cadence®

Export DIE abstract (XDA) from Virtuoso for use with SiP Layout and OrbitIO

Application Note

Product Version IC6.1.7
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Contents

Purpose

After going through this application note you will be able to export DIE data from IC(Virtuoso) to Cadence Chip packaging tool (SiP and OrbitIO).

This also covers what are the associated files generated and use of them in exporting the DIE data.

Audience

Virtuoso Layout Engineers

IC packaging engineers

Chip Leads

Product Engineers

Terms

OA	Open Access
VLS	Virtuoso Layout Suite
VLE	Virtuoso Layout Editor
PCB	Printer Circuit Board
PKG	IC Package Substrate
RMB	Right Mouse Button
XDA	Die Abstract File in XML Format
RDL	Redistribution Layer
VSDP	Virtuoso System Design Packager
SiP	System in Package

Overview

Virtuoso has ability to export the DIE data generated in a single file. This file is known as **DIE abstract** with file extension .XDA (XML DIE Abstract).

Cadence PACKAGING tools has now ability to import this file which brings the complete DIE data. This eliminates the need for own developed automation methods of exchanging die data.

VSDP license feature number 95441 is required for exporting the DIE information.

NOTE: The scope of this document is to cover the views which are generated for Cadence packaging Tool. When you export DIE, there are other views generated for package schematic.

Read Application Note on https://support.cadence.com **VSE Views overview**

What is DIE Abstract

Cadence has developed die abstract to simplify the exchange of die information between Virtuoso and Cadence packager tool like Sip and OrbitIO. The intent of the die abstract is to contain in a single file the basic information to describe a die when it is referenced in the context of another die or package.

DIE abstract contains the following information

- **Basic Layer information**
- **Library information**
- **Netlist**
- **Floorplan**

Read Application Note on https://support.cadence.com that covers in detail about what all information goes in above heads

Die Abstract: Exchanging Die Information

How to generate DIE Data

Open Virtuoso with the help of below command from UNIX shell terminal.

UNIX> virtuoso -sdp

To generate the DIE data, we need to enable the SDP menu in Virtuoso menu bar.

Click on Launch > SDP. It adds the SDP menu toolbar

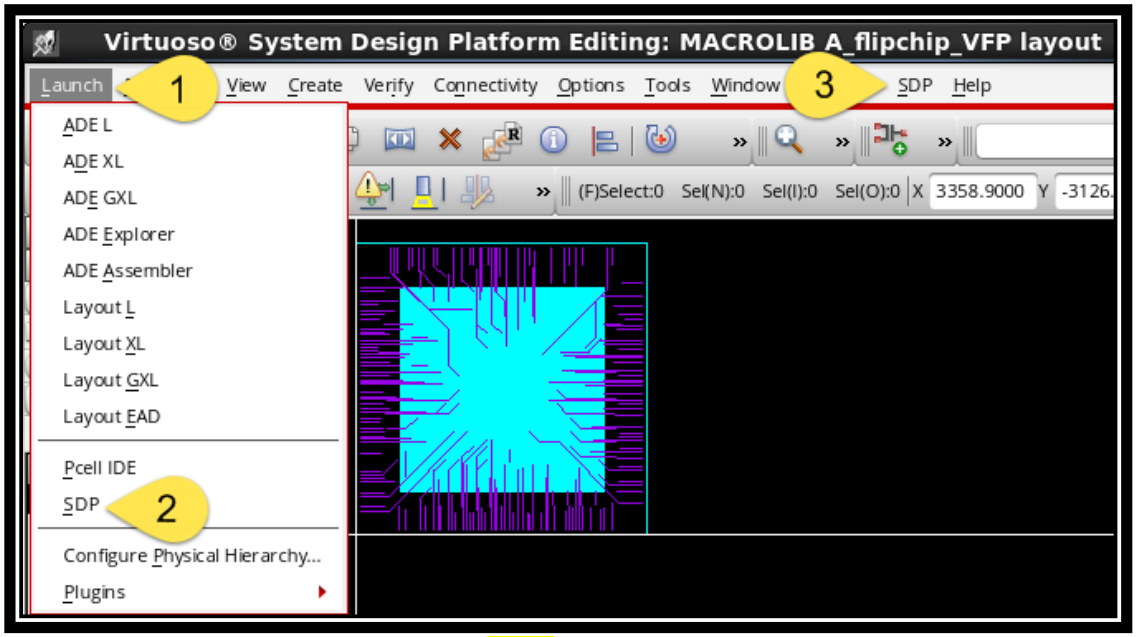

Fig1

Watch Video on https://support.cadence.com that demostrates the detail steps of exporting the DIE data from Virtuoso.

