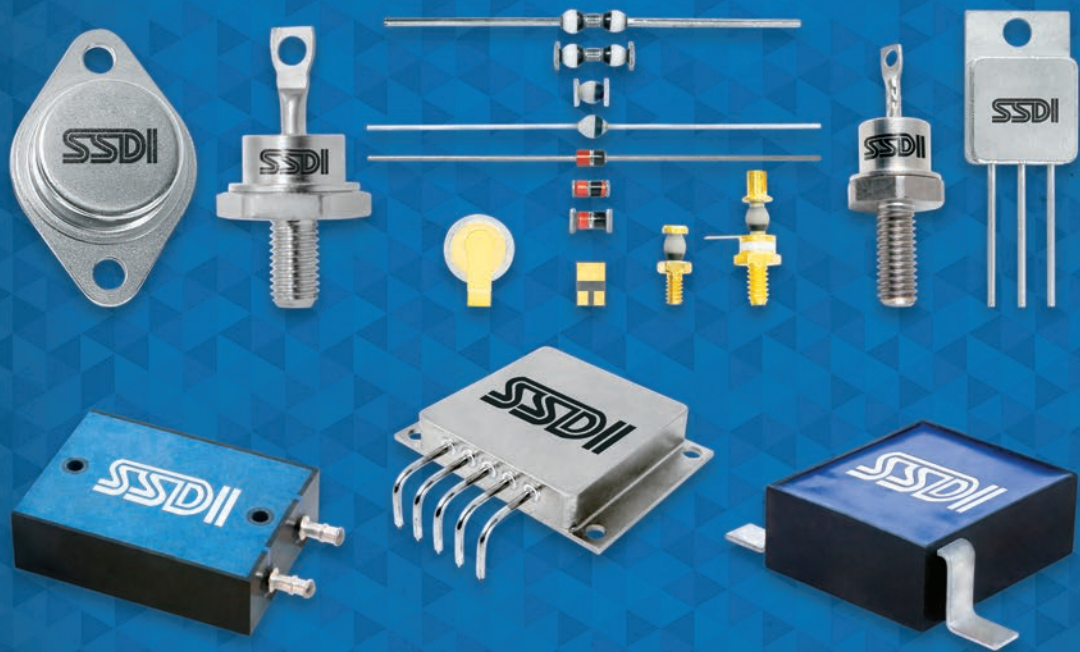




# ZENER & TVS

CATALOG 2024 - 2025



# SSDI

SOLID STATE DEVICES, INC.

EST. 1967

JANS Certified  
ISO 9001 & AS9100 Certified  
[www.ssdi-power.com](http://www.ssdi-power.com)



## SSDI LIFTS PROGRAMS TO NEW HEIGHTS BY FOCUSING ON:

### HIGH RELIABILITY

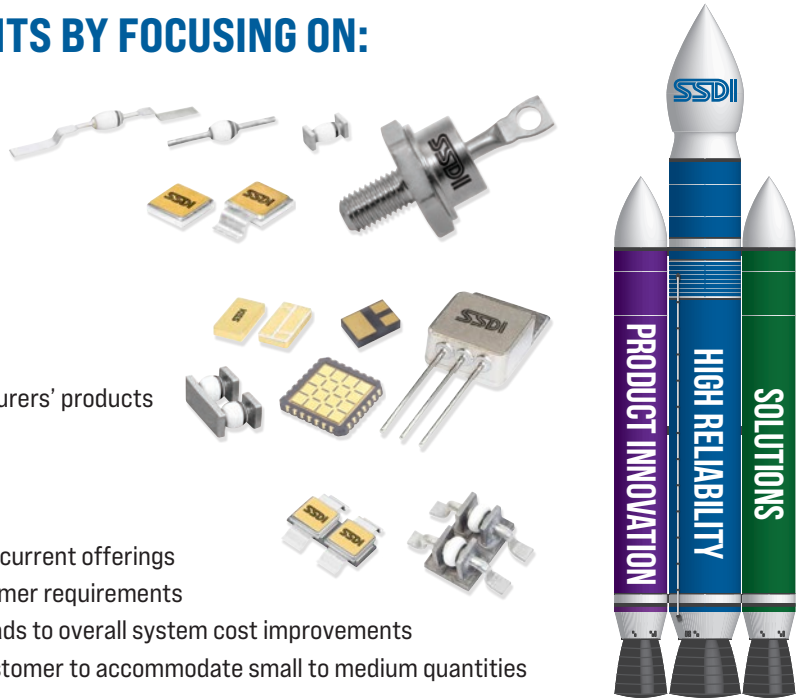
- 50+ years serving the HiRel market
- JANS certified and ISO 9001 / AS9100 certified
- 96% of sales for Aerospace and Defense applications

### PRODUCT INNOVATION

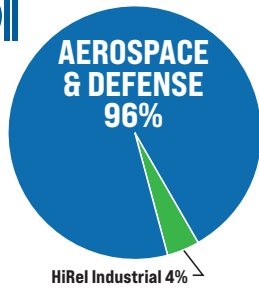
- Developing innovative, state of the art products: pushing the envelope with performance not matched by other manufacturers' products
- Exploring new technology (e.g. GaN, SiC, etc.)

### SOLUTIONS

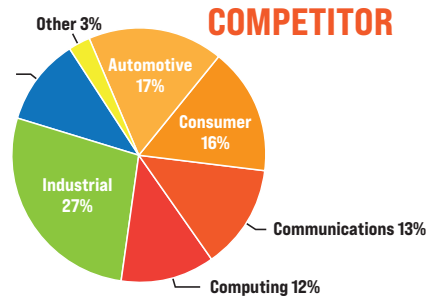
- Broad Capabilities: catalog showcases capability, not limited to current offerings
- Design Support / Flexibility: make adjustments to satisfy customer requirements
- Packaging Flexibility: improve density of board design which leads to overall system cost improvements
- Sustainment: support for the life of the program; work with customer to accommodate small to medium quantities



