Automotive-grade 1200 V SCR AC/DC converter applications

These 1200 V, high temperature automotive-grade thyristors make AC/DC converters safer by limiting the inrush current and providing functional isolation against AC line overvoltage.

KEY FEATURES
- On-state RMS current: 30-50 A
- Blocking voltage: 1200 V
- High turn on robustness: 200 A/μs
- High off-state immunity: 1000 V/μs
- Gate trigger current: 50 mA
- ECOPACK®2 compliant

TARGETED APPLICATIONS
- EV/HEV (on board, off board battery chargers)
- Industrial battery chargers
- Renewable energy inverters
- Solid state relays
- Uninterruptible power supplies (bypass)
- Motor drives (inrush current limiter, soft start)
- Industrial welding system

KEY BENEFITS
- Automotive grade: reliability, quality and AEC-Q101 compliance
- Reduce BOM: extra power device no longer needed in the rectifier bridge
- Same efficiency/dissipation and cooling size as diode bridge
- High PCB creepage distance above 4mm
- Control peak current at charger power up

Available in through-hole and surface-mount packages (SMD), ST automotive-grade silicon-controlled rectifiers (SCR Thyristors), are suitable for automotive / stationary battery chargers, renewable energy generators, uninterruptible power supplies, solid-state relays, welding equipment and motor drive applications.

- The TN5050H-12WY in a TO-247 package offers superior performance in surge current handling (I_{rms} = 580 A at 10 ms), thermal cooling capabilities (R_{thjc} = 0.3 °C/W) and high surge voltage withstanding capability (V_{DSM}/V_{RSM} = 1300 V).
- The 30 A TN3050H is available in a TO-247 for high thermal cooling performance or a D²PAK SMD package for automated assembly and compact design boards.
AUTOMOTIVE SCR IN BRIEF

Automotive grade:
Enhance reliability and quality, AEC-Q101 compliance
Enhance commercial services (priority and stocks)

Reduced BOM:
No more extra power device in the bridge

EFFICIENCY:
Same efficiency and cooling size as diode bridge

ROBUST DESIGN:
Inrush current limiter voltage withstanding capability

Tj = -40 to 150 °C

AUTOMOTIVE SCR PRODUCT TABLE

<table>
<thead>
<tr>
<th>Part number</th>
<th>Package</th>
<th>Junction temperature Tj</th>
<th>Repetitive peak off-state voltage VDRM, VRRM</th>
<th>RMS on-state current IT(RMS)</th>
<th>Non-repetitive surge-peak on-state current (tR=10 ms) ITSM</th>
<th>Triggering gate current IGT</th>
<th>Peak on-state voltage VTM</th>
<th>Maximum leakage current (tR=25°C) IDRM, IRRM</th>
<th>Critical rate of rise of off-state voltage dV/dt</th>
<th>Junction-to-case thermal resistance Rth(j-c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN3050H-12GY</td>
<td>D²PAK</td>
<td>150</td>
<td>1200</td>
<td>30</td>
<td>300</td>
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Application note AN4606 with additional information about the inrush current limiter function in triacs and thyristors (SCR) is available on www.st.com