

UNISONIC TECHNOLOGIES CO., LTD

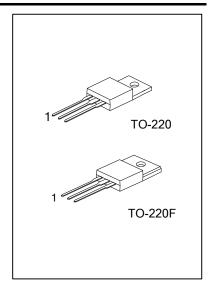
6N50 **Preliminary Power MOSFET**

6 Amps, 500 Volts N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC 6N50 is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

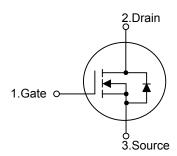
The UTC 6N50 is generally applied in high efficiency switch mode power supplies, active power factor correction and electronic lamp ballasts based on half bridge topology.



FEATURES

- * 6A, 500V, $R_{DS(ON)}$ =1.15 Ω @ V_{GS} =10V
- * High Switching Speed
- * 100% Avalanche Tested

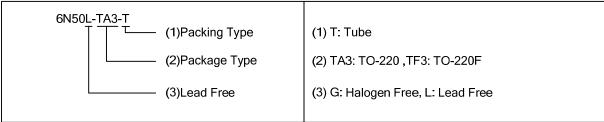
SYMBOL



ORDERING INFORMATION

Ordering Number		Dookogo	Pin Assignment			Dooking	
Lead Free	Halogen Free	Package	1	2	3	Packing	
6N50L-TA3-T	6N50G-TA3-T	TO-220	G	D	S	Tube	
6N50L-TF3-T	6N50G-TF3-T	TO-220F	G	D	S	Tube	

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



www.unisonic.com.tw 1 of 6

■ ABSOLUTE MAXIMUM RATINGS (T_C=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	Continuous (T _C =25°C)		I _D	6 *	Α	
Drain Current	Pulsed (Note 1)		I _{DM}	24 *	Α	
Avalanche Current (Note 1)			I _{AR}	6	Α	
Avalanche Energy	Single Pulsed (Note 2)		E _{AS}	270	mJ	
	Repetitive (Note 3)		E _{AR}	20	mJ	
Peak Diode Recovery dv/dt (Note 3)			dv/dt	4.5	V/ns	
Power Dissipation	T _C =25°C	TO-220	P _D	89	— W — W/°C	
		TO-220F		31		
	Derate above 25°C	TO-220		0.71		
		TO-220F		0.24		
Junction Temperature			TJ	+150	°C	
Storage Temperature			T _{STG}	-55~+150	°C	

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT	
Junction to Ambient	TO-220	0	62.5	°C/W	
Junction to Ambient	TO-220F	θ_{JA}	62.5		
lunction to Coop	TO-220	θ _{JC}	1.4	°C/W	
Junction to Case	TO-220F		4.0	C/VV	

^{*} Drain current limited by maximum junction temperature

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

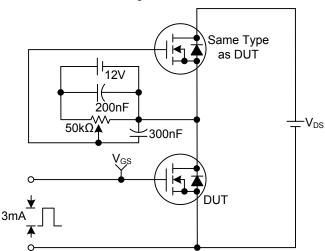
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
OFF CHARACTERISTICS	01111202	1201 CONDITIONS	1		1711 0 1	01111		
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	500			V		
Drain-Source Leakage Current	I _{DSS}	V _{DS} =500V, V _{GS} =0V			1	μA		
Forward		V _{GS} =+30V, V _{DS} =0V			+100	nA		
Gate- Source Leakage Current Reverse	I _{GSS}	V _{GS} =-30V, V _{DS} =0V			-100	nA		
ON CHARACTERISTICS								
Gate Threshold Voltage	V _{GS(TH)}	$V_{DS}=V_{GS}$, $I_{D}=250\mu A$			4.0	V		
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3A		0.95	1.15	Ω		
DYNAMIC PARAMETERS								
Input Capacitance	C _{ISS}			720	960	pF		
Output Capacitance	Coss	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		85	115	pF		
Reverse Transfer Capacitance	C_{RSS}			6.3	10	pF		
SWITCHING PARAMETERS								
Total Gate Charge	Q_G	-V _{GS} =10V, V _{DS} =400V, I _D =6A		15	20	nC		
Gate to Source Charge	Q_GS	V _{GS} =10V, V _{DS} =400V, I _D =6A -(Note 4, 5)		4.5		nC		
Gate to Drain Charge	Q_GD	(11016 4, 3)		6		nC		
Turn-ON Delay Time	t _{D(ON)}			17	45	ns		
Rise Time	t_{R}	V_{DD} =250V, I_{D} =6A, R_{G} =25 Ω		30	70	ns		
Turn-OFF Delay Time	t _{D(OFF)}	(Note 4, 5)		35	80	ns		
Fall-Time	t _F			20	50	ns		
SOURCE- DRAIN DIODE RATINGS AND	CHARACTERI	STICS						
Maximum Body-Diode Continuous Current	Is				6	Α		
Maximum Body-Diode Pulsed Current	I _{SM}				24	Α		
Drain-Source Diode Forward Voltage	V _{SD}	I _S =6A, V _{GS} =0V			1.5	V		
Body Diode Reverse Recovery Time	t _{RR}	I _S =6A, V _{GS} =0V, dI _F /dt=100A/μs		85		ns		
Body Diode Reverse Recovery Charge	Q_{RR}	(Note 4)		0.15		μC		

