



## UF110N06

Preliminary

Power MOSFET

### 110A, 60V N-CHANNEL POWER MOSFET

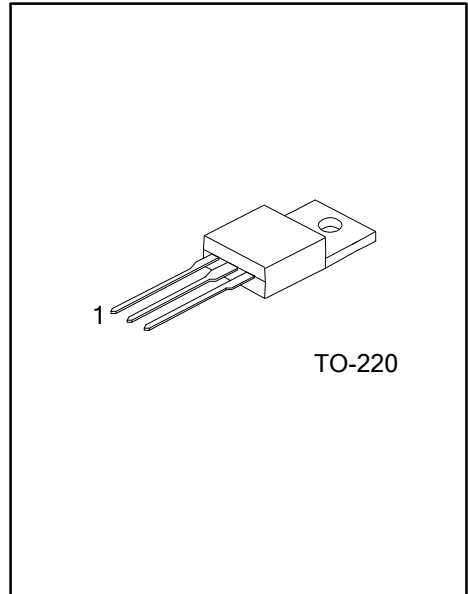
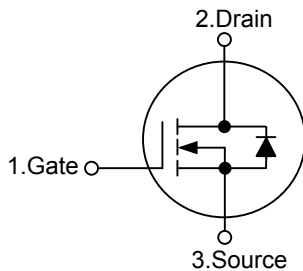
#### DESCRIPTION

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



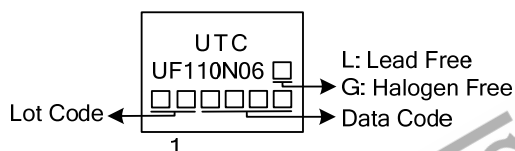
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF110N06L-TA3-T	UF110N06G-TA3-T	TO-220	G	D	S	Tube

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

<p>UF110N06L-TA3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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#### MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_J=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	60	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	110	A
	Pulsed	$I_{DM}$	440	A
Avalanche Current (Note 2)		$I_{AR}$	110	A
Avalanche Energy	Single Pulsed (Note 3)	$E_{AS}$	605	mJ
Peak Diode Recovery dv/dt		dv/dt	4	V/ns
Power Dissipation		$P_D$	100	W
Junction Temperature		$T_J$	+150	$^{\circ}\text{C}$
Storage Temperature		$T_{STG}$	-55~+150	$^{\circ}\text{C}$

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.  $L = 0.1\text{mH}$ ,  $I_{AS} = 110\text{A}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^{\circ}\text{C}$

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

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	1.25	$^{\circ}\text{C}/\text{W}$

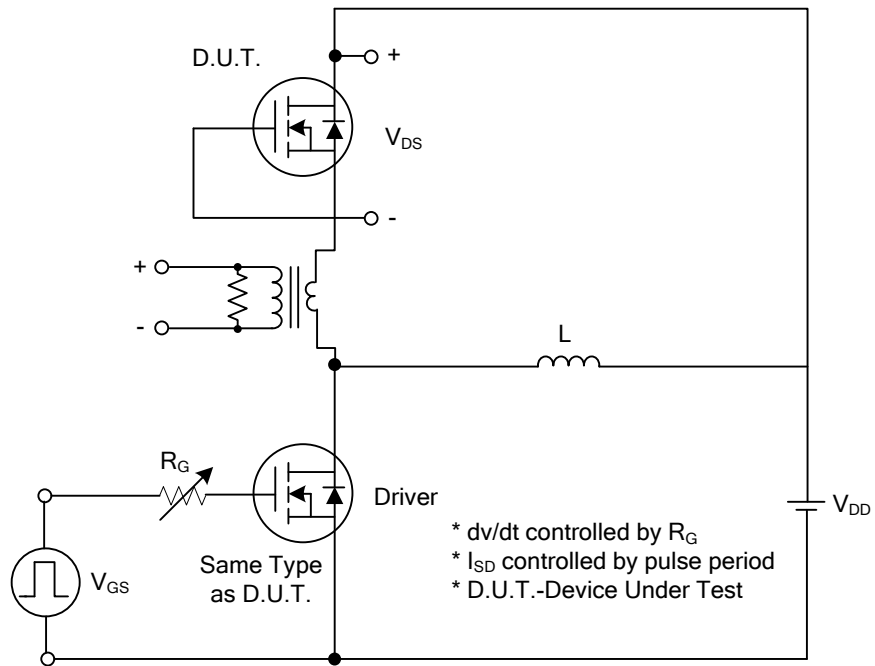
■ ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Source Leakage Current	Forward	$V_{DS}=0V, V_{GS}=+20V$ $V_{DS}=0V, V_{GS}=-20V$			+100	nA
	Reverse				-100	nA
<b>ON CHARACTERISTICS</b> (Note1)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=55A$			12	m $\Omega$
<b>DYNAMIC PARAMETERS</b> (Note 2)						
Input Capacitance	$C_{ISS}$	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$		2810		pF
Output Capacitance	$C_{OSS}$			715		pF
Reverse Transfer Capacitance	$C_{RSS}$			105		pF
<b>SWITCHING PARAMETERS</b> (Note 2)						
Total Gate Charge	$Q_G$	$V_{DS}=50V, V_{GS}=10V, I_D=1.3A,$ $I_G=100\mu A$ (Note 1, 2)		290		nC
Gate Source Charge	$Q_{GS}$			20		nC
Gate Drain Charge	$Q_{GD}$			32		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30V, V_{GS}=10V, I_D=0.5A,$ $R_G = 25\Omega$ (Note 1, 2)		88		ns
Turn-ON Rise Time	$t_R$			175		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			860		ns
Turn-OFF Fall-Time	$t_F$			390		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Current	$I_S$				110	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				440	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=110A$			1.4	V
Body Diode Reverse Recovery Time	$t_{RR}$	$V_{GS}=0V, I_S=30A$		80		ns
Body Diode Reverse Recovery Charge	$Q_{RR}$	$di_f/dt=100A/\mu s$ (Note 1)		200		nC

