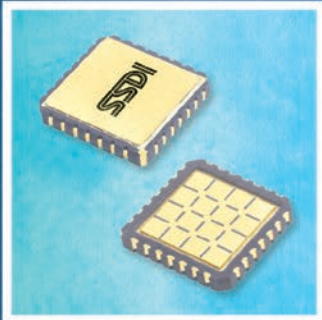


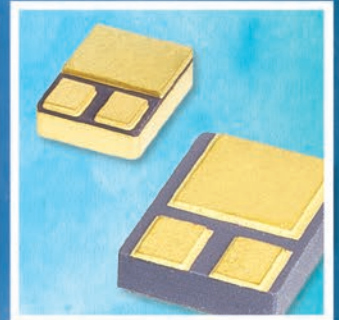


HERMETIC



³¹
Ga
69.723

⁷
N
14.007



POWER FETs

FOR AEROSPACE & DEFENSE



SOLID STATE DEVICES, INC.

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

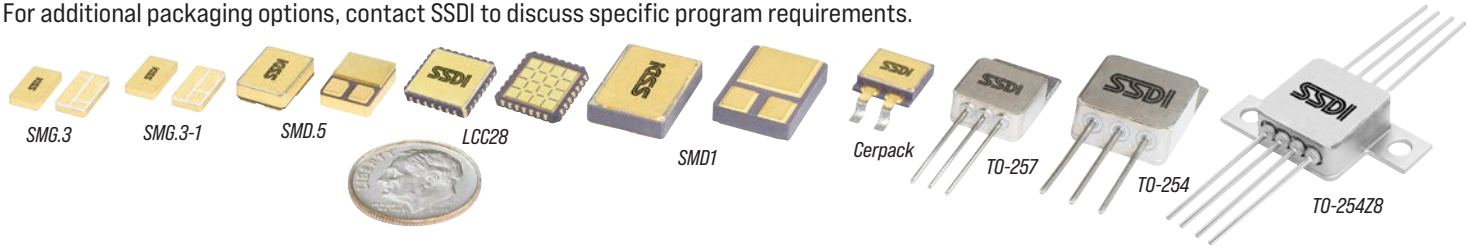
Gallium Nitride (GaN) is a hard and stable substance that is revolutionizing semiconductors for military communications, radar, and electronic warfare. SSDI specializes in offering fully screened GaN products in hermetically sealed packaging. Contact the factory to inquire about modifications or other requirements.

- Solid State Devices, Inc. - Company Overview 3
- GaN Product Tree / Hermetic Packages 4
- Advantages / Applications 5
- Electrical Characteristics 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 / Contact back cover



Hermetic GaN Power FETs

For additional packaging options, contact SSDI to discuss specific program requirements.



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 | 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

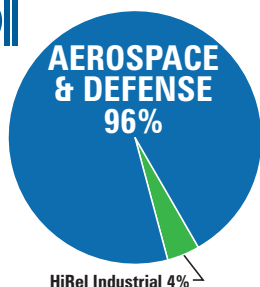
- Developing innovative, state of the art products: pushing the envelope with performance not matched by other manufacturers' products
- Exploring new technology (e.g. GaN, SiC, etc.)

SOLUTIONS

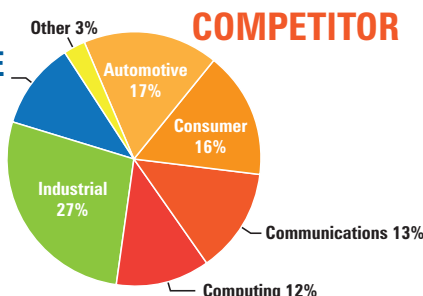
- Broad Capabilities: catalog showcases capability, not limited to current offerings
- Design Support / Flexibility: make adjustments to satisfy customer requirements
- Packaging Flexibility: improve density of board design which leads to overall system cost improvements
- Sustainment: support for the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



