



**UFZ34**

Preliminary

*Power MOSFET*

**28A, 60V N-CHANNEL POWER MOSFET**

■ DESCRIPTION

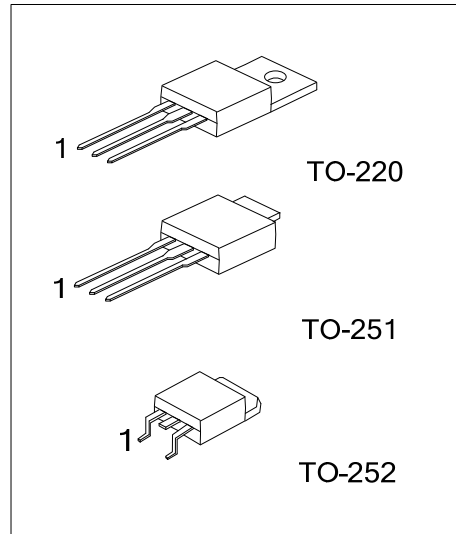
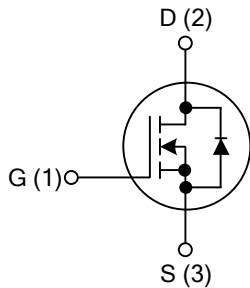
The UTC **UFZ34** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

The UTC **UFZ34** is suitable for all commercial-industrial applications, etc.

■ FEATURES

- \*  $R_{DS(ON)} < 0.042\Omega @ V_{GS}=10V, I_D=17A$
- \* High switching speed
- \* Low gate charge

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UFZ34L-TA3-T	UFZ34G-TA3-T	TO-220	G	D	S	Tube
UFZ34L-TM3-T	UFZ34G-TM3-T	TO-251	G	D	S	Tube
UFZ34L-TN3-R	UFZ34G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UFZ34L-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 RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	60	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current	Continuous	$I_D$	$T_C=25^\circ\text{C}$	28	A
			$T_C=100^\circ\text{C}$	20	A
	Pulsed (Note 1)		$I_{DM}$	112	A
Avalanche Current (Note 1)		$I_{AR}$	17	A	
Avalanche Energy	Single Pulsed (Note 2)		$E_{AS}$	97	mJ
	Repetitive (Note 1)		$E_{AR}$	6.8	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	5.0	V/ns	
Power Dissipation		$P_D$	68	W	
					$T_C=25^\circ\text{C}$
Linear Derating Factor			0.46	W/ $^\circ\text{C}$	
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 CHARACTERISTICS

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	$\theta_{JA}$	62	$^\circ\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	3.3	$^\circ\text{C}/\text{W}$

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.  
2.  $L=670\mu\text{H}$ ,  $I_{AS}=17\text{A}$ ,  $R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$ .  
3.  $I_{SD}\leq 17\text{A}$ ,  $di/dt\leq 200\text{A}/\mu\text{s}$ ,  $V_{DD}\leq BV_{DSS}$ , Starting  $T_J\leq 175^\circ\text{C}$ .