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

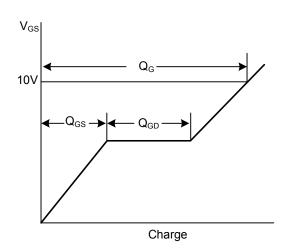
- 2. L =13mH, I_{AS} = 6A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25 $^{\circ}$ C
- 3. $I_{SD} \le 6A$, di/dt $\le 200A/\mu s$, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25^{\circ}C$
- 4. Pulse Test: Pulse width ≤ 300µs, Duty cycle ≤ 2%
- 5. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

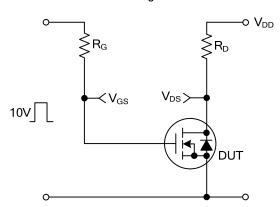
Gate Charge Test Circuit



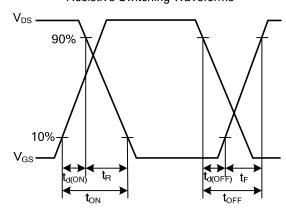
Gate Charge Waveforms



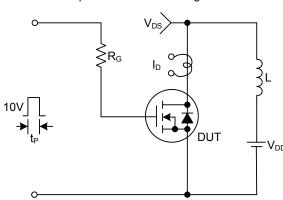
Resistive Switching Test Circuit



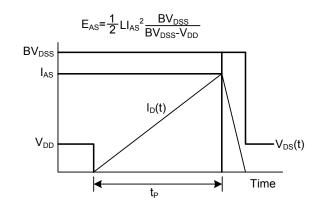
Resistive Switching Waveforms



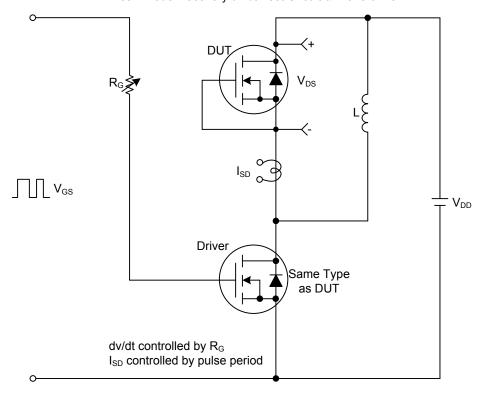
Unclamped Inductive Switching Test Circuit

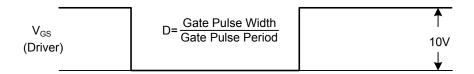


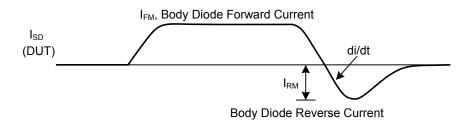
Unclamped Inductive Switching Waveforms

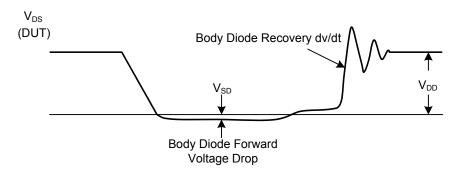


Peak Diode Recovery dv/dt Test Circuit & Waveforms









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.