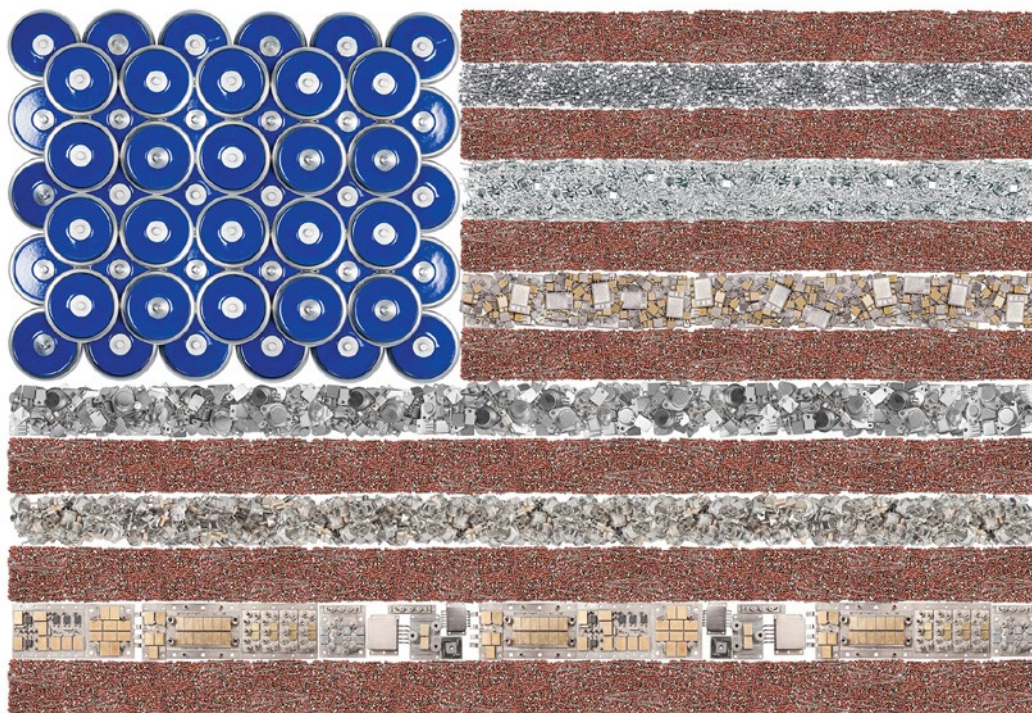
SALES BY SECTOR



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)