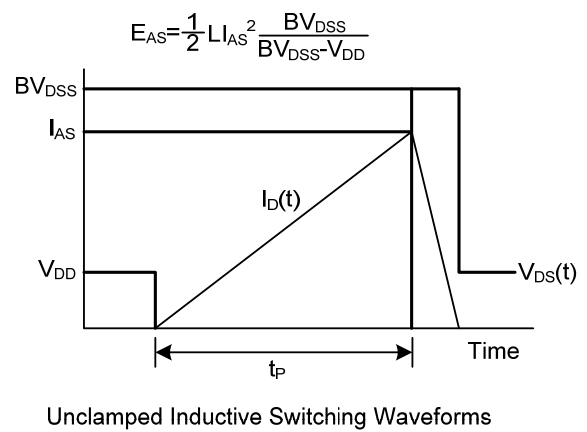
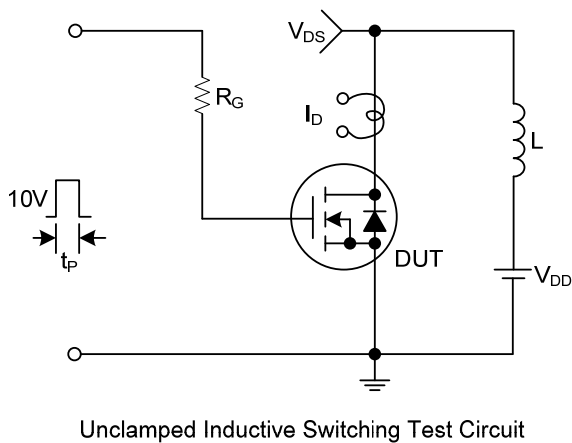
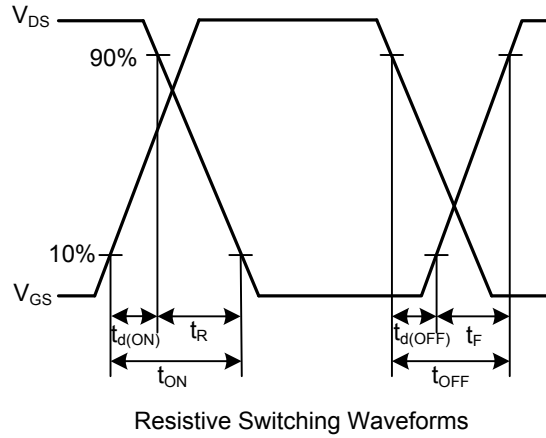
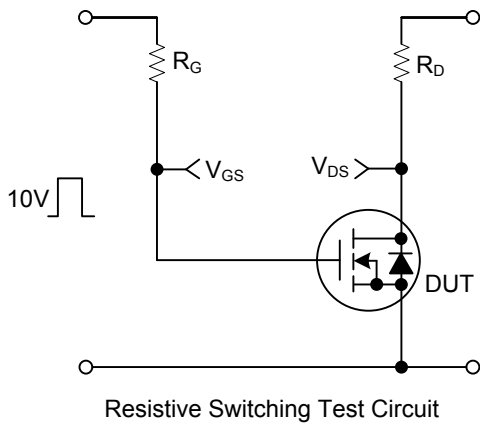
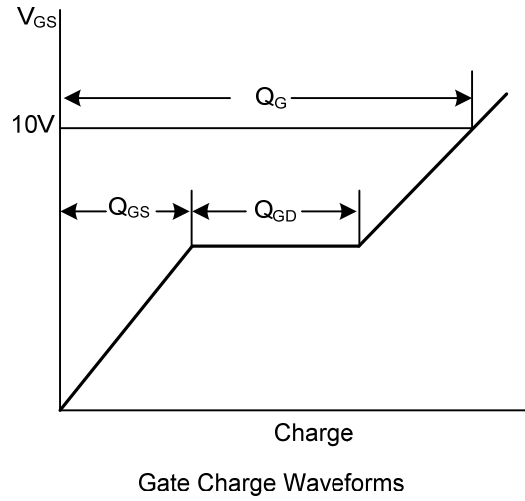
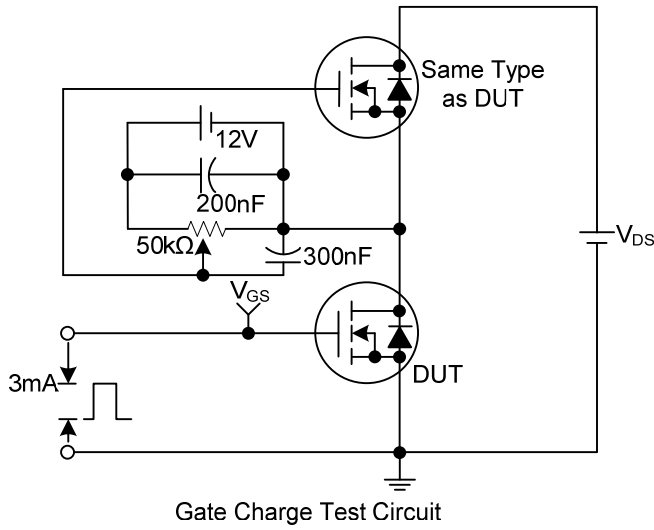
■ ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	60			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$			25	$\mu\text{A}$
Gate-Source Leakage Current	Forward Reverse	$I_{GSS}$			+100	nA
					-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=17\text{A}$			0.042	$\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$		680		pF
Output Capacitance	$C_{OSS}$			220		pF
Reverse Transfer Capacitance	$C_{RSS}$			80		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{GS}=10\text{V}$ , $V_{DS}=48\text{V}$ , $I_D=17\text{A}$ (Note 4)			30	nC
Gate to Source Charge	$Q_{GS}$				6.7	nC
Gate to Drain Charge	$Q_{GD}$				12	nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}$ , $I_D=17\text{A}$ , $R_G=13\Omega$ , $R_D=1.8\Omega$ (Note 2)		5.1		ns
Rise Time	$t_R$			30		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			22		ns
Fall-Time	$t_F$			30		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				28	A
Maximum Body-Diode Pulsed Current (Note 1)	$I_{SM}$				100	A
Drain-Source Diode Forward Voltage (Note 2)	$V_{SD}$	$T_J=25^\circ\text{C}$ , $I_S=17\text{A}$ , $V_{GS}=0\text{V}$			1.3	V
Body Diode Reverse Recovery Time	$t_{RR}$	$T_J=25^\circ\text{C}$ , $I_F=17\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$		63	95	ns
Body Diode Reverse Recovery Charge (Note 2)	$Q_{RR}$			130	200	nC
Forward Turn-On Time	$t_{ON}$	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S+L_D$ )				

