



**80N06**

Preliminary

**Power MOSFET**

**80A, 60V N-CHANNEL  
POWER MOSFET**

■ DESCRIPTION

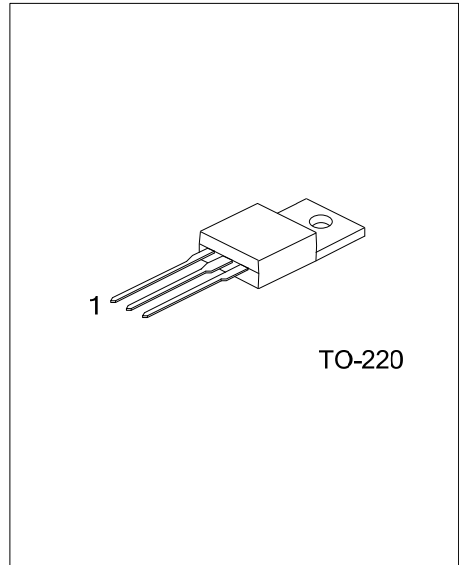
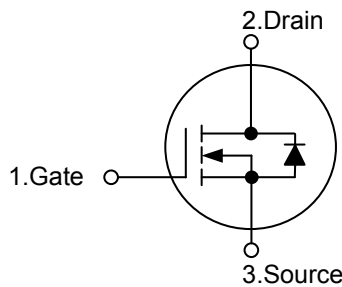
The UTC **80N06** is an N-channel MOSFET using UTC advanced technology.

The UTC **80N06** is suitable for power supply (secondary synchronous rectification), industrial and primary switch etc.

■ FEATURES

\*  $R_{DS(ON)} < 8.5m\Omega @ V_{GS} = 10V, I_D = 40A$

■ SYMBOL



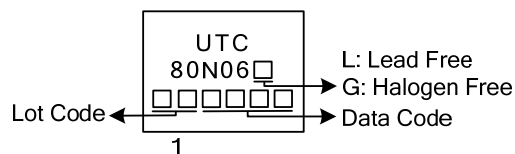
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
80N06L-TA3-T	80N06G-TA3-T	TO-220	G	D	S	Tube

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

<p>80N06L-TA3-T</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube</li> <li>(2) TA3: TO-220</li> <li>(3) L: Lead Free, G: Halogen Free and Lead Free</li> </ul>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	60	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	Continuous	$I_D$	80	A
Pulsed Drain Current	Pulsed (Note 2)	$I_{DM}$	320	A
Avalanche Current (Note 3)		$I_{AR}$	58	A
Avalanche energy	Single Pulsed (Note 3)	$E_{AS}$	168	mJ
Peak Diode Recovery $dv/dt$ (Note 4)		$dv/dt$	6.0	V/nS
Power Dissipation		$P_D$	200	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature Range		$T_{STG}$	-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.  $L=0.1\text{mH}$ ,  $I_{AS}=58\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ .  
 4.  $I_{SD} \leq 30\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J = 25^\circ\text{C}$ .

■ THERMAL DATA

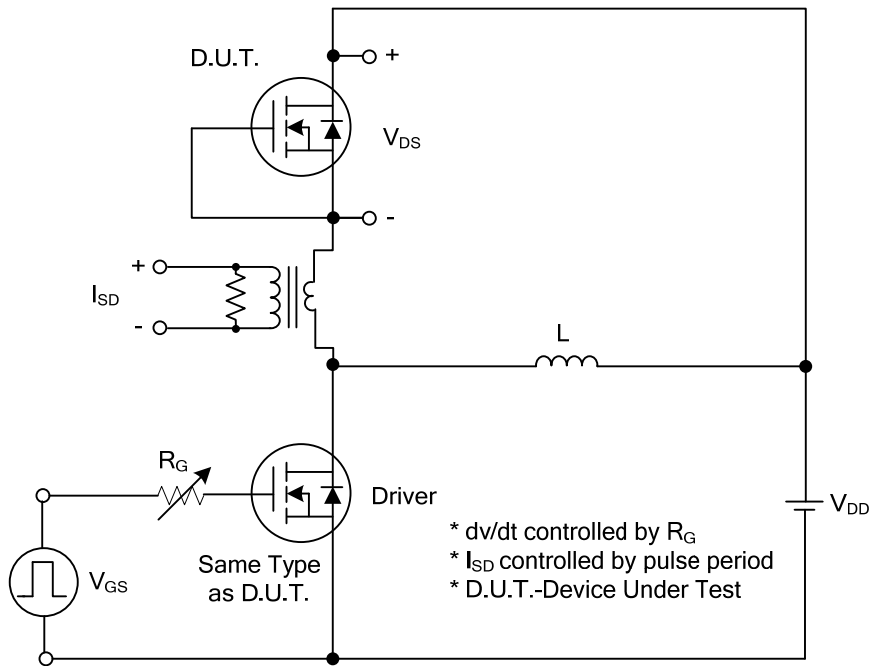
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	0.625	$^\circ\text{C}/\text{W}$

