

Application Note



5800 Series- Using CAPG to allocate DTP Pins

Reference: AN517-02



Although intended for digital functional testing, the 5800 series DTP (Digital Test Point) Board can also be used to route the test point connections for making analog measurements. This is useful for testing for contact, shorts/opens as well as checking pull-up resistors and other analog components that are connected to a digital device.

CAPG V3.4 includes some new features to assist in the allocation of the DTP pins. A brief explanation of how to use these features is given in this document.

Allocation of DTP Pins

CAPG can now automatically allocate DTP test pins to a cluster. This will usually only occur after all the TPR pins have been allocated. In order to force the allocation of a DTP pin to a particular cluster (e.g. one with digital devices connected), a dummy device test can be used:

1. Create a Local UUT Specific Device Library
2. In the new library, create an entry to define the digital pins (For example called "DigCluster")
3. Use a class of "mp".
4. Create a Pinlist file. Include each of the digital clusters that require allocation. The Pin Type is not important and can be left as "N".
5. Now enter a test name and use the "Make Dummy" option to create a dummy test.
6. Select a test style of "Analog Statement"
7. Change the TCR requirement for each of the pins to "D4". This will force a DTP pin to be allocated.
8. Save the dummy module and exit the MkDummy program.
9. Click Apply and save the library entry.

Now edit the .cb file for the design and add a new device of type "DigCluster". Connect the pins of this device to the relevant clusters in the .cb file. When CAPG is run in the usual way, it will allocate DTP pins to the clusters you have just defined.

Allocation Rules

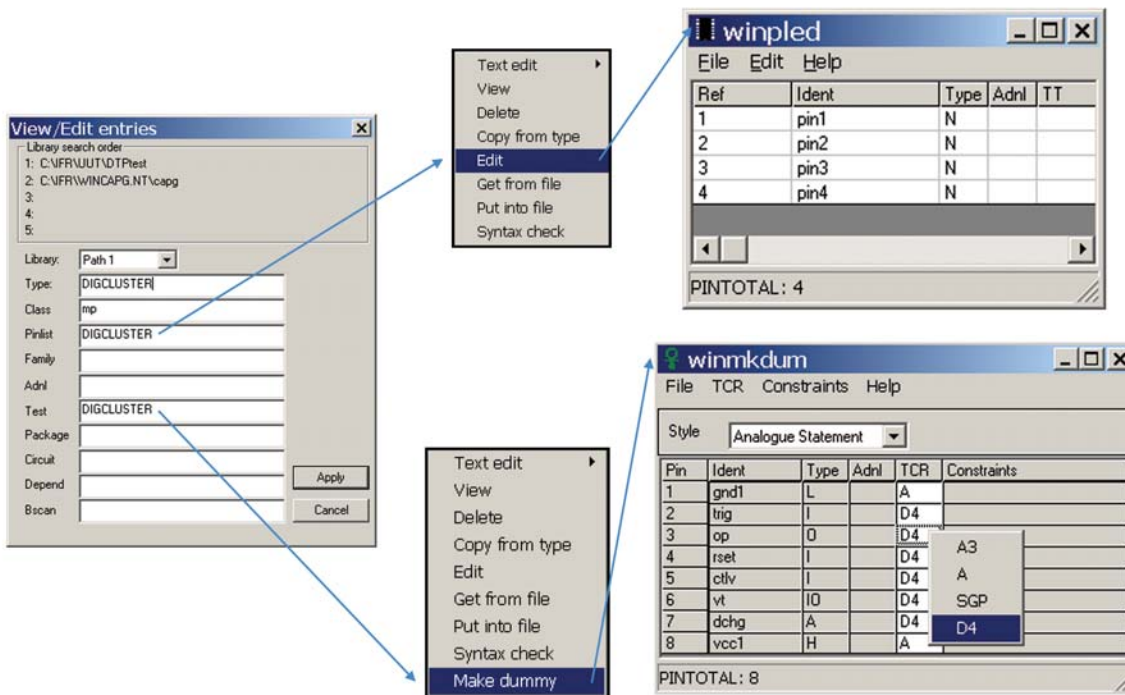
For each cluster, any D4 pins will be allocated first as defined by the dummy module (see above). These D4 pins will also be used to satisfy any A or A3 requirements provided all the constraints can be met. Next, all remaining A and A3 requirements will be met by allocating TPR pins.

Occasionally both a DTP and a TPR pin may be allocated to a single cluster. This can be avoided by using the following procedure:

1. Run CAPG to create the allocation.
2. Copy the .TCA file to create a .TCP file.
3. Edit the .TCP file and remove all pin allocations except those used for the dummy digital test.
4. Re-run CAPG using the .TCP file as a pre-allocation input file.

Restrictions of DTP Pins

As the DTP was designed for digital testing, it has restricted analog routing compared with the TPR board. This means that some components cannot be tested using only DTP pins. These include three legged devices (Tran, FET etc) and two legged devices that use guard pins. In practice, this should not cause any real problem as a spare TPR pin can be used to resolve any problems.



Multi-Board Generation

DTP boards can be used with the CAPG multi-board software but you must remember that the DTP only has 64 channels compared with the TPR board, which has 192. To create a Multi-Board program, we must tell CAPG that both the DTP and TPR cards have 64 test channels per board. To do this, the test pin range must be manually defined as from 0 to 63 in the "Test Point Management" dialog of the "Multi-Board" option.

Note that this will cause the remaining 128 channels on each TPR board to be ignored.

AIDE Program Code

The technique outlined in this document will insert the dummy code created from the library model into the "MiscPassives" method. The example below shows the test point allocation and a dummy test entry created for device IC1. Any In-Circuit tests that use DTP pins will be inserted into the appropriate method as usual.

Program	
1495	Method MiscPassives [] ()
1496	Local Symbols
1500	Method Code
1501	Evaluate \$System.Reset()
1502	Evaluate ProgramControl.DisplayTestStage("Passive Devices")
1503	Comment " IC1 NOT tested - dummy test used"
1504	Comment " TESTPIN ALLOCATION DATA"
1505	Comment " gnd1:1 allocated to #7.181 "
1506	Comment " trig:2 allocated to #D9.59 "
1507	Comment " op:3 allocated to #D9.63 "
1508	Comment " rset:4 allocated to #D9.55 "
1509	Comment " ctlv:5 allocated to #D9.51 "
1510	Comment " vt:6 allocated to #D9.47 "
1511	Comment " dchg:7 allocated to #D9.43 "
1512	Comment " vcc1:8 allocated to #7.176 "
1513	Comment " insert test code here"
1514	Comment " Dummy code to ensure test failure"
1515	Test IC1

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