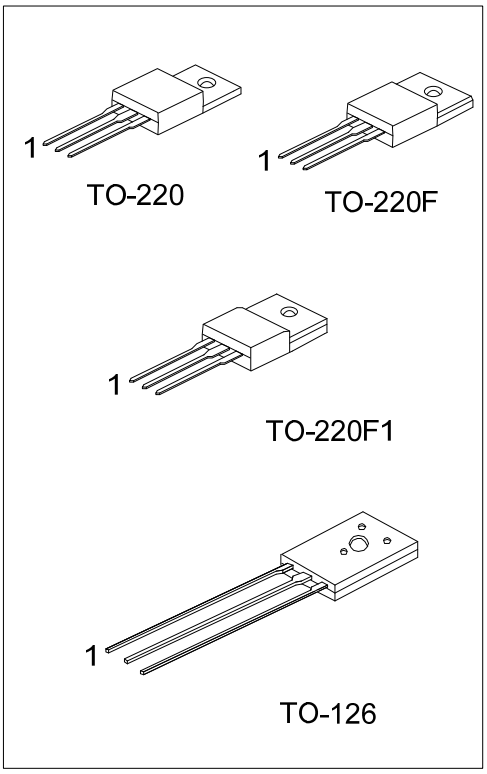
US104S/N

SCR

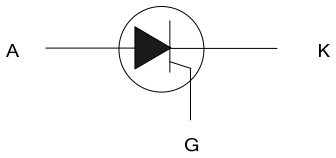
SCRS



■ 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

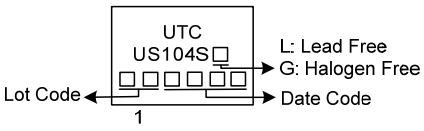
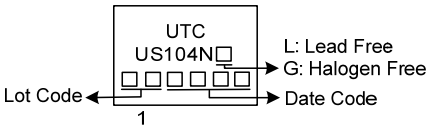
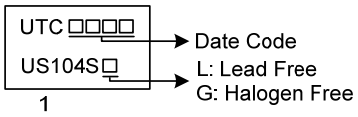
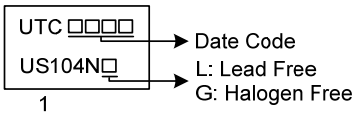
Note: Pin Assignment: K: Cathode A: Anode G: Gate

US104SG-x-TA3-T

(1)Packing Type
(2)Package Type
(3)Peak Voltage
(4)Green Package

(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

■ 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	V_{DRM}, V_{RRM}	400	V
	US104S/N-6		600	
	US104S/N-8		800	
RMS On-State Current (180° Conduction Angle) (T_C=115°C)		$I_{T(RMS)}$	4	A
Average On-State Current (180° Conduction Angle) (T_C=115°C)		$I_{T(AV)}$	2.5	A
Non Repetitive Surge Peak On-State Current (T_J= 25°C)	t_P=8.3ms	I_{TSM}	33	A
	t_P=10ms		30	
I^2t Value For Fusing (t_P = 10 ms, T_J = 25°C)		I^2t	4.5	A^2S
Critical Rate Of Rise Of On-State Current (I_G = 2 x I_{GT} , tr ≤ 100 n s, F= 60 Hz ,T_J = 125°C)		dI/dt	50	A/μs
Peak Gate Current (t_P=20μs, T_J = 125°C)		I_{GM}	1.2	A
Average Gate Power Dissipation (T_J = 125°C)		$PG_{(AV)}$	0.2	W
Storage Temperature		T_{STG}	-40 ~ +150	°C
Junction Temperature		T_J	-40 ~ +125	°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°C ~70°C operating temperature range and assured by design from –20°C ~85°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	TO-220 TO-220F TO-220F1	$θ_{JA}$	60	K/W
	TO-126		75	K/W
Junction to Ambient	TO-220	$θ_{JC}$	3.0	K/W
	TO-220F TO-220F1		4.4	K/W
	TO-126		4.0	K/W

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

US104S(SENSITIVE)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	I_{GT}	V_D=12 V, R_L=33Ω			200	μA
Gate Trigger Voltage	V_{GT}	V_D=12 V, R_L=33Ω			0.8	V
Gate Non-Trigger Voltage	V_{GD}	V_D=V_{DRM}, R_L=3.3kΩ R_{GK}=220 T_J=125°C	0.1			V
Reverse Gate Voltage	V_{RG}	I_{RG}=10μA	8			V
Holding Current	I_H	I_T=50mA, R_{GK}=1kΩ			5	mA
Latching Current	I_L	I_G=1mA, R_{GK}=1kΩ			6	mA
Circuit Rate Of Change Of off-State Voltage	dV/dt	V_D=67% V_{DRM} ,R_{GK}=220Ω, T_J=125°C	5			V/μs
On-State Voltage	V_{TM}	I_{TM}= 8 A, t_P = 380 μs, T_J = 25°C			1.6	V
Threshold Voltage	V_{t0}	T_J= 125°C			0.85	V
Dynamic Resistance	R_d	T_J= 125°C			90	mΩ
Off-State Leakage Current	I_{DRM}	V_{DRM}=V_{RRM}, R_{GK}=220Ω, T_J=25°C			5	μA
	I_{RRM}	V_{DRM}=V_{RRM}, R_{GK}=220Ω, T_J =125°C			1	mA

■ ELECTRICAL CHARACTERISTICS (Cont.)

US104N(SENSITIVE)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	I_{GT}	V_D=12V, R_L=33Ω	2		15	mA
Gate Trigger Voltage	V_{GT}	V_D=12V, R_L=33Ω			1.3	V
Gate Non-Trigger Voltage	V_{GD}	V_D=V_{DRM}, R_L=3.3 kΩ, T_J=125°C	0.2			V
Holding Current	I_H	I_T =100mA 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} = 220Ω, T_J= 125°C	100			V/μs
On-State Voltage	V_{TM}	I_{TM} = 8 A, t_P = 380 μs, T_J = 25℃			1.6	V
Threshold Voltage	V_{t0}	T_J = 125°C			0.85	V
Dynamic Resistance	R_d	T_J = 125°C			62	mΩ
Off-State Leakage Current	I_{DRM}	V_{DRM} = V_{RRM}, R_{GK} = 220Ω, T_J= 25°C			5	μA
	I_{RRM}	V_{DRM} = V_{RRM}, R_{GK} = 220Ω, T_J = 125°C			2	mA

■ TYPICAL CHARACTERISTICS