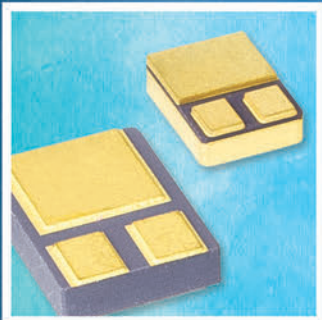


HERMETIC



14

Si

28.085

6

C

12.011



SCHOTTKYS & MOSFETS

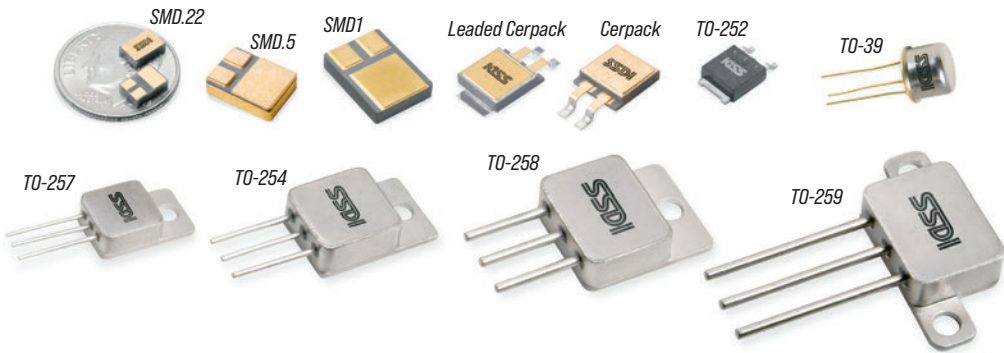
FOR AEROSPACE & DEFENSE



SOLID STATE DEVICES, INC.

ISO 9001 & AS9100 Certified | www.ssd-power.com

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- SiC MOSFETs: Electrical Characteristics / Applications 6
- High Reliability Screening..... 7
 - *TX, TXV, and S-level screening available for all devices. Screening based on MIL-PRF-19500.
 - Screening flows available on request.
- Sales Representatives / Contactback 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 operates three facilities 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 | 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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SSDI LIFTS PROGRAMS TO NEW HEIGHTS BY FOCUSING ON:

HIGH RELIABILITY

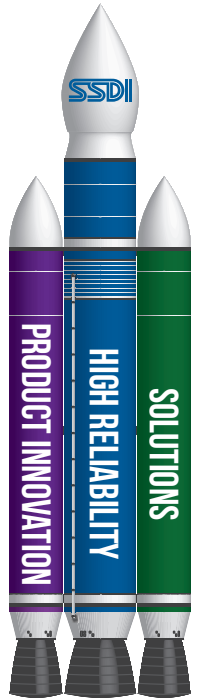
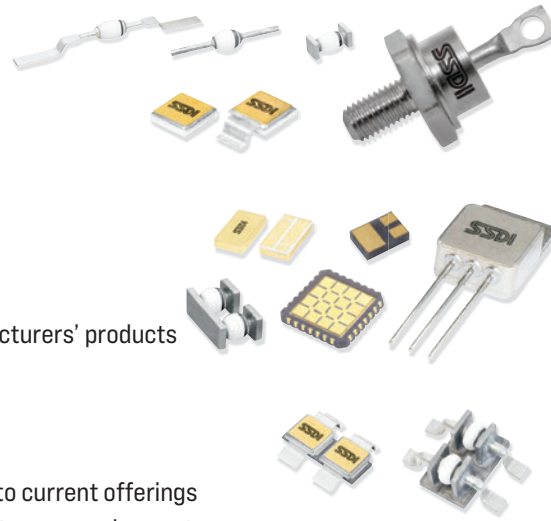
- 50+ years serving the HiRel market
- JANS certified and ISO 9001 / AS9100 certified
- 96% of sales for Aerospace and Defense applications

PRODUCT INNOVATION

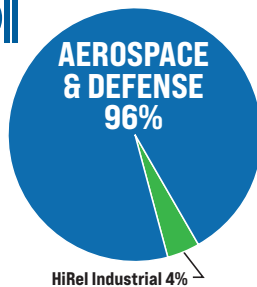
- Developing innovative, state of the art products: pushing the envelope with performance not matched by other manufacturers' products
- Exploring new technology (e.g. GaN, SiC, etc.)

