



## UF9Z34

Preliminary

**POWER MOSFET**

### -17A, -55V P-CHANNEL POWER MOSFET

#### DESCRIPTION

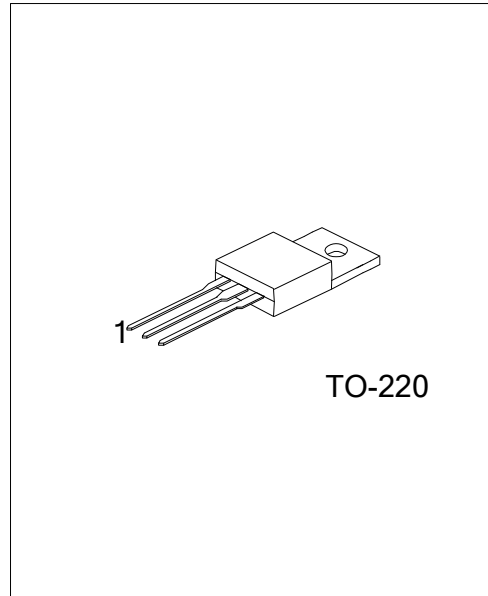
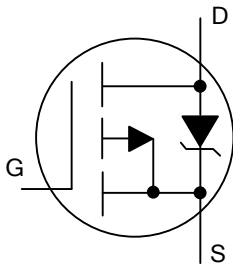
The UTC **UF9Z34** is a P-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

The UTC **UF9Z34** is suitable for all commercial-industrial applications, etc.

#### FEATURES

- \*  $R_{DS(ON)} < 0.1\Omega @ V_{GS} = -10V, I_D = -10A$
- \* High Switching Speed
- \* Dynamic dv/dt Rating

#### SYMBOL



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF9Z34L-TA3-T	UF9Z34G-TA3-T	TO-220	G	D	S	Tube

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

<p>UF9Z34L-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Free</p>	<p>(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free</p>
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### ■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	-55	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Drain Current	Continuous	$I_D$	$V_{GS}=-10V, T_C=25^\circ C$	-17	A
			$V_{GS}=10V, T_C=100^\circ C$	-12	A
	Pulsed (Note 2)		$I_{DM}$	-68	A
Avalanche Current (Note 2)		$I_{AR}$	-10	A	
Avalanche Energy	Single Pulse (Note 3)	$E_{AS}$	180	mJ	
	Repetitive (Note 2)	$E_{AR}$	5.6	mJ	
Peak Diode Recovery dv/dt (Note 4)		dv/dt	-6.7	V/ns	
Power Dissipation ( $T_C=25^\circ C$ )		$P_D$	56	W	
Linear Derating Factor			0.37	W/ $^\circ C$	
Junction Temperature		$T_J$	-55~+150	$^\circ C$	
Storage Temperature Range		$T_{STG}$	-55~+150	$^\circ C$	

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. Starting  $T_J=25^\circ C$ ,  $L=3.6mH$ ,  $R_G=25\Omega$ ,  $I_{AS}=-10A$ .
3.  $I_{SD}\leq -10A$ ,  $di/dt\leq -290A/\mu s$ ,  $V_{DD}\leq BV_{DSS}$ ,  $T_J\leq 150^\circ C$ .
4. Pulse width $\leq 300\mu s$ ; duty cycles $\leq 2\%$ .

### ■ THERMAL RESISTANCE

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62	$^\circ C/W$
Junction to Case	$\theta_{JC}$	2.7	$^\circ C/W$

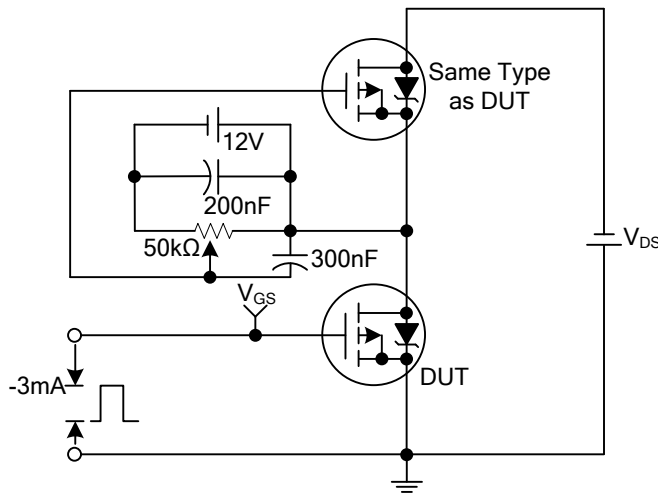
■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

