



-100V, -23A P-CHANNEL POWER MOSFET

DESCRIPTION

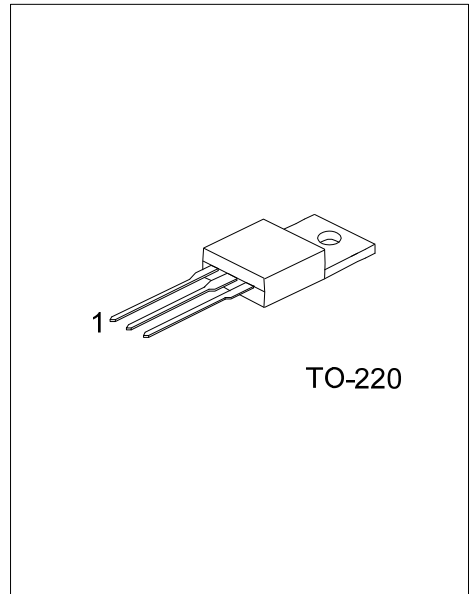
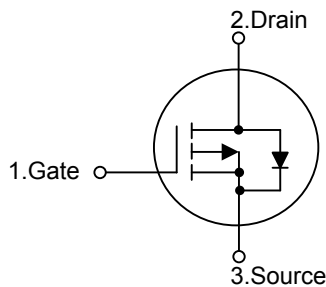
The UTC **UF9540** is an P-channel power MOSFET using UTC's utilize advanced processing techniques to achieve extremely low on-resistance per silicon area.

This benefit, combined with the fast switching speed and ruggedized device design Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

FEATURES

- * Advanced Process Technology
- * Dynamic dv/dt Rating
- * Fast Switching
- * Fully Avalanche Rated

SYMBOL



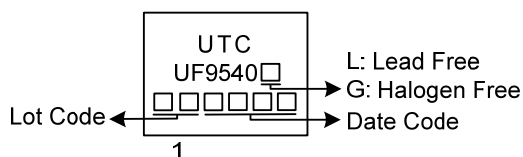
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF9540L-TA3-R	UF9540G-TA3-T	TO-220	G	D	S	Tube

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

<p>UF9540G-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>		(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-100	V
Gate to Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	-23	A
	Pulsed (Note 2)	I_{DM}	-64	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	62	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.7	V/ns
Power Dissipation		P_D	65	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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. $L = 0.1\text{mH}$, $I_{AS} = -35.4\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$, Starting $T_J=25^\circ\text{C}$

4. $I_{SD} \leq -23\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	PATINGS	UNIT
Junction-to-Ambient	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction-to-Case	θ_{JC}	1.92	$^\circ\text{C}/\text{W}$

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

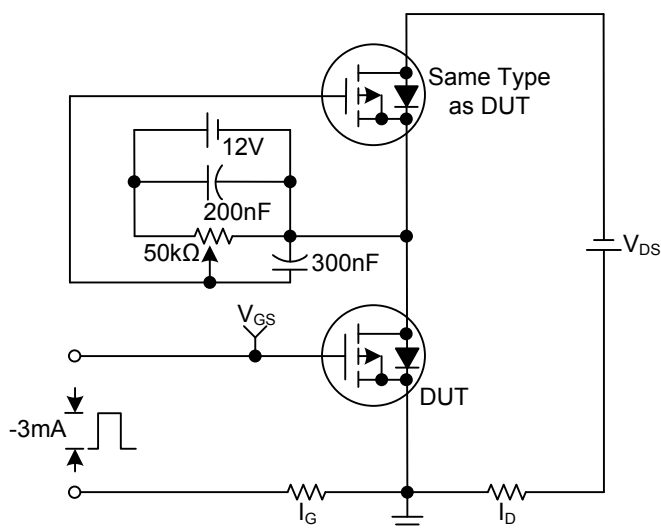
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=-100V, V_{GS}=0V$			-100	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+20V$			+100	nA
	Reverse		$V_{GS}=-20V$			-100	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		$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-6.6A$			110	m Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{DS}=-25V, V_{GS}=0V, f=1.0MHz$		2520		pF
Output Capacitance		C_{OSS}			135		pF
Reverse Transfer Capacitance		C_{RSS}			105		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	$V_{DS}=-80V, V_{GS}=-10V, I_D=-23A$ (Note 1, 2)		41		nC
Gate-Source Charge		Q_{GS}			11.5		nC
Gate-Drain Charge		Q_{GD}			11		nC
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=-50V, V_{GS}=-10V,$ $I_D=-23A, R_G=3\Omega$ (Note 1, 2)		12		ns
Turn-ON Rise Time		t_R			18		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			33		ns
Turn-OFF Fall Time		t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				-23	A
Maximum Body-Diode Pulsed Current		I_{SM}				-64	A
Drain-Source Diode Forward Voltage		V_{SD}	$I_S=-23A, V_{GS}=0V$			-1.4	V
Body Diode Reverse Recovery Time		t_{rr}	$I_F=-23A,$		51		ns
Body Diode Reverse Recovery Charge		Q_{rr}	$dI/dt=100A/\mu s$ (Note 4)		90		nC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