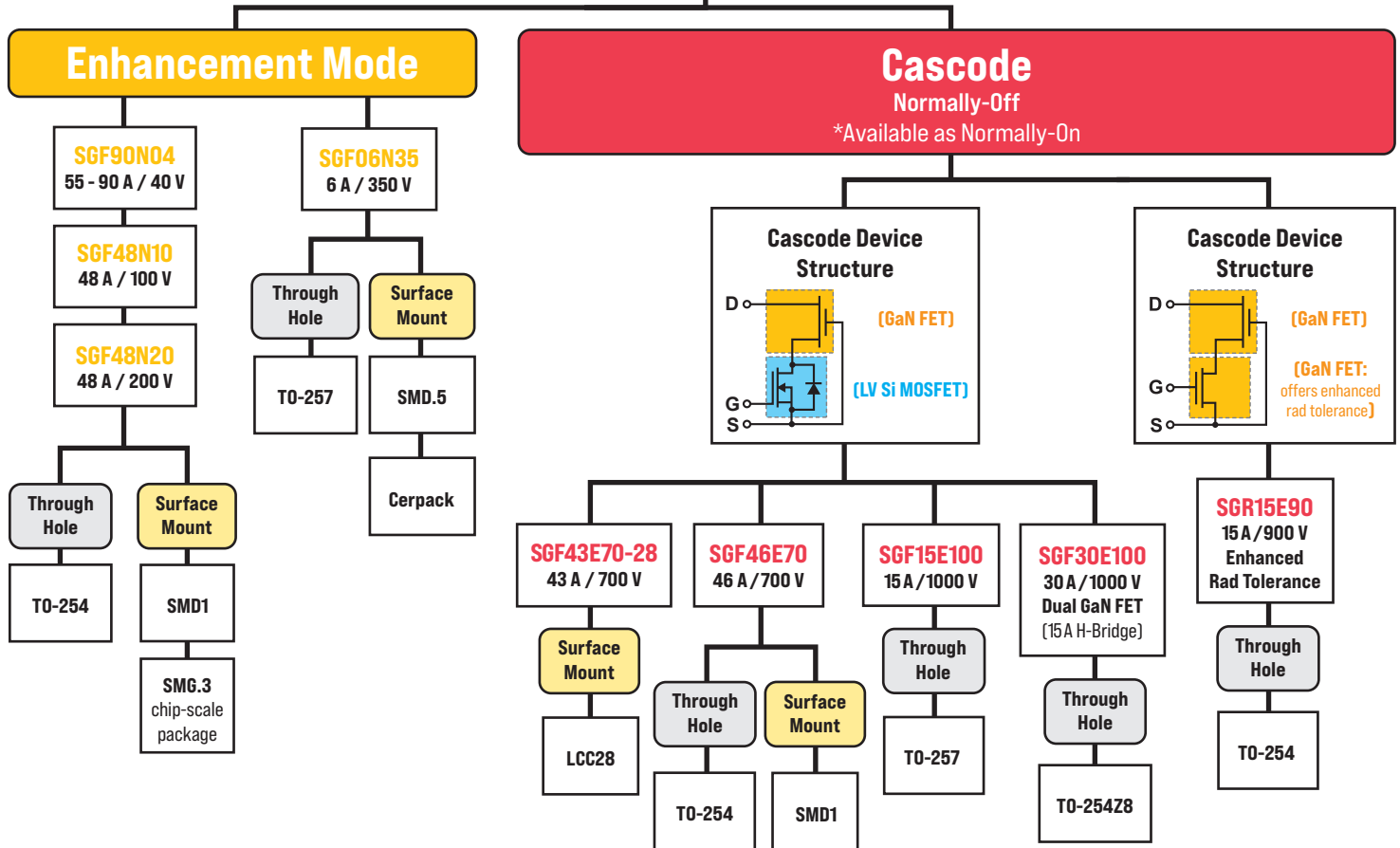
- Power FETs

ASSEMBLY PRODUCTS

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

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

SSDI Hermetic GaN Power FETs

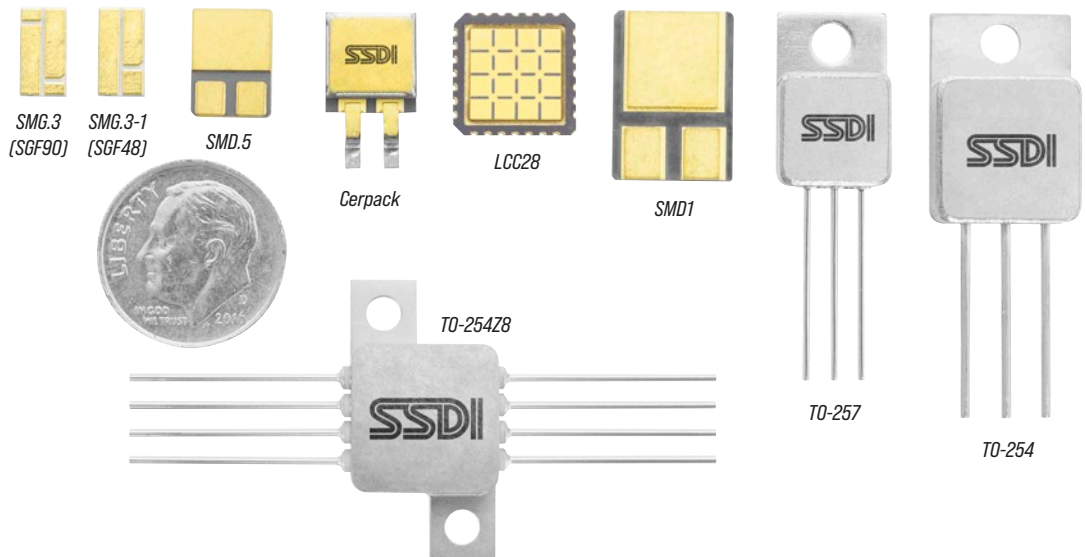


Hermetic Packages

For additional packaging options, contact SSDI to discuss specific program requirements.