Export DIE Abstract from Virtuoso

Views and files are generated for Cadence packaging tools

Suppose you are generating DIE data from layout view as shown.

Fig2

Open “Export Die” form (SDP > Export Die). “Footprint Symbol” of “Export Die” form tab generates the required files for packaging tools.

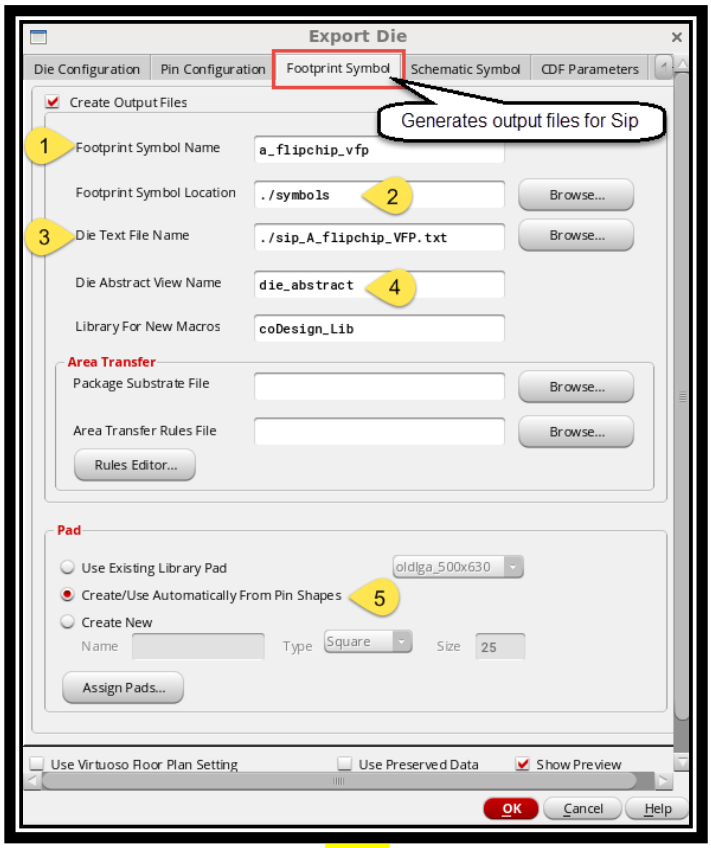

Fig3

S.No.		Form Fields
1	**Footprint Symbol Name**	Specifies footprint symbol to be generated- “a_flipchip_vfp.dra” and “a_flipchip_vfp.psm”
2	**Footprint Symbol location**	*.dra and *.psm generated at ./symbol directory as marked above
3	**File Text File Name**	File “sip_A_flipchip_vfp.txt” captures pin name, number, XY location netname, Padstack, Rotation.
4	**Die Abstract View Name**	File “A_flipchip_VFP.xda” is generated which can be imported by packager tools.
5	**Pad**	It dumps the pad information from pin shapes.

Exporting the DIE data, generates views (see **Fig4**) and filed under directories (see **Fig5** to **Fig8**).