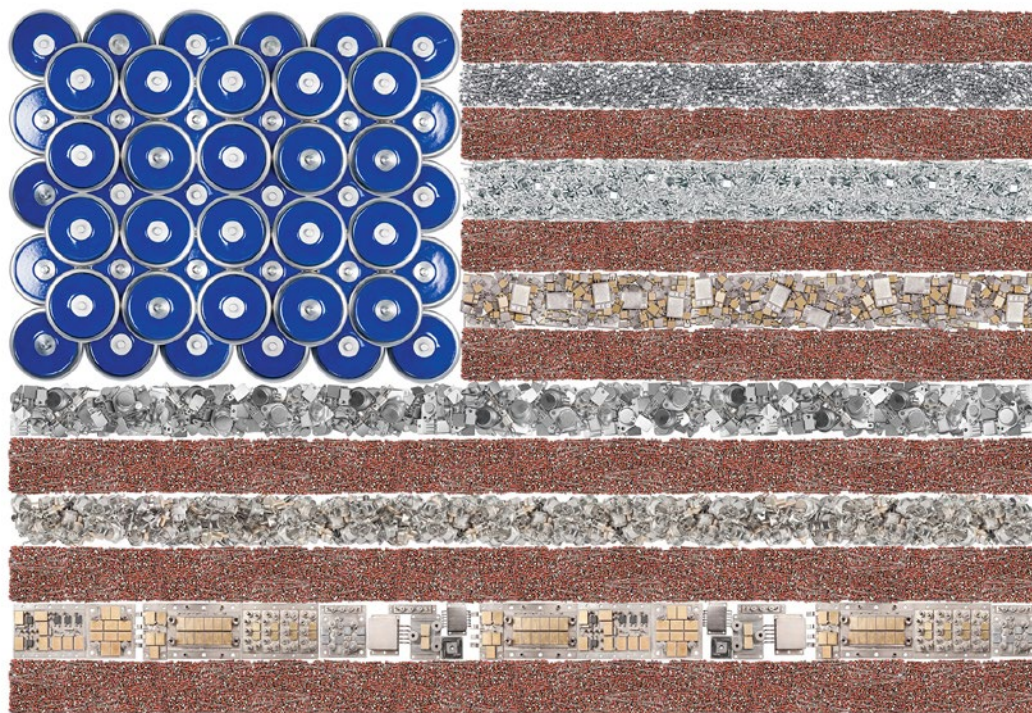
### SALES BY SECTOR



**AEROSPACE & DEFENSE**  
11%



### WIDE RANGE OF HERMETIC PRODUCTS - MADE IN THE USA



#### SILICON

- Rectifiers
- Schottkys
- Zeners
- TVS
- MOSFETs
- Bipolar Transistors
- JFETs
- PIN Diodes
- Thyristors
- IGBTs

#### SILICON CARBIDE (SiC)

- Schottkys
- MOSFETs

#### GALLIUM NITRIDE (GaN)

- Power FETs

#### ASSEMBLY PRODUCTS

- LDO
- DC-DC Converters
- Hybrids
- Assemblies
- Power Modules

Notes: Minimum order may apply.  
Most products available in die form.

## Largest selection of HiRel Zeners & TVS products in the industry / Welcome special requirements

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*TX, TXV, and S-level screening available for all devices. Screening based on MIL-PRF-19500. Screening flows available on request.	
• <b>Sales Representatives / Contact</b> .....	back cover



### SSDI is JANS certified / ISO 9001 and AS9100 certified

SSDI is a world-renowned leader in the design and manufacture of semiconductors, assemblies, and modules. As a pioneer semiconductor manufacturer for over 50 years, SSDI has earned and maintained a reputation for setting the highest standards of reliability and performance. This reputation has been built upon unsurpassed technology and quality in the areas of high density/high power and high voltage discrete semiconductors and modules.

SSDI currently owns three properties within a 3-mile area in the city of La Mirada, California



Firestone Facility



Knott Facility



Wafer Fab Facility

#### For additional information and data sheets:

16961 Knott Ave. La Mirada, CA 90638 | (562) 404-4474 | FAX (562) 404-1773 | [ssdi@ssdi-power.com](mailto:ssdi@ssdi-power.com) | [www.ssdi-power.com](http://www.ssdi-power.com)

The information in this book has been carefully checked and is believed to be accurate; however, no responsibility is assumed for errors or omissions.

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### Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact SSDI.

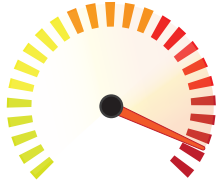
SSDI components may be used in life-support devices or systems only with the express written approval of SSDI. Failure of such components can be reasonably expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intentionally implanted in a human body, or used to support and/or maintain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

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## HOW SSDI ZENERS OUTPERFORM THE COMPETITION:

### HIGH PERFORMANCE



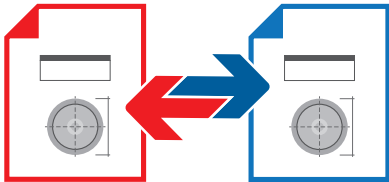
### Wide Voltage Range: $\geq 2.4\text{ V}$ , $\leq 510\text{ V}$

- Each voltage option requires die for that specific voltage
- Other manufacturers are reluctant to mass produce voltages at the lower and higher voltage ranges due to less market demand
- Wafer stacking technology enables high voltage capability

### High Power Capabilities: 250 mW - 200 W

- High density products - develop high power Zeners in small packages to optimize board space and weight savings
- Support high power Zeners up to 50 W in legacy packages such as T0-3, D0-4, and D0-5

### SUSTAINMENT SUPPORT



- Enhanced replacements for most competitors' parts (*just about all 2 terminal devices*)
- Support customer drawings and specific screening requirements
- Support high power legacy packages such as T0-3, D0-4 and D0-5

### DESIGN FLEXIBILITY



- Target key electrical characteristics to meet customer requirements
- Select die and adjust configuration to meet customer requirements

### PACKAGING FLEXIBILITY



- Wide variety of hermetic package options
- In-house tooling and machine shop for unique packaging options or modifications
- Frit glass packages available for Zeners  $\geq 3\text{ W}$

#### Available Packages:

- |                |           |
|----------------|-----------|
| ▪ Axial Leaded | ▪ Sedpack |
| ▪ Button Tab   | ▪ SM      |
| ▪ Custom       | ▪ SMD.22  |
| ▪ D0-4         | ▪ SMS     |
| ▪ D0-5         | ▪ T0-3    |
| ▪ Ministud     |           |

Since SSDI also supplies to customer SCDs, its capabilities far exceed the published data sheet parts. Contact SSDI to discuss your program needs.

