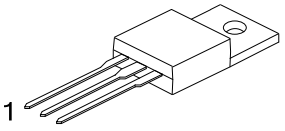
80A, 60V N-CHANNEL POWER MOSFET



TO-220

■ DESCRIPTION

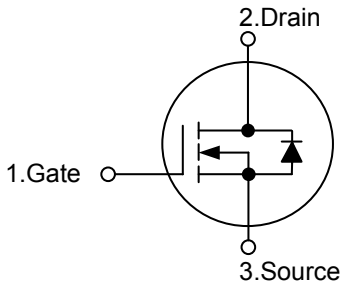
The UTC **80N06** is an N-channel MOSFET using UTC advanced technology.

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

■ FEATURES

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

■ SYMBOL



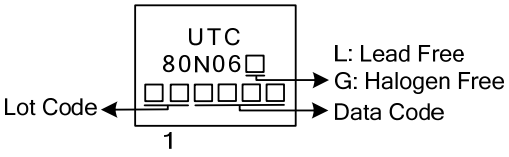
■ ORDERING INFORMATION

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

80N06L-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube (2) TA3: TO-220 (3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±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	°C
Storage Temperature Range		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}=58A, V_{DD}=50V, R_G=25Ω, Starting T_J = 25°C.
4. I_{SD} ≤30A, di/dt ≤200A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J = 25°C.

■ THERMAL DATA

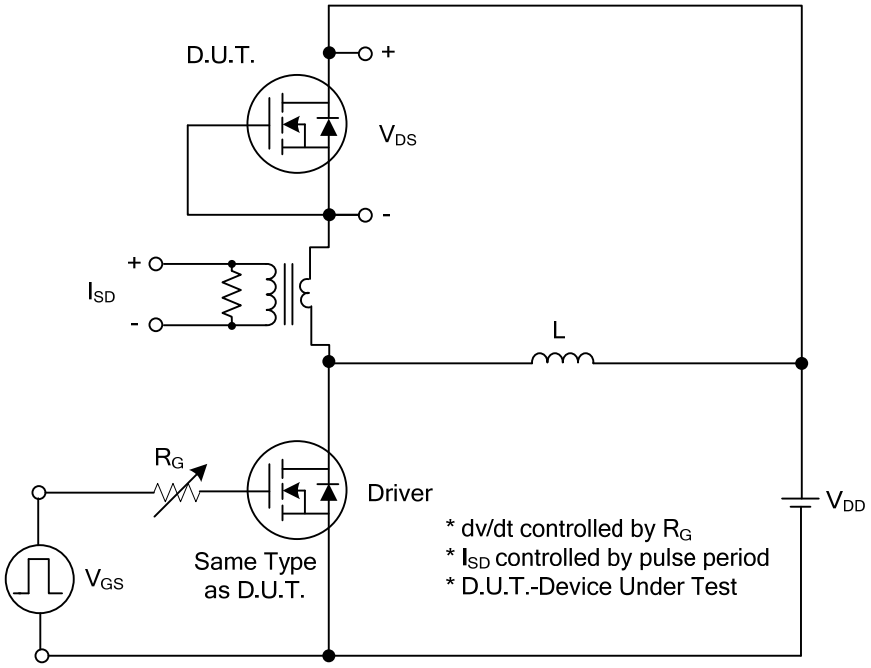
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	0.625	°C/W

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

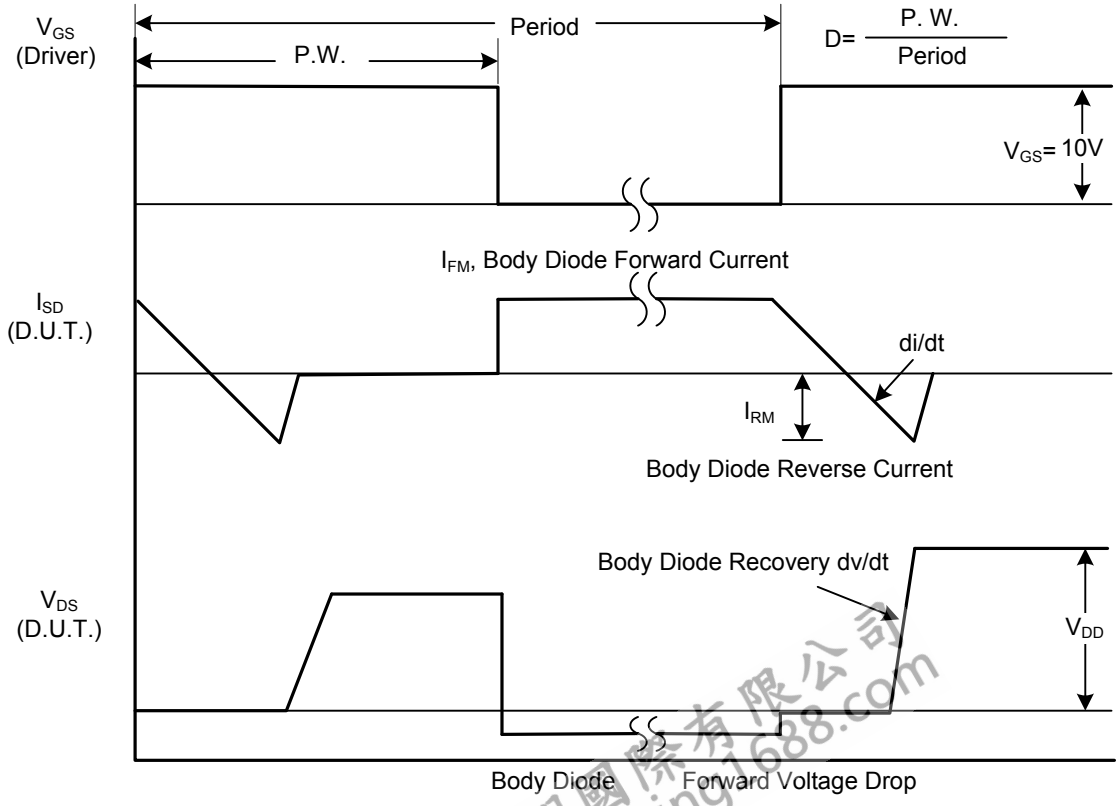
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	60			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
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=40A			8.5	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3500		pF
Output Capacitance	C_{OSS}			370		pF
Reverse Transfer Capacitance	C_{RSS}			295		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	V_{DS}=50V, V_{GS}=10V, I_D=1.3A, I_D=100μA (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}=30V, V_{GS}=10V, I_D=0.5A, R_G=25Ω (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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
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=80A, V_{GS}=0V			1.2	V
Reverse Recovery Time (Note 1)	t_{rr}	I_S=30A, V_{GS}=0V, dI_F/dt=100A/μs		90		ns
Reverse Recovery Charge	Q_{rr}			110		nC

Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

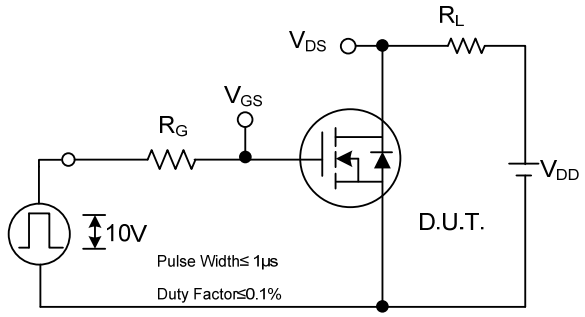


Peak Diode Recovery dv/dt Test Circuit

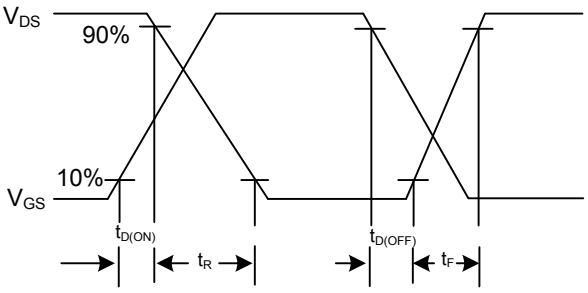


Peak Diode Recovery dv/dt Waveforms

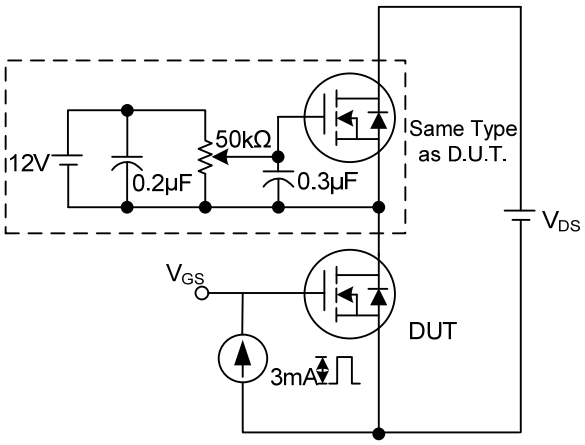
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



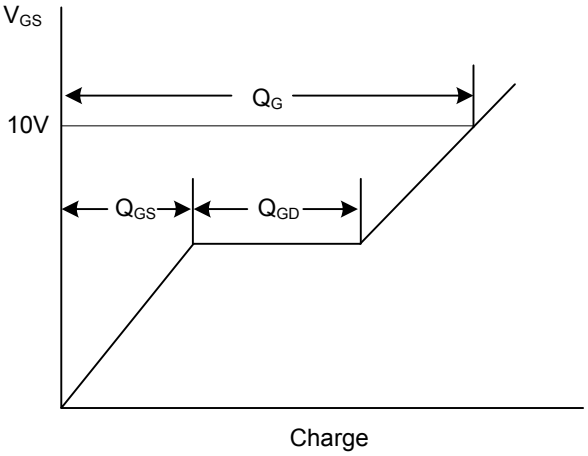
Switching Test Circuit



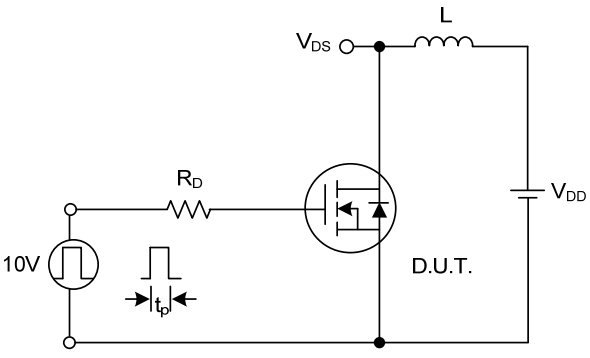
Switching Waveforms



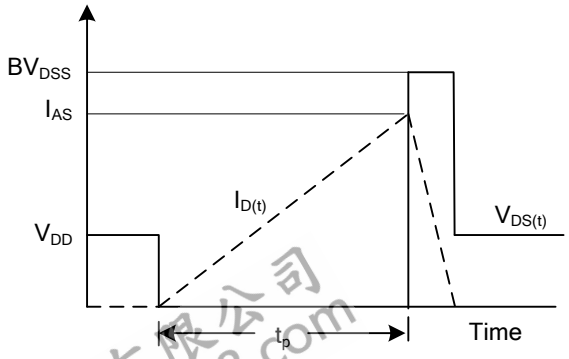
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms