



## UF520

Preliminary

Power MOSFET

### 9.2A, 100V N-CHANNEL POWER MOSFET

#### DESCRIPTION

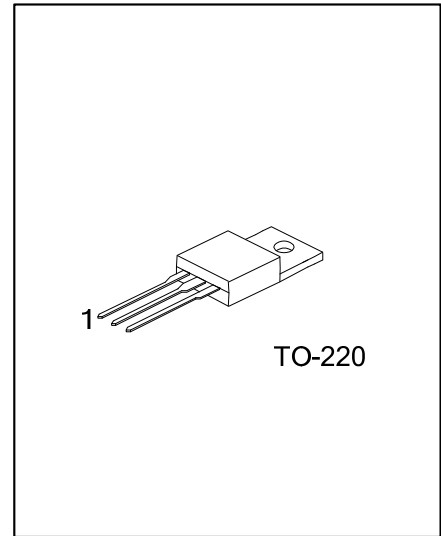
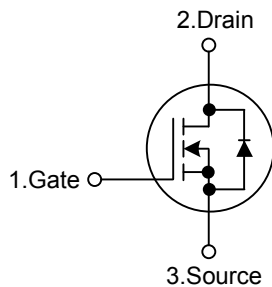
The UTC **UF520** is an N-channel enhancement power MOSFET using UTC's advanced technology to provide the customers with high Input Impedance and high switching speed.

This UTC **UF520** is suitable for motor drivers, switching convertors, switching regulators, relay drivers and drivers for high power bipolar switching transistors.

#### FEATURES

- \*  $R_{DS(ON)}=0.25\Omega @ V_{GS}=10V, I_D=5.6A$
- \* High Input Impedance
- \* High Switching Speed

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF520L-TA3-T	UF520G-TA3-T	TO-220	G	D	S	Tube

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

<p>UF520L-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 RATINGS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	100	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current	Continuous	$I_D$	$T_C=25^\circ\text{C}$	9.2	A
			$T_C=100^\circ\text{C}$	6.5	A
	Pulsed (Note 2)		$I_{DM}$	37	A
Single Pulsed Avalanche Energy (Note 3)		$E_{AS}$	36	mJ	
Power Dissipation		$P_D$	50	W	
Junction Temperature		$T_J$	+150	$^\circ\text{C}$	
Storage Temperature		$T_{STG}$	-55~+175	$^\circ\text{C}$	

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 Max junction temperature. See Transient Thermal Impedance curve

3.  $V_{DD}=25\text{V}$ , starting  $T_J=25^\circ\text{C}$ ,  $L=640\text{mH}$ ,  $R_G=25\Omega$ , peak  $I_{AS}=9.2\text{A}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	80	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	2.5	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS (T<sub>c</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	100			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =95V, V <sub>GS</sub> =0V			250	μA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =5.6A (Note 1)		0.25	0.27	Ω
On State Drain Current (Note 1)	I <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> >I <sub>D(ON)</sub> ×R <sub>DS(ON)</sub> MAX	9.2			A
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		350		pF
Output Capacitance	C <sub>OSS</sub>			130		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			25		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =9.2A, V <sub>DS</sub> =0.8*Rated BV <sub>DSS</sub> , I <sub>G(REF)</sub> =1.5mA (Note 2)		10	30	nC
Gate to Source Charge	Q <sub>GS</sub>			2.5		nC
Gate to Drain Charge	Q <sub>GD</sub>			2.5		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> ≈9.2A, R <sub>G</sub> =18Ω, R <sub>L</sub> =5.5 Ω (Note 3)		9	13	ns
Rise Time	t <sub>R</sub>			30	63	ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			18	70	ns
Fall-Time	t <sub>F</sub>			20	59	ns

