



# MDD PRODUCTS PROFILE

# Products (Main Packages)

## High Power Component

TO-220AB, TO-220AC, ITO-220AB  
ITO-220AC, TO-277A, TO-251/252  
TO-262/263, TO-247

## DIP Bridge Rectifier

KBP, GBU, KBU, GBJ, KBJ, KBL, D3K  
KBPC6, KBPC-W, KBPC-25, DB

## DIP Diode

R-1, R-6, A-405, DO-41, DO-15,  
DO-201AD

## SMD Bridge Rectifier

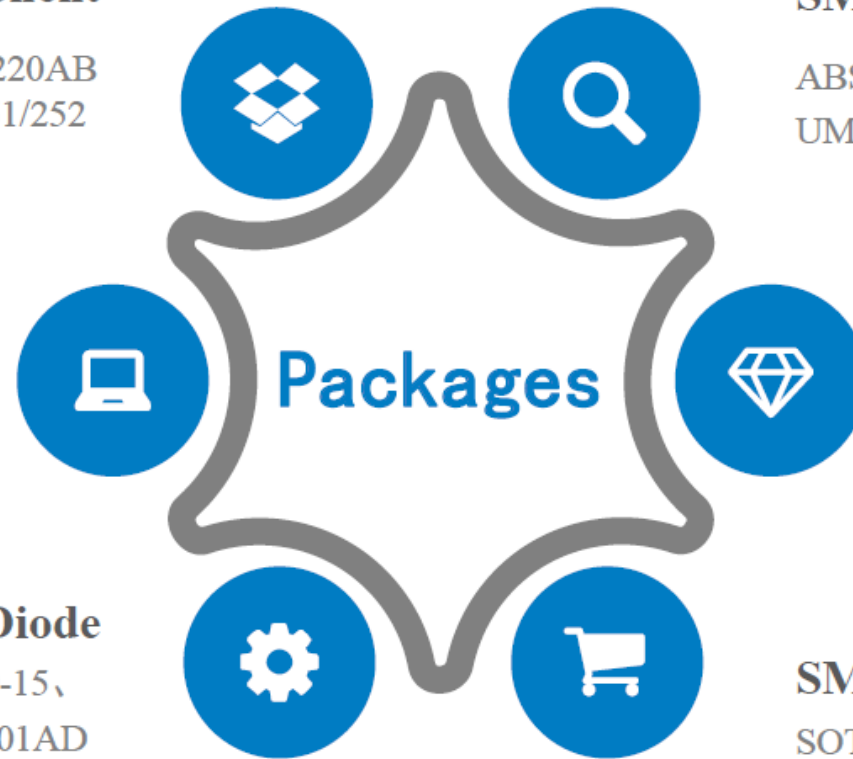
ABS, UMB, MBS, MBF, TBS, DBS,  
UMSB

## SMD Diode

SMA, SMB, SMC, SMAF, SMBF, SOD-  
323, SOD-123, SOD-123FL, DO-213AA,  
DO-213AB, TO-252, TO-263, TO-277

## SMD Transistor

SOT-23, SOT-89



# SMD Packages



SOD-523



SOD-323



SOD-123



SOT-23



SOD-123FL



SMAF



SMA



SMBF



SMB



SMC



TO-277



TO-252

# SMD Bridge Rectifier



UMB



MBF



MBS



ABS



TBS



DBS



UMSB



TTF

# DIP Bridge Rectifier



DB



KBP



D3K



KBL



GBU



KBU



GBJ



KBPC6



KBPC25



KBPC25-W

# DIP DIODE



R-1



A-405



DO-41



DO-15



DO-201AD



R-6

# SMD DIODE



TO-263



DFN2510



DFN1006



SOT-143

# Transistor & High Power Component

## MDD (SMD Transistor)



SOT-23



SOT-89

## MDD (High Power Component)



TO-220AB



ITO-220AB



TO-251



# New launch



# Products Performance



**Schottky**  
– High Power/SMD



**STD/FRD/TVS/ESD**  
– Axial/SMD  
– High Power Devices



**Bridge**  
– DIP/SIP/SMD Bridges

1. 1A-60A; 20V-200V (SIC 4-20A ; 600-3000V);
2. General Schottky Diode;
3. Low VF Schottky Diode (@125°C VF is 15% lower; IR is 10% lower than ordinary products).

