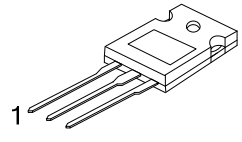
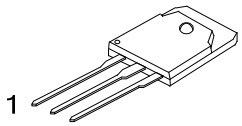
20N50

Power MOSFET

20A, 500V N-CHANNEL POWER MOSFET



TO-247



TO-3P

■ DESCRIPTION

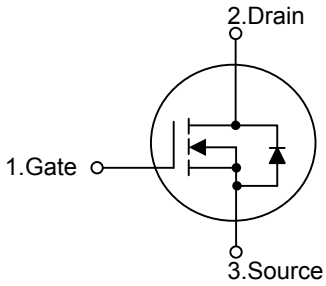
The UTC **20N50** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance, high switching speed and low leakage current, etc.

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

■ FEATURES

* $R_{DS(on)}$ < 0.27Ω @ V_{GS}=10V, I_D=10A
* High switching speed
* Low leakage current

■ SYMBOL



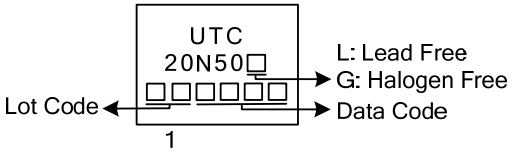
■ ORDERING INFORMATION

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
20N50L-T47-T	20N50G-T47-T	TO-247	G	D	S	Tube

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

20N50L-T3P-T (1)Packing Type	(1) T: Tube
(2)Package Type	(2) T3P: TO-3P, T47: TO-247
(3)Green Package	(3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING



Copyright © 2016 Unisonic Technologies Co., Ltd

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

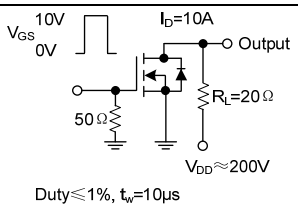
PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current (Note 2)	Continuous	I_D	20	A
	Pulsed	I_{DM}	80	A
Avalanche Current		I_{AR}	20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	960	mJ
	Repetitive (Note 4)	E_{AR}	15	mJ
Power Dissipation (T_C=25°C)	TO-247	P_D	367	W
	TO-3P		416	W
Channel Temperature		T_{CH}	150	°C
Storage Temperature Range		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. 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 DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-247	θ_{JA}	40	°C/W
	TO-3P		30	°C/W
Junction to Case	TO-247	θ_{jC}	0.34	°C/W
	TO-3P		0.3	°C/W

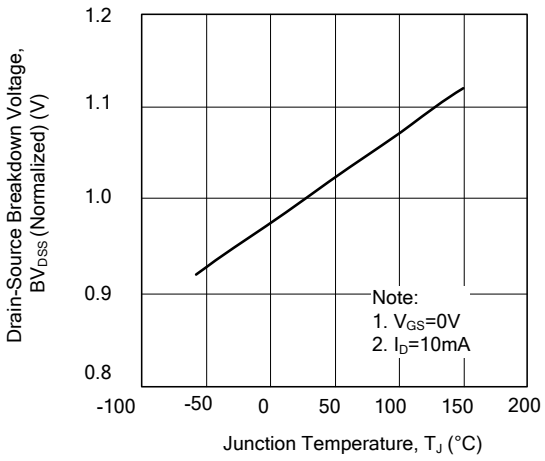
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

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

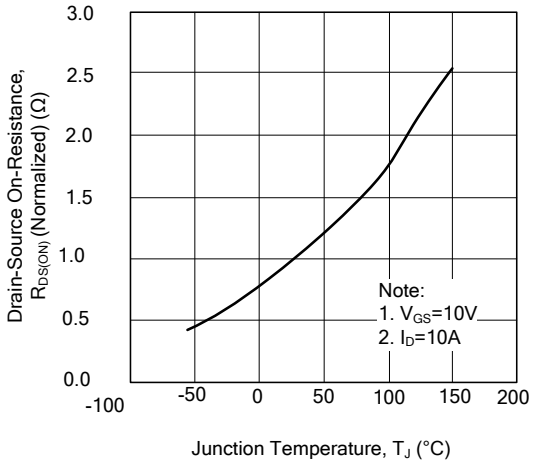
Note: Ensure that the channel temperature does not exceed 150°C.

■ TYPICAL CHARACTERISTICS

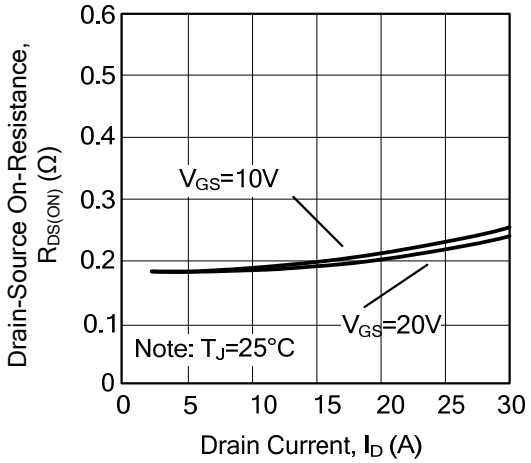
Breakdown Voltage Variation vs. Temperature



