

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

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 ($I_{TSM} = 580 \text{ A}$ at 10 ms), thermal cooling capabilities ($R_{th(j-c)} = 0.3 \text{ }^{\circ}\text{C/W}$) and high surge voltage withstanding capability ($V_{DSM}/V_{RSM} = 1300 \text{ V}$).
- 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.

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

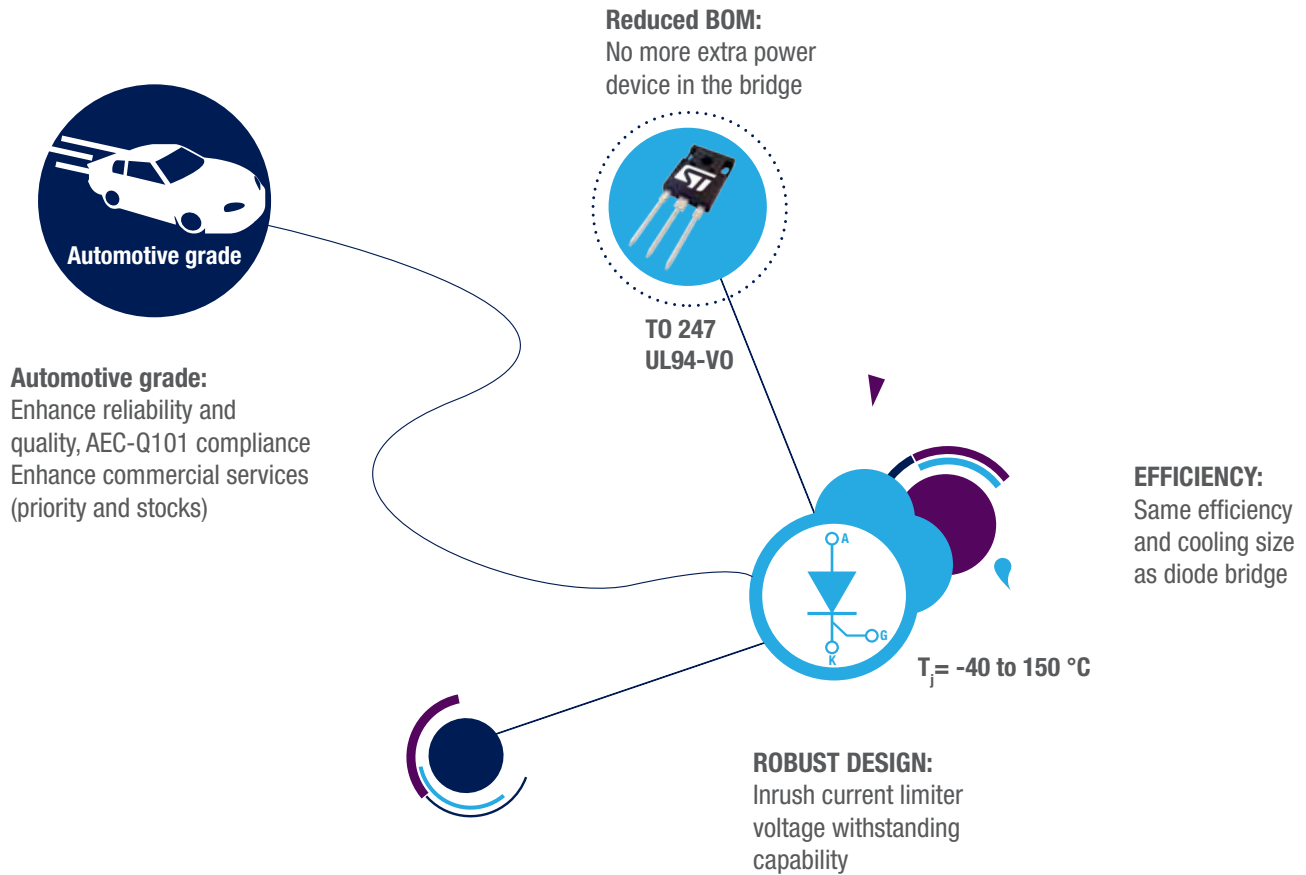
KEY BENEFITS

- 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

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

AUTOMOTIVE SCR IN BRIEF



AUTOMOTIVE SCR PRODUCT TABLE

Part number	Package	Junction temperature T_j	Repetitive peak off-state voltage V_{DRM} , V_{RRM}	RMS on-state current $I_{\text{T(RMS)}}$	Non-repetitive surge-peak on-state current (@ $t_p = 10\text{ ms}$) I_{TSM}	Triggering gate current I_{GT}	Peak on-state voltage V_{TM}	Maximum leakage current (@ $T_j = 25^{\circ}\text{C}$) I_{DRM} , I_{RRM}	Critical rate of rise of off-state voltage dV/dt	Junction-to-case thermal resistance $R_{\text{th(j-c)}}$
		Max. ($^{\circ}\text{C}$)	Max. (V)	(A)	Max. (A)	Max. (mA)	Max. (V)	Max. (μA)	Min. (V/ μs)	($^{\circ}\text{C/W}$)
TN3050H-12GY	D ² PAK	150	1200	30	300	50	1.65	5	1000	0.8
TN3050H-12WY	TO-247	150	1200	30	300	50	1.65	5	1000	0.3
TN5050H-12WY	TO-247	150	1200	50	580	50	1.55	5	1000	0.3

Application note AN4606 with additional information about the inrush current limiter function in triacs and thyristors (SCR) is available on www.st.com



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