



**UNA06R032H**

Preliminary

**POWER MOSFET**

**120A, 60V N-CHANNEL  
POWERTRENCH MOSFET**

■ DESCRIPTION

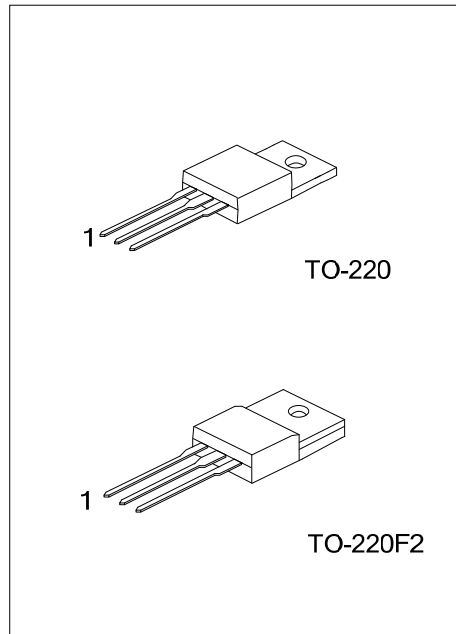
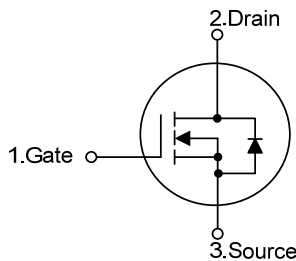
The UTC **UNA06R032H** is an N-channel Power Trench MOSFET, it uses UTC's advanced technology to provide the customers with fast switching speed and a minimum on-state resistance, etc.

The UTC **UNA06R032H** is suitable for battery protection circuit, motor drives and uninterruptible power supplies, etc.

■ FEATURES

- \*  $R_{DS(ON)} < 3.2 \text{ m}\Omega @ V_{GS}=10V, I_D=75A$
- \* Low gate charge
- \* Fast switching speed

■ SYMBOL



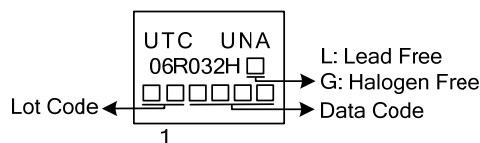
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UNA06R032HL-TA3-T	UNA06R032HG-TA3-T	TO-220	G	D	S	Tube
UNA06R032HL-TF2-T	UNA06R032HG-TF2-T	TO-220F2	G	D	S	Tube

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

<p>UNA06R032HG-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TF2: TO-220F2</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
--	---

■ MARKING



■ ABSOLUTE MAXIMUM RATING ( $T_C=25^{\circ}\text{C}$  unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	60	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	120	A
	Pulsed (Note 1)	$I_{DM}$	480	A
Single Pulse Avalanche Energy (Note 2)		$E_{AS}$	1434	mJ
Peak Diode Recovery (Note 3)		dv/dt	6.0	V/ns
Power Dissipation	TO-220	$P_D$	231	W
	TO-220F2		77	W
Junction Temperature		$T_J$	-55 ~ +175	$^{\circ}\text{C}$
Storage Temperature Range		$T_{STG}$	-55 ~ +175	$^{\circ}\text{C}$