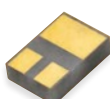
### High Density Solutions / Alternatives to Glass Sleeve Packages



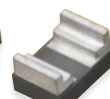
Sedpack 1  
(Direct bond connection / no wire bonds)



SMD.22



SMD.22T



US



SMD.22T: Drop-in replacement for US packages

Part Number <i>(Industry Part Number)</i>	Features / Advantages	P <sub>D</sub> (W)	V <sub>Z nom</sub> (V)	Z <sub>ZM</sub> (Ω)	I <sub>ZM</sub> (mA)	Package	Data Sheet
<b>SZ25A2.4 - SZ25A43</b> <i>(1N3506 - 1N3533)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	0.25	2.4 - 43	36 - 170	95 - 5.5	Axial 	Z00001
<b>SZ25A2.4 - SZ25A43</b> <i>(1N3506 - 1N3533)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	0.4	2.4 - 43	36 - 170	142.5 - 8.25	SM, SMS 	Z00001
<b>SZN6309 - SZN6355</b> <i>(1N6309 - 1N6333)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	0.5	2.4 - 200	30 - 1800	177 - 2.1	Axial, SMS 	Z00011
<b>SZN935 - SZN940</b> <i>(1N935 - 1N940)</i>	<ul style="list-style-type: none"> <li>9 V temperature compensated Zener reference diode</li> <li>Low temperature coefficient: 0.0002%/°C - 0.01%/°C</li> <li>Hermetically sealed in glass</li> </ul>	0.5	8.55 - 9.45	20	50	Axial 	Z00020
<b>SZ5A2.4 - SZ5A200</b> <i>(1N746 - 1N759, 1N957 - 1N992, 1N4099 - 1N4372, 1N4617 - 1N4717)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	0.5	2.4 - 200	30 - 2500	198 - 2.2	Axial 	Z00002
<b>SZ5A2.4 - SZ5A200</b> <i>(1N746 - 1N759, 1N957 - 1N992, 1N4099 - 1N4372, 1N4617 - 1N4717)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	0.8	2.4 - 200	30 - 2500	297 - 3.3	SM, SMS 	Z00002
<b>SZ8706 - SZ8220</b> <i>(UZ8706 - UZ8220)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	1.0	6.8 - 200	3.5 - 1500	140 - 4.7	Axial, SM, SMS 	Z00019
<b>SZ1A3.3 - SZ1A100</b> <i>(1N3016 - 1N3044, 1N3821 - 1N3824)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	1.0	3.3 - 100	10 - 250	276 - 11	Axial 	Z00003
<b>SZ1A3.3 - SZ1A100</b> <i>(1N3016 - 1N3044, 1N3821 - 1N3824)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	1.5	3.3 - 100	10 - 250	414 - 16.5	SM, SMS 	Z00003
<b>SZN4460 - SZN4496</b> <i>(1N4460 - 1N4496)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	1.5	6.2 - 200	4 - 1500	230 - 7.2	Axial, SM, SMS 	Z00008
<b>SZN6485 - SZN6491</b> <i>(1N6485 - 1N6491)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	1.5	3.3 - 5.6	10 - 5	433 - 255	Axial, SM, SMS 	Z00008
<b>SZN5913 - SZ5956</b> <i>(1N5913 - 1N5956)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	1.5	3.3 - 200	10 - 1200	454 - 7	Axial, SMS 	Z00012
<b>SZN5063 - SZN5117</b> <i>(1N5063 - 1N5117)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	3	6.8 - 400	2 - 3500	440 - 7	Axial, SM, SMS 	Z00009
<b>SZ3GA7.5 - SZ3GB510</b> <i>(1N4883A - 1N4884B, 1N4097A - 1N4098B)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	3	7.5 - 510	2 - 5500	400 - 6	Axial 	Z00004
<b>SZ3FA7.5 - SZ3FB510</b> <i>(1N4883A - 1N4884B, 1N4097A - 1N4098B)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>5% and 2% tolerances</li> </ul>	3	7.5 - 510	2 - 5500	400 - 6	Axial 	Z00004
<b>SZ3GA7.5 - SZ3GB510</b> <i>(1N4883A - 1N4884B, 1N4097A - 1N4098B)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>5% and 2% tolerances</li> </ul>	4	7.5 - 510	2 - 5500	400 - 6	SM, SMS 	Z00004
<b>SZ3FA7.5 - SZ3FB510</b> <i>(1N4883A - 1N4884B, 1N4097A - 1N4098B)</i>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>5% and 2% tolerances</li> </ul>	4	7.5 - 510	2 - 5500	400 - 6	SMS 	Z00004

- TX, TXV, and S level screening available. Screening based on MIL-PRF-19500. Screening flows available on request.
- Consult factory for additional voltages and voltage tolerances.

Part Number (Industry Part Number)	Features / Advantages	$P_D$ (W)	$V_{Z\ nom}$ (V)	$Z_{ZM}$ ( $\Omega$ )	$I_{ZM}$ (mA)	Package	Data Sheet
<b>SZ5706 - SZ5890</b> <b>SZ5110 - SZ5227</b> (UZ5706 & UZ5806 Series)	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>5% and 2% tolerances</li> <li>40 mil lead diameter version available</li> </ul>	5	6.8 - 270	1 - 850	675 - 16	Axial, SMS 	Z00007
<b>SZN4954 - SZN4996</b> (1N4954 - 1N4996)	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>5% and 2% tolerances</li> <li>40 mil lead diameter version available</li> </ul>	5	6.8 - 390	1 - 1800	700 - 12	Axial, SMS 	Z00010
<b>SZ6A7.5 - SZ6B270</b>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>5% and 2% tolerances</li> </ul>	6	7.5 - 270	0.7 - 600	750 - 20.4	Axial 	Z00005
<b>SZ6A7.5 - SZ6B270</b>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>5% and 2% tolerances</li> </ul>	8	7.5 - 270	0.7 - 600	1000 - 27.2	Isolated Ministud V 	Z00005
<b>SZ6A7.5 - SZ6B270</b>	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>5% and 2% tolerances</li> </ul>	10	7.5 - 270	0.7 - 600	1250 - 34	Ministud C, SMS 	Z00005
<b>SZN2970 - SZN3015</b> (1N2970 - 1N3015)	<ul style="list-style-type: none"> <li>Hermetically sealed</li> <li>5% and 2% tolerances</li> </ul>	10	6.8 - 200	1.2 - 300	1500 - 46	D0-4 	Z00023
<b>SZH6A4.3 - SZH6B200</b>	<ul style="list-style-type: none"> <li>Low voltage avalanche Zener (LVA)</li> <li>High <math>P_D</math></li> <li>Low Zener impedance / Low <math>I_R</math></li> <li>Small footprint (.157" W x .227" L x .075" H)</li> <li>Hermetically sealed ceramic package</li> <li>5% and 2% tolerances</li> </ul>	12	4.3 - 200	30 - 60	Note 4	SMD.22 	Z00024
<b>SZN2804 - SZN2846</b> <b>SZN4557 - SZN4564</b> (1N2804 - 1N2846, 1N4557 - 1N4564)	<ul style="list-style-type: none"> <li>High <math>P_D</math></li> <li>Hermetically sealed</li> <li>5% and 2% tolerances</li> </ul>	50	3.9 - 200	0.16 - 100	10000 - 240	T0-3 	Z00021
<b>SZN3305 - SZN3350</b> <b>SZN4549 - SZN4556</b> (1N3305 - 1N3350, 1N4549 - 1N4556)	<ul style="list-style-type: none"> <li>High <math>P_D</math></li> <li>Hermetically sealed</li> <li>5% and 2% tolerances</li> </ul>	50	3.9 - 200	0.16 - 100	11900 - 200	D0-5 	Z00022

- TX, TXV, and S level screening available. Screening based on MIL-PRF-19500. Screening flows available on request.
- Consult factory for additional voltages and voltage tolerances.