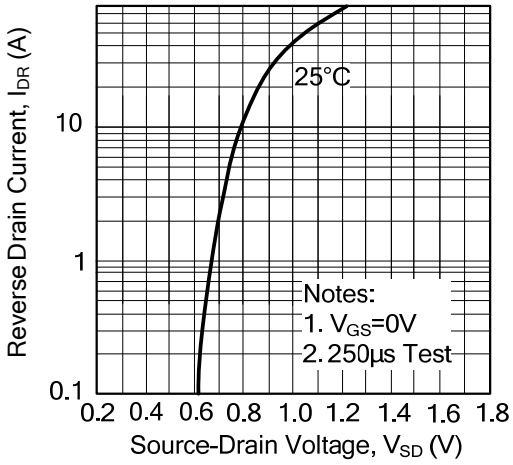
On-Resistance Junction Temperature



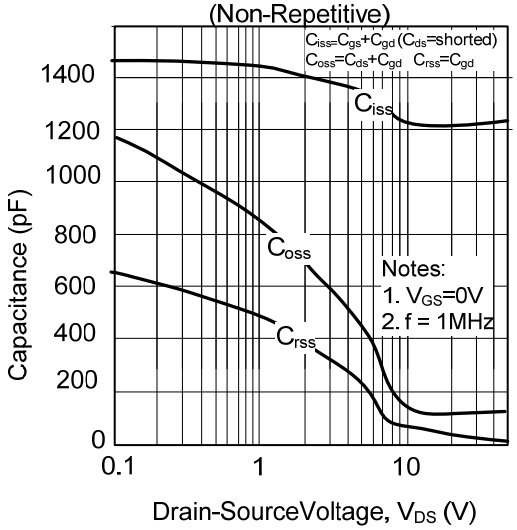
On-Resistance Variation vs. Drain Current and Gate Voltage



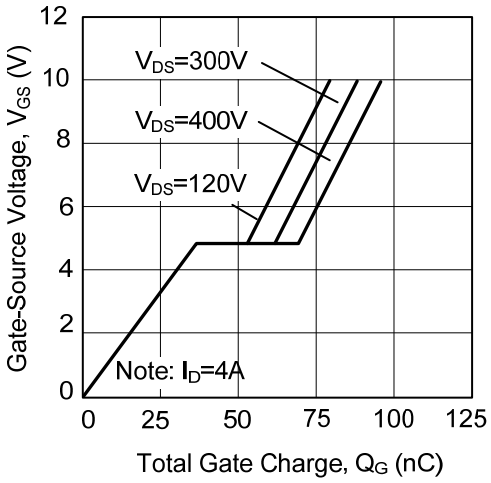
On State Current vs. Allowable Case Temperature



Capacitance Characteristics (Non-Repetitive)

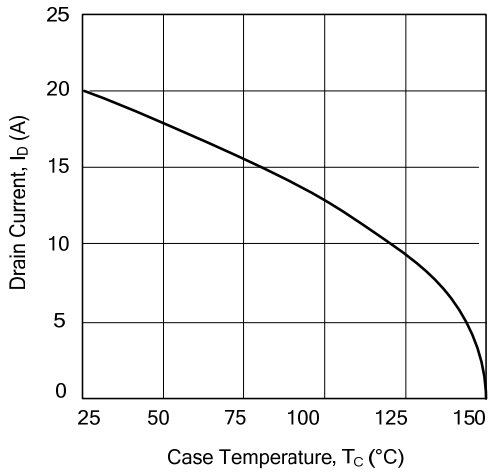


Gate Charge Characteristics

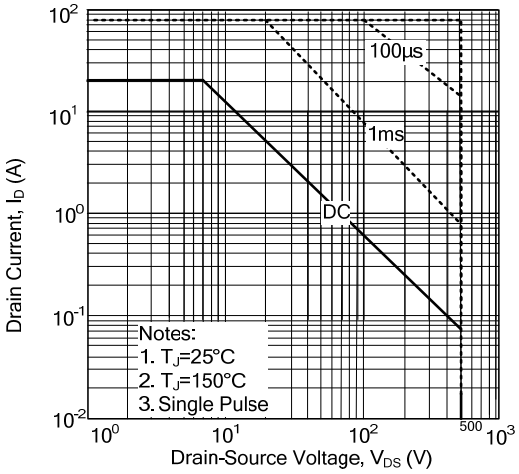


■ TYPICAL CHARACTERISTICS (Cont.)

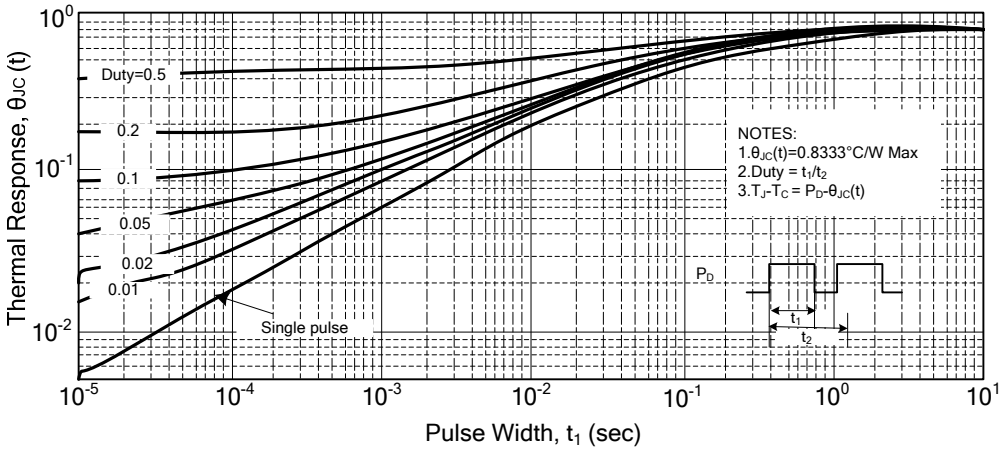
Maximum Drain Current vs. Case Temperature



Safe Operating Area 500V



Transient Thermal Response Curve



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.