

**UF8010**

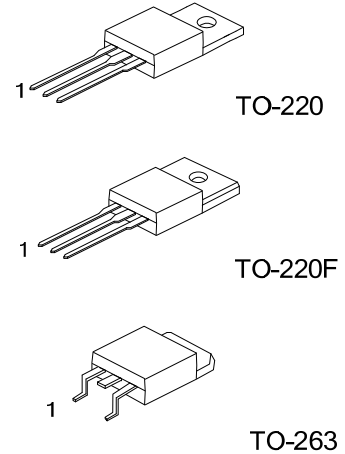
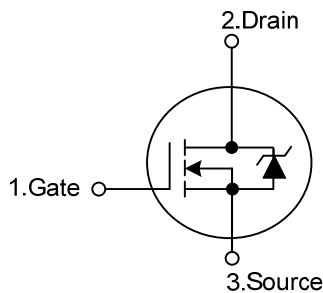
Preliminary

Power MOSFET**80A, 100V N-CHANNEL
POWER MOSFET**■ **DESCRIPTION**

The UTC **UF8010** uses advanced technology to provide excellent $R_{DS(ON)}$, fast switching speed, low gate charge, and excellent efficiency. This device is suitable for high frequency DC-DC converters, UPS and motor control.

■ **FEATURES**

- * $R_{DS(ON)}$:12m Ω (Typ.)
- * Lower gate-drain charge for lower switching losses
- * Perfect avalanche voltage and current performance
- * Fully characterized capacitance including effective C_{OSS} to simplify design

■ **SYMBOL**■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF8010L-TA3-T	UF8010G-TA3-T	TO-220	G	D	S	Tube
UF8010L-TF3-T	UF8010G-TF3-T	TO-220F	G	D	S	Tube
UF8010L-TQ2-T	UF8010G-TQ2-T	TO-263	G	D	S	Tube

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

UF8010L-TA3-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube (2) TA3: TO-220, TF3: TO-220F, TQ2: TO-263 (3) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Gate to Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ($V_{GS}=10\text{V}, T_C=25^{\circ}\text{C}$)		I_D	80 (Note 2)	A
Pulsed Drain Current		I_{DM}	320	A
Avalanche Energy	Single Pulse (Note 2)	E_{AS}	310	mJ
	Repetitive	E_{AR}	26	mJ
Avalanche Current		I_{AR}	45	A
Peak Diode Recovery dv/dt (Note 3)		dv/dt	16	V/ns
Power Dissipation ($T_C=25^{\circ}\text{C}$)	TO-220 / TO-263	P_D	260	W
	TO-220F		54	W
Derating above 25°C	TO-220 / TO-263		1.8	W/ $^{\circ}\text{C}$
	TO-220F		0.36	W/ $^{\circ}\text{C}$
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ + 175	$^{\circ}\text{C}$

Note: 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. Starting $T_J = 25^{\circ}\text{C}$, $L = 0.31\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 45\text{A}$.

3. $I_{SD} \leq 45\text{A}$, $di/dt \leq 110\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, $T_J \leq 175^{\circ}\text{C}$

■ THERMAL DATA

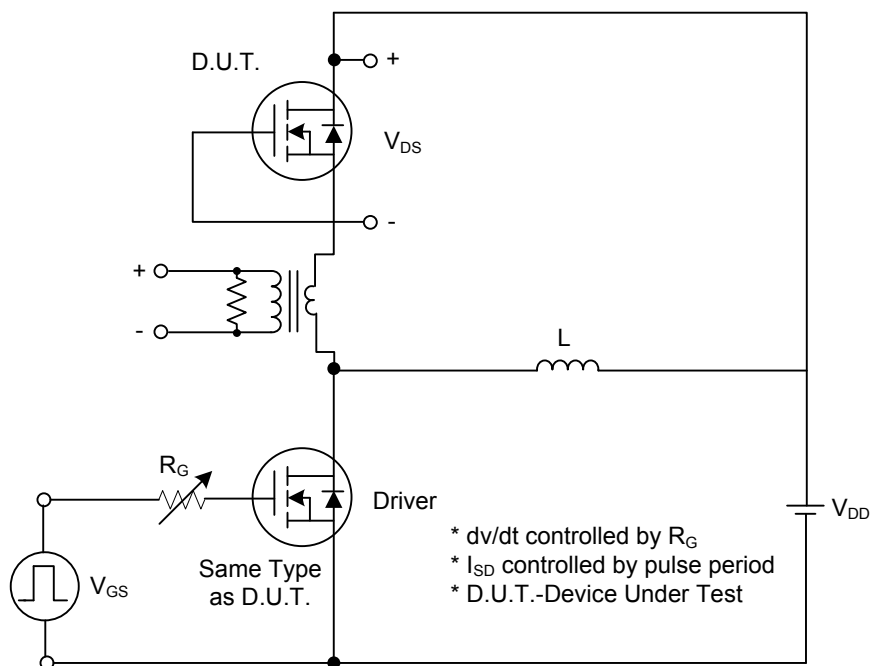
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220 / TO-263	θ_{JC}	0.57	$^{\circ}\text{C}/\text{W}$
	TO-220F		2.3	$^{\circ}\text{C}/\text{W}$