SOLUTIONS

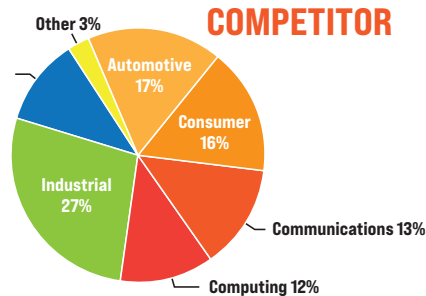
- Broad Capabilities: catalog showcases capability, not limited to current offerings
- Design Support / Flexibility: make adjustments to satisfy customer requirements
- Packaging Flexibility: improve density of board design which leads to overall system cost improvements
- Sustainment: support for the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



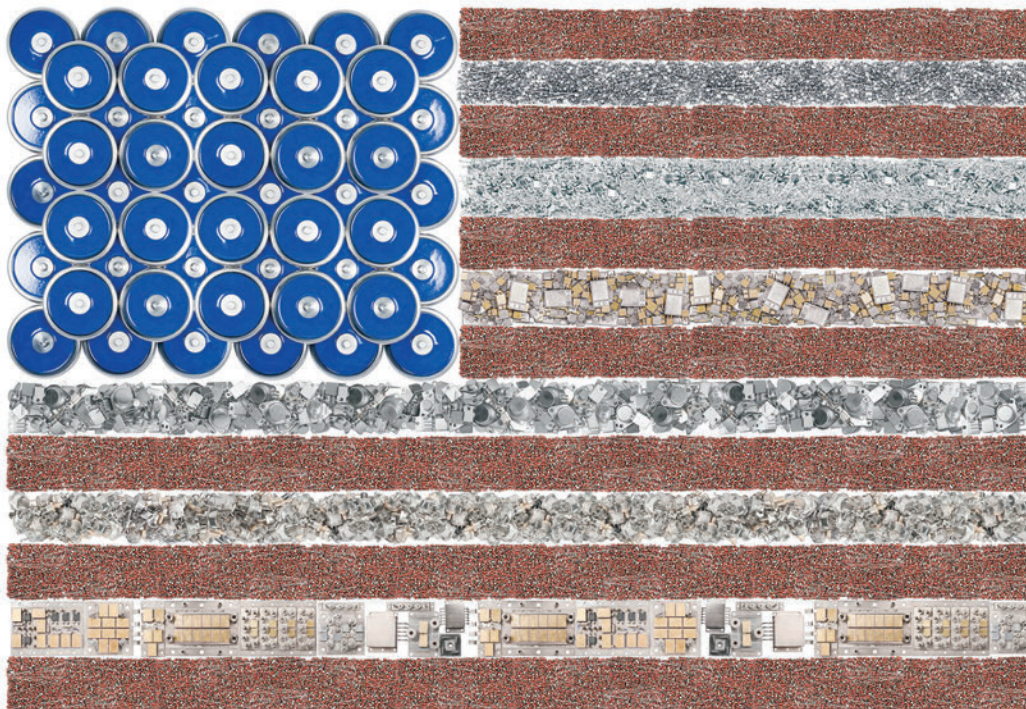
SALES BY SECTOR



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.*

Silicon Carbide (SiC) Technology Advantages

Beyond Si and GaAs:

SiC technology goes far beyond the performance of conventional silicon and GaAs rectifiers, offering significantly lower switching losses and higher switching frequencies, as well as higher operating voltages than GaAs rectifiers.

SiC increases performance in extreme conditions:

With SiC, you can meet the needs of your most demanding designs: tougher, smaller, more reliable designs able to withstand heat, radiation and survive under extreme environmental conditions.

SiC reduces complexity, system costs:

SiC allows applications to operate at high switching frequencies without complex resonant switching circuits or snubbers, which eliminates the need for large heat sinks and cooling fans. This decreases system costs and increases performance and reliability.

Features

- Electrical breakdown 10x Si and GaAs
- Operates up to 300°C without switching losses
- Thermal conductivity 3x Si and 10x GaAs
- Can easily be paralleled for higher currents (matching is not necessary with SiC products due to positive temperature coefficient and negligible reverse recovery time)

Featured SiC Schottkys

SSR12C50S.22 - SSR12C60S.22

12 A, 500 - 600 V SiC Schottkys

- No recovery time (t_{FR} or t_{RR})
- No switching time change over temperature
- Low forward voltage drop
- Low reverse leakage current
- Hermetically sealed surface mount package
- Small footprint (0.157" W x 0.227" L x 0.075" H)



SMD.22

SSR24C60CTJ Series

24 A, 300 - 600 V Center Tap SiC Schottkys

- Very high operating temperature: 250°C
- No recovery time (t_{FR} or t_{RR})
- Hermetically sealed, isolated packaging
- High current operation
- Available in common cathode (CT) and common anode (CA) configurations

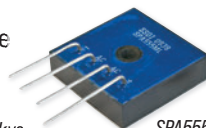


TO-257

SPA555 Series

32 A, 1000 - 1200 V SiC Schottky 1Φ Bridges

- No recovery time (t_{FR} or t_{RR})
- No switching time change over temperature
- Small package size: (1.25" W x 1.25" L x 0.35" H, not including terminals)
- Cases with aluminum heat sink are available
- Terminal options: turret, copper leads, and surface mount



SPA555L
(copper leads)

*See table on next page for additional high reliability SiC Schottkys

Advantages of SSDI HiRel SiC Products

- **Early proponent of hermetic SiC Schottkys**
- **Heritage including airborne / space flight applications**
- **High power / high voltage capabilities:**
 - **SiC Schottkys: up to 100 A, 2000 V**
 - **SiC MOSFETs: up to 200 A, 1700 V**
- **Design flexibility:**
 - Target key electrical parameters to meet mission specific requirements
 - Development of bridge assemblies / power modules
- **Hermetically sealed packaging / package flexibility:**
 - Wide variety of hermetic package options from high density, surface mount packages to legacy TO-25x and stud mount packages
 - In-house machine shop / tooling capabilities provide package modifications to meet mission requirements
- **High reliability screening:**
 - TX, TXV, and S level screening available
 - Based on MIL-PRF-19500 (screening flows available on request)

Featured SiC MOSFETs

SFC35N120 Series

26 - 30 A, 1200 V, 30 ns typ SiC MOSFETs

- Fast switching, low capacitance
- Low $R_{DS(ON)} = 80 \text{ m}\Omega$ typ
- Easy to parallel, simple to drive
- Enhancement mode N-channel



SMD.5

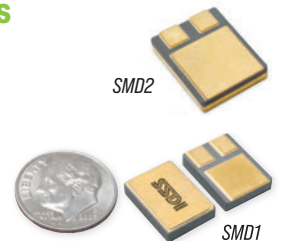
Cerpack

TO-257

SFC85N90S1 / S2

85 A, 900 V, 17 mΩ SiC MOSFETs

- Fast switching, low capacitance
- Low $R_{DS(ON)} = 13 \text{ m}\Omega$ typ
- Easy to parallel, simple to drive
- Enhancement mode N-channel
- Hermetically sealed power packaging:
 - SMD2 (S2), SMD1 (S1),
 - SMD1 with leads (S1L)