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

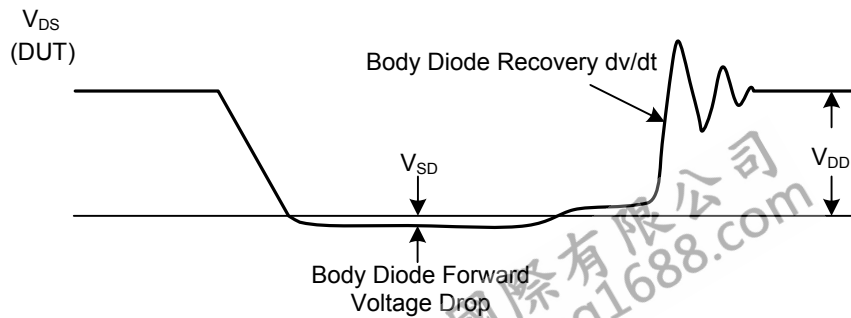
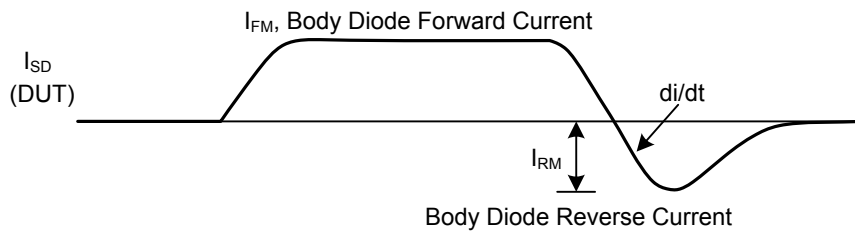
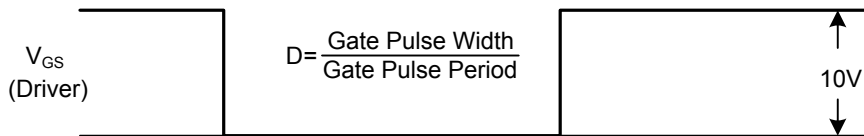
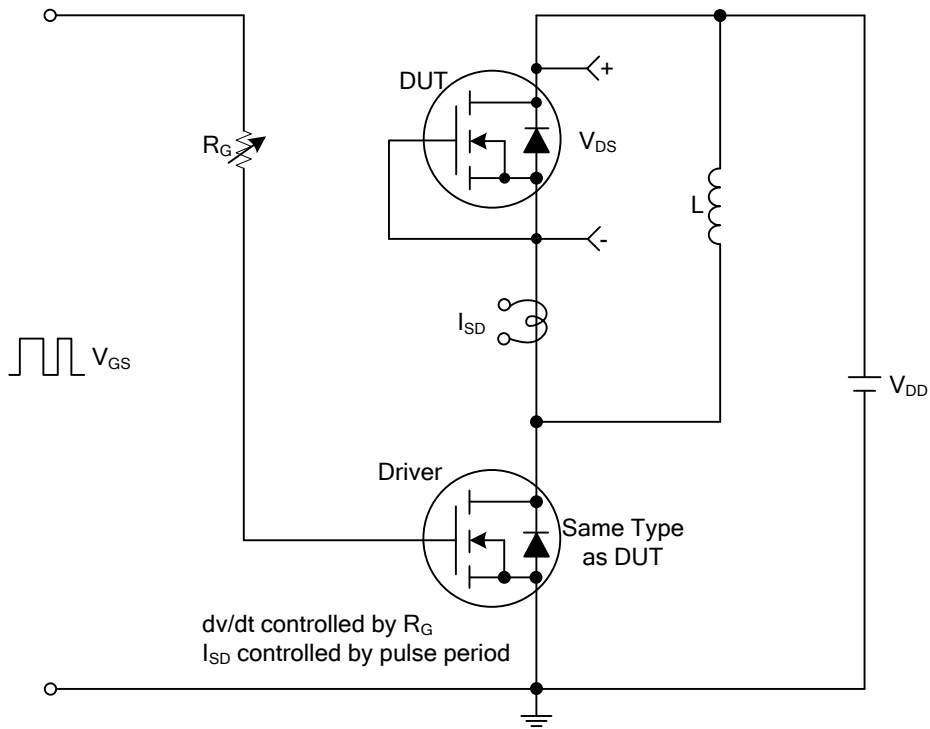
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		$\theta_{JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	$\theta_{JC}$	0.54	$^{\circ}\text{C}/\text{W}$
	TO-220F2		1.62	$^{\circ}\text{C}/\text{W}$

■ 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>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA, T <sub>C</sub> =25°C	60			V	
Breakdown Voltage Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =1mA		0.05		V/°C	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V			1	μA	
		V <sub>DS</sub> =48V, T <sub>C</sub> =150°C			500	μA	
Gate-Source Leakage Current	Forward	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V			+100	nA	
	Reverse	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	2.5	3.5	4.5	V	
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =75A			3.2	mΩ	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =75A		154		S	
<b>DYNAMIC PARAMETERS</b>							
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		1571		pF	
Output Capacitance	C <sub>OSS</sub>			693		pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>			308		pF	
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge at 10V	Q <sub>G</sub>	I <sub>D</sub> =1.3A, V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, (Note 4)		612		nC	
Gate-to-Source Charge	Q <sub>GS</sub>			60		nC	
Gate-to-Drain ("Miller") Charge	Q <sub>GD</sub>			78		nC	
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =0.5A, R <sub>G</sub> =25Ω		440		ns	
Rise Time	t <sub>R</sub>			455		ns	
Turn-OFF Delay Time	t <sub>D(OFF)</sub>		V <sub>GS</sub> =10V, (Note 4)		1370		ns
Fall Time	t <sub>F</sub>				677		ns
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>				193	A	
Maximum Pulsed Drain to Source Diode Forward Current	I <sub>SM</sub>				772	A	
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>SD</sub> =75A, V <sub>GS</sub> =0V			1.3	V	
Reverse Recovery Time	t <sub>rr</sub>	I <sub>SD</sub> =75A, V <sub>GS</sub> =0V,		46		ns	
Reverse Recovery Charge	Q <sub>rr</sub>	di/dt=100A/μs		50		nC	