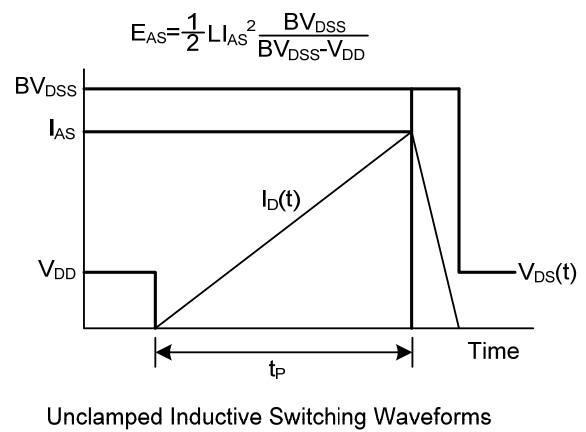
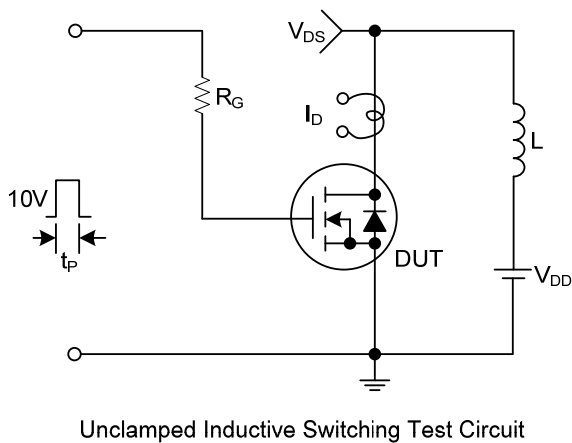
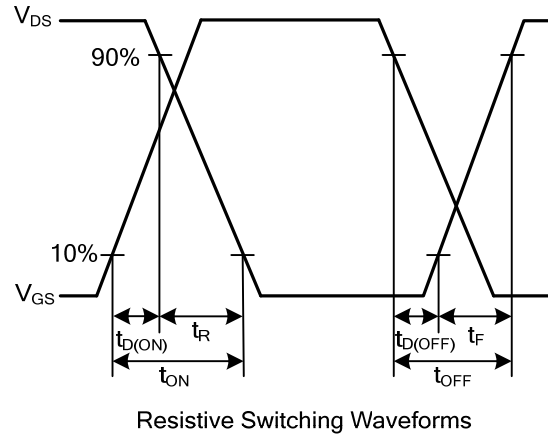
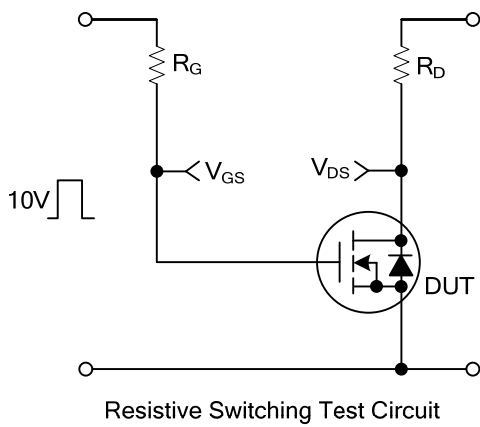
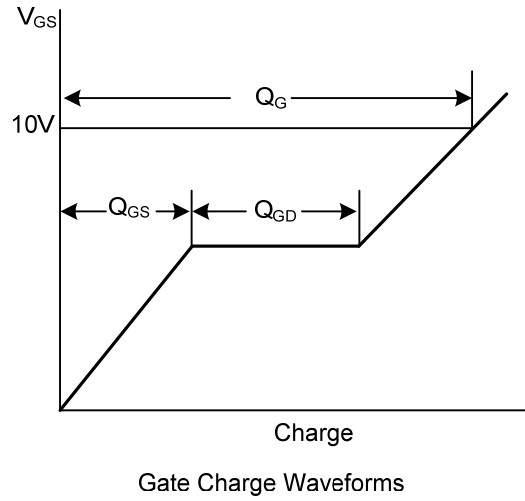
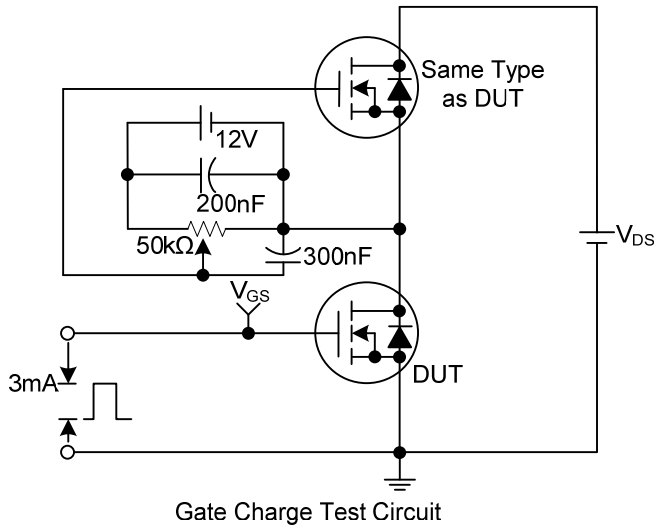
- Notes: 1. Pulse test: pulse width≤300μs, duty cycles≤2%  
 2. Gate Charge is Essentially Independent of Operating Temperature  
 3. MOSFET Switching Times are Essentially Independent of Operating Temperature

