

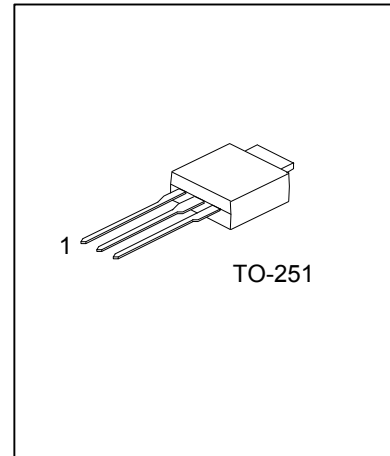


90N02

Preliminary

Power MOSFET

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



■ DESCRIPTION

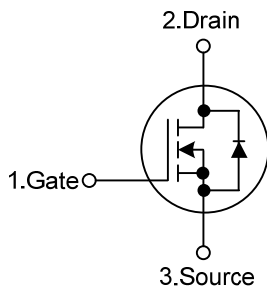
The UTC **90N02** is an N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, superior switching performance and low gate charge.

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}	± 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	θ_{JA}	62.5	$^\circ\text{C/W}$
Junction to Case	θ_{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
OFF CHARACTERISTICS						
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	μA
Gate-Source Leakage Current	Forward	I_{GSS}			+100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	0.9	2.8	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 Ω
DYNAMIC PARAMETERS						
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
SWITCHING PARAMETERS						
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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_{SD}=90\text{A}$		0.9	1.25	V

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