



US104S/N

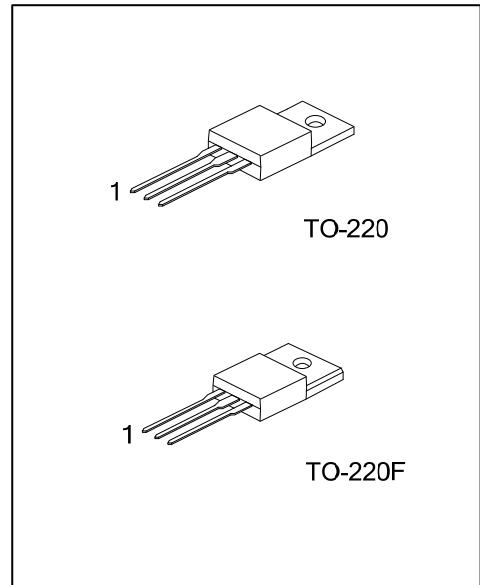
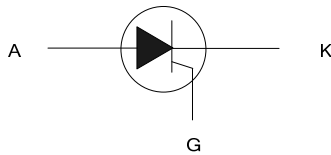
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DESCRIPTION

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
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

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

<p>US104SL-x-TA3-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Peak Voltage (4) Lead Free 	<ul style="list-style-type: none"> (1) T: Tube (2) TA3: TO-220, TF3: TO-220F (3) 4: 400V, 6: 600V, 8: 800V (4) L: Lead Free, G: Halogen Free
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MARKING INFORMATION

PACKAGE	MARKING	
	US104S	US104N
TO-220 TO-220F		

■ 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) ($T_C=115^\circ\text{C}$)		$I_{T(RMS)}$	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 ($T_J = 25^\circ\text{C}$)	$t_p=8.3\text{ms}$	I_{TSM}	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	A^2S
Critical Rate Of Rise Of On-State Current ($I_G = 2 \times I_{GT}, tr \leq 100 \text{ ns}, F = 60 \text{ Hz}, T_J = 125^\circ\text{C}$)		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 ($T_J = 125^\circ\text{C}$)		$P_{G(AV)}$	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		θ_{JA}	60	K/W
Junction to Ambient	TO-220	θ_{JC}	3.0	K/W
	TO-220F		4.4	

■ 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	μA
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	μA
	I_{RRM}	$V_{DRM}=V_{RRM}, R_{GK}=220\Omega, T_J = 125^\circ\text{C}$			1	mA



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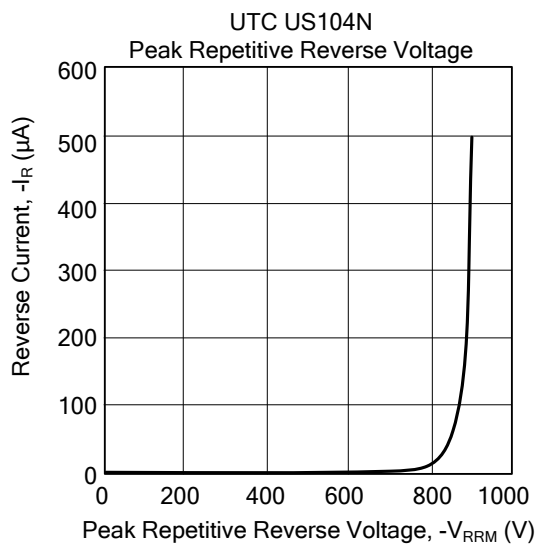
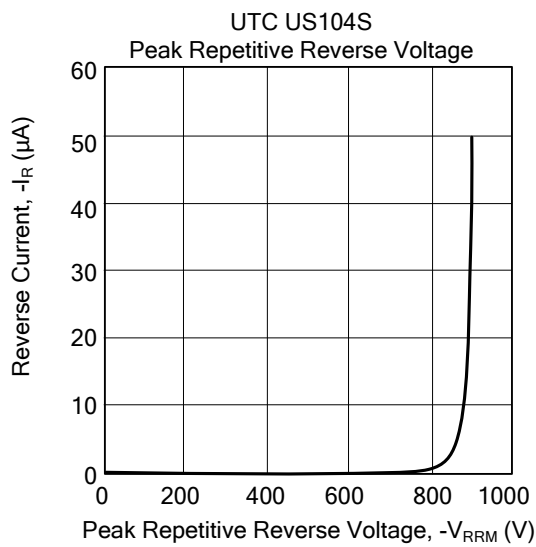
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■ ELECTRICAL CHARACTERISTICS(Cont.)

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/ μs
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 Ω
Off-State Leakage Current	I_{DRM}	$V_{DRM} = V_{RRM}, R_{GK} = 220\Omega, T_J= 25^\circ\text{C}$			5	μA
	I_{RRM}	$V_{DRM} = V_{RRM}, R_{GK} = 220\Omega, T_J = 125^\circ\text{C}$			2	mA

■ TYPICAL CHARACTERISTICS



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