



## 90N02

Preliminary

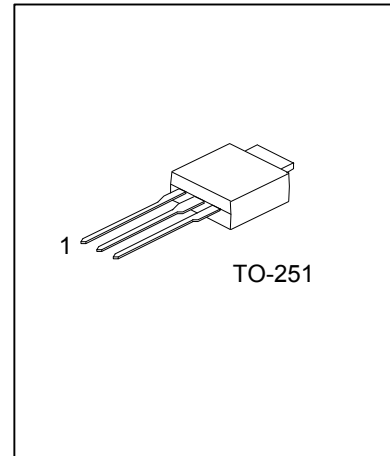
Power MOSFET

### 90A, 20V N-CHANNEL POWER MOSFET

#### DESCRIPTION

The UTC **90N02** is an N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, superior switching performance and low gate charge.

The UTC **90N02** is suitable for switching regulators, DC linear mode control, automotive systems, solenoid & motor control, etc.

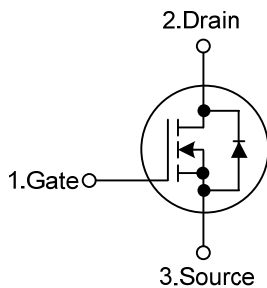


#### FEATURES

\*  $R_{DS(ON)} = 7m\Omega @ V_{GS}=10V, I_D=90A$

\* High switching speed

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
90N02L-TM3-T	90N02G-TM3-T	TO-251	G	D	S	Tube

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

<p>90N02L-TM3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube</p> <p>(2) TM3: TO-251</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 2)		$V_{DSS}$	20	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous ( $T_C < 135^\circ\text{C}$ , $V_{GS}=10\text{V}$ )	$I_D$	90	A
	Pulsed	$I_{DM}$	360	A
Single Pulsed Avalanche Energy (Note 3)		$E_{AS}$	168	mJ
Power Dissipation		$P_D$	54	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55~+150	$^\circ\text{C}$

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. Starting  $T_J=25\sim 150^\circ\text{C}$

3. Starting  $T_J=25^\circ\text{C}$ ,  $L = 0.42\text{mH}$ ,  $I_{AS} = 90\text{A}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	2.3	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	20			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=20\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	Forward	$I_{GSS}$			+100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	0.9	1.8	2.5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=90\text{A}$		5.1	7	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=20\text{V}$ , $f=1.0\text{MHz}$		3565		pF
Output Capacitance	$C_{OSS}$			1310		pF
Reverse Transfer Capacitance	$C_{RSS}$			395		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge at 20V	$Q_G$	$V_{DD}=20\text{V}$ , $I_D=90\text{A}$ , $R_L=0.4\Omega$		46	60	nC
Gate to Source Charge	$Q_{GS}$			6.9		nC
Gate to Drain Charge	$Q_{GD}$			9.8		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=20\text{V}$ , $I_D=90\text{A}$ , $R_L=0.4\Omega$ , $V_{GS}=10\text{V}$ , $R_{GS}=2.5\Omega$		9		ns
Rise Time	$t_R$			106		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			53		ns
Fall-Time	$t_F$			41		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_{SD}=90\text{A}$		0.9	1.25	V

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