SMD2

SMD1

SFC57N170S1

57 A, 1700 V, 70 mΩ SiC MOSFETs

- Fast switching, low capacitance
- Low $R_{DS(ON)} = 45 \text{ m}\Omega$ typ
- Easy to parallel, simple to drive
- Enhancement mode N-channel
- Hermetically sealed power packaging:
 - SMD1 (S1), SMD1 with leads (S1L)



SMD1 with leads

[Customizable ribbon leads option reduces risk of vibration stress and thermal fatigue]

Consider SSDI's hermetic GaN Power FETs for aerospace and defense applications requiring faster switching capabilities:

- Hermetic, high voltage GaN solutions: 40 - 1000 V
- 8 W - 50 W, 6.3 A - 90 A

SiC Schottkys

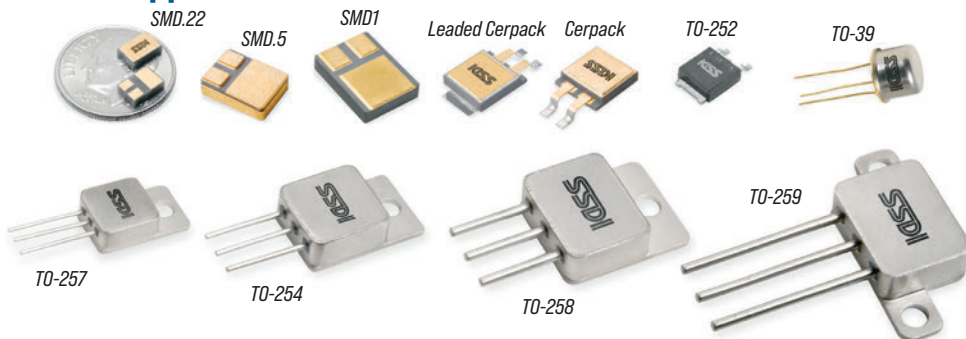
Sorted by I_0 / V_R - Ratings based on 25°C case temperature

