



## 6N10

Preliminary

Power MOSFET

### 6 Amps, 100 Volts N-CHANNEL POWER MOSFET

#### DESCRIPTION

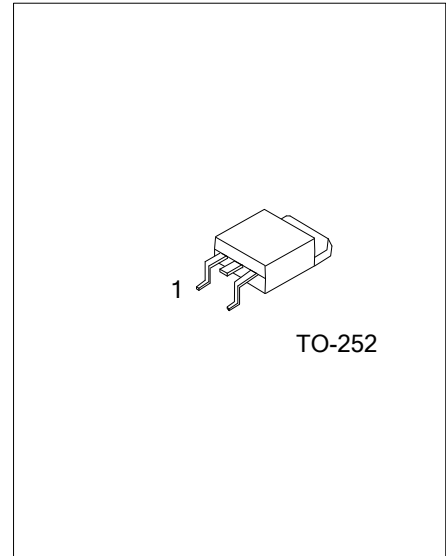
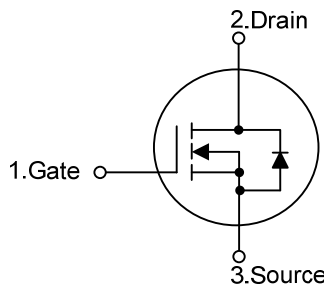
The UTC **6N10** is an N-Channel enhancement mode power FET providing customers with excellent switching performance and minimum on-state resistance.

The UTC **6N10** is generally applied in voltage applications, such as DC motor control, audio amplifier and high efficiency switching DC/DC converters.

#### FEATURES

- \* 6.5A, 100V,  $R_{DS(ON)} = 0.2\Omega @ V_{GS} = 10V$
- \* Fast switching
- \* Improved dv/dt capability

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
6N10L-TN3-R	6N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>6N10L-TN3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252</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		$V_{DS}$	100	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current	Continuous	$I_D$	6.5	A
	Pulsed	$I_{DM}$	8.0	A
Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$ )	L = 0.1 mH	$E_{AR}$	1.25	mJ
Power Dissipation		$P_D$	16	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55~+150	$^\circ\text{C}$

Note : 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.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		$\theta_{JA}$	100	$^\circ\text{C/W}$
Junction to Case		$\theta_{JC}$	7.5	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	100			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=80\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
		$V_{DS}=80\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=125^\circ\text{C}$			50	
		$V_{DS}=80\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=175^\circ\text{C}$			250	
Gate- Source Leakage Current	Forward	$I_{GSS}$			+100	nA
	Reverse					
On-State Drain Current (Note 2)	$I_{D(on)}$	$V_{DS}=5\text{V}$ , $V_{GS}=10\text{V}$	8.0			A
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1.0		3.0	V
Static Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=3\text{A}$		0.160	0.200	$\Omega$
		$V_{GS}=10\text{V}$ , $I_D=3\text{A}$ , $T_J=125^\circ\text{C}$			0.350	
		$V_{GS}=10\text{V}$ , $I_D=3\text{A}$ , $T_J=175^\circ\text{C}$			0.450	
		$V_{GS}=4.5$ , $I_D=1.0\text{A}$		0.180	0.225	
Forward Transconductance (Note 2)	$g_{FS}$	$V_{DS}=15\text{V}$ , $I_D=3\text{A}$		8.5		S
<b>DYNAMIC PARAMETERS (Note1)</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		240		pF
Output Capacitance	$C_{OSS}$			42		pF
Reverse Transfer Capacitance	$C_{RSS}$			17		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 3)	$Q_G$	$V_{DS}=50\text{V}$ , $V_{GS}=5\text{V}$ , $I_D=6.5\text{A}$		2.7	4.0	nC
Gate to Source Charge (Note 3)	$Q_{GS}$			0.6		nC
Gate to Drain Charge (Note 3)	$Q_{GD}$			0.7		nC
Turn-ON Delay Time (Note3)	$t_{D(ON)}$	$V_{DD}=50\text{V}$ , $R_L=7.5\Omega$ , $I_D\approx 6.5\text{A}$ , $V_{GEN}=10\text{V}$ , $R_G=2.5\Omega$		7	11	ns
Rise Time (Note 3)	$t_R$			8	12	ns
Turn-OFF Delay Time (Note 3)	$t_{D(OFF)}$			8	12	ns
Fall-Time (Note 3)	$t_F$			9	14	ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (<math>T_C=25^\circ\text{C}</math>)</b>						
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$				8.0	A
Drain-Source Diode Forward Voltage (Note 2)	$V_{SD}$	$I_F=6.5\text{A}$ , $V_{GS}=0\text{V}$		0.9	1.3	V
Reverse Recovery Time	$t_{RR}$	$I_F=6.5\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$		35	60	ns

Notes: 1. Guaranteed by design, not subject to production testing.

2. Pulse test; pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

3. Independent of operating temperature.

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