



UF9530

Preliminary

POWER MOSFET

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

■ DESCRIPTION

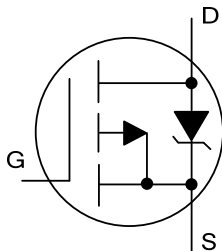
The UTC **UF9530** is a P-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

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

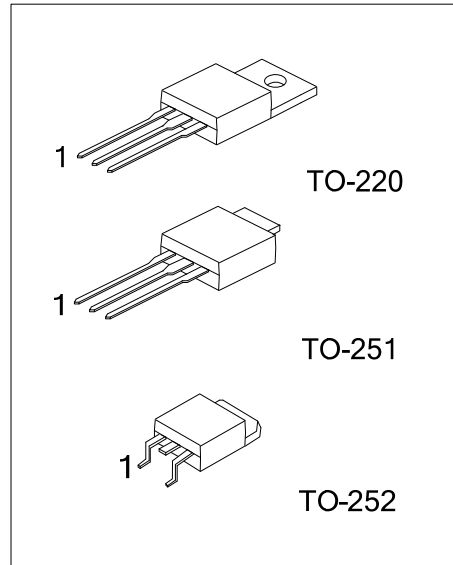


■ ORDERING INFORMATION

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
UF9530L-TM3-T	UF9530G-TM3-T	TO-251	G	D	S	Tube
UF9530L-TN3-T	UF9530G-TN3-T	TO-252	G	D	S	Tube
UF9530L-TN3-R	UF9530G-TN3-R	TO-252	G	D	S	Tape Reel

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, R: Tape Reel</p> <p>(2) TA3: TO-220, TM3: TO-251, TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen 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 ($T_C=25^{\circ}C$)	TO-220	P_D	79	W	
	TO-251/TO-252		46	W	
Linear Derating Factor			0.53	W/ $^{\circ}C$	
Junction Temperature		T_J	-55~+175	$^{\circ}C$	
Storage Temperature Range		T_{STG}	-55~+175	$^{\circ}C$	

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	TO-220	θ_{JA}	62	$^{\circ}C/W$
	TO-251/TO-252		100.3	$^{\circ}C/W$
Junction to Case	TO-220	θ_{JC}	1.9	$^{\circ}C/W$
	TO-251/TO-252		2.7	$^{\circ}C/W$

■ 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	-100			V	
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _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°C			-250	μA	
Gate-Source Leakage Current	Forward	I _{GSS}				nA	
	Reverse						V _{GS} =20V, V _{DS} =0V
						-100	nA
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 =-250μA	-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
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 =9.1Ω R _D =6.2Ω, (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°C, I _S =-8.4A, V _{GS} =0V (Note 4)			-1.6	V	
Body Diode Reverse Recovery Time	t _{RR}	T _J =25°C, I _F =-8.4A, di/dt=-100A/μs (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)					