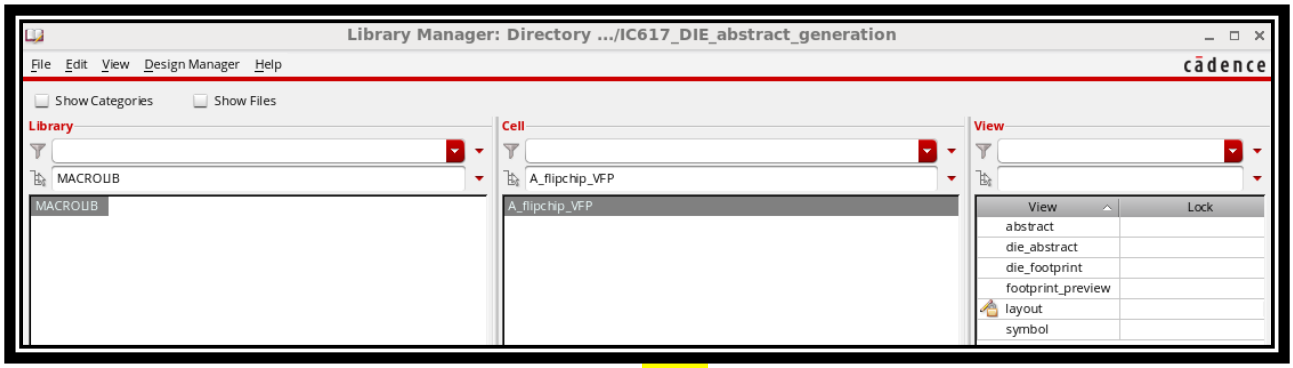

Fig4

Cadence default view-name generated (with Export Die form default option)

View	Files	Available at
Abstract	layout.oa	<Working_Directoy>/MACROLB/A_flipchip_VFP/abstract
die_abstract	A_flipchip_VFP.xda	<Working_Directoy>/MACROLB/A_flipchip_VFP/die_abstract
die_footprint	Netlist.oa	<Working_Directoy>/MACROLB/ A_flipchip_VFP/die_footprint
footprint_preview	a_flipchip_VFP.dra	<Working_Directoy>/MACROLB/A_flipchip_VFP/footprint_preview
symbol	Symbol.oa	<Working_Directoy>/MACROLB/A_flipchip_VFP/symbol

Abstract:
An abstract is a high-level representation of a layout view and it contains information about the type, size and position of pins or terminals. Generated files under abstract view

```
noi-ankgupta:[/export/home/ankgupta/DIE_Export/MACROLIB/A_flipchip_VFP/abstract]% ls -la
total 180
drwxr-xr-x 2 ankgupta cadence1   4096 Sep 18 20:23 ./
drwxr-xr-x 7 ankgupta cadence1   4096 Sep 18 20:23 ../
-rw-r--r-- 1 ankgupta cadence1 167052 Sep 18 20:23 layout.oa
-rw-r--r-- 1 ankgupta cadence1     38 Sep 18 20:23 master.tag
-rw-r--r-- 1 ankgupta cadence1   1807 Sep 18 20:23 thumbnail_128x128.png
noi-ankgupta:[/export/home/ankgupta/DIE_Export/MACROLIB/A_flipchip_VFP/abstract]%
```

Fig5

die_abstract:

An XML version of DIE detailed data.

