

UTC UNISONIC TECHNOLOGIES CO., LTD

MCR100

SENSITIVE GATE SILICON CONTROLLED RECTIFIERS REVERSE BLOCKING THYRISTORS

DESCRIPTION

PNPN devices designed for high volume, line-powered consumer applications such as relay and lamp drivers, small motor controls, gate drivers for larger thyristors, and sensing and detection circuits.

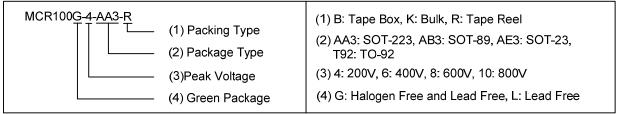
FEATURES

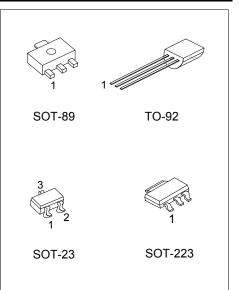
- * Sensitive gate allows triggering by micro controllers and other logic circuits
- * Blocking voltage to 200V-800V
- * On-state current rating of 0.8A RMS at 80°C
- * High surge current capability 10A
- * Minimum and maximum values of $I_{\text{GT}},\,V_{\text{GT}}$ and I_{H} specified for ease of design
- * Immunity to dV/dt 20V/µsec minimum at 110°C
- * Glass-passivated surface for reliability and uniformity

ORDERING INFORMATION

| Ordering Number | | Pin assignment | | | Dealving |
|------------------|--|---|--|--|--|
| Halogen Free | Раскаде | 1 | 2 | 3 | Packing |
| MCR100G-xx-AA3-R | SOT-223 | К | Α | G | Tape Reel |
| MCR100G-xx-AB3-R | SOT-89 | G | Α | К | Tape Reel |
| MCR100G-xx-AE3-R | SOT-23 | K | G | Α | Tape Reel |
| MCR100G-xx-T92-B | TO-92 | К | G | Α | Tape Box |
| MCR100G-xx-T92-K | TO-92 | K | G | Α | Bulk |
| | Halogen Free MCR100G-xx-AA3-R MCR100G-xx-AB3-R MCR100G-xx-AE3-R MCR100G-xx-T92-B | Halogen FreePackageMCR100G-xx-AA3-RSOT-223MCR100G-xx-AB3-RSOT-89MCR100G-xx-AE3-RSOT-23MCR100G-xx-T92-BTO-92 | Halogen FreePackageMCR100G-xx-AA3-RSOT-223MCR100G-xx-AB3-RSOT-89MCR100G-xx-AE3-RSOT-23MCR100G-xx-T92-BTO-92K | Halogen Free Package 1 2 MCR100G-xx-AA3-R SOT-223 K A MCR100G-xx-AB3-R SOT-89 G A MCR100G-xx-AB3-R SOT-23 K G MCR100G-xx-AE3-R SOT-23 K G MCR100G-xx-T92-B TO-92 K G | Halogen FreePackage123MCR100G-xx-AA3-RSOT-223KAGMCR100G-xx-AB3-RSOT-89GAKMCR100G-xx-AE3-RSOT-23KGAMCR100G-xx-T92-BTO-92KGA |

Note: Pin assignment: K: Cathode A: Anode G: Gate





MCR100

MARKING

| Package | MCR100-4 | MCR100-6 |
|---------|--|--|
| SOT-223 | MCR100□ L: Lead Free G: Halogen Free → Date Code | $\begin{array}{c c} MCR100 \\ \hline \\ -6 \\ \hline \\$ |
| SOT-89 | □□□□ Pate Code R4□ L: Lead Free G: Halogen Free | □□□□ → Date Code R6□ L: Lead Free G: Halogen Free |
| SOT-23 | R4□ G: Halogen Free | R6□ L: Lead Free G: Halogen Free |
| TO-92 | UTC MCR100 -4 C: Lead Free G: Halogen Free Date Code | UTC MCR100 -6 1 L: Lead Free G: Halogen Free Date Code |

| Package | MCR100-8 | MCR100-10 |
|---------|--|--|
| SOT-223 | MCR100 → G: Halogen Free -8 → Date Code | MCR100 → G: Halogen Free -10 → Date Code |
| SOT-89 | □□□□ B□□□ Code R8□ L: Lead Free G: Halogen Free | Date Code R10 L: Lead Free G: Halogen Free |
| SOT-23 | R8□ L: Lead Free G: Halogen Free | R10 □ L: Lead Free G: Halogen Free |
| TO-92 | UTC MCR100 -8 -8 -8 Date Code | UTC MCR100 -10 I UTC L: Lead Free G: Halogen Free Date Code |



ABSOLUTE MAXIMUM RATINGS

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|--|----------------|------------------------------------|------------|------------------|
| | MCR100-4 | | 200 | V |
| Peak Repetitive Off-State Voltage(Note 1) (T_J =-40 ~ 110°C, Sine Wave, 50 ~ 60Hz; | MCR100-6 | ., ., | 400 | V |
| | MCR100-8 | V _{DRM} ,V _{RRM} | 600 | V |
| Gate Open) | MCR100-10 | | 800 | V |
| On-Sate RMS Current (Tc=80°C) 180°C Cor | ndition Angles | I _{T(RMS)} | 0.8 | А |
| Peak Non-Repetitive Surge Current (1/2 cycle, Sine Wave, 60Hz, TJ=25°C) | | I _{TSM} | 10 | А |
| Circuit Fusing Considerations (t=8.3 ms) | | l ² t | 0.415 | A ² s |
| Forward Peak Gate Power (T _A =25°C, Pulse Width ≤1.0µs) | | P _{GM} | 0.1 | W |
| Forward Average Gate Power (T _A =25°C, t=8.3ms) | | P _{G(AV)} | 0.01 | W |
| Peak Gate Current – Forward (T _A =25°C, Pulse Width≤1.0µs) | | I _{GM} | 1 | А |
| Peak Gate Voltage – Reverse (T _A =25°C, Pulse Width≤1.0µs) | | V _{GRM} | 5 | V |
| Operating Junction Temperature Range (Rated V _{RRM} and V _{DRM}) | | TJ | -40 ~ +110 | °C |
| Storage Temperature Range | | T _{STG} | -40 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

THERMAL DATA

| PARAMETER | | | SYMBOL | MAX | UNIT |
|---------------------|--|---------------|---------------|-----|------|
| | | SOT-223 | | 180 | °C/W |
| Junction to Ambient | | SOT-23/SOT-89 | θ_{JA} | 400 | °C/W |
| | | TO-92 | | 200 | °C/W |

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise stated)

| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|-----------------------|--------------------|--|-----|------|-----|------|
| OFF CHARACTERISTICS | | | | | | | |
| Peak Forward or Reverse Blocking | T _C =25°C | | V_{D} =Rated V_{DRM} and V_{RRM} ; | | | 10 | μA |
| Current | T _C =110°C | IDRM, IRRM | v_D =Rated v_{DRM} and v_{RRM} ; R _{GK} =1k Ω | | | 100 | μA |
| ON CHARACTERISTICS | | | | | | | |
| Peak Forward On-State Voltage (No | te 2) | V _{TM} | I _{TM} =1A Peak @ T _A =25°C | | | 1.7 | V |
| Gate Trigger Current (Continuous Do | C) (Note 3) | I _{GT} | V_{AK} =7Vdc, R_L =100 Ω , T_C =25°C | 30 | | 100 | μA |
| Holding Current | T _C =25°C | | V _{AK} =7Vdc, initiating | | 0.5 | 5 | mA |
| Holding Current | T _C =-40°C | - I _H | current=20mA | | | 10 | mA |
| Latch Current | T _C =25°C | | V _{AK} =7V, Ig=200μA | | 0.6 | 10 | mA |
| | T _C =-40°C | | | | | 15 | mA |
| Gate Trigger Voltage | T _C =25°C | V | | | 0.62 | 0.8 | V |
| (continuous dc) | T _C =-40°C | V _{GT} | V_{AK} =7Vdc, R _L =100 Ω | | | 1.2 | V |
| DYNAMIC CHARACTERISTICS | | | | | | | |
| | | | V _D =Rated V _{DRM} , Exponential | | | | |
| Critical Rate of Rise of Off-State Volt | age | d _∨ /dt | Waveform, R _{GK} =1000Ω, | 20 | 35 | | V/µs |
| | | | Т _J =110°С | | | | |
| Critical Rate of Rise of On-State Current | | di/dt | I _{PK} =20A; Pw=10μsec; | | | 50 | A/ue |
| | | ui/ut | diG/dt=1A/µsec, Igt=20mA | | | 50 | A/µs |

Notes: 1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

2. Indicates Pulse Test Width \leq 1.0ms, duty cycle \leq 1%.

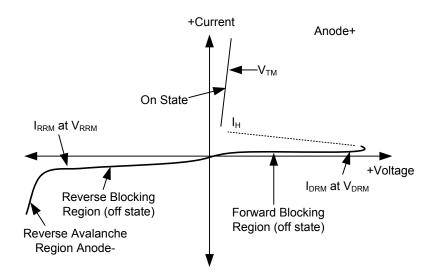
3. Does not include RGK in measurement.



SCR

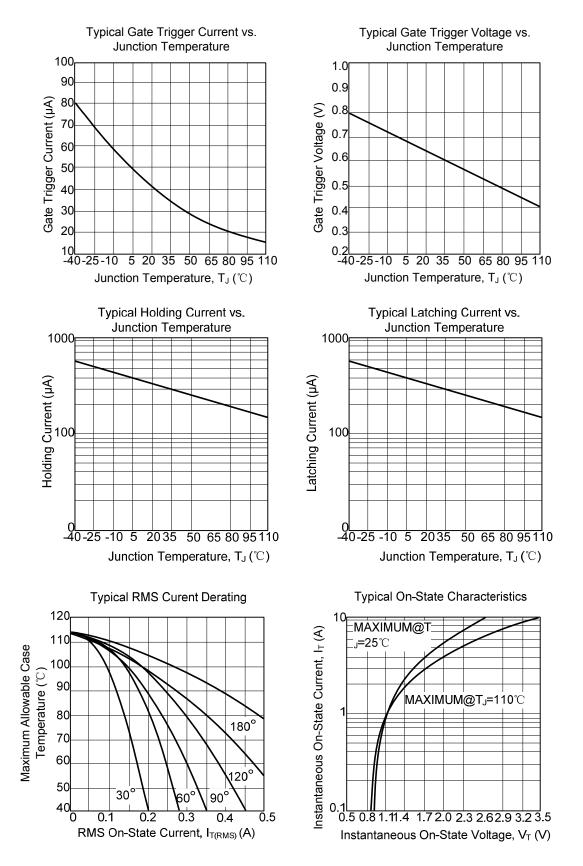
VOLTAGE CURRENT CHARACTERISTIC OF SCR

| PARAMETER | SYMBOL |
|---|------------------|
| Peak Repetitive Off Stat Forward Voltage | V _{DRM} |
| Peak Forward Blocking Current | I _{DRM} |
| Peak Repetitive Off State Reverse Voltage | V _{RRM} |
| Peak Reverse Blocking Current | I _{RRM} |
| Peak On State Voltage | V _{TM} |
| Holding Current | I _H |





TYPICAL CHARACTERISTICS





UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