## Defense Program Encounters Supply Issue

- Requirement: 50 W, 190 V Zener
- Competitor decided to no longer supply this part (many competitors are discontinuing high power products in legacy packages due to difficulties with hermeticity requirements)
- Defense contractors line down due to this supply issue

## Sustainment Support / High Reliability Solution

- SSDI added as supplier to source control drawing and delivered to resolve supply issue
- SSDI accommodates low to medium volume orders for the lifetime of the program

## SUSTAINMENT SUPPORT

Broad capabilities to replace most competitors' parts - also support customer drawings and specific screening requirements

Industry Part Number	SSDI Part Number	Description	Package	Data Sheet
1N746 - 1N759	SZ5B3.3 - SZ5B200	500 - 800 mW, 3.3 - 200 V	Axial, SM, SMS	Z00002
1N935 - 1N940	SZN935 - SZN940	9 V, 0.0002%/°C - 0.01%/°C, Temperature Compensated Zeners	Axial	Z00020
1N957 - 1N992	SZ5B3.3 - SZ5B200	500 - 800 mW, 3.3 - 200 V	Axial, SM, SMS	Z00002
1N1588 - 1N1598	Contact Factory	3.5 W, 3.9 - 27 V	DO-4	-
1N1599 - 1N1609	Contact Factory	10 W, 3.9 - 27 V	DO-4	-
1N1803 - 1N1836	Contact Factory	10 W, 5.6 - 200 V	DO-4	-
1N2041 - 1N2049	Contact Factory	10 W, 4.7 - 22 V	DO-4	-
1N2804 - 1N2846	SZN2804 - SZN2846	50 W, 6.8 - 200 V	T0-3	Z00021
1N2970 - 1N3015	SZN2970 - SZN3015	10 W, 6.8 - 200 V	DO-4	Z00023
1N3016 - 1N3044	SZ1B6.8 - SZ1B100	1 - 1.5 W, 6.8 - 100 V	Axial, SM, SMS	Z00003
1N3045A - 1N3051A	Contact Factory	1 - 1.5 W, 110 - 200 V	Axial, SM	-
1N3305 - 1N3350	SZN3305 - SZN3350	50 W, 6.8 - 200 V	DO-5	Z00022
1N3506 - 1N3533	SZ25B3.3 - SZ25B43	250 - 400 mW, 3.3 - 43 V	Axial, SM, SMS	Z00001
1N3821A - 1N3827A	SZ1B3.3L - SZ1B5.6L	1 - 1.5 W, 3.3 - 5.6 V	Axial, SM, SMS	Z00003
1N3993 - 1N3998	Contact Factory	10 W, 3.9 - 6.2 V	DO-4	-
1N4097A - 1N4098B	SZ3A100 - SZ3B150	3 - 4 W, 100 - 150 V, 5 - 10%	Axial, SM, SMS	Z00004
1N4099 - 1N4372	SZ5B6.8 - SZ5B3.0	500 - 800 mW, 2.4 - 100 V	Axial, SM, SMS	Z00002
1N4460 - 1N4496	SZN4460 - SZN4496	1.5 W, 6.2 - 200 V	Axial, SM, SMS	Z00008
1N4549 - 1N4556	SZN4549 - SZN4556	50 W, 3.9 - 7.5 V	DO-5	Z00022
1N4557 - 1N4564	SZN4557 - SZN4564	50 W, 3.9 - 7.5 V	T0-3	Z00021
1N4617 - 1N4717	SZ5B2.4 - SZ5B43	500 - 800 mW, 2.4 - 43 V	Axial, SM, SMS	Z00002
1N4883A - 1N4884B	SZ3A12 - SZ3B20	3 - 4 W, 12 - 20 V, 5 - 10%	Axial, SM, SMS	Z00004
1N4954 - 1N4996	SZN4954 - SZN4996	5 W, 6.8 - 390 V	Axial, SMS	Z00010
1N5063 - 1N5117	SZN5063 - SZN5117	3 W, 6.8 - 390 V	Axial, SM, SMS	Z00009
1N5518 - 1N5546	SZ5B3.3 - SZ5B33	500 - 800 mW, 3.3 - 33 V	Axial, SM, SMS	Z00002
1N5913 - 1N5956	SZN5913 - SZN5956	1.5 W, 3.3 - 200 V	Axial, SMS	Z00012
1N5968 - 1N5969	Contact Factory	5 W, 5.6 - 6.2 V	Axial, SMS	-
1N6082 - 1N6091	Contact Factory	0.4 W, 4.3 - 10 V Low Voltage Avalanche Diodes	Axial	-
1N6309 - 1N6355	SZN6309 - SZN6355	0.5 W, 2.4 - 200 V	Axial, SMS	Z00011
1N6485 - 1N6591	SZN6485 - SZN6491	1.5 W, 3.3 - 5.6 V	Axial, SM, SMS	Z00008
1N6632 - 1N6637	Contact Factory	5 W, 3.3 - 5.1 V	Axial, SMS	-
LVA 343A - LVA 3100A	Contact Factory	0.4 W, 4.3 - 10 V Low Voltage Avalanche Diodes	Axial	-
LVA 43A - LVA 100A	Contact Factory	0.4 W, 4.3 - 10 V Low Voltage Avalanche Diodes	Axial	-
LVA 450A - LVA 498A	Contact Factory	0.4 W, 5 - 9.8 V Low Voltage Avalanche Diodes	Axial	-
UZ4110 - UZ4120 UZ4210 - UZ4220	Contact Factory	5 W, 100 - 200 V	Axial	-
UZ4706 - UZ4791 UZ4806 - UZ4891	Contact Factory	5 W, 6.8 - 91 V	Axial	-
UZ5110 - UZ5890	SZ5110 - SZ5890	5 W, 6.8 - 100 V, 5 - 10%	Axial, SMS	Z00007
UZ7110 - UZ7890	SZ6B6.8 - SZ6B100	6 - 10 W, 6.8 - 100 V, 5 - 10%	Axial, SMS, C, V	Z00005
UZ8210 - UZ8890	SZ8210 - SZ8890	1 W, 6.8 - 100 V, 5 - 10%	Axial, SM, SMS	Z00019