Maximum Dimensions (in.)

Package	Profile	Footprint
SMG.3	.085	.190 x .345
SMD.5	.135	.304 x .408
Cerpack	.115	.340 x .580
LCC28	.095	.458 x .458
SMD1	.150	.455 x .630
T0-257 (bent leads)	.210	.420 x .840
T0-254 (bent leads)	.260	.545 x .875
T0-254Z8 (bent leads)	.260	.928 x 1.060



GaN Technology Advantages Over Traditional Si Transistors

- Wider bandwidth
- Extremely low reverse recovery charge (Q_{RR})
- Low gate charge (Q_g)
- Low drain to source on state resistance ($R_{DS(ON)}$)
- Low temperature coefficient

Benefits for Circuit Designer

- Higher efficiency
- Fast switching speed
- Lower cross-over losses
- Lower ON-state losses
- Eliminates need to add free-wheeling diode

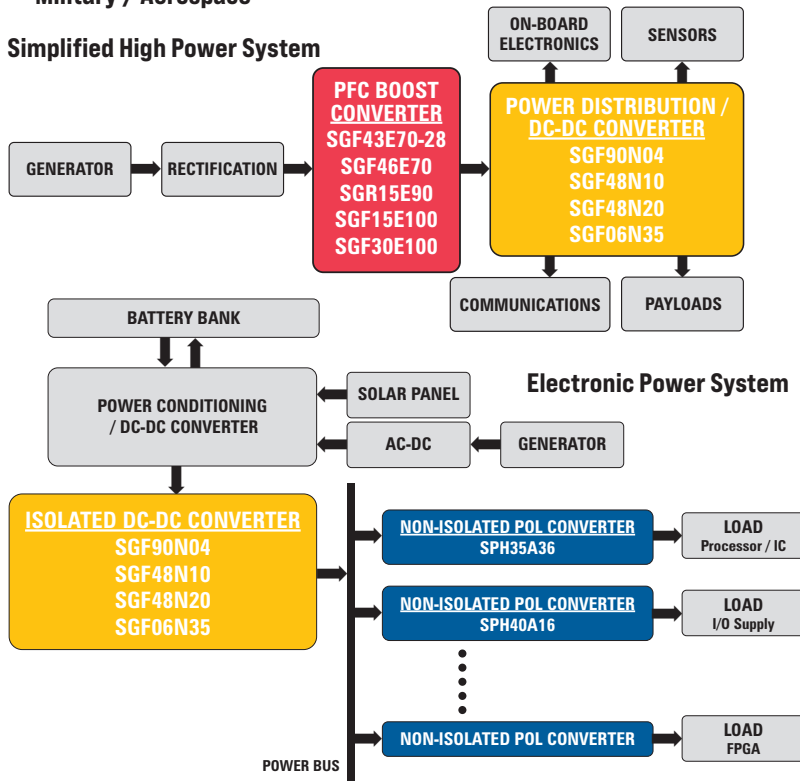
Comparison of SSDI GaN FET with Competitor's MOSFET

