



## UT139E

TRIAC

### TRIAC

#### DESCRIPTION

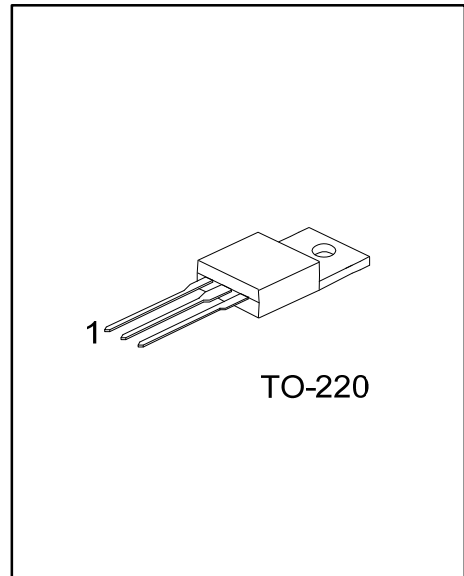
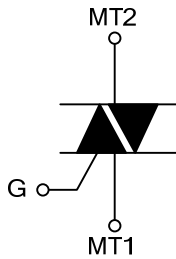
The UTC **UT139E** is a triacs, it uses UTC's advanced technology to provide customers with high bidirectional transient and high thermal cycling performance.

The UTC **UT139E** is suitable for motor control, heating and static switching, etc.

#### FEATURES

- \* High bidirectional transient
- \* High thermal cycling performance
- \* Blocking voltage capability

#### SYMBOL



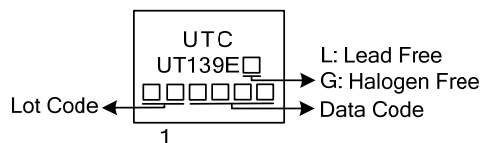
#### ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UT139EL-x-TA3-T	UT139EG-x-TA3-T	TO-220	MT1	MT2	G	Tube

Note: Pin Assignment: G: Gate

<p>UT139EL-x-TA3-T</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Peak Voltage</li> <li>(4) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube</li> <li>(2) TA3: TO-220</li> <li>(3) 6: 600V, 8: 800V</li> <li>(4) L: Lead Free, G: Halogen Free and Lead Free</li> </ul>
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#### MARKING



## ■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Repetitive peak off-state voltages	UT139E-6	$V_{DRM}$	600 (Note 2)	V
	UT139E-8		800	V
RMS on-state current full sine wave; $T_{mb} \leq 99^{\circ}C$		$I_{T(RMS)}$	16	A
Non-repetitive peak on-state current (Full sine wave; $T_J = 25^{\circ}C$ prior to surge)	$t = 20ms$	$I_{TSM}$	140	A
	$t = 16.7 ms$		150	
$I^2t$ for fusing	$t = 10 ms$	$I^2t$	21	$A^2s$
Repetitive rate of rise of on-state current after triggering $I_{TM}=20A$ ; $I_G=0.2A$ ; $dI_G/dt=0.2A/\mu s$	T2+ G+	$di_T/dt$	50	$A/\mu s$
	T2+ G-		50	$A/\mu s$
	T2- G-		50	$A/\mu s$
	T2- G+		10	$A/\mu s$
Peak gate voltage		$V_{GM}$	5	V
Peak gate current		$I_{GM}$	2	A
Peak gate power		$P_{GM}$	5	W
Average gate power (over any 20 ms period)		$P_{G(AV)}$	0.5	W
Junction Temperature		$T_J$	125	$^{\circ}C$
Storage Temperature		$T_{STG}$	-40 ~ +150	$^{\circ}C$

- Note: 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. Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed  $6A/\mu s$ .

## ■ THERMAL RESISTANCES

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Thermal resistance Junction to Ambient	In Free Air	$\theta_{JA}$		60		$^{\circ}C/W$
Thermal resistance Junction to mounting base	Full cycle	$\theta_{JC}$			1.2	$^{\circ}C/W$
	Half cycle				1.7	$^{\circ}C/W$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Gate Trigger Current	$I_{GT}$	$V_D=12V, I_T=0.1A$	T2+G+			10	mA
			T2+G-			10	
			T2-G-			10	
			T2-G+			25	
Latching Current	$I_L$	$V_D=12V, I_{GT}=0.1A$	T2+G+		7	40	mA
			T2+G-		20	60	
			T2-G-		8	40	
			T2-G+		10	60	
Holding Current	$I_H$	$V_D=12V, I_{GT}=0.1A$		6	30	mA	
On-State Voltage	$V_T$	$I_T=20A$		1.2	1.6	V	
Gate Trigger Voltage	$V_{GT}$	$V_D=12V, I_T=0.1A$		0.7	1.5	V	
		$V_D=400V, I_T=0.1A, T_J=125^{\circ}C$	0.25	0.40		V	
Off-State Leakage Current	$I_D$	$V_D=V_{DRM(max)}, T_J=125^{\circ}C$		0.1	0.5	mA	

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Critical Rate Of Rise Of Off-State Voltage	$dV_D/dt$	$V_{DM}=67\% V_{DRM(max)}, T_J=125^{\circ}C$ , Exponential waveform, gate open circuit	100	250		$V/\mu s$
Critical Rate Of Change Of Commutating Voltage	$dV_{com}/dt$	$V_{DM}=400V, T_J=95^{\circ}C, I_{T(RMS)}=16A$ , $dI_{com}/dt=7.2A/ms$ , gate open circuit		20		$V/\mu s$
Gate Controlled Turn-On Time	$t_{gt}$	$I_{TM}=20A, V_D=V_{DRM(max)}, I_G=0.1A$ , $dI_G/dt=5A/\mu s$		2		$\mu s$

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