## HOW SSDI TVS DEVICES OUTPERFORM THE COMPETITION:

### HIGH PERFORMANCE



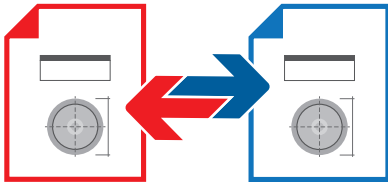
#### Wide Voltage Range: $\geq 6.7 \text{ V}$ , $\leq 510 \text{ V}$

- Each voltage option requires die for that specific voltage
- Other manufacturers are reluctant to mass produce voltages at the lower and higher voltage ranges due to less market demand
- Wafer stacking technology enables high voltage capability

#### High Power Capabilities: 150 W - 160 kW

- High density products - develop high peak pulse power discretes

### SUSTAINMENT SUPPORT



- Enhanced replacements for most competitors' parts (just about all 2 terminal devices)
- Support customer drawings and specific screening requirements
- Support high power legacy packages such as D0-4 and D0-5

### DESIGN FLEXIBILITY



- Target key electrical characteristics to meet customer requirements (e.g. customize clamping voltage / slope)
- Select die and adjust configuration to meet customer requirements

### PACKAGING FLEXIBILITY



- Wide variety of hermetic package options
- In-house tooling and machine shop for unique packaging options or modifications

#### Available Packages:

- |                        |           |
|------------------------|-----------|
| ▪ Axial Leaded         | ▪ Sedpack |
| ▪ Button Tab           | ▪ SM      |
| ▪ Custom               | ▪ SMD.22  |
| ▪ D0-4                 | ▪ SMS     |
| ▪ D0-5                 | ▪ T0-25X  |
| ▪ 5 Pin Flatpack (FP5) | ▪ T0-3    |
| ▪ Ministud             |           |

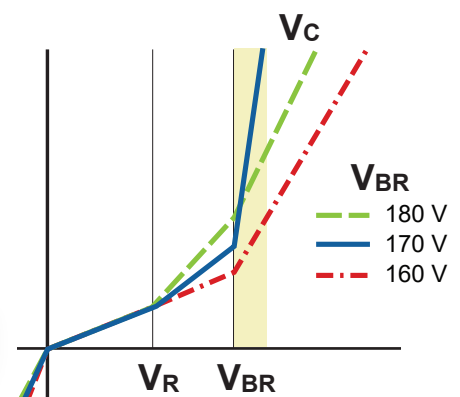
Since SSDI also supplies to customer SCDs, its capabilities far exceed the published data sheet parts. Contact SSDI to discuss your program needs.

### Special Requirement for Spacecraft Program









- Requirement: 1.5 kW, 150 V TVS with  $V_{BR} = 170 \text{ V}$
- Competitor's QPL TVS offered breakdown voltages of 160 V and 180 V
- Competitor's QPL TVS also did not meet the clamping voltage requirements

### Design Flexibility / High Performance Solution

- SSDI developed a 1.5 kW, 150 V TVS with  $V_{BR} = 170 \text{ V}$  and a tighter  $V_C$  slope (represented by blue line in adjacent graph)
- SSDI worked with the customer to understand test requirements and assist with the source control drawing





Part Number <i>(Industry Part Number)</i>	Features / Advantages	$P_{PP}$ (W)	$V_{RWM}$ (V)	$V_{BR\ nom}$ (V)	$V_{CL}$ (V)	Package	Data Sheet
ST150A7.5 - ST150A510	<ul style="list-style-type: none"> <li>Hermetically sealed in glass</li> <li>Available in 10% and 5% tolerances</li> </ul>	150	3 - 370	7.5 - 510	13.3 - 882	Axial, SM, SMS 	T00001
ST200A20 - ST200B75	<ul style="list-style-type: none"> <li>Bidirectional</li> <li>Hermetically sealed ceramic package</li> <li>Small footprint <i>(.157" W x .227" L x .075" H)</i></li> <li>Available in 10% and 5% tolerances</li> </ul>	200	20 - 75	24 - 88	32.4 - 121	SMD.22 	T00045
ST4462 - ST4500	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>Small footprint</li> </ul>	300	6.2 - 240	7.5 - 300	11.3 - 419	SMS 	T00029
ST400A20 - ST400B75	<ul style="list-style-type: none"> <li>Hermetically sealed ceramic package</li> <li>Small footprint <i>(.157" W x .227" L x .075" H)</i></li> <li>Available in 10% and 5% tolerances</li> </ul>	400	20 - 75	24 - 88	32.4 - 121	SMD.22 	T00043
STN6461 - STN6468 <i>(1N6461 - 1N6468)</i>	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Hermetically sealed in glass (Frit glass)</li> <li>Unidirectional (Bidirectional available - consult factory)</li> </ul>	500	5 - 51.6	5.6 - 54 <i>(<math>V_{BR\ min}</math>)</i>	9 - 78.5	Axial, SMS 	T00047
ST500A7.5 - ST500B270	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Hermetically sealed in glass (Frit glass)</li> <li>Can be used as a 5 W Zener</li> <li>Available in 10% and 5% tolerances</li> </ul>	500	6.2 - 220	7.5 - 270	11.3 - 380	Axial, SMS, Ministud C, Isolated Ministud V 	T00023
ST1000A7.5 - ST1000B510	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Hermetically sealed in glass (Frit glass)</li> <li>Can be used as a 5 W Zener</li> <li>Available in 10% and 5% tolerances</li> </ul>	1000	6.2 - 430	7.5 - 510	11.3 - 707	Axial, SMS, Ministud C, Isolated Ministud V 	T00033
STB1000A7.5 - STB1000B510	<ul style="list-style-type: none"> <li>Bidirectional</li> <li>High peak pulse power</li> <li>Hermetically sealed in glass (Frit glass)</li> <li>Can be used as a 5 W Zener</li> <li>Available in 10% and 5% tolerances</li> </ul>	1000	6.2 - 430	7.5 - 510	11.3 - 707	Axial, SMS 	T00038

- TX, TVV, and S level screening available. Screening based on MIL-PRF-19500. Screening flows available on request.
- Consult factory for additional voltages and voltage tolerances.

