



October 28, 2010

PCN Number: 1017

PCN Change Level: Major

Subject: Synopsys Software Bug that Affects Legacy Actel Devices

Dear Customer,

A GIDEP alert (T9-A-10-01) was published in April 2010 referencing a software bug in the Synopsys[®] Synplify[®] (formerly known as Synplicity[®]) synthesis tool. This notification serves to clarify software versions and the Actel devices that were affected, and the solution.

Issue

These versions of software might not correctly infer the triple-module redundancy (TMR) block when the *syn_radhardlevel* attribute is invoked. The attribute (*syn_radhardlevel* set to tmr) applied on a specific register at the lower level does not take precedence over the attribute applied on the higher level architecture (*syn_radhardlevel* set to none). For technical details, refer to this document (a SolvNet login is required to access this document):

https://solvnet.synopsys.com/retrieve/customer/application_notes/attached_files/030423/SynopsysResponseGIDEPT9-A10-01.pdf

Table 1 clarifies which versions are affected and not affected:

Table 1. List of Versions Affected and Not Affected

	Versions Affected	Versions NOT Affected
Synopsys	Synplify, Synplify Pro (8.8, 8.8.0.2, 8.8.0.4, 9.0.2, 9.2.2)	Synplify, Synplify Pro (8.1, 8.2, 8.4, 8.5, 8.6.1, 8.6.2, 9.4, v9.6.1, v9.6.2, C-2009.03, C-2009.06, C-2009.06-SP1 D-2009.12, D-2010.03)
Actel	Libero [®] Integrated Design Environment (IDE) (v8.0, v8.1, v8.2, v8.3)	All others

Devices Affected

If you are designing with, or have designed with, radiation-tolerant or radiation-hardened devices (RT/RH) that do not include hardwired TMR, you need to check the version of Synplify that was used and whether or not the *syn_radhardlevel* attribute was invoked in the design to implement TMR flip-flops. The following devices may be affected:

RH1020 and RH1280
RT1020 and RT1280A
RT1425A, RT1460A, RT14100A
RT54SX16 and RT54SX32

Devices Not Affected

Some of Actel's parts already have hardwired triple-module redundancy implemented in silicon and do not require the use of the *syn_radhardlevel* attribute when synthesizing designs. Therefore Actel does not expect designs targeting these parts to be affected:

RT54SX32S and RT54SX72S
RTSX32SU and RTSX72SU
RTAX250S/SL, RTAX1000S/SL, RTAX2000S/SL, RTAX4000S/SL
RTAX2000D and RTAX4000D

Note: RT3PE600L and RT3PE3000L products do not have TMR implemented in the silicon; however, since these products were recently qualified (July 2010) and the corrected version of Synplify, version 9.4, was released in July 2008, Actel believes it is unlikely that affected versions of Synplify would have been used in RT3PE600L and RT3PE3000L designs.

Solution

1. Use Synopsys versions 9.4.0 and later, which have the fix implemented.

To determine whether your design is affected, Actel recommends that you check the version of the Synopsys Synplify tool used to implement (synthesize) designs for the products listed in [Table 2 on page 3](#). The version can be found in the first few lines of the EDN (EDIF) netlist file. For example:

```
(status
  (written
    (timeStamp 2010 4 15 10 14 44)
    (author "Synplicity, Inc.")
    (program "Synplify Pro" (version "C-2009.03A-2, mapper
      map400act, Build 083R"))
```

2. For designs that were implemented using the affected versions, you can confirm whether the TMR flip-flops were implemented correctly by comparing the flip-flop utilization report from the synthesis log file between the affected Synopsys versions. Alternately you can check the *Technology View* in the Synopsys tool.



Table 2 lists the affected devices.

Table 2. List of Affected Devices

RT1280A	RT54SX16
RT1280A-CQ172B	RT54SX16-CQ208B
RT1280A-1CQ172B	5962-9956901QYC
RT1280A-CQ172E	RT54SX16-1CQ208B
RT1280A-1CQ172E	5962-9956902QYC
RT1425A	RT54SX16-CQ208E
RT1425A-CQ132B	RT54SX16-1CQ208E
RT1425A-1CQ132B	RT54SX16-CQ256B
RT1425A-CQ132E	5962-9956901QXC
RT1425A-1CQ132E	RT54SX16-1CQ256B
RT1460A	5962-9956902QXC
RT1460A-CQ196B	RT54SX16-CQ256E
RT1460A-1CQ196B	RT54SX16-1CQ256E
RT1460A-CQ196E	
RT1460A-1CQ196E	RT54SX32 (not RTSX-S or RTSX-SU)
RT14100A	RT54SX32-CQ208B
RT14100A-CQ256B	5962-9958603QYC
RT14100A-1CQ256B	RT54SX32-1CQ208B
RT14100A-CQ256E	5962-9958604QYC
RT14100A-1CQ256E	RT54SX32-CQ208E
RH1020	RT54SX32-1CQ208E
RH1020-CQ84V	RT54SX32-CQ256B
5962F9096505QTC	5962-9958603QXC
RH1280	RT54SX32-1CQ256B
RH1280-CQ172V	5962-9958604QXC
5962F9215603QYC	RT54SX32-CQ256E
RT1020	RT54SX32-1CQ256E
RT1020-CQ84B	
RT1020-CQ84E	

If you have any additional questions, please do not hesitate to contact Actel's ITAR Technical support at <http://www.actel.com/mycases> or tech_itar@actel.com.

Yours Sincerely,

Actel Corporation