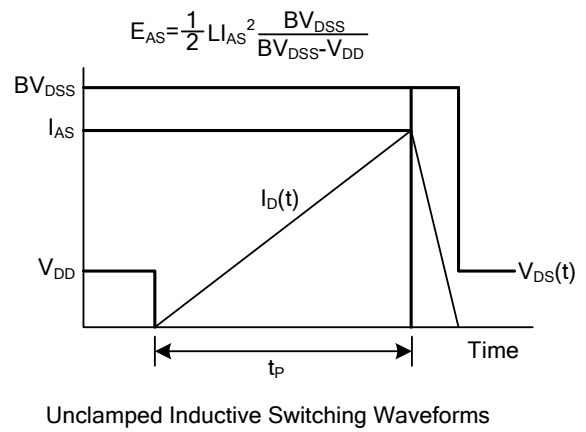
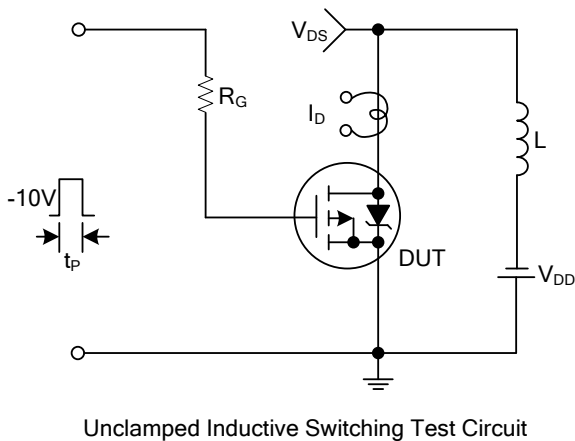
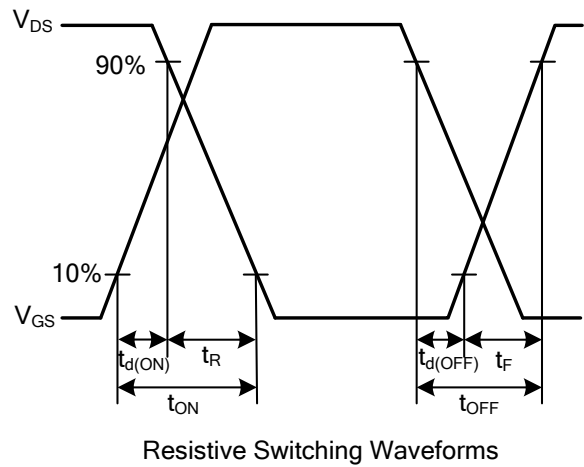
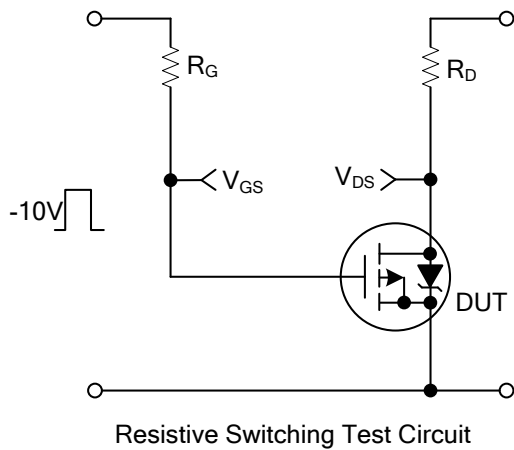
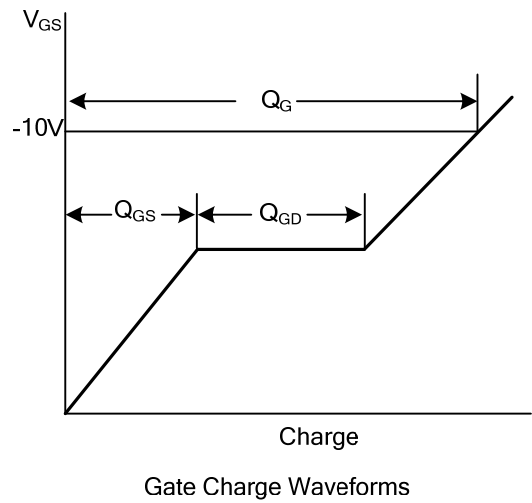
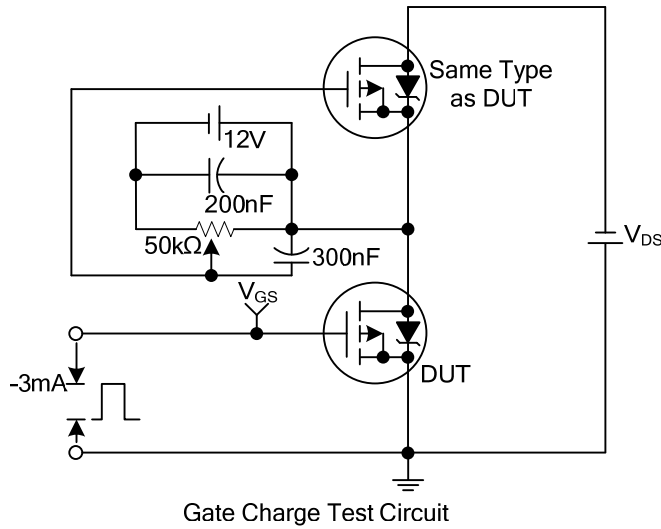
Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Starting T_J=25°C, L=7.0mH, R_G=25Ω, I_{AS}=-8.4A.

