



UF9530

Preliminary

POWER MOSFET

**-14A, -100V P-CHANNEL
POWER MOSFET**

■ DESCRIPTION

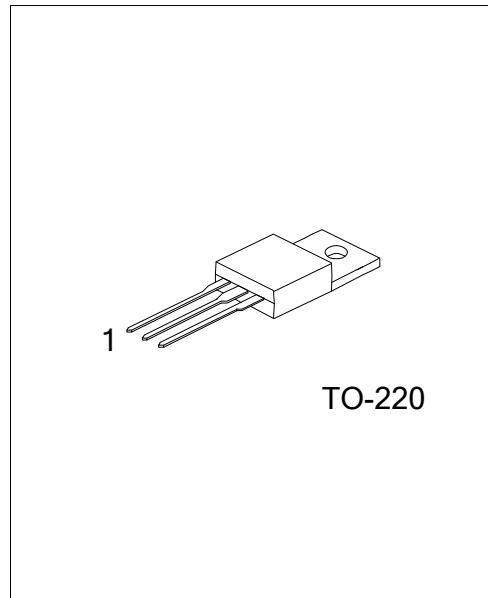
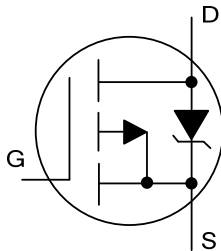
The UTC **UF9530** is a P-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

The UTC **UF9530** is suitable for all commercial-industrial applications, etc.

■ FEATURES

- * -14A, -100V, $R_{DS(ON)} < 0.2\Omega @ V_{GS} = -10V, I_D = -8.4A$
- * High Switching Speed
- * Dynamic dv/dt Rating

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF9530L-TA3-T	UF9530G-TA3-T	TO-220	G	D	S	Tube

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

<p>UF9530L-TA3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V_{DSS}	-100	V	
Gate-Source Voltage		V_{GSS}	±20	V	
Drain Current	Continuous	I_D	$V_{GS}=-10V, T_C=25^{\circ}C$	-14	A
			$V_{GS}=-10V, T_C=100^{\circ}C$	-10	A
	Pulsed (Note 1)		I_{DM}	-56	A
Avalanche Current (Note 1)		I_{AR}	-8.4	A	
Avalanche Energy	Single Pulse (Note 2)	E_{AS}	250	mJ	
	Repetitive (Note 1)	E_{AR}	7.9	mJ	
Peak Diode Recovery dv/dt (Note 3)		dv/dt	-5.0	V/ns	
Power Dissipation ($T_C=25^{\circ}C$)		P_D	79	W	
Linear Derating Factor			0.53	W/°C	
Junction Temperature		T_J	-55~+175	°C	
Storage Temperature Range		T_{STG}	-55~+175	°C	

Note: 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.

■ THERMAL RESISTANCE

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	°C/W
Junction to Case	θ_{JC}	1.9	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=-250\mu A, V_{GS}=0V$	-100			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, $I_D=-1mA$		-0.11		V/°C
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V$			-25	μA
		$V_{DS}=-80V, V_{GS}=0V, T_J=150^{\circ}C$			-250	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$		100	nA
	Reverse			$V_{GS}=-20V, V_{DS}=0V$		-100
ON CHARACTERISTICS						
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-8.4A$ (Note 4)			0.20	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2.0		-4.0	V
Forward Transconductance	g_{FS}	$V_{DS}=-50V, I_D=-8.4A$	3.2			S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=-25V, f=1.0MHz$		760		pF
Output Capacitance	C_{OSS}			260		pF
Reverse Transfer Capacitance	C_{RSS}			170		pF

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$I_D = -8.4A, V_{DS} = -80V, V_{GS} = -10V,$ (Note 4)			58	nC
Gate to Source Charge	Q_{GS}				8.3	nC
Gate to Drain ("Miller") Charge	Q_{GD}				32	nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD} = -50V, I_D = -8.4A, R_G = 9.1\Omega$ $R_D = 6.2\Omega,$ (Note 4)		15		ns
Rise Time	t_R			58		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			45		ns
Fall Time	t_F			46		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body Diode Continuous Source Current	I_S				-14	A
Maximum Body-Diode Pulsed Current (Note 1)	I_{SM}				-56	A
Drain-Source Diode Forward Voltage	V_{SD}	$T_J = 25^\circ C, I_S = -8.4A, V_{GS} = 0V$ (Note 4)			-1.6	V
Body Diode Reverse Recovery Time	t_{RR}	$T_J = 25^\circ C, I_F = -8.4A, di/dt = -100A/\mu s$ (Note 4)		130	190	ns
Body Diode Reverse Recovery Charge	Q_{RR}			650	970	nC
Forward Turn-On Time	t_{ON}	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$)				