■ SOURCE TO DRAIN DIODE SPECIFICATIONS

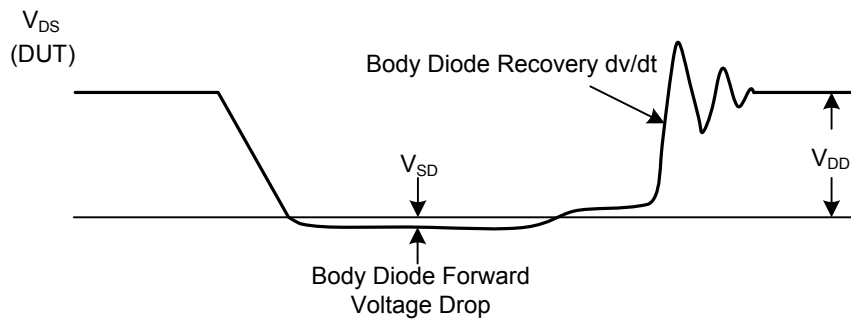
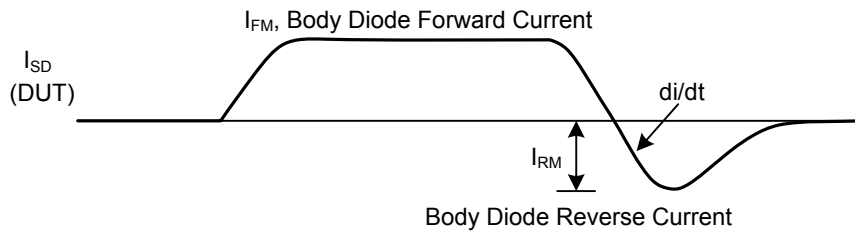
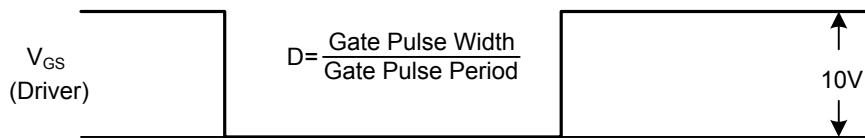
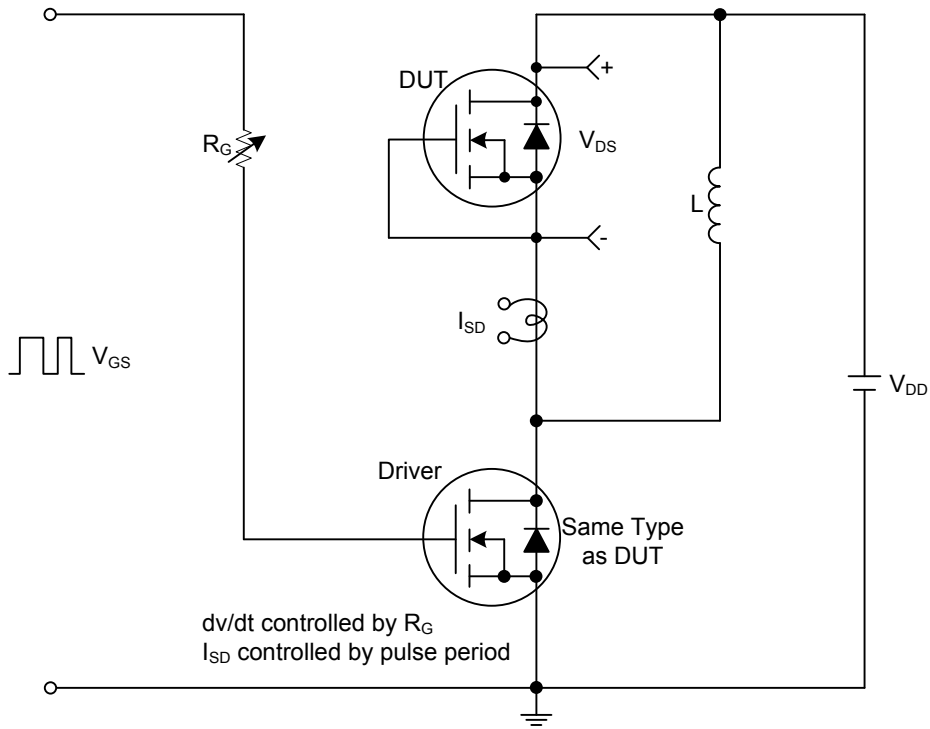
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Source to Drain Diode Voltage	V <sub>SD</sub>	T <sub>J</sub> =25°C, I <sub>SD</sub> =9.2A, V <sub>GS</sub> =0V (Note 1)			2.5	V
Continuous Source to Drain Current	I <sub>SD</sub>	Note 3			9.2	A
Pulse Source to Drain Current (Note 2)	I <sub>SDM</sub>				37	A

- Note : 1. Pulse Test: Pulse width≤300μs, Duty Cycle≤2%.  
 2. Repetitive rating: pulse width limited by Max junction temperature. See Transient Thermal Impedance curve  
 3. Modified MOSFET Symbol Showing the Integral Reverse P-N Junction Diode.

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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