1. 0.7A-30A; 100V-2000V
2. TVS: 200W, 400W, 600W, 1500W , 3000W , 5000W
3. Trr: 25ns-50ns / 150-500ns (FRD), <3000ns (STD)
4. High Voltage Diode: 2kV~15kV
5. ESD Working Voltages: 3.0V~36V; Can provide single-channel, dual-channel and other multi-channel protection, the minimum capacitance up to 0.2pF; Minimum reverse leakage current 1nA

1. 0.7A-30A; 50V-1200V;
2. Low energy bridge rectifier :  
@25°C The low current VF value is 7% lower than general rectifier bridge.  
@125°C The low current VF value is 8% lower than general rectifier bridge.  
There was no significant difference between IR value.

# TVS DIODE

TVS Chip Technology

Technology		Unidirectional	Bidirectional	Characteristic	Application
Mesa Technology				Glass+LTO Double layer passivation protection, Grooved table craft Surface metal can be silver and gold plated	<b>VBR &gt; 8V</b> , Be appropriate for AXAIL, SMD Packages  Double convex mesa leads are used in the welding of bidirectional chips
planar Technology				Ultra-low reverse leakage in planar process  The surface is metal plated with Ag	<b>5V &lt; VBR &lt; 8V</b>  Be appropriate for AXAIL, SMD Packages  Double convex mesa leads are used in the welding of bidirectional chips

## TVS Chip Parameter Selection

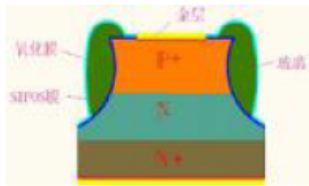

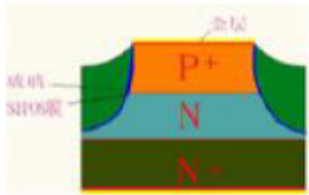

1. Model A has A high consistency of VBR ( $\pm 5\%$ ), and CA represents bidirectional TVS
2. The reverse turn-off voltage, VWM, shall be greater than or equal to the maximum operating voltage of the protected circuit
3. The maximum clamping voltage Vc should be less than the damaged voltage of the protected circuit
4. Maximum peak pulse power  $PW=VC*IPP$ , leaving a margin of 10%~20% depending on the application environment.

# Product Technical Advantages

Advantage technology: scraping and coating method

## GPP (Glassivation Passivation Parts)

- 1 . DB(DoctorBlade): High production efficiency, low reverse leakage current, low power consumption, strong surge capacity, good heat resistance.
- 2 . PG (Photo Glass): Complicated, the stress is better, but the leakage current is large and the cost is high.

Technology			Characteristic	Application
Photo Glass			<p>SIPOS Passivation protection, high temperature performance (HTRB-150°C)</p> <p>Small chip welding window, larger VF, low IFSM</p>	<p>Be appropriate for AXAIL、 SMD Packages</p> <p>In consumer, industrial, vehicle-mounted and other projects as a pre-finishing, filtering use.</p>
DoctorBlade SIPOS			<p>SIPOS Passivation protection, high temperature performance (HTRB-150°C)</p> <p>Effectively improve the welding window, reducing VF and increasing the IFSM</p>	<p>Be appropriate for AXAIL、 SMD Packages. In consumer, industrial, vehicle-mounted and other projects as a pre-finishing, filtering use. Especially in lightning strike, ringing and other pulse improvement has remarkable effect</p>