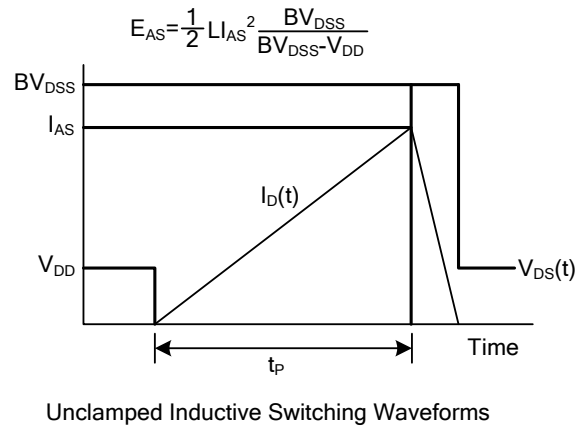
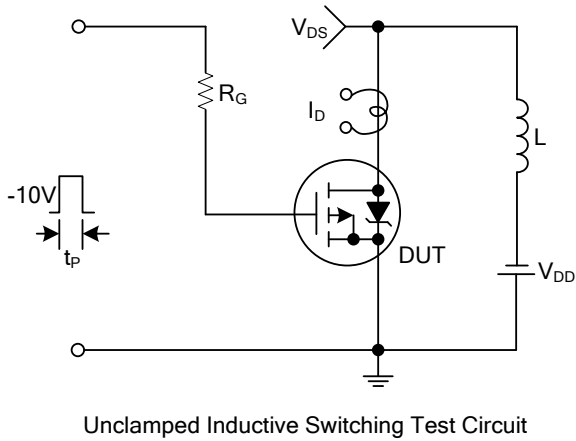
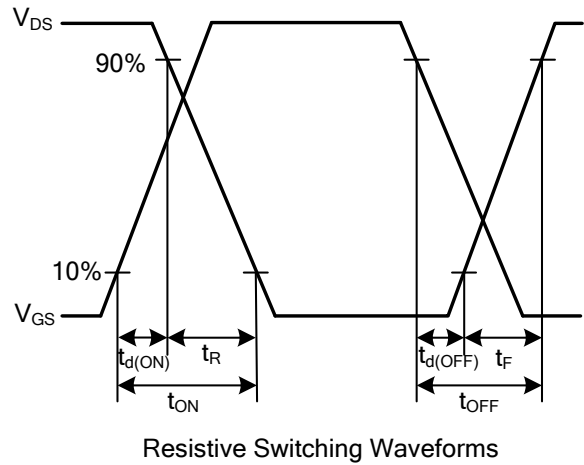
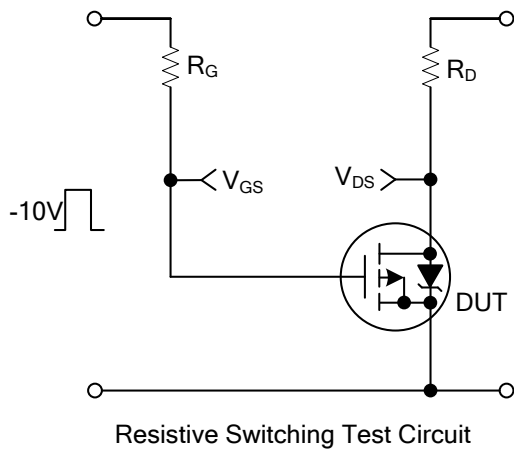
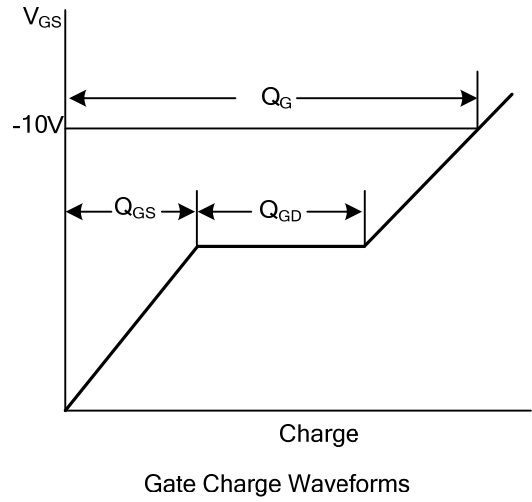
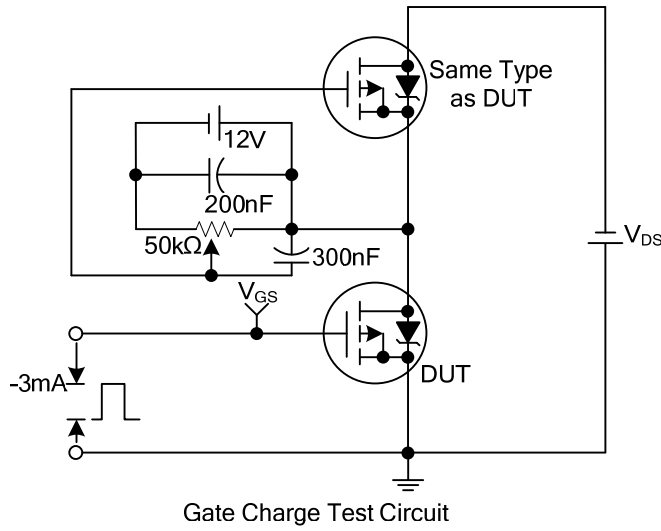
Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Starting $T_J = 25^\circ C, L = 7.0mH, R_G = 25\Omega, I_{AS} = -8.4A.$