Part Number <i>(Industry Part Number)</i>	Features / Advantages	P <sub>pp</sub> (W)	V <sub>RWM</sub> (V)	V <sub>BR nom</sub> (V)	V <sub>CL</sub> (V)	Package	Data Sheet
ST1.5KA7.5 - ST1.5KB270	<ul style="list-style-type: none"> <li>Hermetically sealed in glass (Frit glass)</li> <li>Metallurgically bonded</li> <li>Solid silver leads for high power dissipation</li> <li>10% and 5% tolerances</li> </ul>	1500	5.6 - 200	7.5 - 270	11.7 - 380	Axial, SMS, Ministud C, Isolated Ministud V 	T00002
STN6469 - STN6476 <i>(1N6469 - 1N6476)</i>	<ul style="list-style-type: none"> <li>Unidirectional (bidirectional available - consult factory)</li> <li>Hermetically sealed in glass (Frit glass)</li> </ul>	1500	5 - 51.6	5.6 - 54 (V <sub>BR min</sub> )	9 - 78.5	Axial, SMS 	T00031
ST2.5KA400	<ul style="list-style-type: none"> <li>Bidirectional</li> <li>Hermetically sealed in glass (Frit glass)</li> </ul>	2500	400	Contact Factory	Contact Factory	Axial, SMS 	Contact Factory
STA3KA13.6JE - STA3KA800JE	<ul style="list-style-type: none"> <li>Unidirectional</li> <li>Glass passivated junction, epoxy encapsulated assembly</li> <li>Meets all environmental requirements of MIL-PRF-19500</li> </ul>	3000	10.6 - 684	13.6 - 800	21 - 1096	T0-257JE 	TVS001
STD5KA5.0 - STD5KB110	<ul style="list-style-type: none"> <li>Unidirectional</li> <li>Hermetically sealed</li> <li>Meets all environmental requirements of MIL-S-19500</li> <li>Reverse polarity (cathode to stud) also available</li> <li>10% and 5% tolerances</li> </ul>	5000	5 - 110	7.3 - 135 (V <sub>BR max</sub> )	9.6 - 177	D0-5 	T00030
ST10K18BT - ST10K100BT	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Hermetically sealed ceramic package</li> <li>Direct bond connection (no wire bonds)</li> <li>Small footprint (.45" W x .6" L)</li> </ul>	10000	18 - 100	21.1 - 116	31 - 159	Button 	T00042
ST10KS12MB - ST10KS110MB	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>High surge rating (500 A)</li> <li>Hermetically sealed</li> <li>5% tolerance</li> </ul>	10000	12 - 110	14.7 - 135 (V <sub>BR max</sub> )	19.9 - 177	T0-254 	T00046

- TX, TXV, and S level screening available. Screening based on MIL-PRF-19500. Screening flows available on request.
- Consult factory for additional voltages and voltage tolerances.

## Special Requirement for Space Program








- Requirement: ≥ 3 kW, 100 V TVS with small footprint to optimize board space
- Competitor's 1 kW devices failed to meet specifications for new design

## Design Flexibility / High Density Solution

- SSDI developed the ST10K100BT, a 10 kW, 100 V TVS
- New ceramic button package with small footprint (0.45" W x 0.6" L)
- New package utilizes direct bond connection (no wire bonds) for more efficient power dissipation
- Higher voltages available, up to 400 V
- Supplied mechanical samples for package qualification and engineering prototypes for rapid evaluation



Ceramic Button  
(Direct bond connection / no wire bonds)

Part Number <i>(Industry Part Number)</i>	Features / Advantages	P <sub>pp</sub> (kW)	V <sub>RWM</sub> (V)	V <sub>BR nom</sub> (V)	V <sub>CL</sub> (V)	Package	Data Sheet
ST15KS12MB - ST15KS110MB	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>High surge rating (500 A)</li> <li>Hermetically sealed</li> <li>5% tolerance</li> </ul>	15	12 - 110	14.7 - 135 (V <sub>BR max</sub> )	19.9 - 177	T0-254 	T00046
STA15K7.9 - STA15K100 <i>(Smaller than 704-15K36 &amp; 704-15K36T types)</i>	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Unidirectional</li> <li>Hermetically sealed</li> <li>Meets all environmental requirements of MIL-PRF-19500</li> <li>TX &amp; TXV Screening Available</li> </ul>	15	5.6 - 75	7.9 - 100	11.7 - 136.4	STA15 	T00004
STA15K7.5P - STA15K100P <i>(Smaller than 704-15K36 &amp; 704-15K36T types)</i>	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Unidirectional</li> <li>Hermetically sealed</li> <li>Meets all environmental requirements of MIL-PRF-19500</li> <li>TX &amp; TXV Screening Available</li> </ul>	15	5.6 - 75	7.5 - 100	11.7 - 136.4	STA15 	T00006
STA60K7.9P - STA60K100P <i>(Smaller than 60KS200C types)</i>	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Bidirectional</li> <li>Hermetically sealed</li> <li>Meets all environmental requirements of MIL-PRF-19500</li> <li>TX &amp; TXV Screening Available</li> </ul>	60	5.6 - 75	7.9 - 100	14.5 - 138.5	STA60 	T00008
STA60K79S - STA60K1000S <i>(Smaller than 60KS200C types)</i>	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Bidirectional</li> <li>Hermetically sealed</li> <li>Meets all environmental requirements of MIL-PRF-19500</li> <li>TX &amp; TXV Screening Available</li> </ul>	60	56 - 750	79 - 1000	145 - 1385	STA60 	T00014
STM8057	<ul style="list-style-type: none"> <li>Available voltages from 96 V to 1600 V - consult factory</li> <li>Reverse polarity also available</li> <li>Meets all environmental requirements of MIL-PRF-19500</li> <li>TX &amp; TXV Screening Available</li> </ul>	120	800	840 (V <sub>BR min</sub> )	1000	STM8057 	TVS002
ST160KS014 - ST160KS132	<ul style="list-style-type: none"> <li>High peak pulse power</li> <li>Hermetically sealed</li> <li>Unidirectional (bidirectional available - consult factory)</li> </ul>	160	144 - 1320	176.4 - 1620 (V <sub>BR max</sub> )	238.8 - 2124	FP5 	T00048

- TX, TXV, and S level screening available. Screening based on MIL-PRF-19500. Screening flows available on request.
- Consult factory for additional voltages and voltage tolerances.





## HIGH PERFORMANCE

Wide Voltage Range:  
 $\geq 6.7 \text{ V}, \leq 510 \text{ V}$   
 High Power Capabilities:  
**150 W - 160 kW**



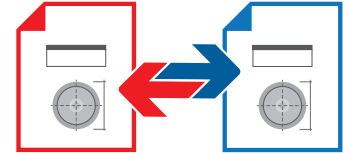
## DESIGN FLEXIBILITY

Target key electrical characteristics to meet customer requirements (e.g. customize clamping voltage / slope)



## PACKAGING FLEXIBILITY

Select / modify package to meet customer requirements



## SUSTAINMENT SUPPORT

Broad capabilities to replace most competitors' parts - also support customer drawings and specific screening requirements

Industry Part Number	SSDI Part Number	Description	Package	Data Sheet
1N6461 - 1N6468	STN6461 - STN6468 / SMS	500 W, 5.6 - 54 V, Unidirectional	Axial, SMS	T00047
1N6469 - 1N6476	STN6469 - STN6476 / SMS	1,500 W, 5.6 - 54 V, Unidirectional	Axial, SMS	T00031
60KS200C Types	STA60K7.9P - STA60K100P	60 kW, 7.9 - 100 V, Low Voltage Bidirectional	STA60	T00008
60KS200C Types	STA60K79S - STA60K1000S	60 kW, 79 - 1000 V, High Voltage Bidirectional	STA60	T00014
704-15K35 / 704-15K35T Types	STA15K7.5 - STA15K100P	15 kW, 7.5 - 100 V, Unidirectional	STA15	T00006
704-15K36 / 704-15K36T Types	STA15K7.9 - STA15K100	15 kW, 7.9 - 100 V, Unidirectional	STA15	T00004

Since SSDI also supplies to customer SCDs, its capabilities far exceed the published data sheet parts. Contact SSDI to discuss your program needs.