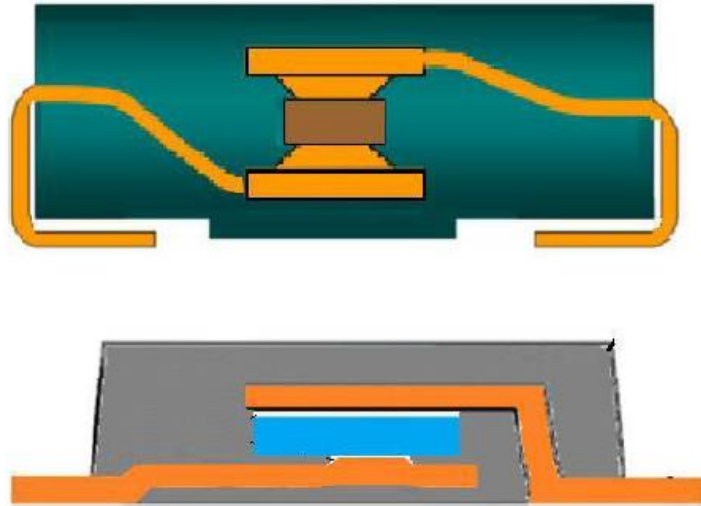
## GPP Chip Parameter Selection

1. Selection of rated current
2. The reverse breakdown voltage is generally more than the voltage of the lightning pulse applied instantaneously at both ends of the diode
3. Fast recovery FRD products should be selected for high frequency rectification, with small TRR and fast response time
4. Surge IFSM and I2T were used to convert the positive swirl wave surge of 8.3ms to the square wave surge of 1ms2ms, with a conversion ratio of 60-70%.

# Framework Package Technology

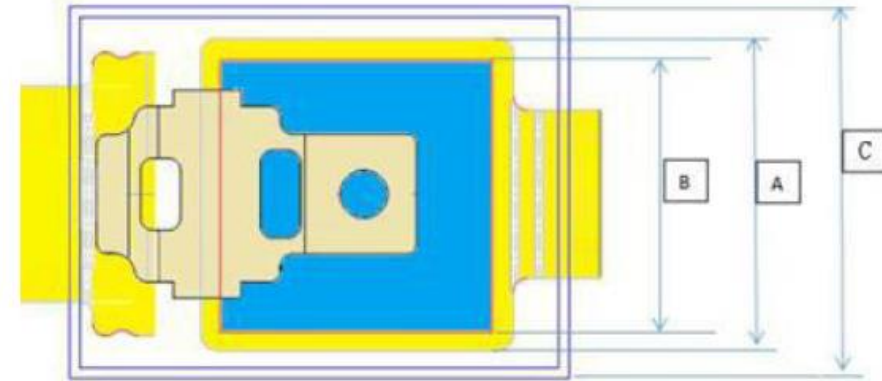
## 1、 Structure design

The frame is matched with chip and plastic sealing body, and the frame is designed with buffering mark, bending and opening. High density package. Multilayer design stress release.



### Multi-level structure:

Multi-level bending, buffer embossing, buffer pins cut off stress transfer.



A: Pad size of welding surface B: grain size C: width size of packaging body

### Design rules:

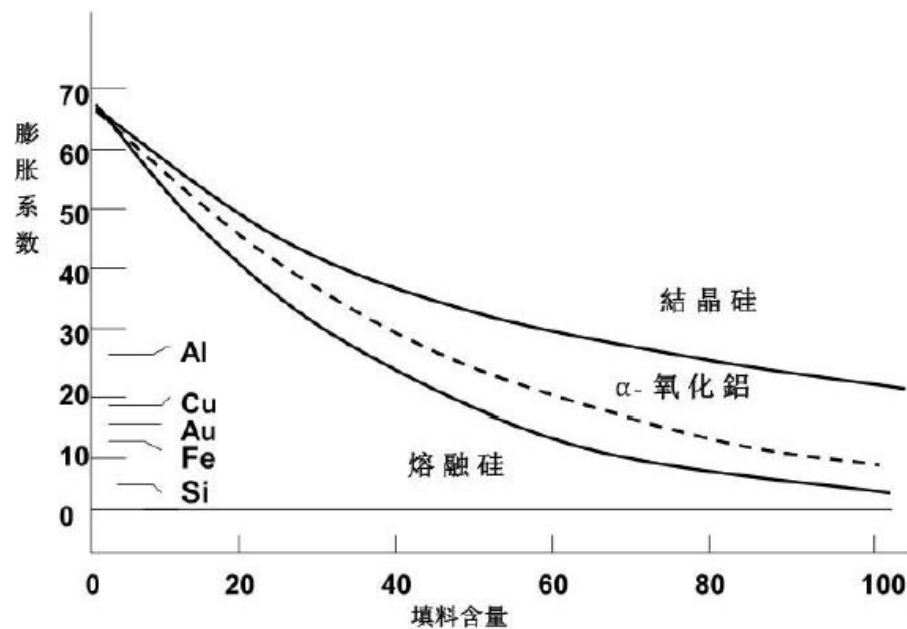
$(A-B) / 2 > 0.4\text{mm}$  , Single chip reserve 0.2mm ( 8mil )  
 $(C-A) / 2 > 0.5\text{mm}$  , Frame reserve 0.25mm ( 10mil )