Parameters / Electrical Characteristics	SGF46E70	Competitor's MOSFET
Continuous Drain Current, I_D	46 A	46 A
Drain-Source Breakdown Voltage, $V_{(BR)DSS \text{ MIN}}$	700 V	650 V
Drain to Source On State Resistance, $R_{DS(ON)}$ $V_{GS} = 10 \text{ V}$, $I_D = 30 \text{ A}$, $T_J = 25^\circ \text{C}$	Typ Max 30 m Ω (@ $I_D = 32 \text{ A}$) 41 m Ω (@ $I_D = 32 \text{ A}$)	40 m Ω (@ $I_D = 24.9 \text{ A}$) 45 m Ω (@ $I_D = 24.9 \text{ A}$)
Total Gate Charge, Q_g $V_{DS} = 400 \text{ V}$, $T_J = 25^\circ \text{C}$	Typ 24 nC (@ $I_D = 32 \text{ A}$)	93 nC (@ $I_D = 24.9 \text{ A}$)
Source to Drain Reverse Recovery Time, t_{RR} $V_{DD} = 400 \text{ V}$, $T_J = 25^\circ \text{C}$	Typ 65 ns (@ $I_S = 30 \text{ A}$, $di/dt = 1000 \text{ A}/\mu\text{s}$)	725 ns (@ $I_F = 46 \text{ A}$, $di/dt = 60 \text{ A}/\mu\text{s}$)
Reverse Recovery Charge, Q_{RR} $V_{DD} = 400 \text{ V}$, $T_J = 25^\circ \text{C}$	Typ 178 nC (@ $I_S = 30 \text{ A}$, $di/dt = 1000 \text{ A}/\mu\text{s}$)	13,000 nC (@ $I_F = 46 \text{ A}$, $di/dt = 60 \text{ A}/\mu\text{s}$)
Package	SMD1, T0-254	T0-247

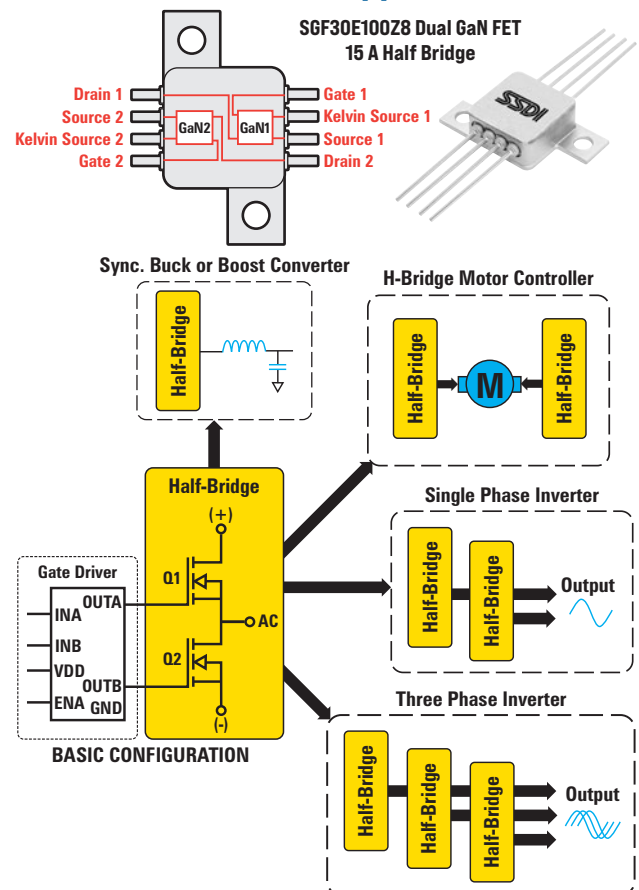
Examples of Applications

- High efficiency DC-DC / PoL converters
- Motor controller
- Robotics / automation
- Military / Aerospace



















