %
! DUT: high 2.42n, low 1.98n
! TEST: high limit 2.644n, low limit 644.075p
! Capacitor compensation is used for this test.
! Tolerance Multiplier 5.00
! Remote Sensing is Allowed
```

- Link test files 1% to 256%
- Test files 257% onwards stay unchanged
- Compile all test files



Debug

Debug tests

- ◆ **Debug 1%test for 1%test to 256%test**
 - ◆ **Debug 257%test onwards individually**
 - ◆ **Compile all tests**
- 



Release to Production

- ◆ **Testplan**
 - ◆ **Use Paneltest testplan**
 - ◆ **Change BoardSet and BoardSet_boards_1_to_nnn dimension**
 - ◆ **Change test subroutines**
 - ◆ **Bulk test**
 - ◆ **Conditional test based on BoardSet (software overhead)**
- ◆ **For more sophistication**
 - ◆ **Modify Testplan Macros in Debug folder**

Release to Production

◆ Testplan

◆ With status update

```
sub Shorts (Status_Code, Message$)
global All_Failed
global BoardSet_boards_1_to_264(*)
global Boardfailed(*)

if Message$ <> "" then print tab(5);Message$
-----
call Panel_Enable_Boards
for I = 1 to 264
  if BoardSet_boards_1_to_264(I) then
    test val$(I)&"%shorts"
    if dutfailed then Boardfailed(I) = 1
  end if
next I
call Update_Status (Status_Code, All_Failed)
subend
```

◆ Bulk testing

```
sub Shorts (Status_Code, Message$)
global All_Failed
global BoardSet_boards_1_to_264(*)
global Boardfailed(*)
-----

if Message$ <> "" then print tab(5);Message$

test "1%shorts"
test "2%shorts"
test "3%shorts"
test "4%shorts"
test "5%shorts"
test "6%shorts"
test "7%shorts"
```

```
sub Analog_Tests (Status_Code, Message$)
global All_Failed
global BoardSet_boards_1_to_264(*)
global Boardfailed(*)

if Message$ <> "" then print tab(5);Message$
call Panel_Enable_Boards

for I = 1 to 264
  if BoardSet_boards_1_to_264(I) then
    if dutfailed then Boardfailed(I) = 1
    test val$(I)&"%c1"
    if dutfailed then Boardfailed(I) = 1
    test val$(I)&"%c2"
    if dutfailed then Boardfailed(I) = 1
    test val$(I)&"%r1"
    if dutfailed then Boardfailed(I) = 1
    test val$(I)&"%..."
    if dutfailed then Boardfailed(I) = 1
    test val$(I)&"%..."
    if dutfailed then Boardfailed(I) = 1
  end if
next I

call Update_Status (Status_Code, All_Failed)
subend
```

```
sub Analog_Tests (Status_Code, Message$)
global All_Failed
global BoardSet_boards_1_to_264(*)
global Boardfailed(*)
-----

if Message$ <> "" then print tab(5);Message$

test "1%c100"
test "2%c100"
test "3%c100"
test "4%c100"
test "5%c100"
test "6%c100"
test "7%c100"
```



Release to Production

Failing daughter board information in Bulk testing

- ◆ Report all failures in a file after cleanup:
- ◆ Extract failing daughter board information
 - ◆ Use grep “%” /sed or perl or any regex tool
- ◆ Feed it back to testplan
 - ◆ Set Boardfailed(I) for failing boards

Release to Production

◆ Graphics

The screenshot displays the Agilent Medalist i3070 Mux software interface. The window title is "Agilent Medalist i3070 Mux -". The menu bar includes "File", "Edit", "View", "Actions", and "Help".

Testhead Control Panel:

- START (F1) button (green)
- STOP (F4) button (red)
- LOAD (F5) button (grey)
- UNLOAD (F8) button (grey)

Information:

- FAIL** (red background)
- 99.8% FPY** (green background)
- 840704 Passed 842120 Tested

Worst Probe Report:

Empty box for reporting the worst probe.

User Defined Controls:

- Browser button (grey)
- USER2 button (grey)
- USER3 button (grey)
- USER4 button (grey)

Output:

	1	2	3	4	5	6	7	8	9	10	11	12
A	█	█	█	█	█	█	█	█	█	█	█	█
B	█	█	█	█	█	█	█	█	█	█	█	█
C	█	█	█	█	█	█	█	█	█	█	█	█
D	█	█	█	█	█	█	█	█	█	█	█	█
E	█	█	█	█	█	█	█	█	█	█	█	█
F	█	█	█	█	█	█	█	█	█	█	█	█
G	█	█	█	█	█	█	█	█	█	█	█	█
H	█	█	█	█	█	█	█	█	█	█	█	█
I	█	█	█	█	█	█	█	█	█	█	█	█
J	█	█	█	█	█	█	█	█	█	█	█	█
K	█	█	█	█	█	█	█	█	█	█	█	█
L	█	█	█	█	█	█	█	█	█	█	█	█
M	█	█	█	█	█	█	█	█	█	█	█	█
N	█	█	█	█	█	█	█	█	█	█	█	█
O	█	█	█	█	█	█	█	█	█	█	█	█
P	█	█	█	█	█	█	█	█	█	█	█	█
Q	█	█	█	█	█	█	█	█	█	█	█	█
R	█	█	█	█	█	█	█	█	█	█	█	█
S	█	█	█	█	█	█	█	█	█	█	█	█
T	█	█	█	█	█	█	█	█	█	█	█	█
U	█	█	█	█	█	█	█	█	█	█	█	█
V	█	█	█	█	█	█	█	█	█	█	█	█

Failed: 60

Cycle Time: 10.131

Load panel and press START

Status: Waiting...

Release to Production

◆ Reporting

Board Version: 1110
BOARD_1
Mon May 07 01:32:08 2018

1%current_meas HAS FAILED
Subtest: Output_low
CURRENT_MEAS
Measured: 99.262m
High Limit: 98.500m
Low Limit: 40.000m
Direct Current VOLTS

Serial #: 406638311103
System / FixtureID / Board version :
I3070SGH3275YTX / 962 / 1110

Paneltest

Board Version: **BASE**
Tue May 08 15:01:28 2018

60%c103 HAS FAILED

Measured: 36.841p
Nominal: 0.47000u
High Limit: 0.52029u
Low Limit: 0.30550u
Capacitance in FARADS

Serial #: 400004911614
System / FixtureID / Board version :
I3070SGH3275YTX / 231 / 1161

Current solution




Release to Production

Test time and Throughput multiplier

- ◆ **Solution nullifies Throughput multiplier use**
- ◆ **Test time increase can be offset by bulk testing**

Datalogging

- ◆ **One record instead of Multiple records**
 - ◆ **Create custom DB records if needed**
 - ◆ **Same QSTAT data except for the events file (for statistical analysis)**
- 



- **Questions?**
- **Comments!**