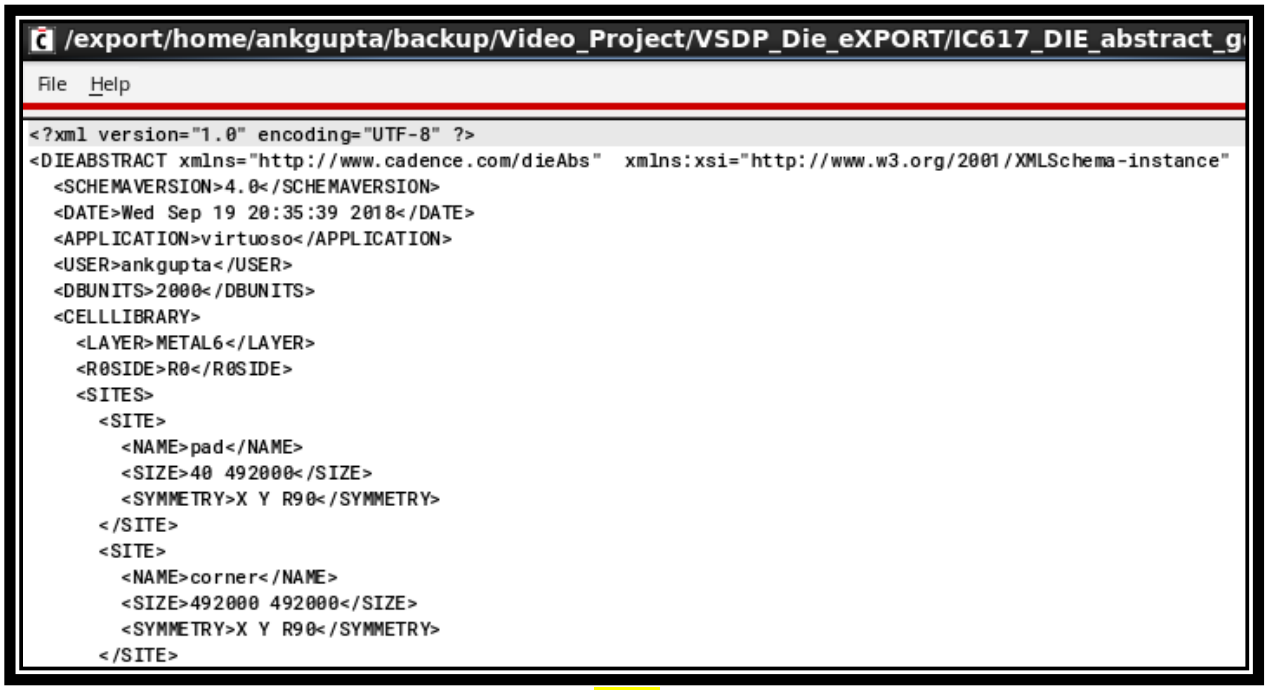

Fig6

DIE abstract file is generated with *.xda name like A_flipchip_VFP.xda

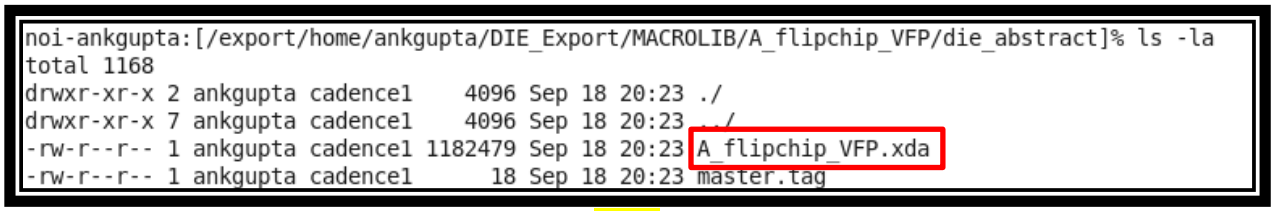

Fig7

die_footprint:

This information is used for creating the physical layout for SiP, in SiP Layout

```
noi-ankgupta:[/export/home/ankgupta/DIE_Export/MACROLIB/A_flipchip_VFP/die_footprint]% ls -la
total 72
drwxr-xr-x 2 ankgupta cadence1  4096 Sep 18 20:23 ./
drwxr-xr-x 7 ankgupta cadence1  4096 Sep 18 20:23 ../
-rw-r--r-- 1 ankgupta cadence1    39 Sep 18 20:23 master.tag
-rw-r--r-- 1 ankgupta cadence1 60644 Sep 18 20:23 netlist.oa
```