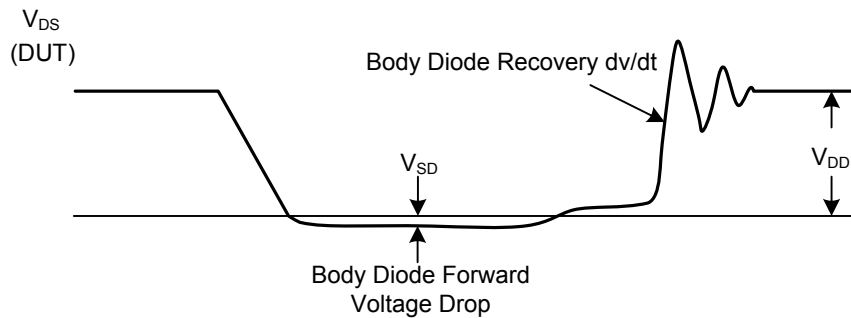
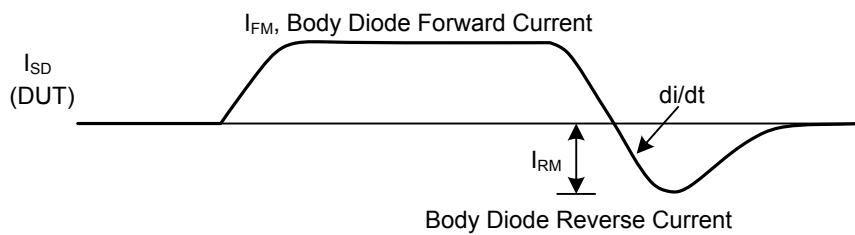
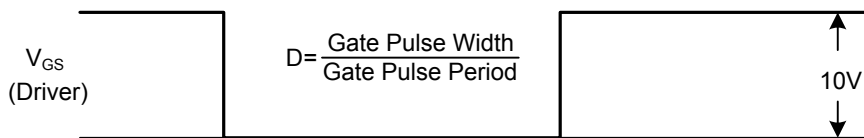
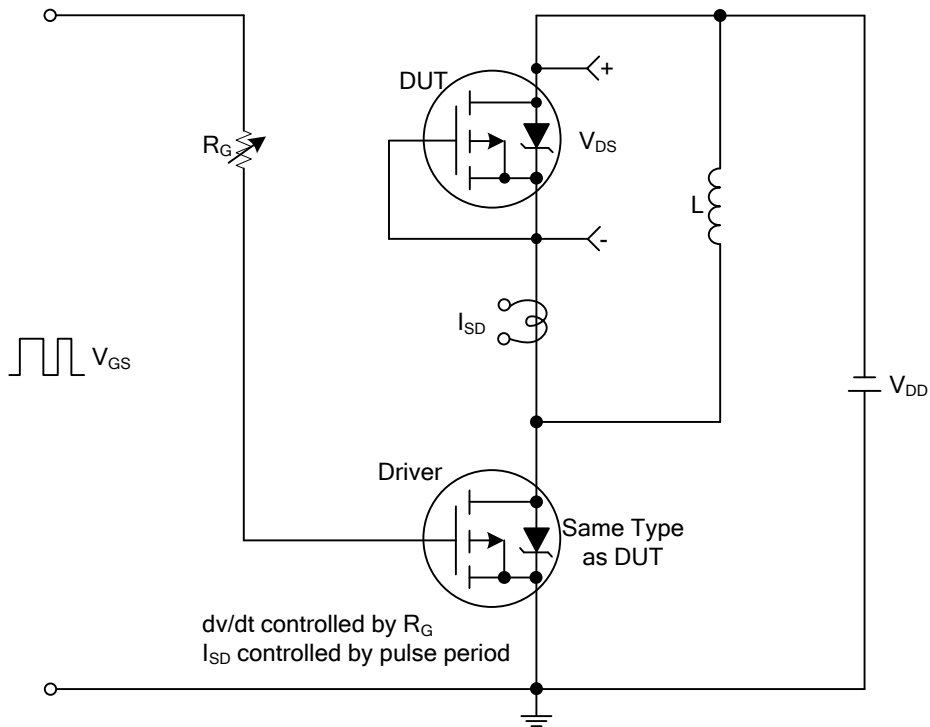
3. I_{SD}≤-8.4A, di/dt≤-490A/μs, V_{DD}≤BV_{DSS}, T_J≤175°C.

4. Pulse width≤300μs; duty cycle≤2%.

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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