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

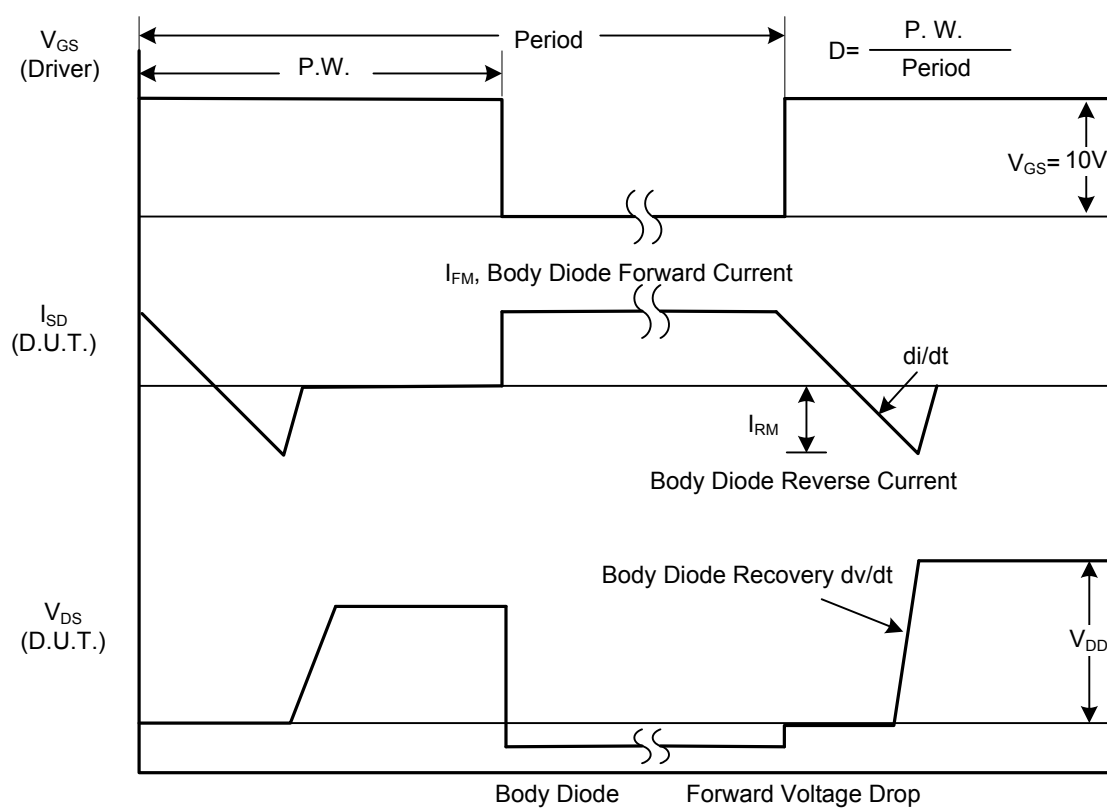
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{ V}, I_D=250\mu\text{A}$	100			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100\text{V}, V_{GS}=0\text{V}$			20	μA
Gate-Source Forward Current	I_{GSS}	$V_{GS}=20\text{ V}$			200	nA
Gate-Source Reverse Current		$V_{GS}=-20\text{ V}$			-200	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0		4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{ V}, I_D=45\text{A (Note 1)}$		12	15	m Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{DS}=25\text{ V}, V_{GS}=0\text{V}, f=1.0\text{MHz}$		3830		pF
Output Capacitance	C_{OSS}			480		pF
Reverse Transfer Capacitance	C_{RSS}			59		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DS}=50\text{V}, I_D=80\text{A}, R_G=39\Omega$ $V_{GS}=10\text{V (Note 1)}$		15		ns
Rise Time	t_R			130		ns
Turn-Off Delay Time	$t_{D(OFF)}$			61		ns
Fall Time	t_F			120		ns
Total Gate Charge	Q_G	$V_{DS}=80\text{V}, V_{GS}=10\text{V}$ $I_D=80\text{A (Note 1)}$		81	120	nC
Gate-Source Charge	Q_{GS}			22		nC
Gate-Drain Charge	Q_{GD}			26		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=80\text{ A}, V_{GS}=0\text{ V},$ $T_J=25^\circ\text{C (Note 1)}$			1.3	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				80	A
Maximum Pulsed Drain-Source Diode Forward Current (Note 1)	I_{SM}				320	A
Reverse Recovery Time	t_{RR}	$I_F=80\text{A}, V_{DD}=50\text{V}, T_J=150^\circ\text{C}$		99	150	ns
Reverse Recovery Charge	Q_{RR}	$di/dt=100\text{ A}/\mu\text{s (Note 1)}$		460	700	nC