## New TVS Products

High Density Solutions and High Peak Pulse Power Solutions

### ST200A20 - ST200B75

- $P_{PP} = 200 \text{ W}$
- Bidirectional
- SMD.22 (.157" W x .227" L x .075" H)



### ST400A20 - ST400B75

- $P_{PP} = 400 \text{ W}$
- Unidirectional
- SMD.22 (.157" W x .227" L x .075" H)



### ST160KS014 - ST160KS132

- $P_{PP} = 160 \text{ kW}$
- $V_{RWM} = 144 - 1320 \text{ V}$
- 5 Pin Flat Pack



## SEMICONDUCTOR MARKET OVERVIEW

While SSDI has the capabilities to supply most **standard, generic products** (represented by the orange section below), its sales primarily address the need for **End of Life / DMS Solutions** or **New, Innovative Solutions**, which are not readily available through high volume manufacturers or distribution channels (represented by the 2 blue sections below).



## SEMICONDUCTOR MARKET TREND

Due to market changes (i.e. mergers, acquisitions, etc.), there is an increasing trend of planned obsolescence or product discontinuation due to insufficient demand across the entire customer base. As inventory of **standard, generic products** shrinks, SSDI is able to fill these gaps and even fulfill small- to medium-sized orders. SSDI's flexibility also allows it to offer application specific solutions. With this investment in the specific needs of each program, SSDI benefits by supporting the full life span of the program while alleviating potential supply concerns for the customer.

**When demand diminishes, competitors often discontinue products**



## HOW SSDI RESCUES PROGRAMS FROM:

### RELIABILITY ISSUES

- Offer up to JANS level / equivalent S level screening
- 2 JANS certified facilities in the USA
- 50+ years supporting aerospace & defense applications
- In-house screening capabilities (additional screening options to match mission specs)

### SUPPLY ISSUES

- Offer replacements for most products from competitors (e.g. Microsemi, Infineon / IR, TI, Siliconix, etc.)
- Maintain materials inventory (work with customer to forecast future orders)
- Shorter lead times (TX, TXV, and S level equivalent screening - offering faster delivery than out of stock QPL devices awaiting approval)
- Work with customer to accommodate small orders

### PERFORMANCE ISSUES

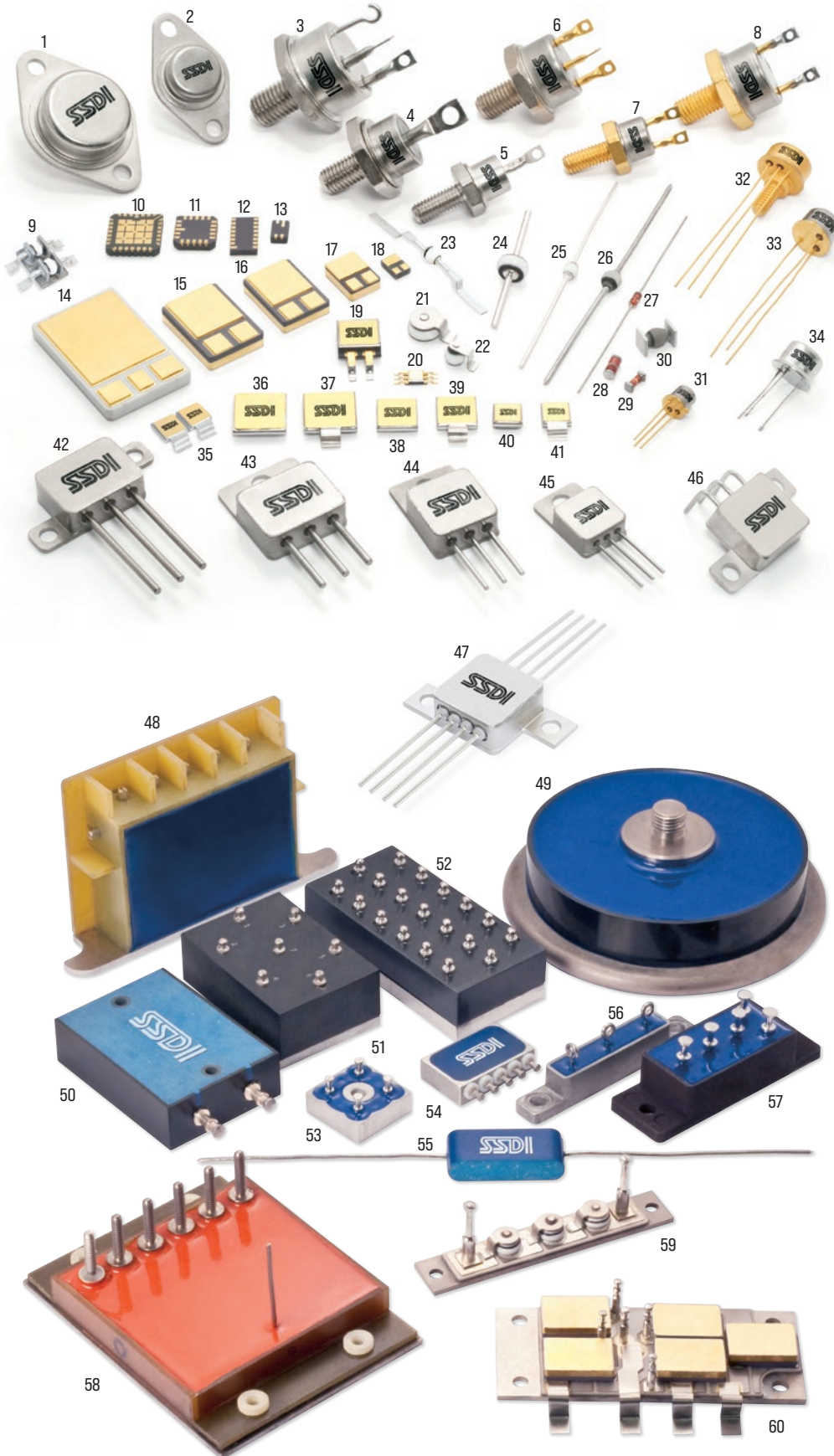
- Design flexibility (target key electrical characteristics to match mission specs)
- Packaging flexibility (improve density of board design which leads to overall system cost improvements)
- Build to data sheets & SCDs
- Product development (offer higher performance than standard, generic products)