Fig8

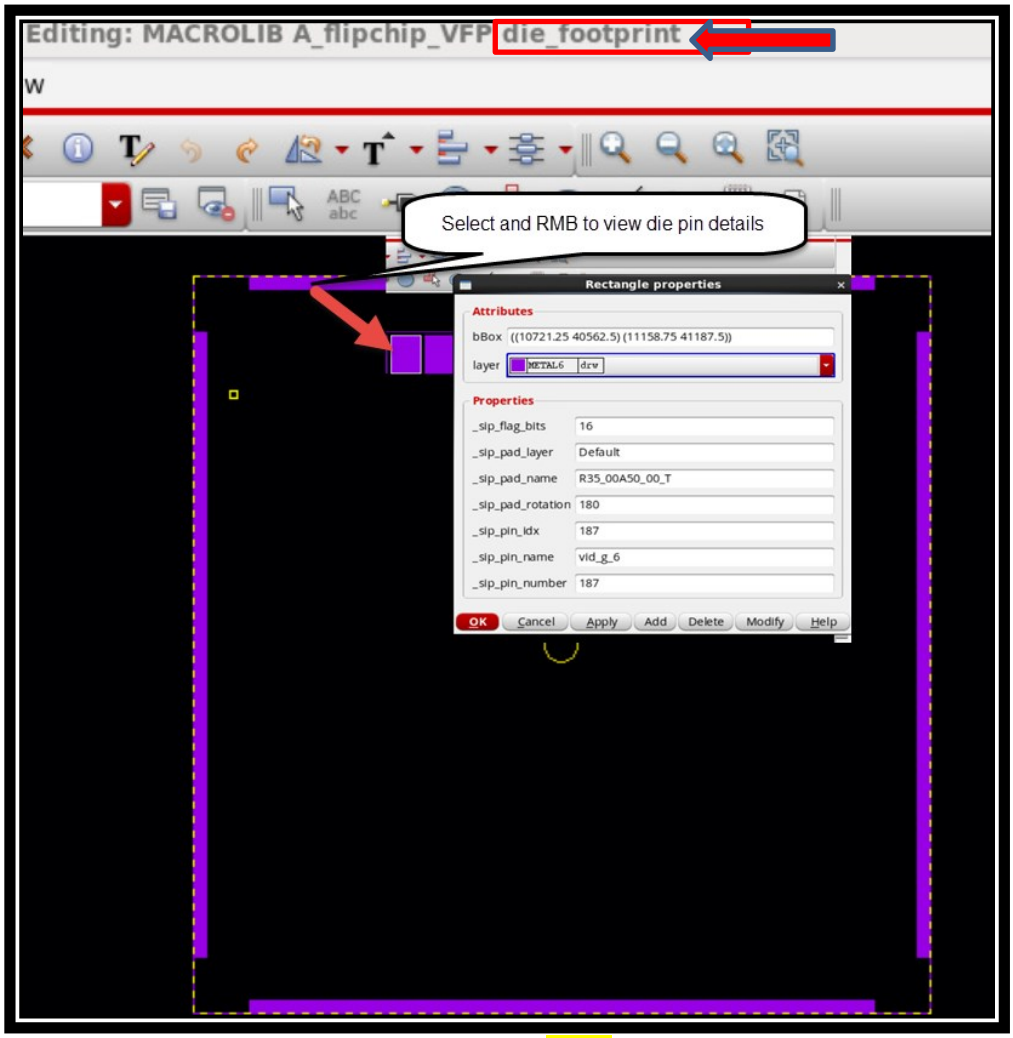

Fig9

footprint_preview:

SiP reads the .dra file which generates during exporting DIE data.

```
noi-ankgupta:[/export/home/ankgupta/DIE_Export/MACROLIB/A_flipchip_VFP/footprint_preview]% ls -la
total 20
drwxr-xr-x 2 ankgupta cadence1 4096 Sep 19 16:04 ./
drwxr-xr-x 8 ankgupta cadence1 4096 Sep 19 16:04 ../
lrwxrwxrwx 1 ankgupta cadence1  115 Sep 19 16:04 a_flipchip_vfp.dra
-rw-r--r-- 1 ankgupta cadence1   18 Sep 19 16:04 master.tag
-rw-r--r-- 1 ankgupta cadence1  570 Sep 19 16:04 thumbnail_128x128.png
```

Fig10

To view the footprint, it needs the cdnsip editor.

