

Comparison of SiC vs Si Technologies

Silicon vs Silicon Carbide	Performance of SiC Power Device	Impact on AC-DC/DC-AC Circuits
Higher Breakdown Field (10X)	Lower On-State Voltage Drop (2X-3X)	Higher Efficiency
Smaller Epitaxial Field (10X – 20X)	Faster Switching Speeds (100-1000X)	Size Reduction
Higher Thermal Conductivity (3.3-4.5W/cmK vs 1.5W/cmK)	Higher Chip Temperatures (250-300°C vs 125°C)	Higher Continuous Current and Pulsed Power
Higher Melting Point (2X)	Higher Operating Temperature (3X)	Smaller, Simpler Heat Sink
Larger Bandgap (3X) Smaller n_i ($10^{16}X$)	Higher Intrinsic Adiabatic Pulsed Current Level (3X-10X)	Higher Current Capability

SiC Power Schottky Diode Products

* Schottky Rectifiers

[GB01SLT06-214](#) 650V 1A SMB (DO-214) Production

[GB01SLT12-220](#) 1200V 1A TO-220 Production

[GB01SLT12-252](#) 1200V 1A TO-252 Production

[GB01SLT12-214](#) 1200V 1A SMB(DO-214) Production

[GB02SLT12-214](#) 1200V 2A SMB(DO-214) Production

[GB02SLT12-220](#) 1200V 2A TO-220 Production

[GB02SLT12-252](#) 1200V 2A TO-252 Production

[GB05SLT12-220](#) 1200V 5A TO-220 Production

[GB05SLT12-252](#) 1200V 5A TO-252 Production

[GB10SLT12-220](#) 1200V 10A TO-220 Production

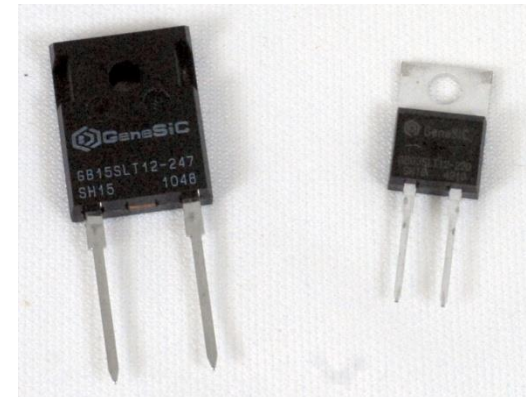
[GB10SLT12-252](#) 1200V 10A TO-252 Production

[GB20SLT12-247](#) 1200V 20A TO-247 Production

[GB50SLT12-247](#) 1200V 50A TO-247 Production

[GAP3SLT33-220FP](#) 3300V 0.3A TO-220FP Production

[GAP3SLT33-214](#) 3300V 0.3A SMB(DO-214) Production

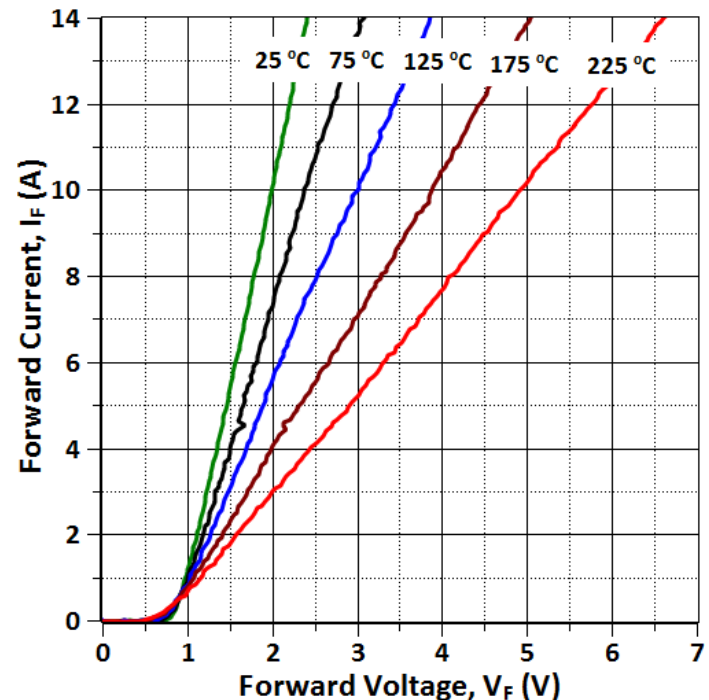


Performance of 1200V SiC Power Schottky Diodes

* Forward Characteristics

- GeneSiC Diodes are designed to operate at **High** temperatures (= **225 °C**) and exhibit **Low** On State Voltages, thereby resulting in **Low** Conduction Losses
- Implementation of Optimized Device Design and Robust Processing Techniques allow GeneSiC Diodes to deliver **Superior Surge Current Capability** with **Temperature Independent** Barrier Heights and Ideality Factors