# Framework Package Technology

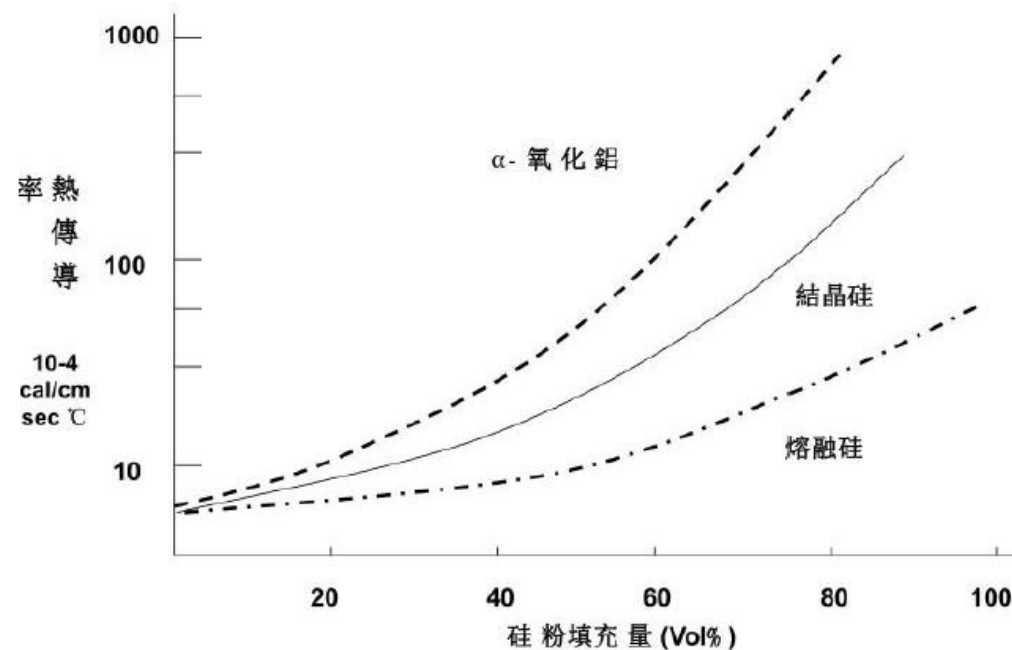
## 2、Epoxy Plastic Package Technology

Through reasonable debugging of temperature, pressure, time and other process conditions, improve the quality of plastic package.

In the choice of plastic package material, plastic package material with different characteristics (low stress, high thermal conductivity, low water absorption, etc.) should be selected according to different applications.



Packing material filler composition ratio to coefficient of expansion stress



The composition ratio of plastic packing material dissipates heat to thermal conductivity

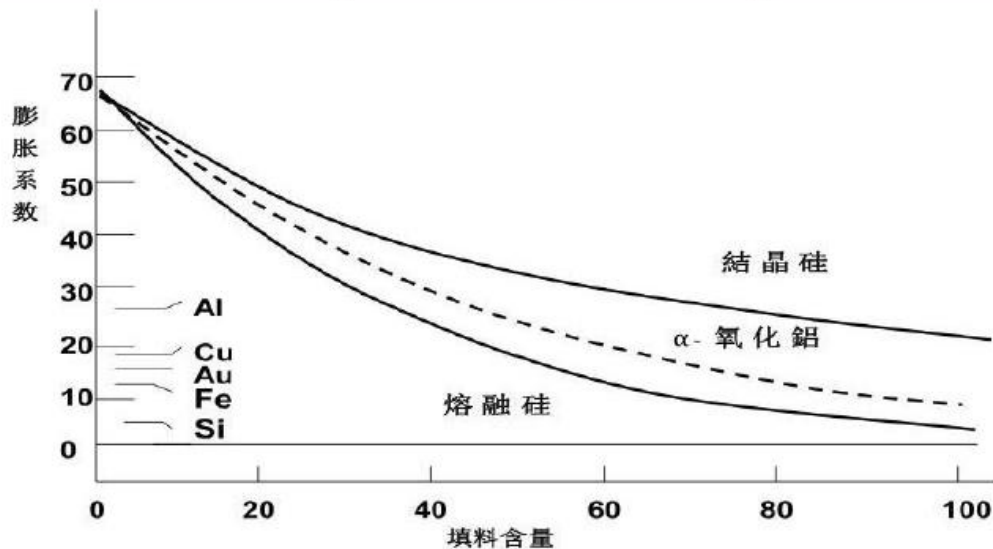
Core technology: Through the combination of plastic sealing process and plastic sealing materials with different characteristics, to meet the product characteristics of different application requirements.(Low stress, high thermal conductivity, sealing)

