

UNISONIC TECHNOLOGIES CO., LTD

8NM50 Preliminary Power MOSFET

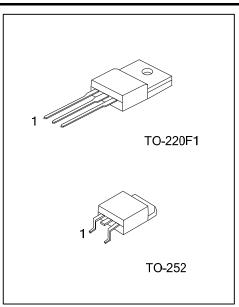
8.0A, 500V N-CHANNEL SUPER-JUNCTION MOSFET

■ DESCRIPTION

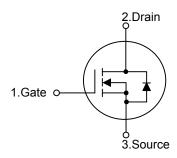
The **UTC 8NM50** is a Super Junction MOSFET Structure and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and a high rugged avalanche characteristics. This power MOSFET is usually used at DC-DC, AC-DC converters for power applications.

■ FEATURES

- * $R_{DS(ON)}$ < 0.49 Ω @ V_{GS} =10V, I_{D} =4.0A
- * High Switching Speed
- * 100% Avalanche Tested



■ SYMBOL

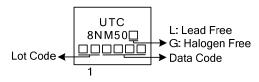


ORDERING INFORMATION

	Ordering Number		Daakaga	Pin Assignment			Dooking	
	Lead Free	Halogen Free	Package	1	2	3	Packing	
	8NM50L-TF1-T	8NM50G-TF1-T	TO-220F1	G	D	S	Tube	
	8NM50L-TN3-R	8NM50G-TN3-R	TO-252	G	D	S	Tape Reel	
1	Note: Pin Assignment: G: Gate D: Drain S: Source							

8NM50L-TF1-T (1)Packing Type (1) T: Tube, R: Tape Reel (2) TF1: TO-220F1, TN3: TO-252 (3)Green Package (3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING



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

PARAME	TER	SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V_{DSS}	500	V	
Gate-Source Voltage		V_{GSS}	±30	V	
Drain Current	Continuous	I_D	8.0	Α	
Drain Current	Pulsed (Note 2)	I _{DM}	32	Α	
Avalanche Current (Note 2)		I_{AR}	3.9	Α	
Avalanche Energy Single Pulsed (Note 3)		E _{AS}	236	mJ	
Peak Diode Recovery dv/dt (N	ote 4)	dv/dt	8.0	V/ns	
Dower Discipation	TO-220F1	D	42	W	
Power Dissipation	TO-252	P_{D}	80		
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. Repetitive Rating: Pulse width limited by maximum junction temperature.
- 3. L = 31mH, I_{AS} = 3.9A, V_{DD} = 50V, R_{G} = 25 Ω , Starting T_{J} = 25 $^{\circ}$ C
- 4. $I_{SD} \le 8.0$ A, di/dt ≤ 200 A/ μ s, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25$ °C

■ THERMAL DATA

PARAM	METER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	TO-220F1	0	62.5	°C/W	
	TO-252	θ_{JA}	110	°C/W	
unation to Coop	TO-220F1	θ_{JC}	3	°C/W	
Junction to Case	TO-252		1.56	°C/W	

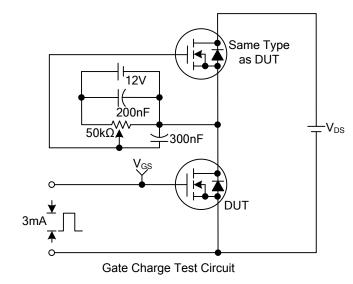
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise noted)

