



90N02/A

Power MOSFET

90A, 20V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **90N02/A** 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.

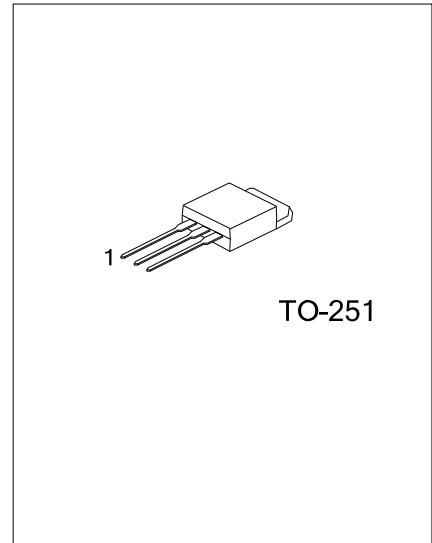
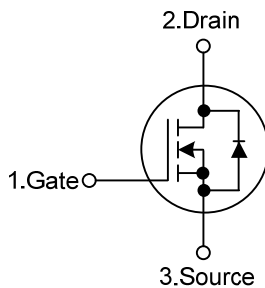
The UTC **90N02/A** is suitable for switching regulators, DC linear mode control, automotive systems, solenoid & motor control, etc.

FEATURES

* $R_{DS(ON)} = 12\text{ m}\Omega/10\text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=90\text{A}$

* 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
90N02AL-TM3-T	90N02AG-TM3-T	TO-251	G	D	S	Tube

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

90N02L-TM3-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) TM3: TO-251
	(3)Lead Free	(3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 2)		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	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 $T_J=25^\circ\text{C}$, $L = 0.42\text{mH}$, $I_{AS} = 90\text{A}$

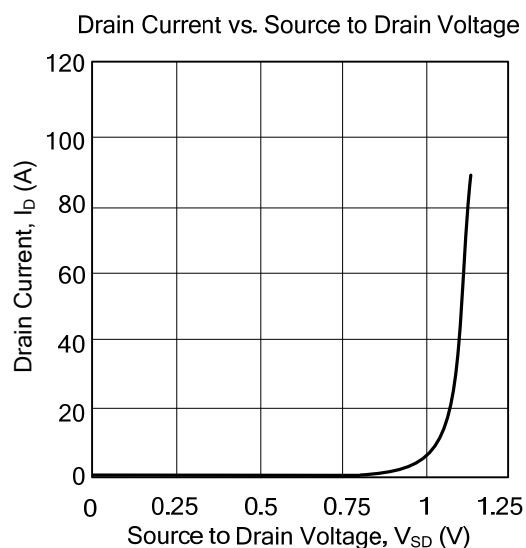
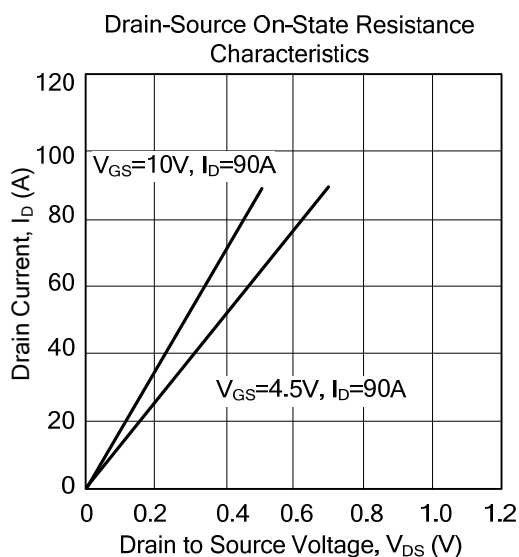
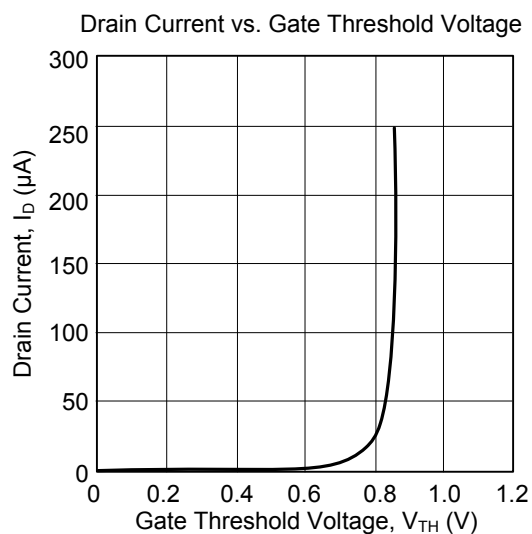
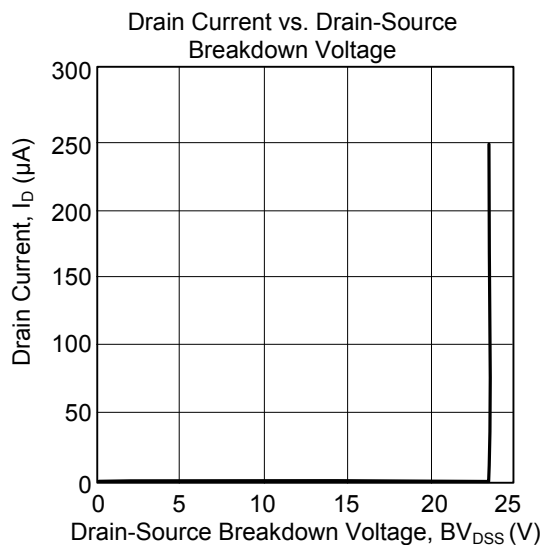
■ THERMAL DATA

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}	$I_D=250\mu A, V_{GS}=0V$	20			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+8V, V_{DS}=0V$			+100	nA
	Reverse		$V_{GS}=-8V, V_{DS}=0V$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.55		1.2	V
Static Drain-Source On-State Resistance	90N02	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=90A$			12	m Ω
	90N02A					10	m Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0V, V_{DS}=20V, f=1.0MHz$		3565		pF
Output Capacitance		C_{OSS}			1310		pF
Reverse Transfer Capacitance		C_{RSS}			395		pF
SWITCHING PARAMETERS							
Total Gate Charge at 20V		Q_G	$V_{DD}=20V, I_D=90A, R_L=0.4\Omega$		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		$t_{D(ON)}$	$V_{DD}=20V, I_D=90A, R_L=0.4\Omega, V_{GS}=5V, R_{GS}=2.5\Omega$		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}	$I_{SD}=90A$		0.9	1.25	V

■ TYPICAL CHARACTERISTICS



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