# Examples of Hermetic Packaging



## In-House Machine Shop / Packaging & Tooling Capabilities

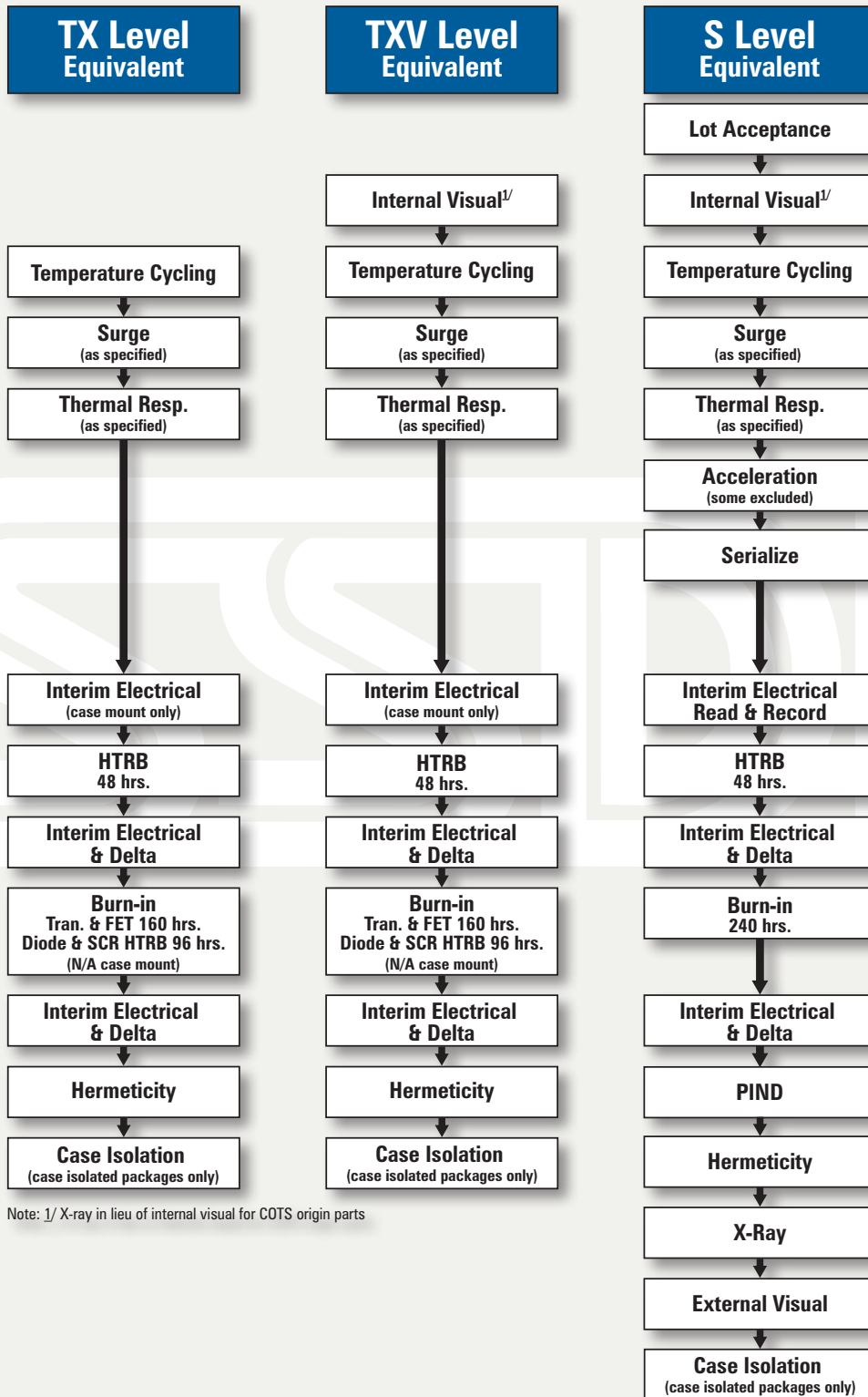
Contact SSDI to discuss modifications and additional packaging options



1. TO-3
2. TO-66
3. TO-63
4. DO-5
5. DO-4
6. TO-61 (3 terminals)
7. TO-59
8. TO-61 (2 terminals)
9. SPA648
10. LCC28
11. LCC20
12. LCC16
13. LCC4
14. Milpack 3
15. SMD2
16. SMD1
17. SMD.5
18. SMD.22
19. Cerpack
20. Gullwing
21. SRM Button Tab
22. SRL Button Tab
22. SRM Surface Mount Square Tab (SMS)
23. Flat Leads
24. SRM Axial
25. 1N7068 Axial
26. Frit Glass Axial
27. Glass Sleeve Axial
28. Glass Sleeve Surface Mount Round Tab (SM)
29. Glass Sleeve Surface Mount Square Tab (SMS)
30. Frit Glass Surface Mount Square Tab (SMS)
31. TO-52
32. TO-82
33. TO-5
34. TO-39
35. Sedpack CT1 Front Mount
36. Sedpack 3
37. Sedpack 3 With Lead
38. Sedpack 2
39. Sedpack 2 With Lead
40. Sedpack 1
41. Sedpack 1 With Lead
42. TO-259
43. TO-258
44. TO-254
45. TO-257
46. TO-254Z
47. TO-254Z8
48. SDA475 HV Multiplier Rectifier Stack
49. SDAD103 Stackable HV Rectifier
50. STA60 HV Bidirectional TVS
51. SPA516 Dual Single Phase Bridge Assembly
52. SPX2091 HV Rectifier Bridge Stack
53. SDA267 Single Phase Bridge Rectifier Assembly
54. SDA669T Three Phase Bridge Rectifier Assembly
55. HV Stick
56. SDA380 Centertap Rectifier
57. SDA167 Three Phase Bridge Rectifier Assembly
58. SPMQ461 IGBT Power Module
59. SPMR494 Battery Charge Power Module
60. Battery Bypass Power Module



## Solid State Devices Screening Per MIL-PRF-19500 Guidelines\*



**\*Specific Product Types May Have Alternate Screening Flows**  
 Contact your local SSDI Representative or contact the factory directly at (562) 404-4474.  
 Email: [ssdi@ssdi-power.com](mailto:ssdi@ssdi-power.com)