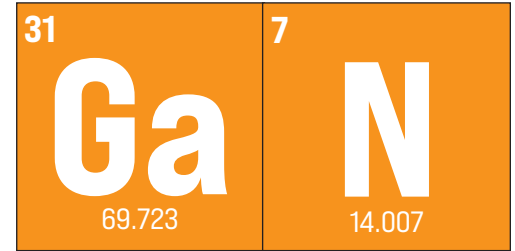
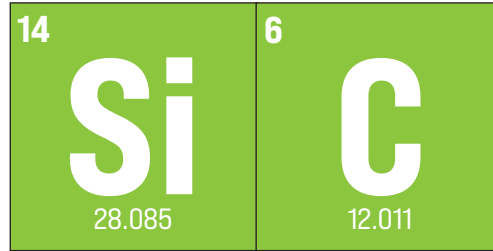
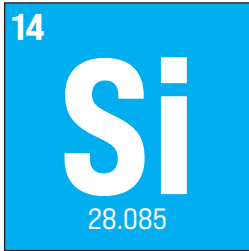
Part Number	I_0 [A]	V_R [V]	I_{FSM} [A]	V_F typ [V]	V_F max [V]	I_R typ [μA]	I_R max [μA]	Package	Data Sheet
SSR02C50 - SSR02C60	2	500 - 600	4	1.75	2	0.2	100	Cerpack, SMD.22	RS0204
SSR04C50CTG - SSR04C60CTG SSR04C50CTS.22 - SSR04C60CTS.22	4	500 - 600	8	1.8	2	0.2	100	Cerpack, SMD.22	SH0111
SSR04C50CT/39 - SSR04C60CT/39 SSR04C50CTS.5 - SSR04C60CTS.5	4	500 - 600	4	1.8	1.94	100	200	T0-39, SMD.5	RS0022
SSR05C50 - SSR05C60	5	500 - 600	40	1.4	1.8	0.1	10	Cerpack, SMD.22, SMD.5	SH0113
SSR05C100 - SSR05C120	5	1000 - 1200	30	1.65	1.8	2	100	Cerpack, Leaded Cerpack, SMD.5	SH0030
SSR10C20 - SSR10C30	10	200 - 300	18	1.5	1.65	25	100	Cerpack, SMD.5	RS0032
SSR10C30CTG - SSR10C60CTG	10	300 - 600	20	1.95	2	10	250	Cerpack	SH0036
SSR10C50S.22 - SSR10C60S.22	10	500 - 600	70	1.7	1.9	0.2	20	SMD.22	SH0131
SSR10C080J / M - SSR10C120J / M	10	800 - 1200	60	1.53	1.8	10	50	T0-257, T0-254	SH0080
SSR10C080 - SSR10C120	10	800 - 1200	50	1.5	2	10	100	Cerpack, Leaded Cerpack, SMD.5	SH0067
SSR12C50S.22 - SSR12C60S.22	12	500 - 600	50	1.54	1.75	3	25	SMD.22	SH0121
SSR25C50DM - SSR25C60DM	12.5	500 - 600	80	2	2.3	0.5	50	T0-254	RC0165
SSR15C50D1 - SSR15C120D1	15	500 - 1200	100	2.1	Note 1	1	200	T0-252	SH0114
SSR20C080CTS1 - SSR20C120CTS1	20	800 - 1200	50	2.1	2.5	40	500	SMD1	SH0049
SSR20C080CT - SSR20C120CT	20	800 - 1200	50	1.53	1.8	10	50	T0-257, T0-254	SH0029
SSR20C180	20	1800	Note 1	2	2.25	20	200	Cerpack, SMD.5	SH0128
SSR24C30CT - SSR24C60CT	24	300 - 600	50	1.5	1.7	1	200	Cerpack, SMD.5	RS0020
SSR24C30CAJ - SSR24C60CTJ	24	300 - 600	50	1.5	1.75	1	200	T0-257	RS0028
SSR25C50CAM - SSR25C60CTM	25	500 - 600	80	2	2.3	0.5	50	T0-254	RC0165
SPA555	32	1000 - 1200	125	1.45	1.53	20	100	SPA555	RA0038
SSR40C20CT - SSR40C60CT	40	200 - 600	150	1.65	1.75	1	50	Cerpack, SMD.5, T0-254	RS0024
SSR40C50D - SSR40C60D	40	500 - 600	100	2.03	2.2	10	250	T0-258, T0-259	SH0082
SSR40C100S1 - SSR40C120S1	40	1000 - 1200	200	1.45	1.65	30	100	SMD1	SH0043
SSR50C50CTM - SSR50C60CTM	50	500 - 600	100	1.6	1.9	20	250	T0-254	RC0140
SSR80C50CT - SSR80C60CA	80	500 - 600	100	2.03	2.2	10	250	T0-258, T0-259	SH0082

For high reliability aerospace and defense applications such as:

1/ Contact factory for more information

- High voltage power supplies
- Switches
- Power controls





FAST

Replacements available for most products from Infineon / IR, Texas Instruments, Vishay, etc.

FASTER

Faster switching, rad tolerant replacements for Silicon MOSFETs

FASTEST

Recommended for new designs requiring the fastest switching performance

Silicon MOSFETs

- 10 A - 250 A
- -200 V - 1000 V
- 50 W - 500 W
- Wide variety of package options and performance capabilities

Silicon Carbide MOSFETs

- Up to 200 A
- Up to 1700 V
- Offers highest voltage capability compared to Silicon MOSFETs and GaN FETs
- Lower $R_{DS(ON)}$ than Silicon MOSFETs

Gallium Nitride FETs

- 6.3 A - 90 A
- 40 V - 1000 V
- Lowest $R_{DS(ON)}$, $\geq 2.5 \text{ m}\Omega$
- Rad tolerant
- Highest voltage available for hermetic GaN FETs in the industry