Note: 1. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$

■ TEST CIRCUITS AND WAVEFORMS

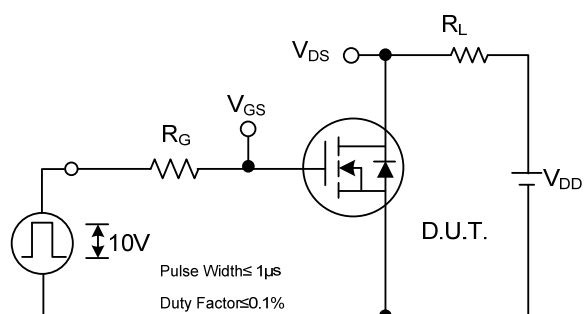


Peak Diode Recovery dv/dt Test Circuit

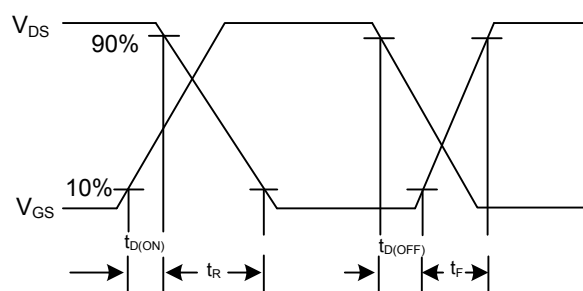


Peak Diode Recovery dv/dt Waveforms

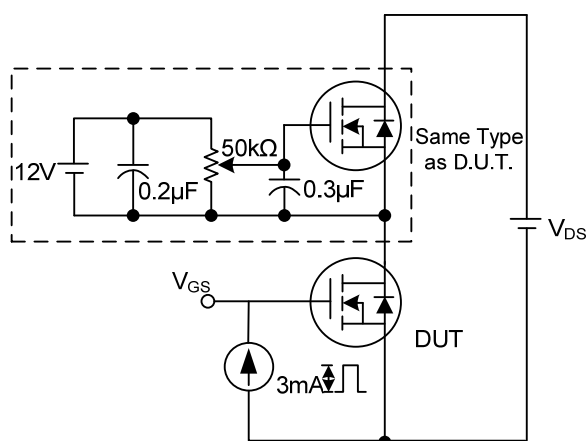
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



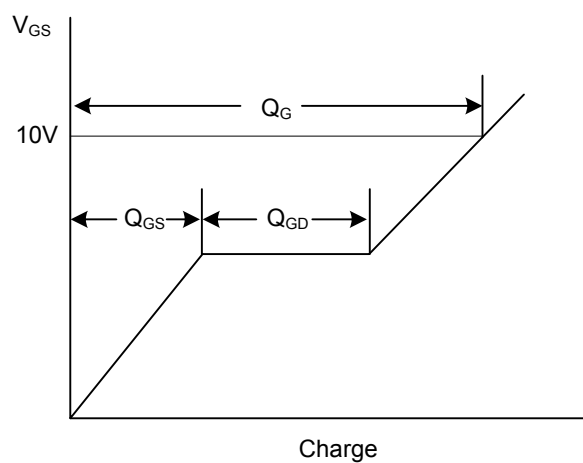
Switching Test Circuit



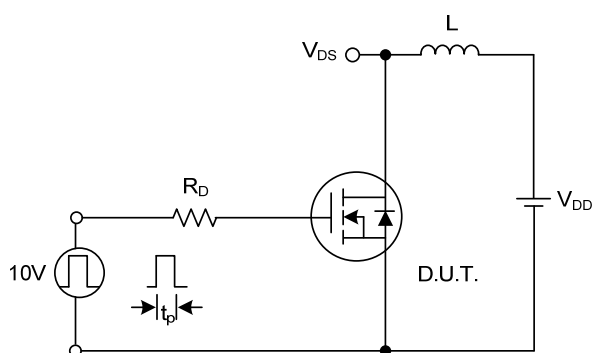
Switching Waveforms



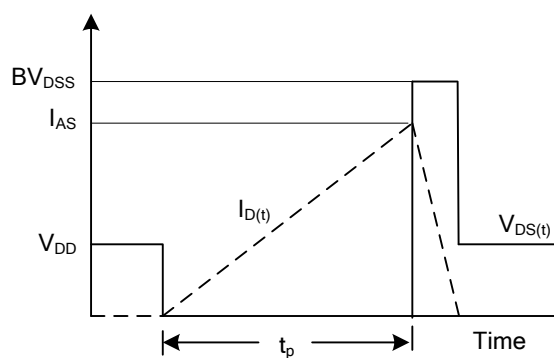
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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