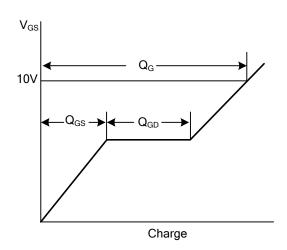
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
OFF CHARACTERISTICS									
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	500			V		
Drain-Source Leakage Current		I _{DSS}	V _{DS} =500V, V _{GS} =0V			1	μΑ		
Forward			V _{GS} =+30V, V _{DS} =0V			+100	nA		
Gate- Source Leakage Current	Reverse	I_{GSS}	V _{GS} =-30V, V _{DS} =0V			-100	nA		
ON CHARACTERISTICS									
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2.5		4.5	V		
Static Drain-Source On-State Resi	stance	R _{DS(ON)}	V _{GS} =10V, I _D =4.0A			0.49	Ω		
DYNAMIC PARAMETERS									
Input Capacitance		C_{ISS}			460		pF		
Output Capacitance		Coss	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		430		pF		
Reverse Transfer Capacitance		C_{RSS}			62		pF		
SWITCHING PARAMETERS									
Total Gate Charge (Note 1)		Q_G	 V _{DS} =50V, I _D =1.3A, I _G =100μA		30		nC		
Gate to Source Charge		Q_GS	V _{GS} =10V (Note 1,2)		3		nC		
Gate to Drain Charge		Q_GD	VGS=10V (Note 1,2)		13		nC		
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$			50		ns		
Rise Time		t_R	V_{DD} =30V, I_{D} =0.5A, R_{G} =25 Ω ,		104		ns		
Turn-OFF Delay Time		$t_{D(OFF)}$	V _{GS} =10V (Note 1,2)		182		ns		
Fall-Time		t_{F}					ns		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS									
Maximum Body-Diode Continuous Current		Is				8.0	Α		
Maximum Body-Diode Pulsed Curi	rent	I _{SM}				32	Α		
Drain-Source Diode Forward Volta	ge (Note 1)	V_{SD}	I _S =8.0A, V _{GS} =0V			1.4	V		
Body Diode Reverse Recovery Tin	ne (Note 1)	t _{rr}	I _S =8.0A, V _{GS} =0V,		270		ns		
Body Diode Reverse Recovery Ch	arge	Q_{rr}	dI _F /dt=100A/μs		3.05		μC		

Notes: 1. Pulse Test: Pulse width ≤ 300µs, Duty cycle ≤ 2%

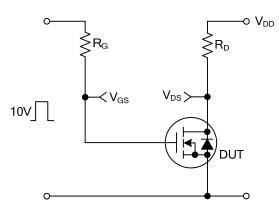
^{2.} Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

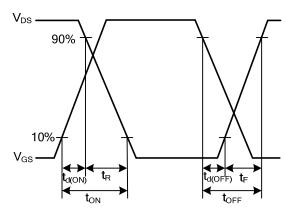




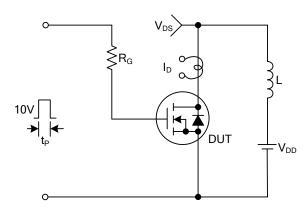
Gate Charge Waveforms



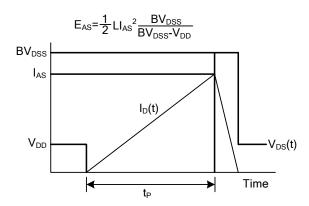
Resistive Switching Test Circuit



Resistive Switching Waveforms

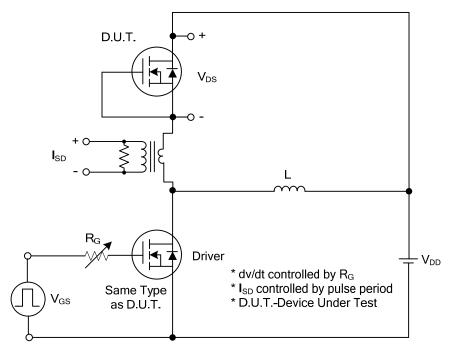


Unclamped Inductive Switching Test Circuit

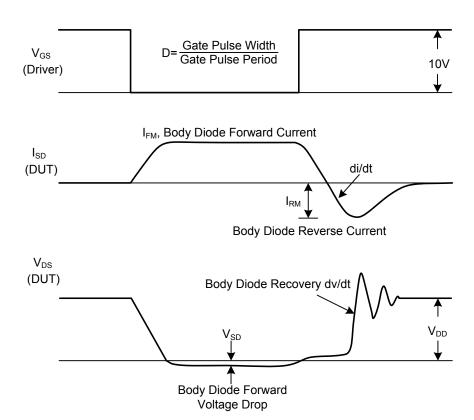


Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit & Waveforms



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