* GB07SHT12-247



SiC Schottky Rectifiers

* Features/Benefits

- Operating temperatures up to 225 °C
- Industry's lowest device Zero Bias Capacitance and Reverse Recovery Charge
- Easy paralleling due to Positive Temperature Coefficient of V_f
- Temperature Independent Extremely Fast Switching Transients
- Improved Circuit Efficiencies
- Best in class Reverse Leakage Current at operating temperatures

* Applications

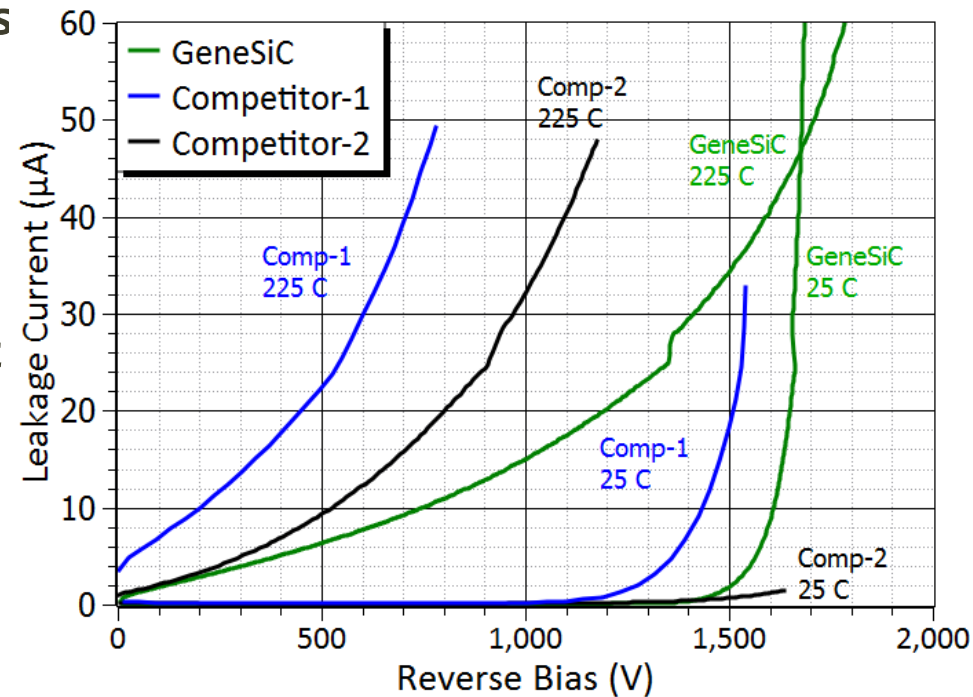
- Power Factor Correction
- Switch Mode Power Supply^(a)
- Inverter, Motor Drives^(b)
- Induction Heating
- Uninterruptable Power Supply
- Down Hole Oil Drilling, Geothermal Instrumentation
- Aerospace and Defense



* Blocking Characteristics

- GeneSiC 1200 V Diodes are designed to deliver **Best-in-Class Blocking Performance** with **leakage current densities** less than **1 mA/cm²** even at **225 °C** operating temperatures
- GeneSiC diodes display **smallest increase** in the **leakage current** as the temperature is increased from **25 °C to 225 °C**
- The Blocking Performance is **solely limited by Avalanche Breakdown**

* 1200 V / 10 A SiC Schottky rectifiers



* Turn-Off Characteristics

- GeneSiC Diodes offer **Lowest Reverse Recovery Charge, Q_C** and **Lowest Figure of Merit, Q_C/I_F** for any current rating
- Moreover, Q_C is **independent** of applied di/dt , I_F and **Temperature**
- Lower ' Q_C ' values will drastically reduce the switching losses in the inverter and converter applications

* 1200 V / 10 A SiC Schottky rectifiers