# Framework Package Technology

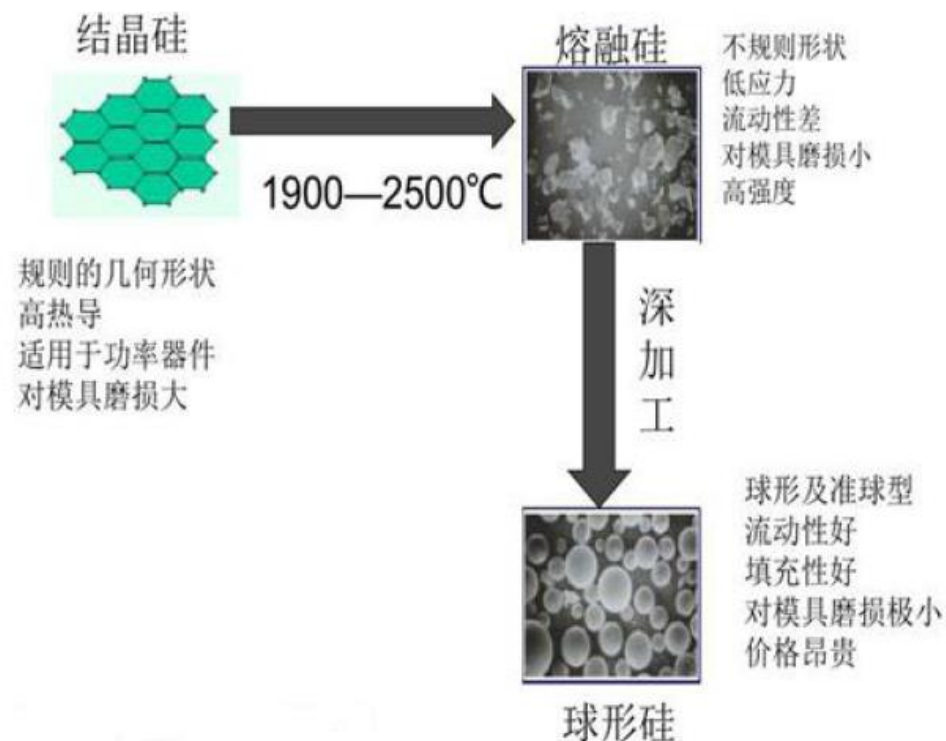
## 3、SMD stress screening and release technology

3.1、Material-low stress molding compound: The difference between conventional and low stress molding compound is mainly in Coefficient of expansion, Cohesion and filler. The typical comparison table is as follows:

Classification	Low stress molding compound	Conventional molding compound
Coefficient of expansion	less than $22 \times 10^{-6}$	more than $26 \times 10^{-6}$
Cohesion	300N以上	200-300N
Filler	Melting type (ball type)	Crystalline