SiC MOSFETs

Sorted by V_{DSS} / I_D - Ratings based on 25°C case temperature

Part Number	V_{DSS} [V]	I_D [A]	$R_{DS(ON)}$ typ [mΩ]	$R_{DS(ON)}$ max [mΩ]	Q_g typ [nC]	Q_g max [nC]	P_D [W]	Package	Data Sheet
SFC85N80S2	800	85	8.7	10	270	Note 1	326	SMD2	FT0105
SFC85N90S1	900	85	10	17	130	Note 1	288	SMD1	FT0083
SFC85N90S1L	900	85	10	17	130	Note 1	288	SMD1 with leads	FT0083
SFC85N90S2	900	85	10	17	130	Note 1	288	SMD2	FT0083
SFC200N90P6	900	200	7	10	420	Note 1	428	6 Pin T0-259 (P6)	FT0097
SFC35N120G	1200	26	80	96	46	65	64	Cerpack	FT0079
SFC35N120S.5	1200	26	80	96	46	65	64	SMD.5	FT0079
SFC35N120J	1200	30	80	96	46	65	86	T0-257	FT0079
SFC57N170S1	1700	57	45	70	188	Note 1	227	SMD1	FT0082
SFC57N170S1L	1700	57	45	70	188	Note 1	227	SMD1 with leads	FT0082

1/ Contact factory for more information

For high reliability aerospace and defense applications such as:

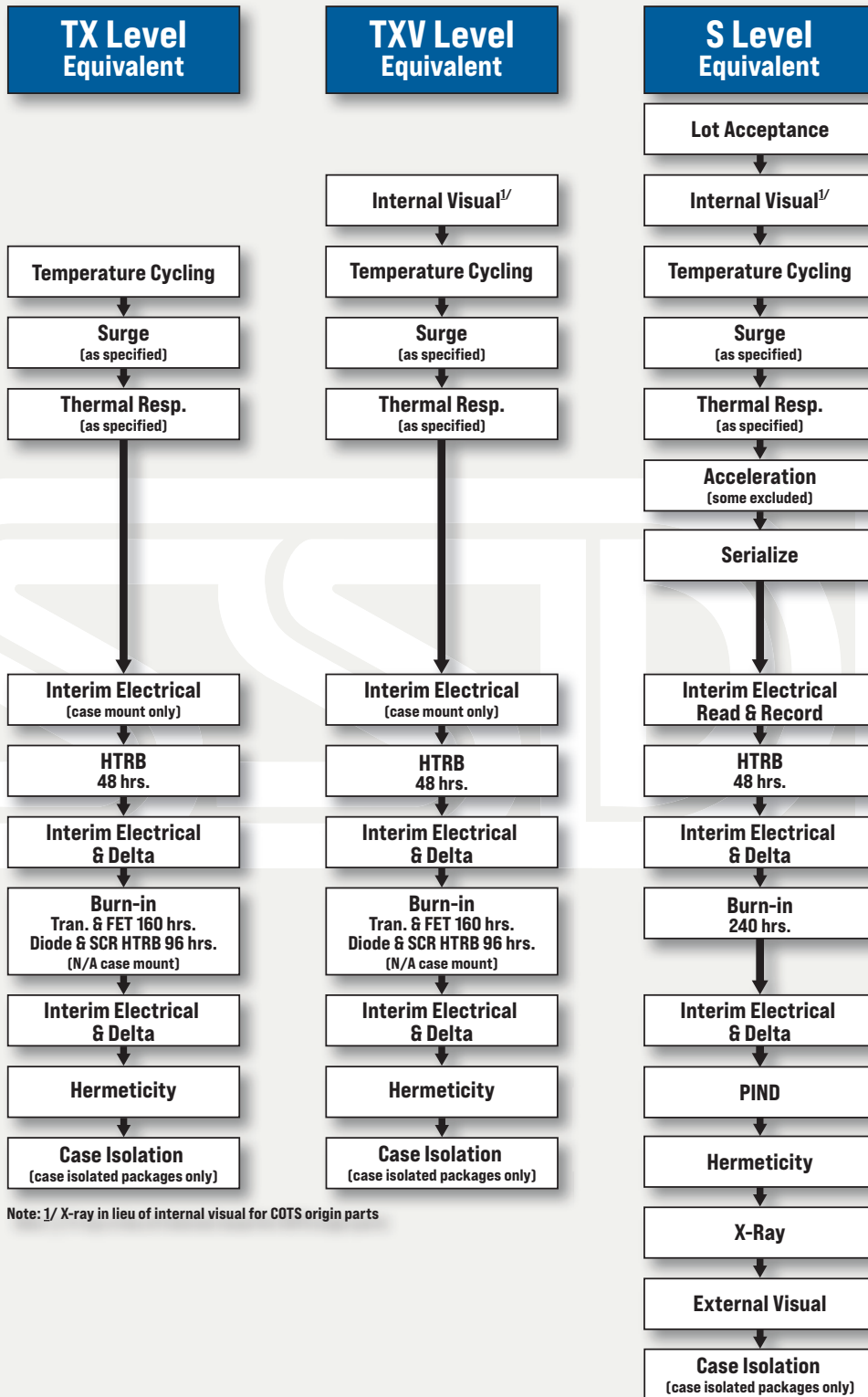
- High voltage DC-DC converters
- Switch mode power supplies
- Solar inverters
- Motor drive
- Pulsed power applications