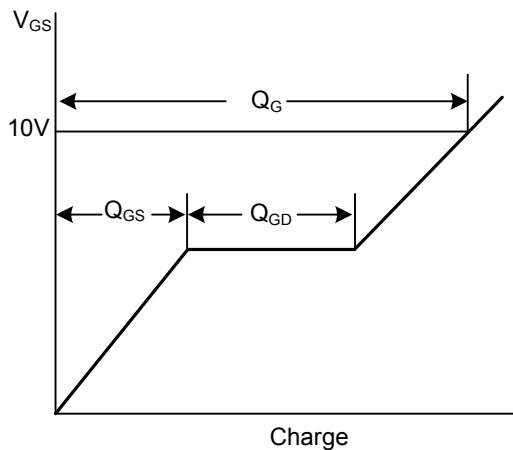
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

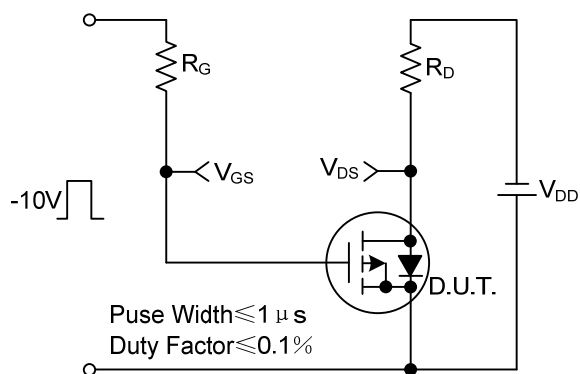
Gate Charge Test Circuit



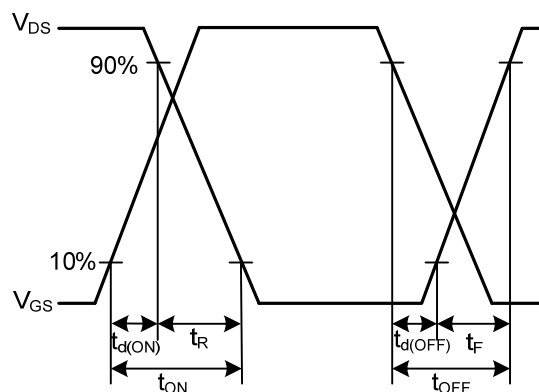
Gate Charge Waveforms



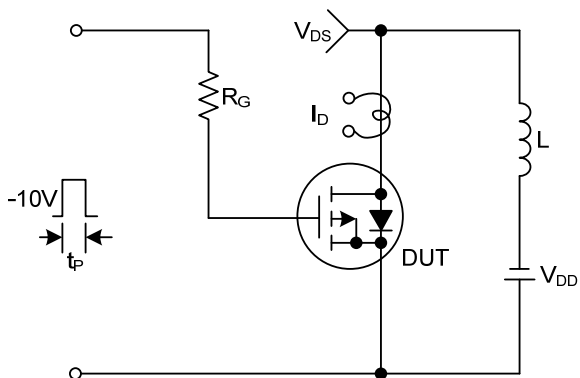
Resistive Switching Test Circuit



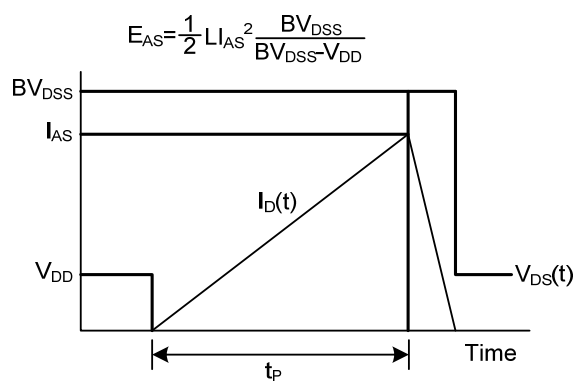
Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



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