

# UF110N06

Preliminary

**Power MOSFET** 

# 110A, 60V N-CHANNEL POWER MOSFET

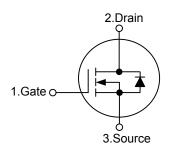
## DESCRIPTION

The UTC **UF110N06** 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
- \*  $R_{DS(ON)}$  < 12m $\Omega$  @  $V_{GS}$  =10V,  $I_D$  =55A
- \* 100% avalanche tested
- \* Improved dv/dt capability

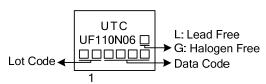
### SYMBOL

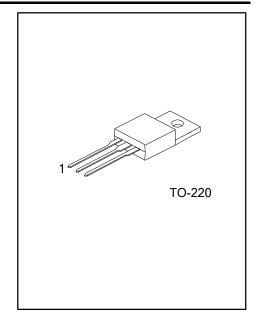


### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Deaking	
Lead Free	Lead Free Halogen Free		1	2	3	Packing	
UF110N06L-TA3-T	UF110N06G-TA3-T	TO-220	G	D	S	Tube	
Note: Pin Assignment: G: Gate D: Drain S: Source							
UF110N06L-TA3-T (1)Packing Type (2)Package Type (3)Green Package		<ul> <li>(1) T: Tube</li> <li>(2) TA3: TO-220</li> <li>(3) L: Lead Free, G: Halogen Free and Lead Free</li> </ul>					

### MARKING





### ABSOLUTE MAXIMUM RATINGS (TJ=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V <sub>DSS</sub>	60	V	
Gate-Source Voltage		V <sub>GSS</sub>	±20	V	
Drain Current	Continuous	I <sub>D</sub>	110	А	
	Pulsed	I <sub>DM</sub>	440	А	
Avalanche Current (Not	e 2)	I <sub>AR</sub>	110	А	
Avalanche Energy	Single Pulsed (Note 3)	E <sub>AS</sub>	605	mJ	
Peak Diode Recovery of	lv/dt	dv/dt	4	V/ns	
Power Dissipation		PD	100	W	
Junction Temperature	Inction Temperature		+150	°C	
Storage Temperature		T <sub>STG</sub>	-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,  $I_{AS}$  = 110A,  $V_{DD}$  = 50V,  $R_G$  = 25 $\Omega$ , 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 DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	$\theta_{JA}$	62.5	°C/W	
Junction to Case	θ <sub>JC</sub>	1.25	°C/W	



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### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub> =25°C, unless otherwise noted)

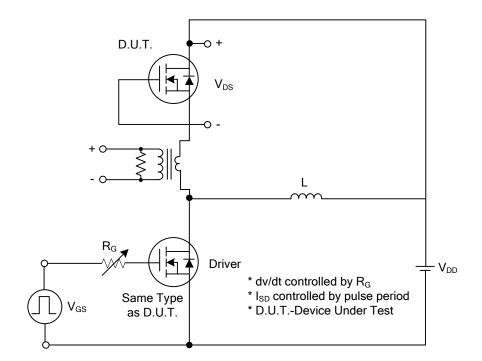
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS	01111202				110 0 (	0.111
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250 μA	60			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V,V <sub>GS</sub> =0V			1	μA
Forward		V <sub>DS</sub> =0V, V <sub>GS</sub> =+20V			+100	nA
Gate-Source Leakage Current Reverse	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =-20V			-100	nA
ON CHARACTERISTICS(Note1)	•			•		
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250µA	2.0		4.0	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =55A			12	mΩ
DYNAMIC PARAMETERS (Note 2)						
Input Capacitance	CISS			2810		pF
Output Capacitance	C <sub>OSS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		715		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			105		pF
SWITCHING PARAMETERS(Note 2)			-			
Total Gate Charge	$Q_G$	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =1.3A,		290		nC
Gate Source Charge	$Q_{GS}$	$I_{G}=100\mu A$ (Note 1, 2)		20		nC
Gate Drain Charge	$Q_{GD}$	$IG = 100 \mu A (NOTE 1, 2)$		32		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>			88		ns
Turn-ON Rise Time	t <sub>R</sub>	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =0.5A,		175		ns
Turn-OFF Delay Time	$t_{D(OFF)}$	$R_{G} = 25\Omega$ (Note 1, 2)		860		ns
Turn-OFF Fall-Time	t <sub>F</sub>			390		ns
SOURCE- DRAIN DIODE RATINGS AND	CHARACTE	RISTICS			÷	
Drain-Source Diode Forward Current	ls				110	Α
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				440	Α
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =110A			1.4	V
Body Diode Reverse Recovery Time	t <sub>RR</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =30A		80		ns
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	dI <sub>F</sub> /dt=100A/µs (Note 1)		200		nC

Notes: 1. Pulse Test: Pulse width  $\leq$  300µs, Duty cycle  $\leq$  2%.

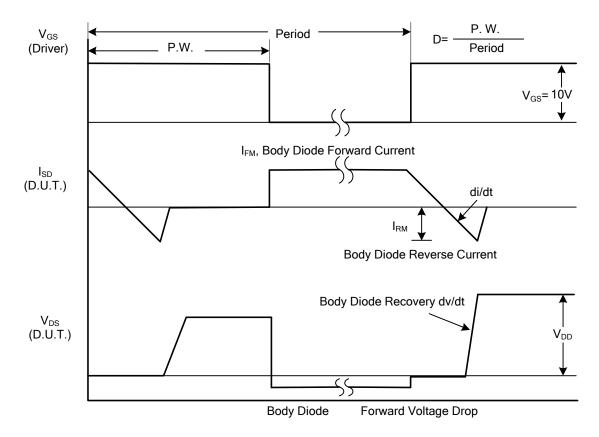
2. Essentially independent of operating temperature.

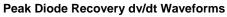


## ■ TEST CIRCUITS AND WAVEFORMS



### Peak Diode Recovery dv/dt Test Circuit

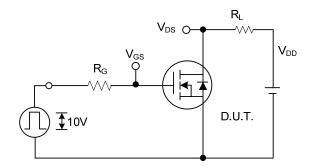


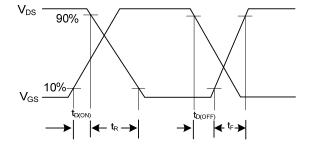




# **UF110N06**

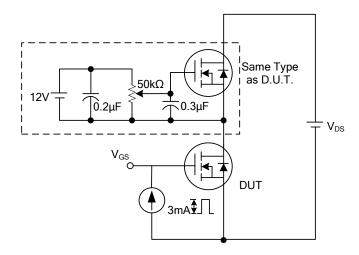
## **TEST CIRCUITS AND WAVEFORMS (Cont.)**



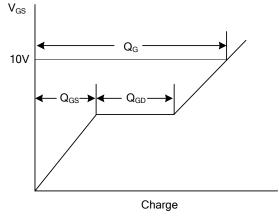


**Switching Test Circuit** 

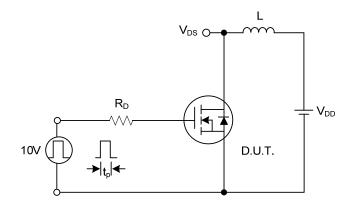




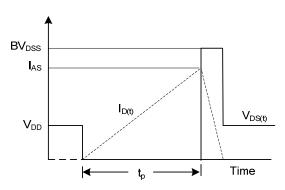
**Gate Charge Test Circuit** 



**Gate Charge Waveform** 



**Unclamped Inductive Switching Test Circuit** 



**Unclamped Inductive Switching Waveforms** 



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