Simplified High Power System



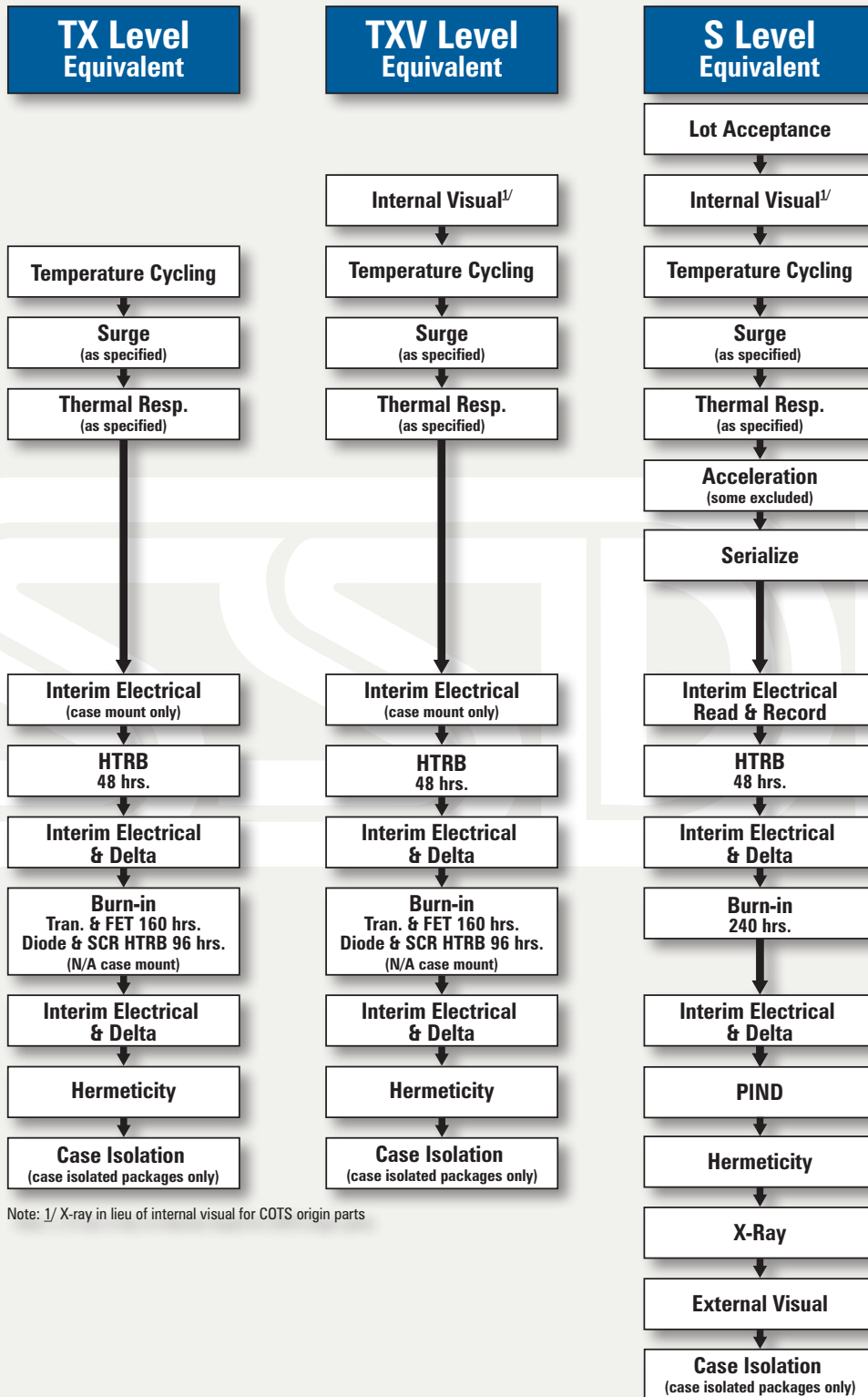
GaN and Si FET Applications



Sorted by V_{DSS}

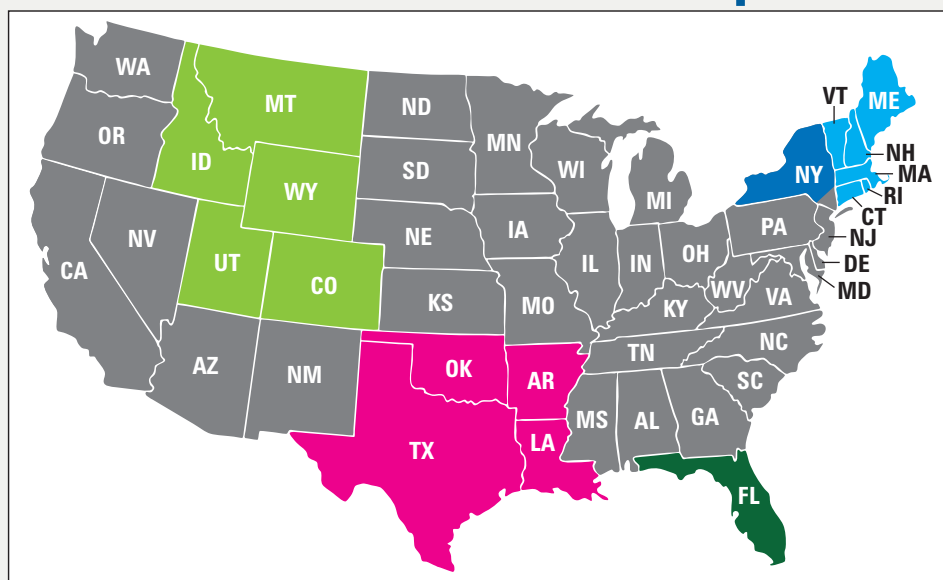
Part Number	V_{DSS} (V)	I_D (A)	$R_{DS(ON)}$ TYP (m Ω)	$R_{DS(ON)}$ MAX (m Ω)	Q_{RR} TYP (nC)	Q_G TYP (nC)	Q_G MAX (nC)	P_D (W)	Package	Data Sheet
SGF90N04	40	90	2	2.5	0	18	24	25	SMG.3 	FT0078
SGF90N04M	40	55	-	7	0	18	24	25	T0-254 	FT0077
SGF90N04S1	40	55	-	5	0	18	24	25	SMD1 	FT0077
SGF48N10	100	48	5.5	6	0	12	15	25	SMG.3-1 	FT0071
SGF48N10M	100	48	-	10	0	12	15	25	T0-254 	FT0070
SGF48N10S1	100	48	-	8	0	12	15	25	SMD1 	FT0070
SGF48N20	200	48	8	11	0	12	15	25	SMG.3-1 	FT0073
SGF48N20M	200	40	13	16	0	9	11	25	T0-254 	FT0072
SGF48N20S1	200	40	11	14	0	9	11	25	SMD1 	FT0072
SGF06N35G	350	6.3	42	65	0	3.4	4.3	10.4	Cerpack 	FT0075