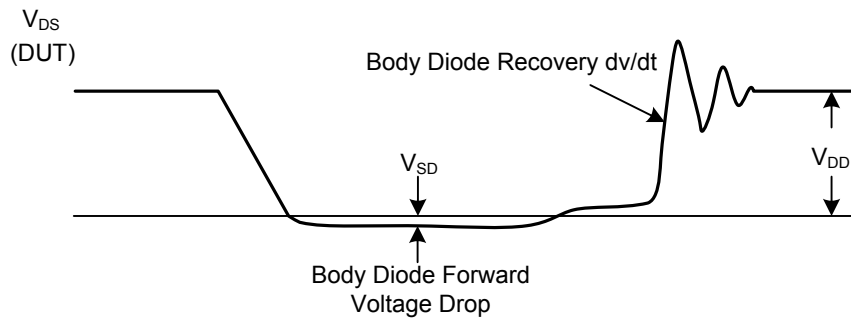
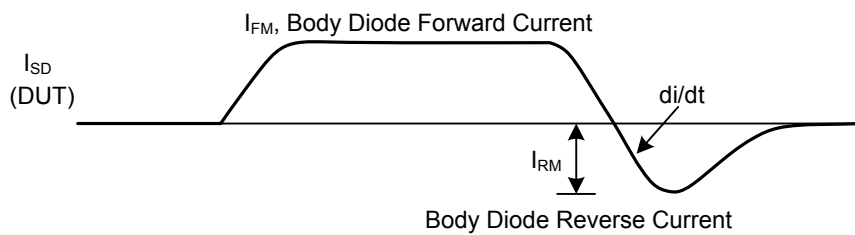
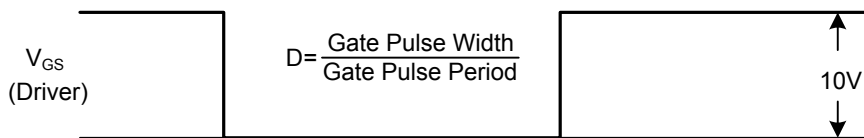
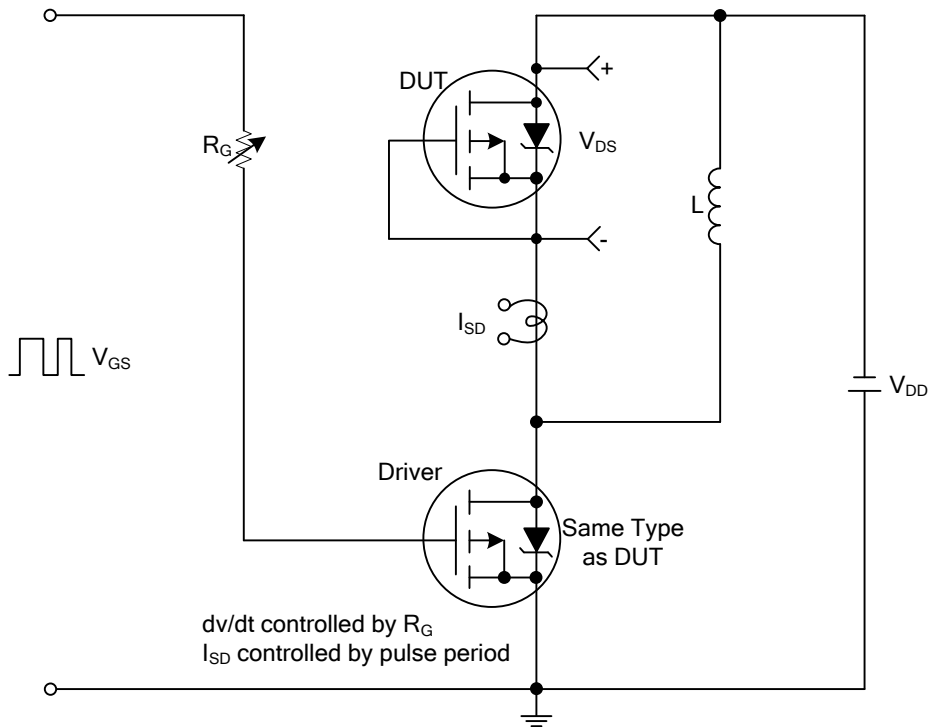
3. $I_{SD} \leq -8.4A, di/dt \leq -490A/\mu s, V_{DD} \leq BV_{DSS}, T_J \leq 175^\circ C.$

4. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%.$

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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