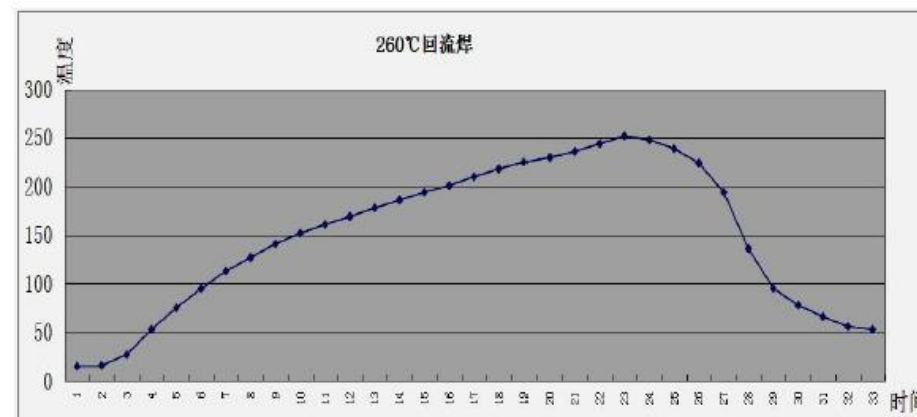
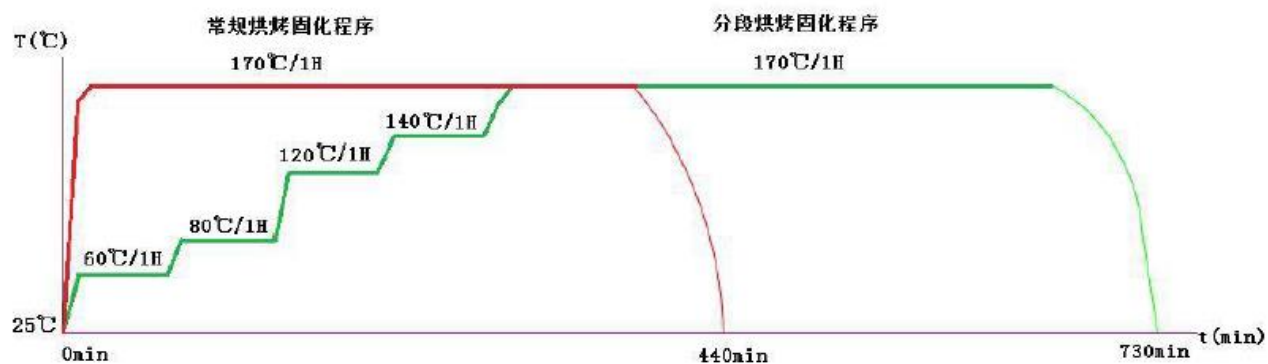
Choose different characteristics of plastic molding compound to release structure and surface stress



# Product Introduction--[Frame Packaging Process Features]

## ( 3 ) SMD stress screening and release technology

- a) Process stress release (screening) - elimination of early defective products (bath curve): frame lead annealing, release welding stress (optional) - segmented baking, slow stress release (100%) reflow soldering, stress screening (100%) .
- b) Temperature shock, stress screening (-55°C→150°C) (optional) High temperature storage, stress relief (150°C) (optional).



Through stress release and screening, more than 80% of early failure products can be effectively reduced.





# Application

Packages	Products	Application
TO251/252、TO263、TO-247、SMC、 DO-27、TO-220、ITO-220	Schottky Diode, Fast Recovery Diode	Welding machine, Inverter, Industrial power supply, Security power supply, TV, Medical power supply
SOD-323、SOD-523、SOD-923、SOT-23、 SOT-26、SOT-363、SOT-143、DFN1006-2L、 DFN1006-3L、DFN0603、DFN1610-2L、DFN1610- 6L、DFN2020-3L、DFN2510-10L	ESD Diode	Network communication equipment, Consumer electronics, Security equipment, IOT
UMSB、D3K、KBP、GBL、GBU、GBJ、KBJ	Low VF Bridge Rectifier	Adapter, TV, Industrial power supply, Automotive electronics
UMSB、TTF	3A、4A、5A、6A、8A SMD Bridge Rectifier	TV, Adapter, Monitor

# Application

- Standard Rectifier Diode: Used in signals without any requirements;
- Fast Recovery & Super Fast Diode: Used in power devices, Freewheeling, rectification, inverter, bypass;
- Schottky Diode:  $V_f$  is lower and faster speed;
- Zener Diode: Steady-state voltage protection;
- TVS: Transient voltage protection;
- Bridge Rectifier: Household appliances, power supplies, industrial control, LED lighting;

Smart Terminal	Household / Office	Industrial control	VOBC	LED Lighting	PV
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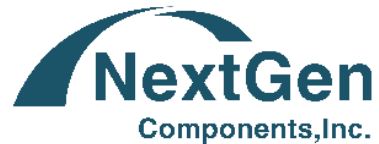
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