SGF06N35J	350	6.3	42	65	0	3.4	4.3	10.4	T0-257 	FT0075
SGF06N35S.5	350	6.3	42	65	0	3.4	4.3	10.4	SMD.5 	FT0075
SGF43E70-28	700	43	39	45	178	24	36	83	LCC28 	FT0080
SGF46E70M	700	46	30	41	178	24	36	125	T0-254 	FT0074
SGF46E70S1	700	46	30	41	178	24	36	125	SMD1 	FT0074
SGR15E90M	900	15	160	190	49	10	18	62	T0-254 	FT0085
SGF15E100J	1000	15	160	190	49	10	-	62	T0-257 	FT0076
SGF30E100Z8	1000	30 (15 A Half Bridge)	160	190	49	10	-	62	T0-254Z8 	FT0087

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

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Website: www.zimmermansales.com

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FLA. Technology Sales, Inc. (FL)

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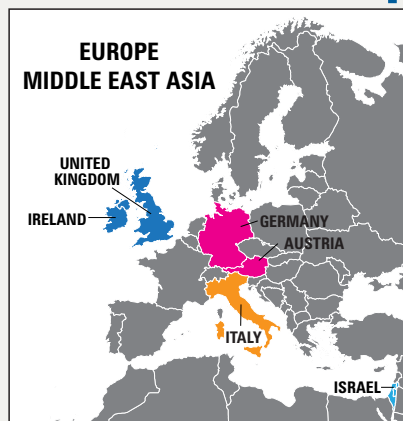
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