

## STPS80A150CHR die-form versions

### Introduction

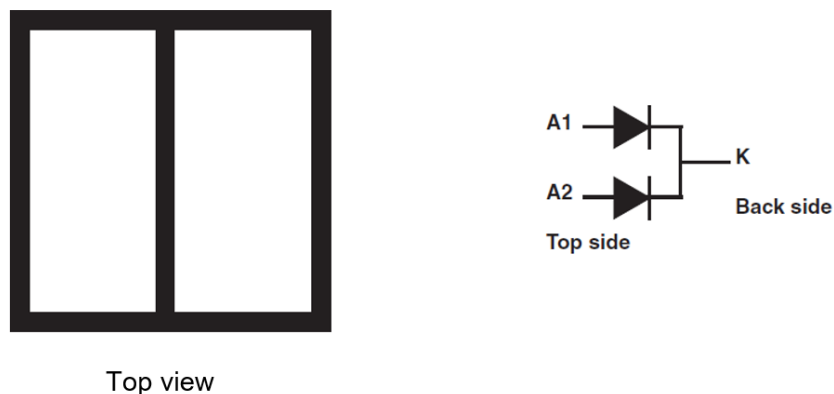
This technical note provides information about the die versions of the STPS80A150CHR by amending and completing the product datasheet, which is the reference product specification of the SMD.5 packaged versions.

The die attach of the package version is made with a soft solder process. The bonding is made with two 15 mils aluminum wires on both anodes. Provided the dice are mounted and bonded using appropriate die attach and bonding processes, information of the datasheet applies to the die versions, including absolute maximum ratings, operational conditions, and electrical and timing characteristics, unless otherwise specified in this technical note or unless it is package-related. However, the purchasers are solely responsible for the use of the product, and ST assumes no liability for the actual specification of the mounted products.

### References

- [STPS80A150CHR](#) data sheet
- [TN0873](#): DIE2HR/D2HR manufacturing and quality specification
- [TN1181](#): Engineering Model quality level

Figure 1. Pinout



The product is a monolithic dual die Schottky rectifier with common cathode.

The anodes are on the top of the die, the common cathode in the back of the die.

# 1 Characteristics

Some parameters described in the datasheet are directly related to the package. They cannot therefore be guaranteed for the die versions. Other parameters are impacted by the assembly. Mostly by the die attach, the bonding or the package dissipation. Unless specified below, such parameters can meet the product datasheet limits with die form versions provided their assembly at least meets ST's recommendations. The end user is sole responsible of defining the actual limits of the part mounted with their process and using their raw material in their application.

The table below provides the list of such parameters for the **STPS80A150CHR** in die form:

**Table 1. STPS80A150CHR parameters**

Parameters	Not relevant for die	Depending on assembly
$R_{th(j-c)}$	X	
$V_F$		Strong dependence
$I_O$		Strong dependence
$I_{FSM}$		Strong dependence

In addition, the absolute maximum ratings of the product in die form are the same as these of packaged version, except:

- The specified operating temperature range is applicable for packaged parts to the case, while it is applicable to the junction temperature for products in die form
- The storage temperature:
  - Unopened packing can be stored at 21 °C ±3 °C for 1 year after shipment
  - Once the packing is opened, the dice must be stored in a dry, inert atmosphere, such as nitrogen

Test equipment limits the maximum current during electrical wafer sort far below the maximum current of the STPS80A150CHR. The  $V_F$  specification is supported as described below, and therefore not 100% tested in production at -55 °C and +125 °C:

- The characterization made on packaged parts
- 100% wafer probing at 25 °C at low currents, with a correlation allowing to extrapolate the value at -55 °C and +125 °C
- The test at -55 °C and + 125 °C of 25 packaged samples, as described in TN0873 for FM and TN1181 for EM

The die attach process for diodes and rectifiers to be used in non-high reliability programs includes the typical recommendations provided in **Table 2**. However, end users are sole responsible of defining a process allowing their product to comply with each mission profile.

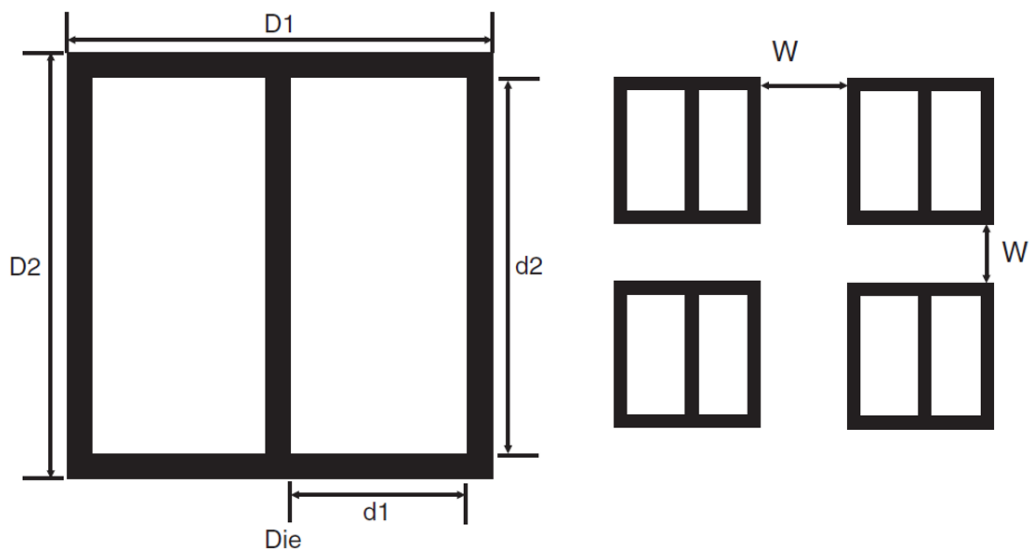
**Table 2. Typical recommendations**

Item	Recommendation
Die attach temperature	410 °C max with no more than 1 minute between 340 °C and 410 °C
Preform or solder paste	Lead-tin-silver 95.5/2/2.5