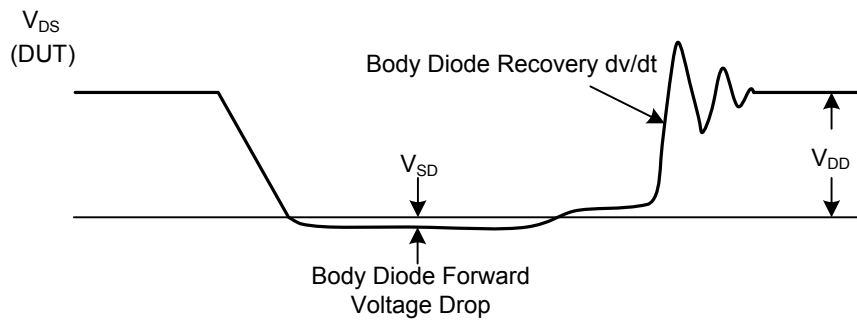
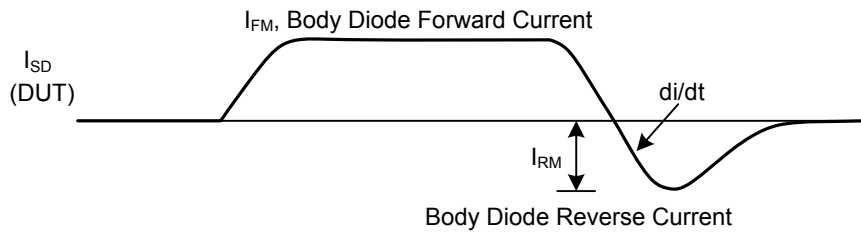
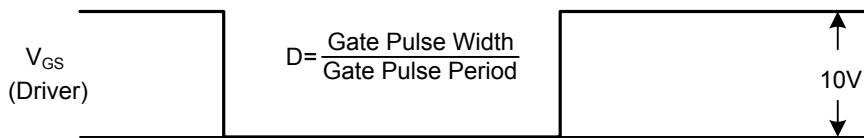
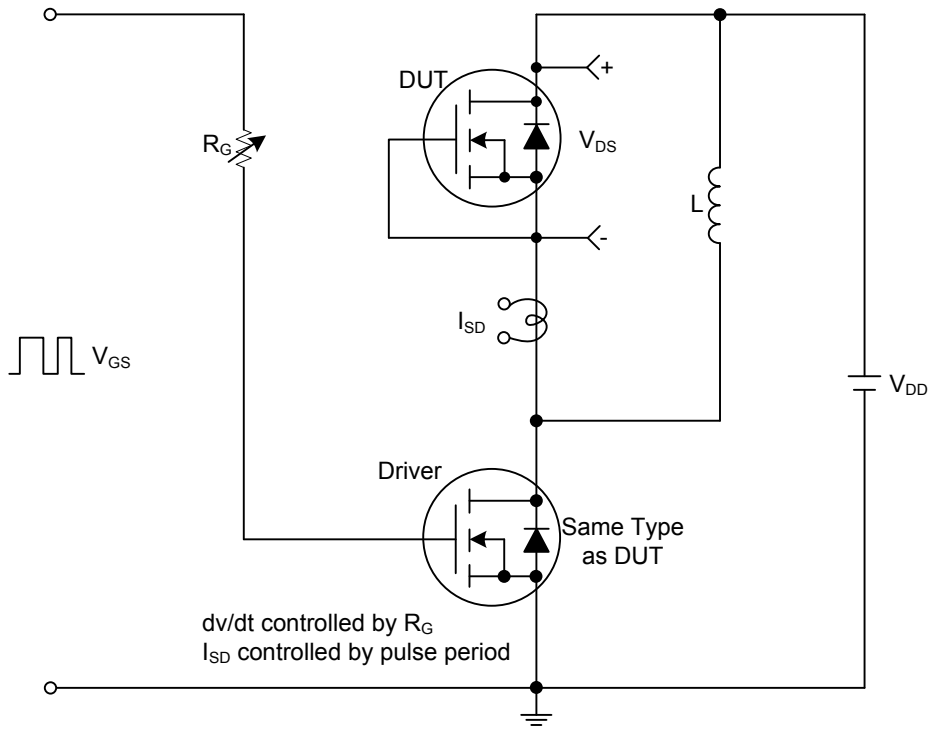
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

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

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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