

UNISONIC TECHNOLOGIES CO., LTD

UF130N07

Preliminary

130A, 70V N-CHANNEL POWER MOSFET

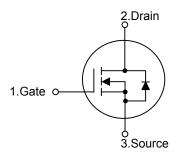
DESCRIPTION

The UTC **UF130N07** is a high voltage MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

FEATURES

- * Fast switching speed
- * $R_{DS(ON)}$ < 9.0m Ω @ V_{GS} =10V, I_D =65A
- * 100% avalanche tested
- * Improved dv/dt capability

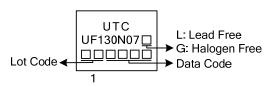
SYMBOL

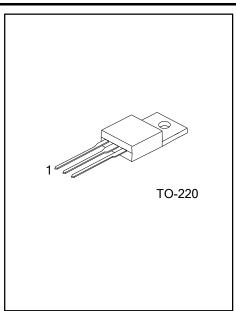


ORDERING INFORMATION

Ordering Number		Packago	Pin Assignment			Decking	
Lead Free	Halogen Free	Package	1	2	3	Packing	
UF130N07L-TA3-T	UF130N07G-TA3-T	TO-220	G	D	S	Tube	
Note: Pin Assignment: G: Gate D: Drain S: Source							
UF130N07L-TA3-T	 (1) T: Tube (2) TA3: TO-220 (3) L: Lead Free, G: Halogen Free and Lead Free 						

MARKING





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

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V _{DSS}	70	V	
Gate-Source Voltage		V _{GSS}	±20	V	
Drain Current	Continuous	ID	130	А	
	Pulsed	I _{DM}	520	А	
Avalanche Current (Note 2)		I _{AR}	130	А	
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	845	mJ	
Peak Diode Recovery dv/	ak Diode Recovery dv/dt		3.6	V/ns	
Power Dissipation		PD	175	W	
Junction Temperature		TJ	+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 = 0.1mH, I_{AS} = 130A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25°C

4. $I_{SD} \le 30A$, di/dt $\le 200A/\mu s$, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25^{\circ}C$

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	θ _{JA}	62.5	°C/W	
Junction to Case	θ _{JC}	0.714	°C/W	



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

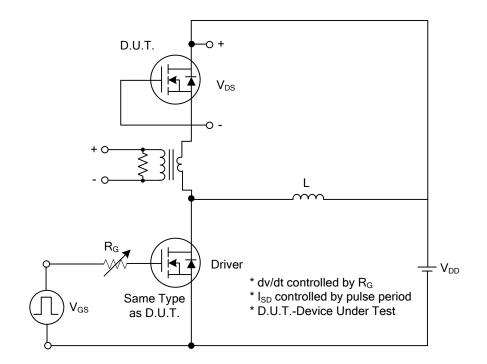
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	70			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =70V, V _{GS} =0V			10	μA
Gate- Source Leakage Current	- I _{GSS}	V _{DS} =0V, V _{GS} =+20V			+100	nA
Reverse		V _{DS} =0V, V _{GS} =-20V			-100	nA
ON CHARACTERISTICS			_			
Gate Threshold Voltage	$V_{GS(TH)}$	V _{DS} =V _{GS} , I _D =250µA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =65A			9	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	CISS			5100		pF
Output Capacitance	Coss	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		1100		pF
Reverse Transfer Capacitance				81		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_{G}			450		nC
Gate to Source Charge	Q_{GS}	V _{DS} =50V, V _{GS} =10V, I _D =1.3A, I _G =100µA (Note 1, 2)		22		nC
Gate to Drain Charge	Q_{GD}	$1G = 100 \mu A (100 e 1, 2)$		52		nC
Turn-ON Delay Time	t _{D(ON)}			120		ns
Rise Time	t _R	V _{DD} =30V, V _{GS} =10V, I _D =0.5A,		250		ns
Turn-OFF Delay Time	t _{D(OFF)}	R _G = 25Ω (Note 1, 2)		1500		ns
Fall-Time	t⊧			600		ns
SOURCE- DRAIN DIODE RATINGS AND (CHARACTER	STICS				
Maximum Body-Diode Continuous Current	ls				130	Α
Maximum Body-Diode Pulsed Current	I _{SM}				520	Α
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =130A			1.4	V
Reverse Recovery Time	t _{RR}	V _{GS} =0V, I _S =30A,		82		ns
Reverse Recovery Charge	Q_RR	di/dt=100A/µs		230		nC
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Notes: 1. Pulse Test: Pulse width \leq 300µs, Duty cycle \leq 2%.

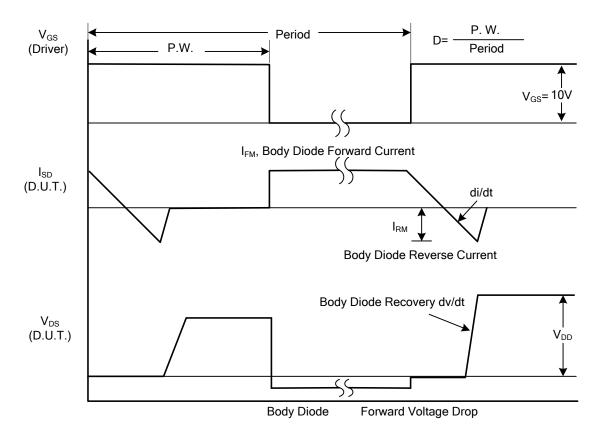
2. Essentially independent of operating temperature.

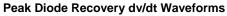


■ TEST CIRCUITS AND WAVEFORMS



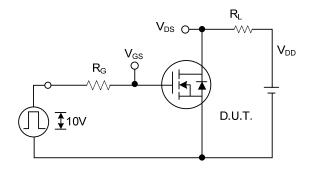




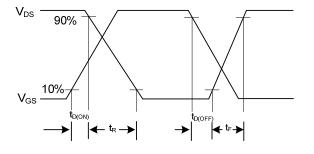




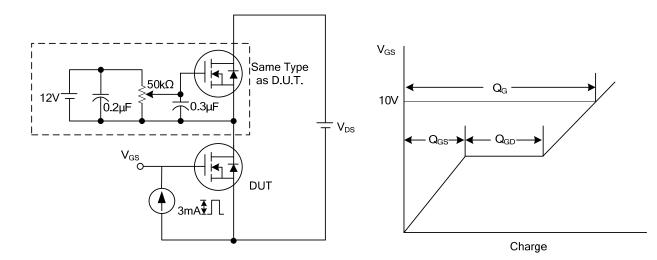
TEST CIRCUITS AND WAVEFORMS (Cont.)



Switching Test Circuit

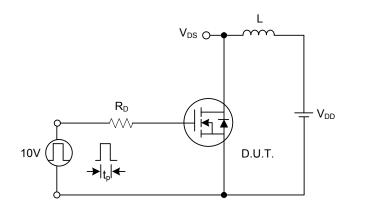


Switching Waveforms



Gate Charge Test Circuit





Unclamped Inductive Switching Test Circuit

 BV_{DSS} I_{AS} V_{DD} V_{DD} $V_{DS(t)}$ $V_{DS(t)}$ $V_{DS(t)}$ $V_{DS(t)}$

Unclamped Inductive Switching Waveforms



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