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

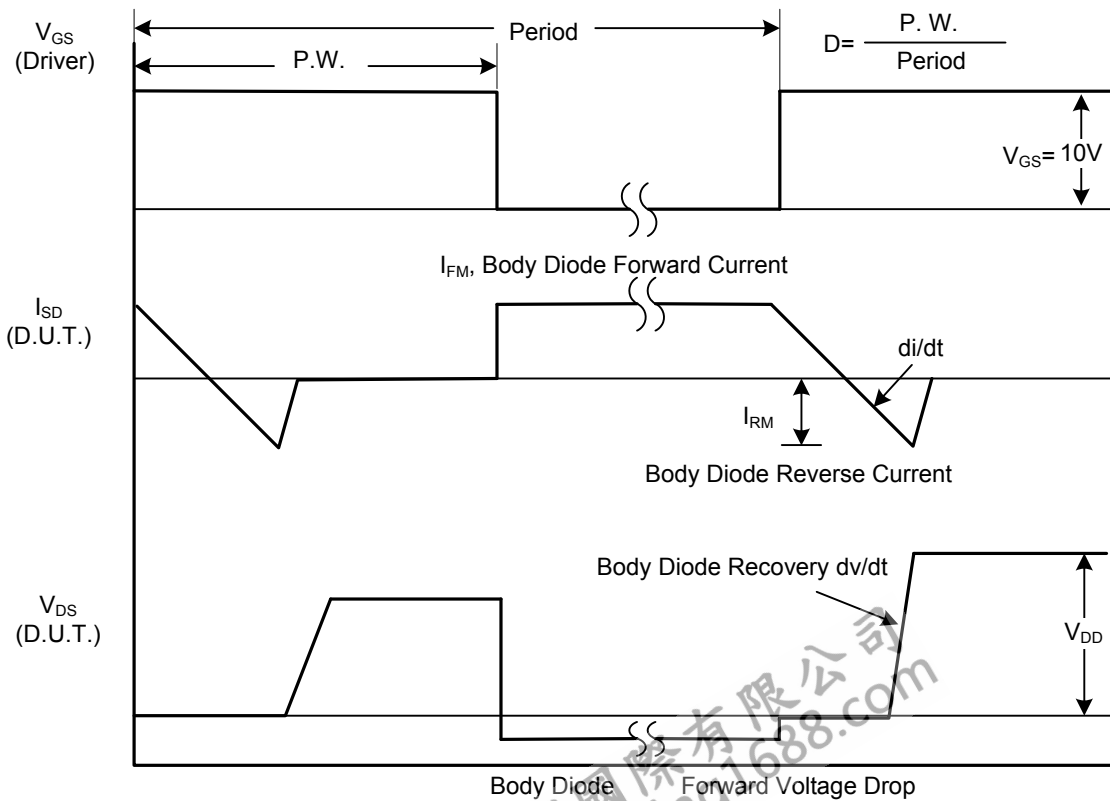
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	60			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=40\text{A}$			8.5	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		3500		pF
Output Capacitance	$C_{OSS}$			370		pF
Reverse Transfer Capacitance	$C_{RSS}$			295		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	$Q_G$	$V_{DS}=50\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=1.3\text{A}$ , $I_D=100\mu\text{A}$ (Note 1, 2)		308		nC
Gate to Source Charge	$Q_{GS}$			12		nC
Gate to Drain Charge	$Q_{GD}$			45		nC
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=30\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=0.5\text{A}$ , $R_G=25\Omega$ (Note 1, 2)		45		ns
Rise Time	$t_R$			76		ns
Turn-off Delay Time	$t_{D(OFF)}$			155		ns
Fall-Time	$t_F$			473		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				80	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				320	A
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$I_S=80\text{A}$ , $V_{GS}=0\text{V}$			1.2	V
Reverse Recovery Time (Note 1)	$t_{rr}$	$I_S=30\text{A}$ , $V_{GS}=0\text{V}$		90		ns
Reverse Recovery Charge	$Q_{rr}$	$dI_F/dt=100\text{A}/\mu\text{s}$		110		nC

- Notes: 1. Pulse Test : Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .  
 2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

