

## US104S/N

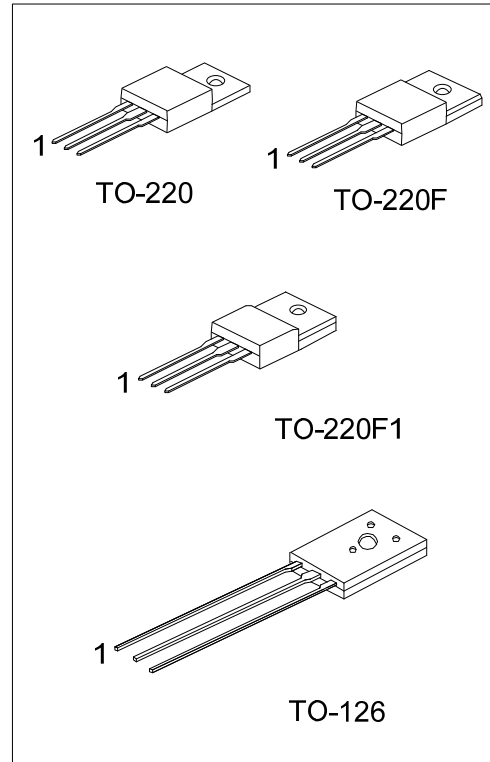
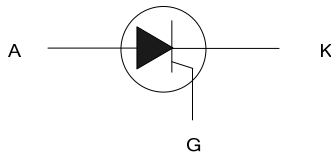
SCR

### SCRS

#### DESCRIPTION

Thanks to highly sensitive triggering levels, the UTC **US104S/N** is suitable for all applications where the available gate current is limited, such as motor control for hand tools, kitchen aids, overvoltage crowbar protection for low power supplies, Available in through-hole or surface-mount packages, they provide an optimized performance in a limited space area.

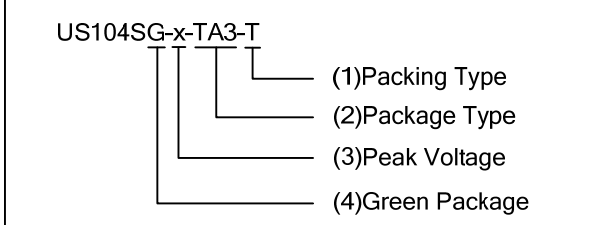
#### SYMBOL



#### ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
US104SL-x-TA3-T	US104SG-x-TA3-T	TO-220	K	A	G	Tube
US104SL-x-TF3-T	US104SG-x-TF3-T	TO-220F	K	A	G	Tube
US104SL-x-TF1-T	US104SG-x-TF1-T	TO-220F1	K	A	G	Tube
US104SL-x-T60-K	US104SG-x-T60-K	TO-126	K	A	G	Bulk
US104NL-x-TA3-T	US104NG-x-TA3-T	TO-220	K	A	G	Tube
US104NL-x-TF3-T	US104NG-x-TF3-T	TO-220F	K	A	G	Tube
US104NL-x-TF1-T	US104NG-x-TF1-T	TO-220F1	K	A	G	Tube
US104NL-x-T60-K	US104NG-x-T60-K	TO-126	K	A	G	Bulk

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

<p>US104SG-x-TA3-T</p> 	<p>(1) T: Tube, K: Bulk                  (2) TA3: TO-220, TF1: TO-220F1, TF3: TO-220F                  T60: TO-126                  (3) 4: 400V, 6: 600V, 8: 800V                  (4) G: Halogen Free and Lead Free, L: Lead Free</p>
--	--

■ MARKING

PACKAGE	MARKING	
	US104S	US104N
TO-220 TO-220F TO-220F1		
TO-126		

## ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Repetitive Peak Off-State Voltages And Repetitive Peak Reverse Voltage	US104S/N-4	400	V
	US104S/N-6	600	
	US104S/N-8	800	
RMS On-State Current (180° Conduction Angle) ( $T_C=115^\circ\text{C}$ )	$I_{T(RMS)}$	4	A
Average On-State Current (180° Conduction Angle) ( $T_C=115^\circ\text{C}$ )	$I_{T(AV)}$	2.5	A
Non Repetitive Surge Peak On-State Current ( $T_J=25^\circ\text{C}$ )	$t_p=8.3\text{ms}$	33	A
	$t_p=10\text{ms}$	30	
$I^2t$ Value For Fusing ( $t_p = 10 \text{ ms}, T_J = 25^\circ\text{C}$ )	$I^2t$	4.5	$\text{A}^2\text{S}$
Critical Rate Of Rise Of On-State Current ( $I_G = 2 \times I_{GT}, tr \leq 100 \text{ n s}, F = 60 \text{ Hz}, T_J = 125^\circ\text{C}$ )	$di/dt$	50	$\text{A}/\mu\text{s}$
Peak Gate Current ( $t_p=20\mu\text{s}, T_J = 125^\circ\text{C}$ )	$I_{GM}$	1.2	A
Average Gate Power Dissipation ( $T_J = 125^\circ\text{C}$ )	$PG_{(AV)}$	0.2	W
Storage Temperature	$T_{STG}$	-40 ~ +150	$^\circ\text{C}$
Junction Temperature	$T_J$	-40 ~ +125	$^\circ\text{C}$

- Notes: 1. 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.  
 2. The device is guaranteed to meet performance specification within  $0^\circ\text{C} \sim 70^\circ\text{C}$  operating temperature range and assured by design from  $-20^\circ\text{C} \sim 85^\circ\text{C}$ .

## ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	$\theta_{JA}$	60	K/W
		75	K/W
		TO-220 TO-220F TO-220F1	
Junction to Ambient	$\theta_{JC}$	3.0	K/W
		4.4	K/W
		4.0	K/W
		TO-220 TO-220F TO-220F1	

## ■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

### US104S(SENSITIVE)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	$I_{GT}$	$V_D=12 \text{ V}, R_L=33\Omega$			200	$\mu\text{A}$
Gate Trigger Voltage	$V_{GT}$	$V_D=12 \text{ V}, R_L=33\Omega$			0.8	V
Gate Non-Trigger Voltage	$V_{GD}$	$V_D=V_{DRM}, R_L=3.3\text{k}\Omega$ $R_{GK}=220 \text{ } T_J=125^\circ\text{C}$	0.1			V
Reverse Gate Voltage	$V_{RG}$	$I_{RG}=10\mu\text{A}$	8			V
Holding Current	$I_H$	$I_T=50\text{mA}, R_{GK}=1\text{k}\Omega$			5	mA
Latching Current	$I_L$	$I_G=1\text{mA}, R_{GK}=1\text{k}\Omega$			6	mA
Circuit Rate Of Change Of off-State Voltage	$dV/dt$	$V_D=67\% V_{DRM}, R_{GK}=220\Omega, T_J=125^\circ\text{C}$	5			$\text{V}/\mu\text{s}$
On-State Voltage	$V_{TM}$	$I_{TM}=8 \text{ A}, t_p = 380 \mu\text{s}, T_J = 25^\circ\text{C}$			1.6	V
Threshold Voltage	$V_{T0}$	$T_J=125^\circ\text{C}$			0.85	V
Dynamic Resistance	$R_d$	$T_J=125^\circ\text{C}$			90	$\text{m}\Omega$
Off-State Leakage Current	$I_{DRM}$	$V_{DRM}=V_{RRM}, R_{GK}=220\Omega, T_J=25^\circ\text{C}$			5	$\mu\text{A}$
	$I_{RRM}$	$V_{DRM}=V_{RRM}, R_{GK}=220\Omega, T_J=125^\circ\text{C}$			1	mA





## US104S/N

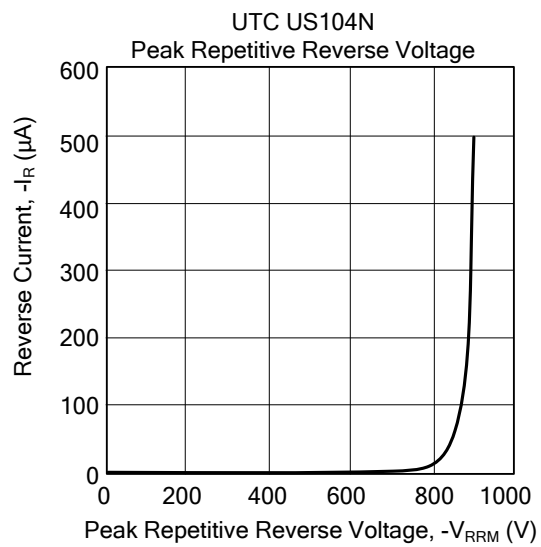
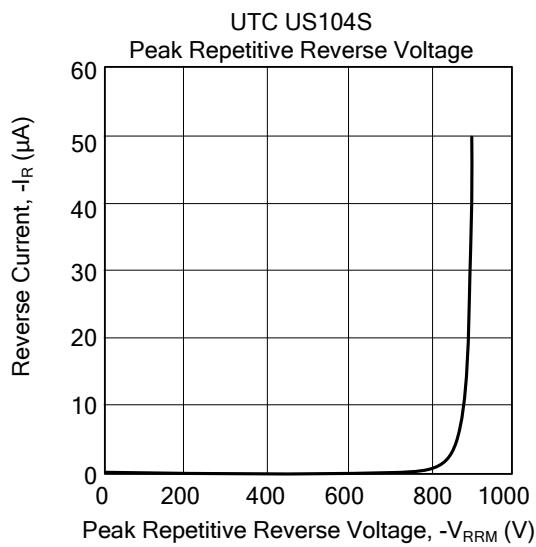
SCR

### ■ ELECTRICAL CHARACTERISTICS (Cont.)

#### US104N(SENSITIVE)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	$I_{GT}$	$V_D=12V, R_L=33\Omega$	2		15	mA
Gate Trigger Voltage	$V_{GT}$	$V_D=12V, R_L=33\Omega$			1.3	V
Gate Non-Trigger Voltage	$V_{GD}$	$V_D=V_{DRM}, R_L=3.3\text{ k}\Omega, T_J=125^\circ\text{C}$	0.2			V
Holding Current	$I_H$	$I_T=100\text{mA}$ Gate open			30	mA
Latching Current	$I_L$	$I_G=1.2 I_{GT}$			60	mA
Circuit Rate Of Change Of off-State Voltage	dV/dt	$V_D=67\% V_{DRM}, R_{GK}=220\Omega, T_J=125^\circ\text{C}$	100			V/ $\mu\text{s}$
On-State Voltage	$V_{TM}$	$I_{TM}=8\text{ A}, t_P=380\mu\text{s}, T_J=25^\circ\text{C}$			1.6	V
Threshold Voltage	$V_{t0}$	$T_J=125^\circ\text{C}$			0.85	V
Dynamic Resistance	$R_d$	$T_J=125^\circ\text{C}$			62	m $\Omega$
Off-State Leakage Current	$I_{DRM}$	$V_{DRM}=V_{RRM}, R_{GK}=220\Omega, T_J=25^\circ\text{C}$			5	$\mu\text{A}$
	$I_{RRM}$	$V_{DRM}=V_{RRM}, R_{GK}=220\Omega, T_J=125^\circ\text{C}$			2	mA

## ■ 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.