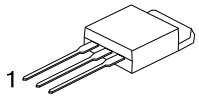
90A, 20V N-CHANNEL POWER MOSFET



TO-251

■ DESCRIPTION

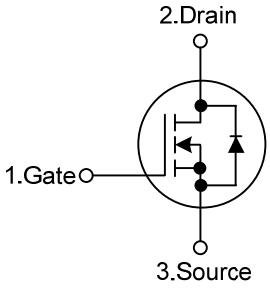
The UTC **90N02/A** is an N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, superior switching performance and low gate charge.

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

■ FEATURES

* $R_{DS(ON)}$= 12 mΩ/10mΩ @ 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
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 (2)Package Type (3)Lead Free	(1) T: Tube (2) TM3: TO-251 (3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 2)		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current	Continuous (T_C<135°C, V_{GS}=10V)	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	°C
Storage Temperature		T_{STG}	-55~+150	°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=25~150°C
3. Starting T_J=25°C , L = 0.42mH, I_{AS} = 90A

■ THERMAL DATA

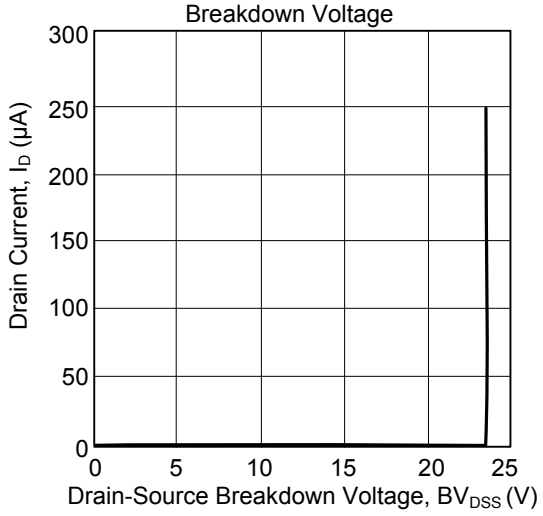
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	2.3	°C/W

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

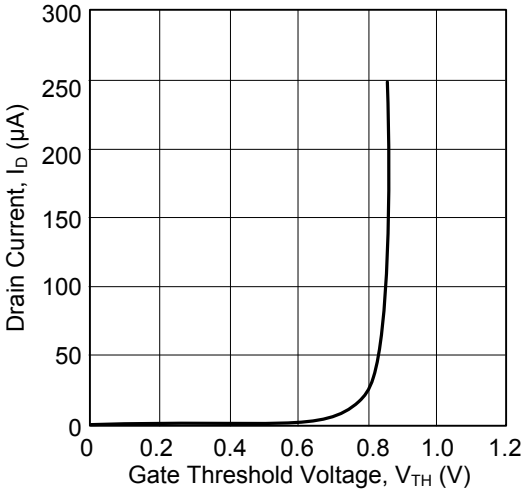
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	20			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+8V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-8V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.55		1.2	V
Static Drain-Source On-State Resistance	90N02	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=90A			12	mΩ
	90N02A					10	mΩ
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=0.4Ω		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=0.4Ω, V_{GS}=5V, R_{GS}=2.5 Ω		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

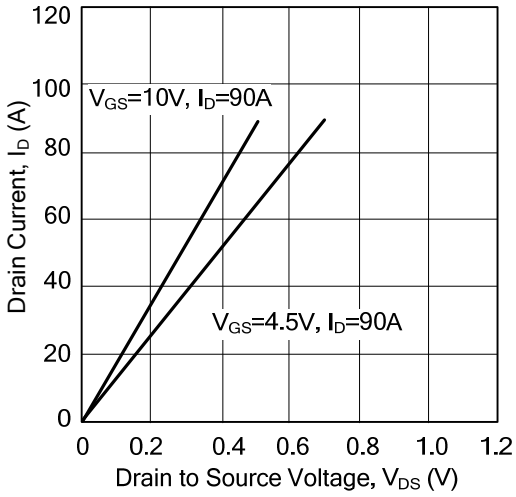
Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics



Drain Current vs. Source to Drain Voltage