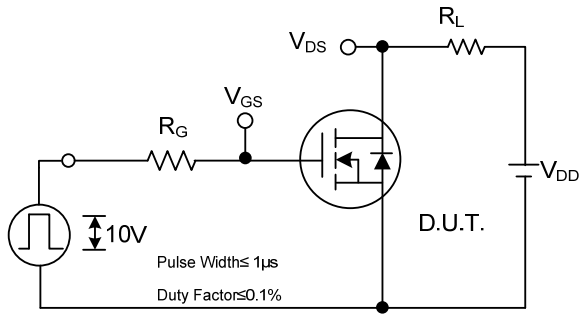


Peak Diode Recovery  $dv/dt$  Test Circuit

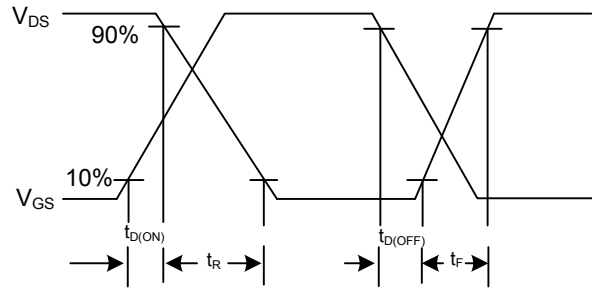


Peak Diode Recovery  $dv/dt$  Waveforms

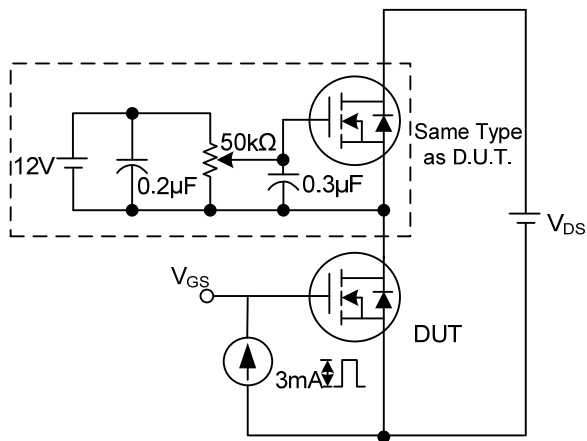
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



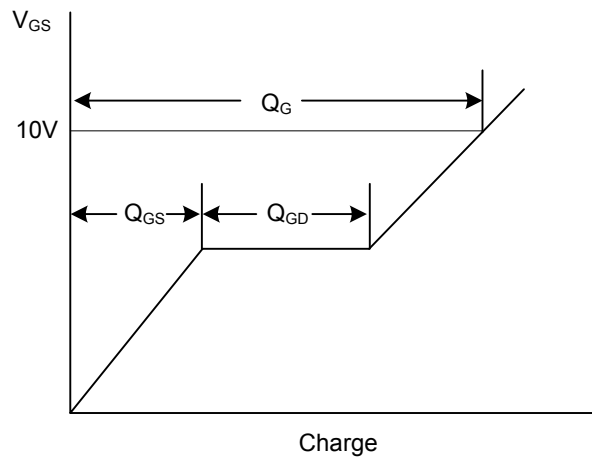
Switching Test Circuit



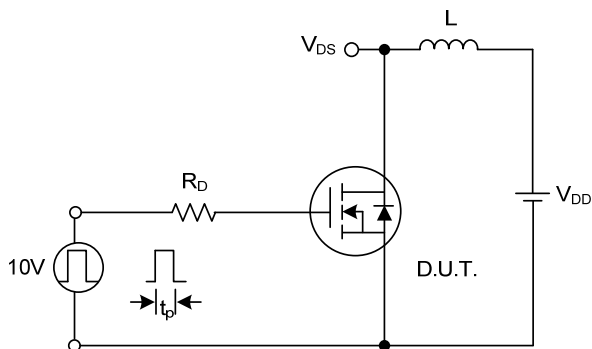
Switching Waveforms



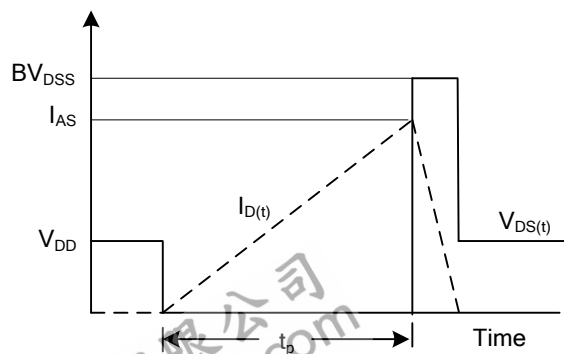
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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