Contact SSDI to request samples or discuss specific program requirements:

(562) 404 - 4474 | ssdi@ssdi-power.com | www.ssdi-power.com

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

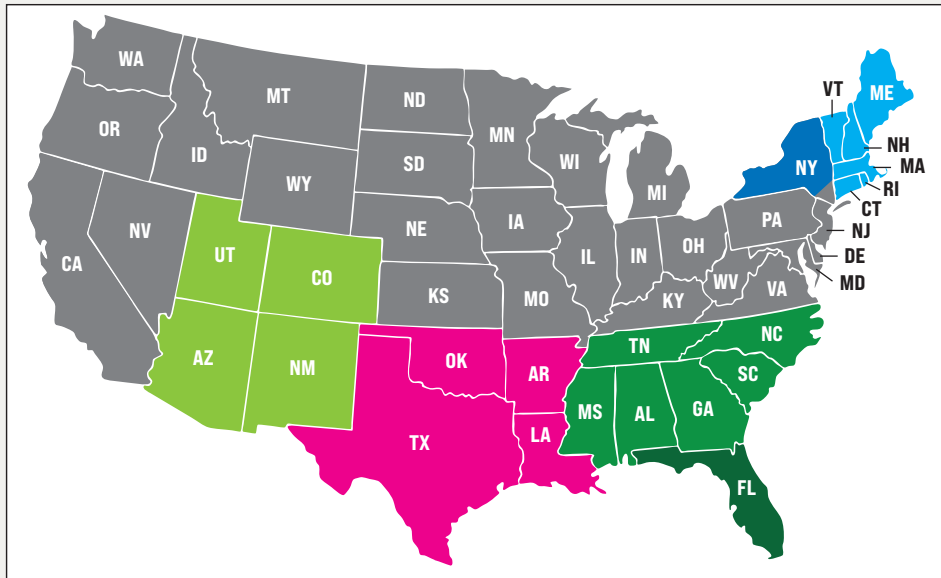


*Specific Product Types May Have Alternate Screening Flows

Contact your local SSDI Representative or contact the factory directly at (562) 404-4474.

Email: ssdi@ssdi-power.com

Domestic Sales Representatives



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EAST ASIA SOUTH ASIA



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