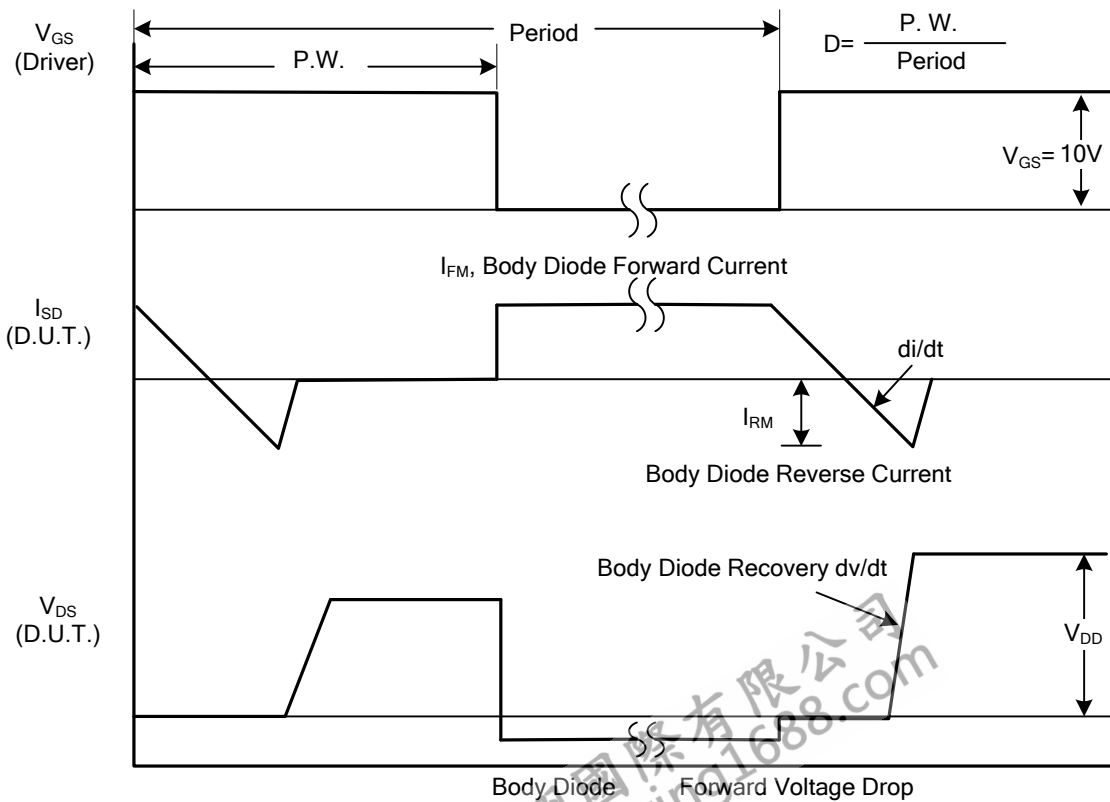
Notes: 1. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