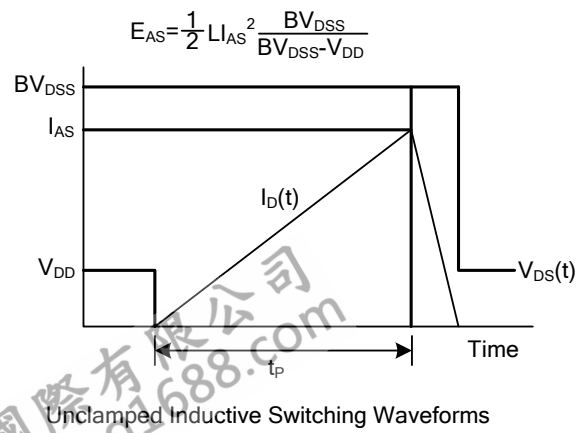
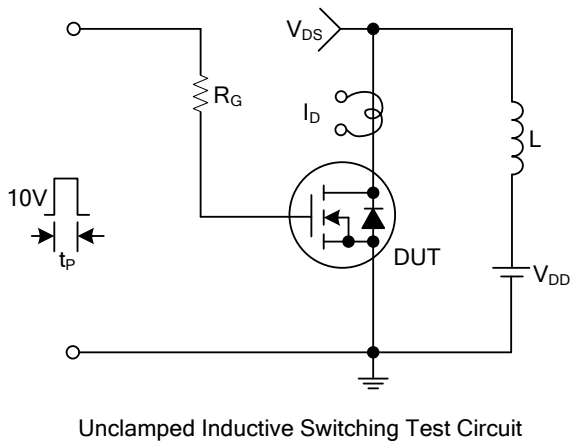
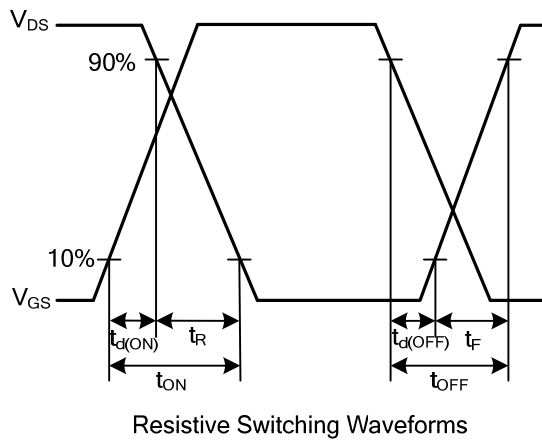
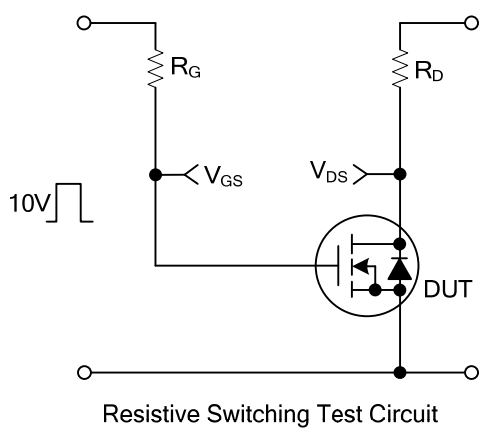
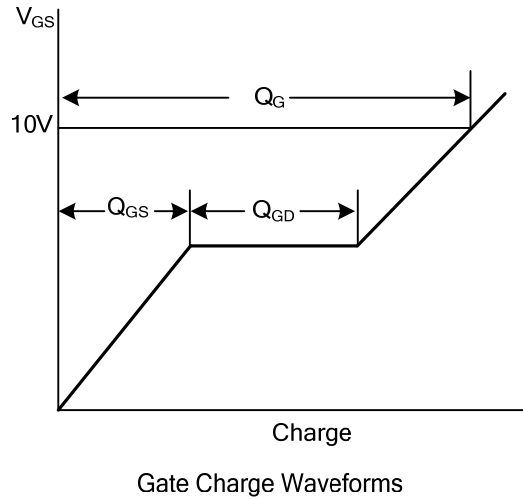
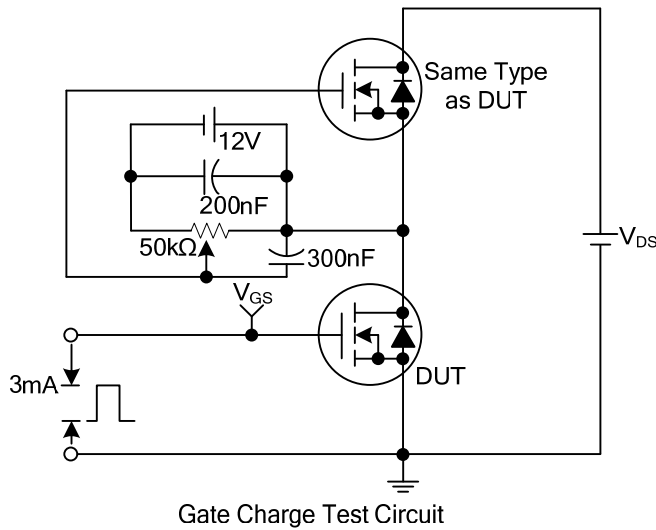
- Notes: 1. Repetitive rating: pulse-width limited by maximum junction temperature.  
 2. L=0.51mH, I<sub>AS</sub>=75A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, starting T<sub>J</sub>=25°C.  
 3. I<sub>SD</sub>≤75A, di/dt≤450A/μs, V<sub>DD</sub>≤BV<sub>DSS</sub>, starting T<sub>J</sub>=25°C.  
 4. Essentially independent of operating temperature typical characteristics.

■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit and Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.