



## UT75N02

Preliminary

Power MOSFET

### 75A, 25V N-CHANNEL POWER MOSFET

#### DESCRIPTION

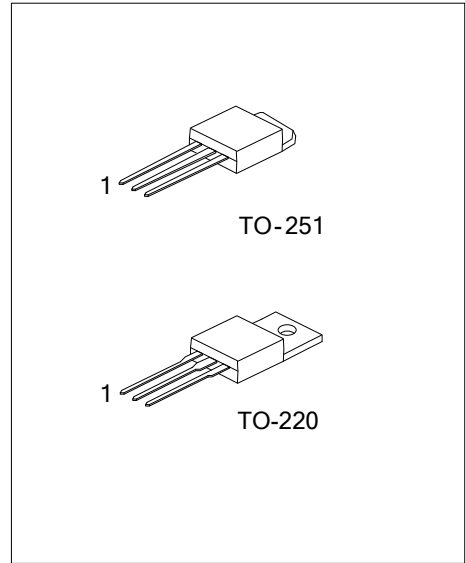
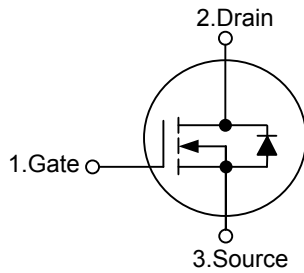
The UTC **UT75N02** uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

\*  $R_{DS(ON)} < 7m\Omega @ V_{GS}=10V$

\*  $R_{DS(ON)} < 8m\Omega @ V_{GS}=7V$

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT75N02L-TA3-T	UT75N02G-TA3-T	TO-220	G	D	S	Tube
UT75N02L-TM3-T	UT75N02G-TM3-T	TO-251	G	D	S	Tube

Note: Pin Assignment: G: Gate D: Drain S: Source

<p>UT75N02L-TA3-T</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TM3: TO-251</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain Source Voltage		$V_{DSS}$	25	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current		$I_D$	75	A
Pulsed Drain Current (Note 2)		$I_{DM}$	170	A
Avalanche Current		$I_{AR}$	60	A
Avalanche Energy	L=0.1mH	$E_{AS}$	140	mJ
Repetitive Avalanche Energy (Note 3)	L=0.05mH	$E_{AR}$	5.6	mJ
Power Dissipation	TO-220	$P_D$	40	W
	TO-251		28	
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

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. Pulse width limited by maximum junction temperature.

3. Duty cycle  $\leq 1\%$ .

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	$\theta_{JA}$	62.5	$^\circ\text{C/W}$
	TO-251		110	
Junction to Case	TO-220	$\theta_{JC}$	3.13	$^\circ\text{C/W}$
	TO-251		4.53	

■ ELECTRICAL CHARACTERISTICS (T<sub>c</sub> = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	25			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V			25	μA
		V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C			250	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±250	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.5	3	V
On-State Drain Current (Note 1)	I <sub>D(ON)</sub>	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V	70			A
Static Drain-Source On-Resistance (Note 1)	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A		5	7	mΩ
		V <sub>GS</sub> = 7V, I <sub>D</sub> = 24A		6	8	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0 V, f=1MHz		5000		pF
Output Capacitance	C <sub>OSS</sub>			1800		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			800		pF
<b>SWITCHING PARAMETERS (Note 2)</b>						
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> ≈30A R <sub>GS</sub> = 2.5Ω, R <sub>L</sub> = 1Ω,		7		ns
Turn-ON Rise Time	t <sub>R</sub>			7		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			24		ns
Turn-OFF Fall-Time	t <sub>F</sub>			6		ns
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =0.5V <sub>(BR)DSS</sub> , V <sub>GS</sub> =10V, I <sub>D</sub> =35A		140		nC
Gate Source Charge	Q <sub>GS</sub>			40		nC
Gate Drain Charge	Q <sub>GD</sub>			75		nC
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Forward Voltage (Note 1)	V <sub>SD</sub>	I <sub>F</sub> = I <sub>S</sub> , V <sub>GS</sub> = 0V			1.3	V
Continuous Current	I <sub>S</sub>				75	A

- Notes: 1. Pulse test : Pulse Width≤300μsec, Duty Cycle≤2%  
 2. Independent of operating temperature

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