## 2 Die specific information

The dimension and key features of the die are provided below:

**Figure 2. Dimensions (definitions)**



**Table 3. Die characteristics**

Item	Values
Technology	Planar
Dimensions	D1 : 4173 $\mu\text{m}^{(1)}$ D2 : 3674 $\mu\text{m}^{(1)}$ d1 : 1860 $\mu\text{m}$ d2 : 3420 $\mu\text{m}$
Die thickness	280 $\mu\text{m}$
Top side contact	Anode
Top metallization	Aluminum
Passivation	Polyimide
Back side contact	Cathode
Back metallization	Ti-Ni-Au
Sawing street width, W	70 $\mu\text{m}$
Maximum number of dice per waffle pack	49 dice
Suggested wire bonding	2 x 15 mils aluminum wires per bond pad

1. Typical die dimension after sawing.

### 3 Conditioning and packing

Dice are packed in suitable antistatic waffle packs, vacuum sealed with adequate protection to avoid contamination or mechanical stress during shipment and handling.

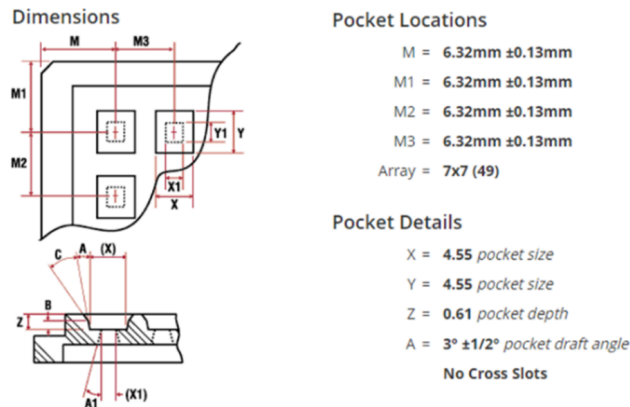
The waffle pack key features are summarized in the table below:

**Table 4. Waffle pack key features**

Item	Value
Number of cavity	49
Outside dimension	Width: 50.67 +/-0.25µm Length: 50.67 +/-0.25µm Height: 3.94 +0.08 / -0.16 mm Flatness: 0.30 mn
Cavity dimension	4.5 x 4.5 x 0.61 mm
Material	Polypropylene with carbon powder and glass bead

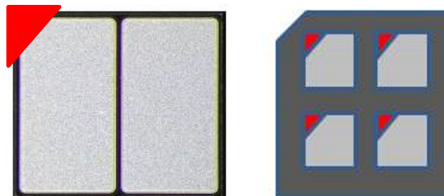
The details of the cavity dimensions are provided in the figure below:

**Figure 3. Tray detail**



Die orientation : In the waffle pack, all dice are back side down and oriented as shown below, with the middle line vertical. The die being symmetrical, there is no top and down side.

**Figure 4. Die orientation**



Each waffle pack contains dice from a single wafer.

## 4 Ordering information

Two delivery options are proposed, each corresponding to specific deliverables as described below.

**Table 5. Ordering information**

Part Number	Description	Packing
STPS80A150CD2S	Engineering Model as per <a href="#">TN1181</a>	Waffle pack
STPS80A150CD2HR	Flight Model as per <a href="#">TN0873</a>	Waffle pack
DIE-QA-LOT-78	Qualification fee - Standard option <sup>(1)</sup>	
WLQ-78	Qualification fee - Premium option <sup>(1)</sup>	

1. Refer to ST Technical Note [TN0873](#).

## 5 Other information

### 5.1 Documentation

Each product shipment includes a set of associated documentation within the shipment box. This documentation depends on the quality level of the products, as detailed in the table below.

The documentation is provided on printed paper in a dedicated envelop.

**Table 6. Default documentation provided with the parts**

Quality level	Documentation
Engineering Model	Certificate of Conformance including : <ul style="list-style-type: none"> <li>• Customer name</li> <li>• Customer purchase order number</li> <li>• ST sales order number and item</li> <li>• ST part number</li> <li>• Quantity delivered</li> <li>• Reference data sheet</li> <li>• Reference to TN1181 on engineering models</li> <li>• ST Rennes assembly lot ID</li> </ul>
ESCC Flight	Certificate of Conformance including: <ul style="list-style-type: none"> <li>• Customer name</li> <li>• Customer purchase order number</li> <li>• ST sales order number and item</li> <li>• ST part number</li> <li>• Quantity delivered</li> <li>• Diffusion line (plant + wafer size)</li> <li>• Diffusion run (wafer lot number) and wafer ID</li> <li>• Reference to the ESCC detail specification</li> <li>• ST Rennes assembly lot ID</li> </ul>

### 5.2 Traceability information

Each waffle pack is labelled with a sticker carrying the traceability information as described in the table below:

**Table 7. Traceability information on waffle pack stickers**

	D2S	D2HR
ST Part Number	X	X
Quantity of dice	X	X
Diffusion lot ID (in the diffusion plant)		X
Wafer ID		X
ST shipment order reference	X	X
ST assembly batch ID	X	X

The die itself doesn't carry any marking. The traceability of products once the cover is open is under the sole responsibility of the customers.

## Revision history

**Table 8. Document revision history**

Date	Revision	Changes
21-Oct-2021	1	Initial release.
15-Dec-2021	2	Updated <a href="#">Section 1 Characteristics</a>

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