

UNISONIC TECHNOLOGIES CO., LTD

UF8010

Preliminary

Power MOSFET

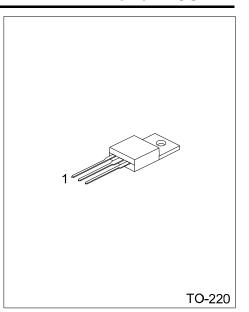
80 Amps, 100 Volts N-CHANNEL POWER MOSFET

DESCRIPTION

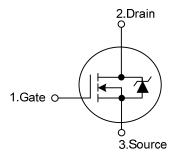
The UTC **UF8010** uses advanced technology to provide excellent $R_{DS(ON)}$, fast switching speed, low gate charge, and excellent efficiency. This device is suitable for high frequency DC-DC converters, UPS and motor control.

■ FEATURES

- * R_{DS(ON)}:12mΩ (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		Daakaga	Pin Assignment			Booking	
Lead Free	Halogen Free	Package	1	2	3	Packing	
UF8010L-TA3-T	UF8010G-TA3-T	TO-220	G	D	S	Tube	

(2)	Packing Type Package Type Halogen Free	(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free
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ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Gate to Source Voltage		V _{GS}	±20	V
Continuous Drain Current (V _{GS} =10V,T _C =25°C)		ID	80 (Note 2)	А
Pulsed Drain Current		I _{DM}	320	A
Avalanche Energy	Single Pulse (Note 2,3)	E _{AS}	310	mJ
	Repetitive	E _{AR}	26	mJ
Avalanche Current		I _{AR}	45	A
Peak Diode Recovery dv/dt (Note 4)		dv/dt	16	V/ns
Power Dissipation (T _C =25°C) Derating above 25°C		5	260	W
		P _D	1.8	W/°C
Junction Temperature		TJ	+175	°C
Storage Temperature		T _{STG}	-55 ~ + 175	°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. Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.

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

4. I_{SD}≤45A, di/dt≤110A/µs, V_{DD}≤BV_{DSS}, T_J≤ 175°C

THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient	θ _{JA}			62	°C/W
Junction to Case	θις			0.57	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	
	STIVIBUL	TEST CONDITIONS	IVIIIN	ITP	INAA	UNIT
STATIC CHARACTERISTICS			1		1	
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0 V, I _D =250µA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V,V _{GS} =0V			20	μA
Gate-Source Forward Current		V _{GS} = 20 V			200	nA
Gate-Source Reverse Current	I _{GSS}	V _{GS} = -20 V			-200	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	2.0		4.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10 V, I _D = 45A (Note 1)		12	15	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =25 V,V _{GS} =0V, f =1.0MHz		3830		рF
Output Capacitance	Coss			480		pF
Reverse Transfer Capacitance	C _{RSS}			59		рF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}			15		ns
Rise Time	t _R	V_{DD} =50V,I _D = 80A, R _G = 39Ω V_{GS} = 10V (Note 1)		130		ns
Turn-Off Delay Time	t _{D(OFF)}			61		ns
Fall Time	t⊨			120		ns
Total Gate Charge	Q_{G}	V _{DS} =80V, V _{GS} =10V I _D = 80A (Note 1)		81	120	nC
Gate-Source Charge	Q_{GS}			22		nC
Gate-Drain Charge	Q_{GD}			26		nC



ELECTRICAL CHARACTERISTICS(Cont.)

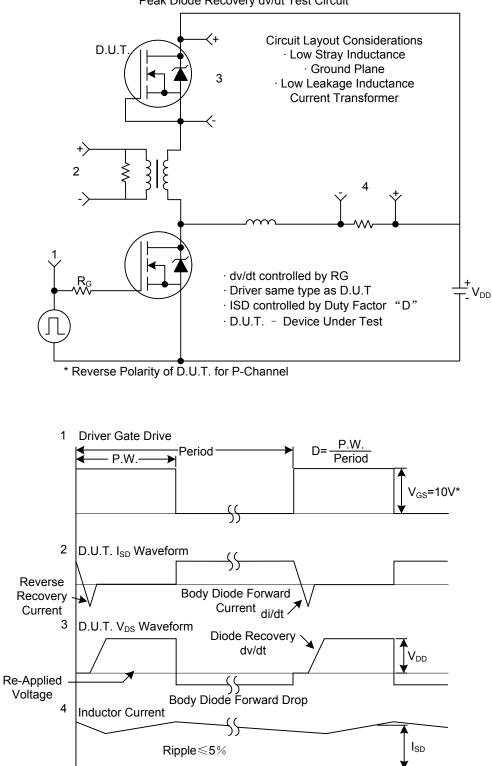
PARAMETER	SYMBOL	TEST CONDITIONS		TYP	MAX	UNIT			
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS									
Drain-Source Diode Forward Voltage	V_{SD}	I _S =80 A ,V _{GS} =0 V, T _J = 25°C (Note 1)			1.3	V			
Maximum Continuous Drain-Source Diode Forward Current	ls				80	А			
Maximum Pulsed Drain-Source Diode Forward Current (Note 1,2)	I _{SM}				320	А			
Reverse Recovery Time	t _{RR}	I_F =80 A, V_{DD} =50V, T_J = 150°C		99	150	ns			
Reverse Recovery Charge	Q _{RR}	di/dt = 100 A/µs (Note 1)		460	700	nC			

Notes: 1. Pulse width \leq 300µs; duty cycle \leq 2%

2. Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.



TEST CIRCUITS AND WAVEFORMS

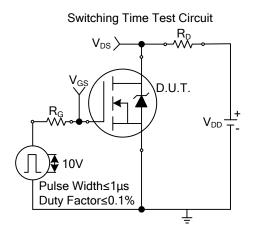


Peak Diode Recovery dv/dt Test Circuit

* V_{GS} = 5.0V for Logic Level Devices



TEST CIRCUITS AND WAVEFORMS(Cont.)



Unclamped Inductive Test Circuit

D.U.T.

0.01Ω

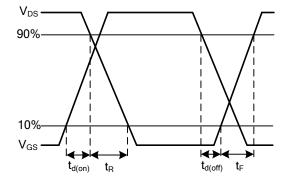
VDS

15V

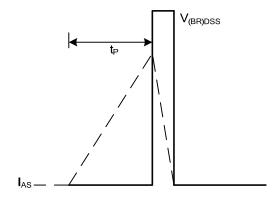
Driver

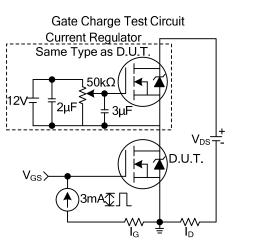
V_{DD}-

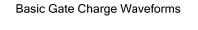
Switching Time Waveforms

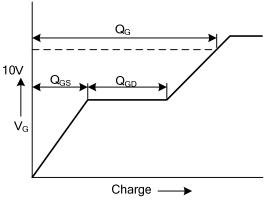


Unclamped Inductive Waveforms











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