

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.

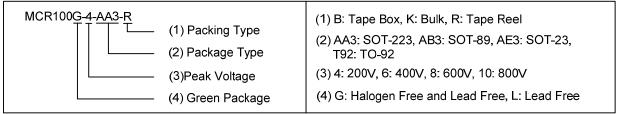
FEATURES

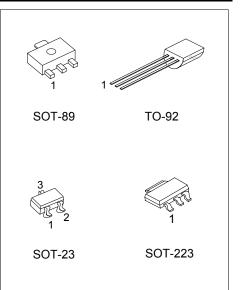
- * Sensitive gate allows triggering by micro controllers and other logic circuits
- * Blocking voltage to 200V-800V
- * On-state current rating of 0.8A RMS at 80°C
- * High surge current capability 10A
- * Minimum and maximum values of $I_{\text{GT}},\,V_{\text{GT}}$ and I_{H} specified for ease of 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%.

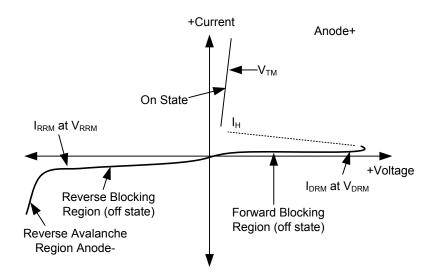
3. Does not include RGK in measurement.



SCR

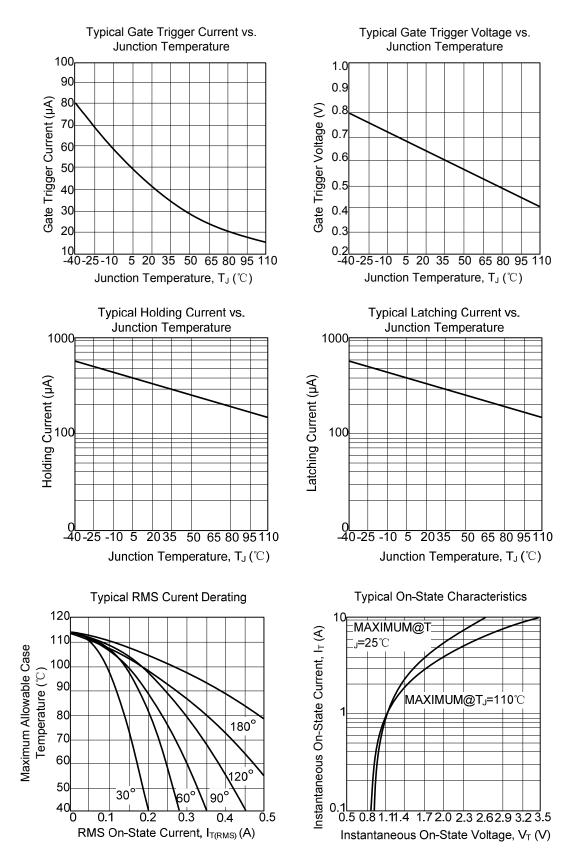
VOLTAGE CURRENT CHARACTERISTIC OF SCR

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.

