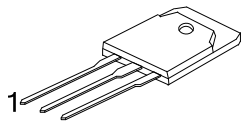
20A, 500V N-CHANNEL POWER MOSFET



TO-3P

■ DESCRIPTION

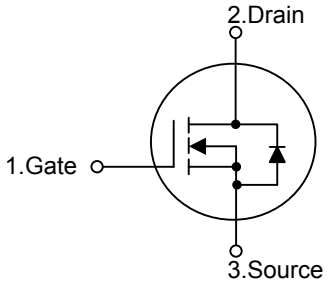
The UTC **20N50** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance, high switching speed and low leakage current, etc.

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

■ FEATURES

* $R_{DS(on)}$=0.21Ω @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

20N50L-T3P-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube (2) T3P: TO-3P (3) L: Lead Free, G: Halogen Free

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

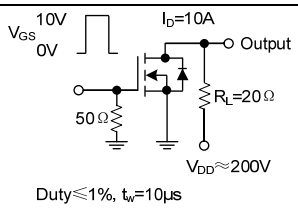
PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current (Note 2)	Continuous	I_D	20	A
	Pulsed	I_{DM}	80	A
Avalanche Current		I_{AR}	20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	960	mJ
	Repetitive (Note 4)	E_{AR}	15	mJ
Power Dissipation (T_C=25°C)		P_D	150	W
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{STG}	-55~+150	°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°C.
3. V_{DD}=90V, T_{ch}=25°C (initial), L=4.08mH, R_G=25Ω, I_{AR}=20A.
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	θ_{JA}	50	°C/W
Junction to Case	θ_{JC}	0.833	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=10mA, V_{GS}=0V	500			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=500V, V_{GS}=0V			100	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+30V, V_{DS}=0V			+10	μA
	Reverse		V_{GS}=-30V, V_{DS}=0V			-10	μA
Gate-Source Breakdown Voltage		$V_{(BR)GSS}$	I_G=±10μA, V_{DS}=0V	±30			V
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=10V, I_D=1mA	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=10A		0.21	0.27	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3400		pF
Output Capacitance		C_{OSS}			320		pF
Reverse Transfer Capacitance		C_{RSS}			25		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DD}≈400V, I_D=20A		70		nC
Gate to Source Charge		Q_{GS}			45		nC
Gate to Drain Charge		Q_{GD}			25		nC
Turn-ON Delay Time		$t_{D(ON)}$			130		ns
Rise Time		t_R			70		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			280		ns
Fall-Time		t_F			70		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current (Note)		I_S				20	A
Maximum Body-Diode Pulsed Current (Note)		I_{SM}				80	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=20A, V_{GS}=0V			1.7	V
Body Diode Reverse Recovery Time		t_{RR}	I_S=20A, V_{GS}=0V, dI_{DR}/dt=100A/μs		1300		ns
Body Diode Reverse Recovery Charge		Q_{RR}			20		μC

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