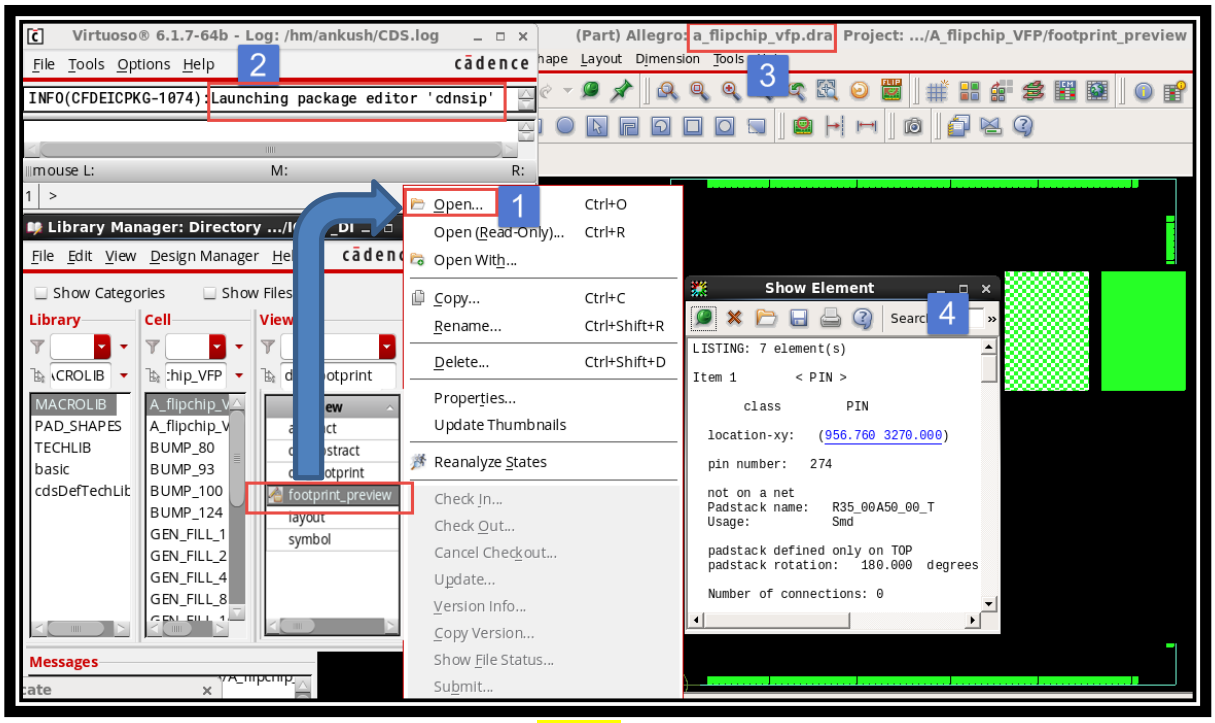

Fig11

symbols:

A symbol view generated from Die Layout or Schematic depending upon the option during Export -Die

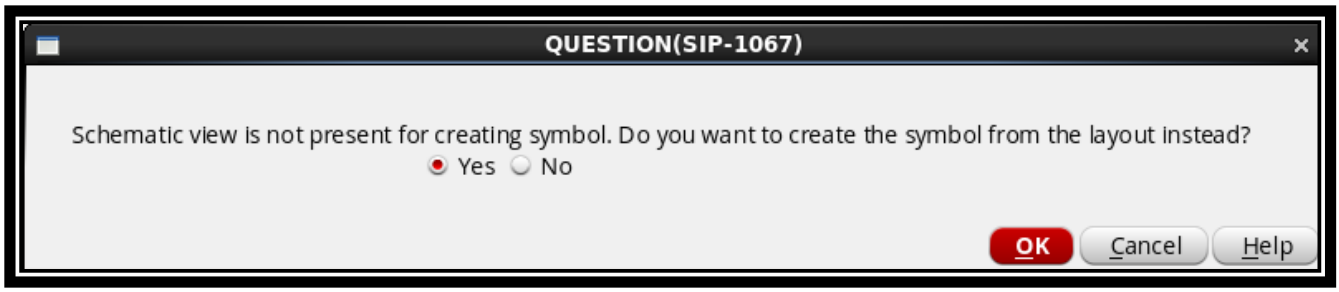

Fig12

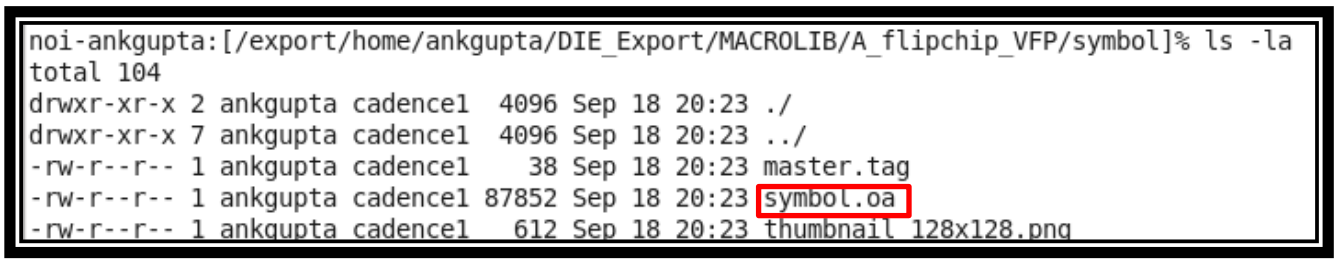

Fig13

Summary

DIE abstract is the common DIE data file which virtuoso can export, and packager tool can read in. It improves the design chain communication and verification of DIE in design and DIE on Package.

References

Exporting a DIE abstract from Virtuoso IC617

Virtuoso System Design Platform User Guide

Support

Cadence Support Portal provides access to support resources, including an extensive knowledge base, access to software updates for Cadence products, and the ability to interact with Cadence Customer Support. Visit https://support.cadence.com.

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