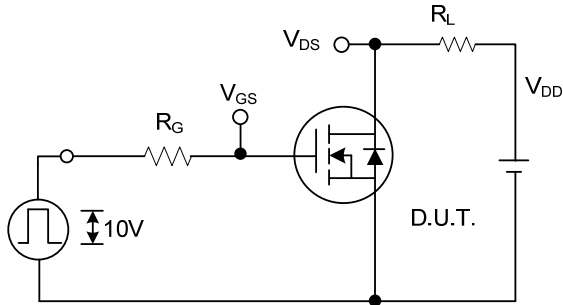


Peak Diode Recovery dv/dt Test Circuit

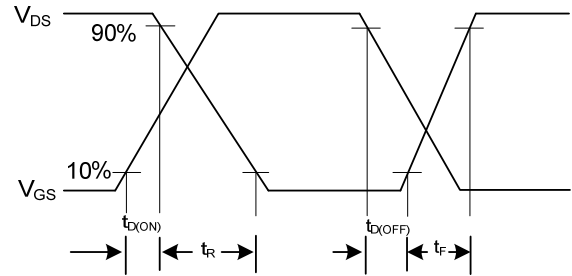


Peak Diode Recovery dv/dt Waveforms

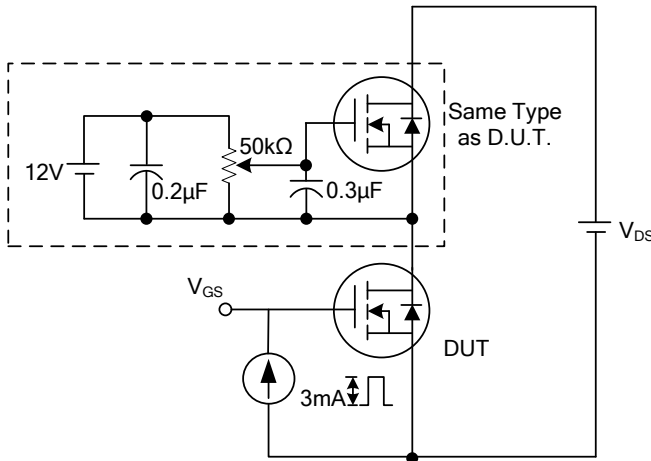
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



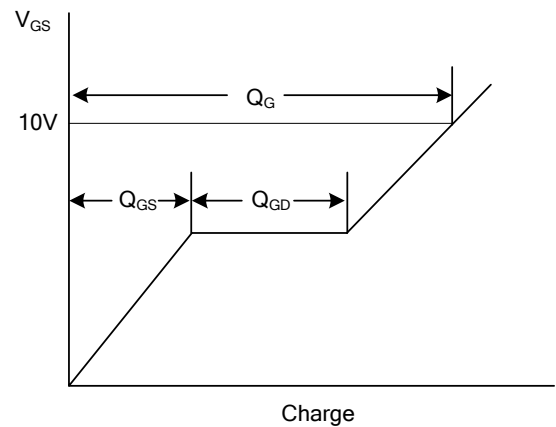
Switching Test Circuit



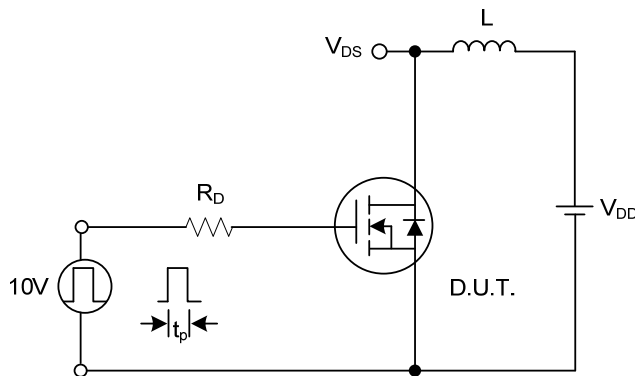
Switching Waveforms



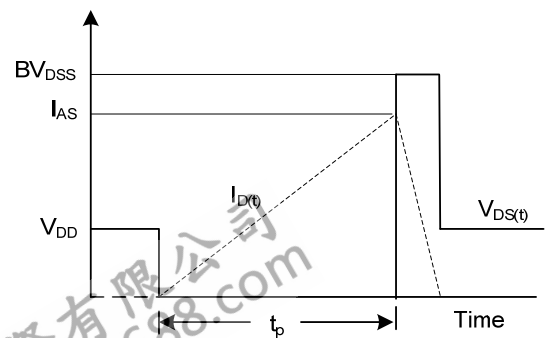
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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