



## 20N50

Preliminary

Power MOSFET

### 20A, 500V N-CHANNEL POWER MOSFET

#### DESCRIPTION

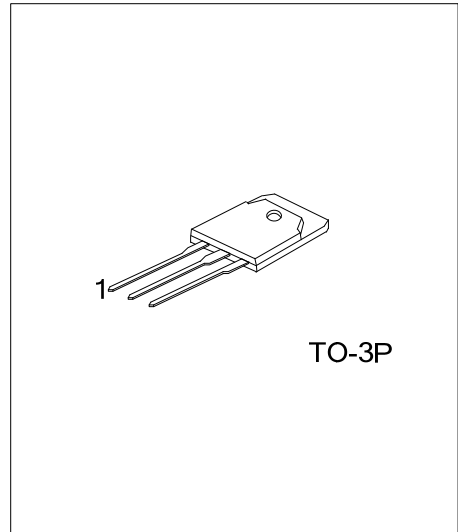
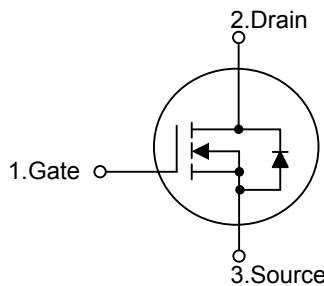
The UTC **20N50** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance, high switching speed and low leakage current, etc.

The UTC **20N50** is suitable for switching regulator application, etc.

#### FEATURES

- \*  $R_{DS(on)}=0.21\Omega @V_{GS}=10V, I_D=10A$
- \* High switching speed
- \* Low leakage current

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
20N50L-T3P-T	20N50G-T3P-T	TO-3P	G	D	S	Tube

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

<p>20N50L-T3P-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube</p> <p>(2) T3P: TO-3P</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{DSS}$	500	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	V
Drain Current (Note 2)	Continuous	$I_D$	20
	Pulsed	$I_{DM}$	80
Avalanche Current	$I_{AR}$	20	A
Avalanche Energy	Single Pulsed (Note 3)	$E_{AS}$	960
	Repetitive (Note 4)	$E_{AR}$	15
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	150	W
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55~+150	$^\circ\text{C}$

Note: 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. Ensure that the channel temperature does not exceed  $150^\circ\text{C}$ .

3.  $V_{DD}=90\text{V}$ ,  $T_{ch}=25^\circ\text{C}$  (initial),  $L=4.08\text{mH}$ ,  $R_G=25\Omega$ ,  $I_{AR}=20\text{A}$ .

4. Repetitive rating: pulse width limited by maximum channel temperature This transistor is an electrostatic-sensitive device. Handle with care.

■ THERMAL CHARACTERISTICS THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	50	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	0.833	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =10mA, V <sub>GS</sub> =0V	500			V	
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =500V, V <sub>GS</sub> =0V			100	μA	
Gate-Source Leakage Current	I <sub>GSS</sub>	Forward			+10	μA	
		Reverse			-10	μA	
Gate-Source Breakdown Voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> =±10μA, V <sub>DS</sub> =0V	±30			V	
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	2.0		4.0	V	
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A		0.21	0.27	Ω	
<b>DYNAMIC PARAMETERS</b>							
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		3400		pF	
Output Capacitance	C <sub>OSS</sub>			320		pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>			25		pF	
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> ≈400V, I <sub>D</sub> =20A		70		nC	
Gate to Source Charge	Q <sub>GS</sub>			45		nC	
Gate to Drain Charge	Q <sub>GD</sub>			25		nC	
Turn-ON Delay Time	t <sub>D(ON)</sub>	<p>Duty ≤1%, t<sub>w</sub>=10μs</p>		130		ns	
Rise Time	t <sub>R</sub>				70		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>				280		ns
Fall-Time	t <sub>F</sub>				70		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Maximum Body-Diode Continuous Current (Note)	I <sub>S</sub>				20	A	
Maximum Body-Diode Pulsed Current (Note)	I <sub>SM</sub>				80	A	
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =20A, V <sub>GS</sub> =0V			1.7	V	
Body Diode Reverse Recovery Time	t <sub>RR</sub>	I <sub>S</sub> =20A, V <sub>GS</sub> =0V, dI <sub>DR</sub> /dt=100A/μs		1300		ns	
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>				20		μC

Note: Ensure that the channel temperature does not exceed 150°C.

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