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	-55			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
Drain -Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-55V, V <sub>GS</sub> =0V			-25	μA
		V <sub>DS</sub> =-44V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C			-250	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>						
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A (Note 2)			0.10	Ω
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
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1.0MHz		620		pF
Output Capacitance	C <sub>OSS</sub>			280		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			140		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	I <sub>D</sub> =-10A, V <sub>DS</sub> =-44V, V <sub>GS</sub> =-10V (Note 2)			35	nC
Gate to Source Charge	Q <sub>GS</sub>				7.9	nC
Gate to Drain ("Miller") Charge	Q <sub>GD</sub>				16	nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =-28V, I <sub>D</sub> =-10A, R <sub>G</sub> =13Ω R <sub>D</sub> =2.6Ω (Note 2)		13		ns
Rise Time	t <sub>R</sub>			55		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			30		ns
Fall Time	t <sub>F</sub>			41		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body Diode Continuous Source Current	I <sub>S</sub>				-17	A
Maximum Body-Diode Pulsed Current (Note 1)	I <sub>SM</sub>				-68	A
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	T <sub>J</sub> =25°C, I <sub>S</sub> =-10A, V <sub>GS</sub> =0V (Note 2)			-1.3	V
Body Diode Reverse Recovery Time	t <sub>RR</sub>	T <sub>J</sub> =25°C, I <sub>F</sub> =-10A, di/dt=-100A/μs		54	82	ns
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	(Note 2)		110	160	nC

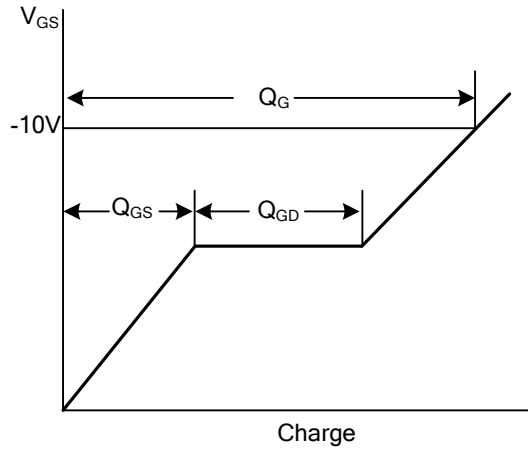
Note: 1. Starting T<sub>J</sub>=25°C, L=3.6mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=-10A

2. Pulse width≤300μs; duty cycle≤2%.

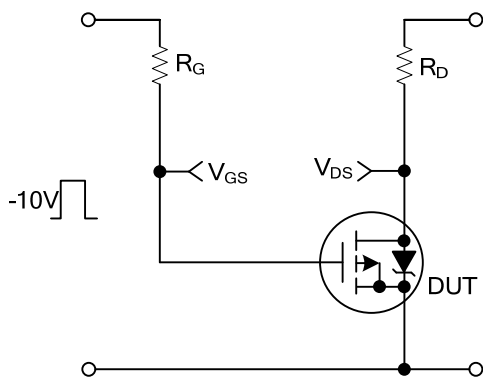
■ TEST CIRCUITS AND WAVEFORMS



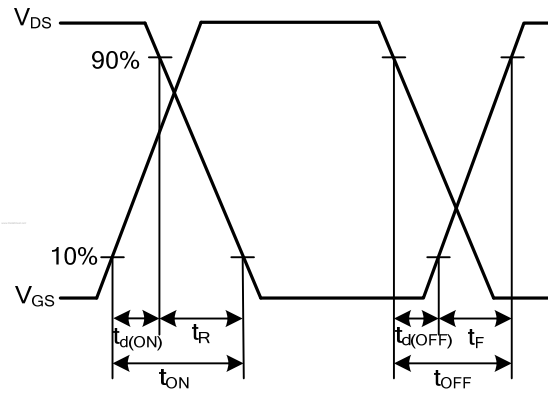
Gate Charge Test Circuit



Gate Charge Waveforms

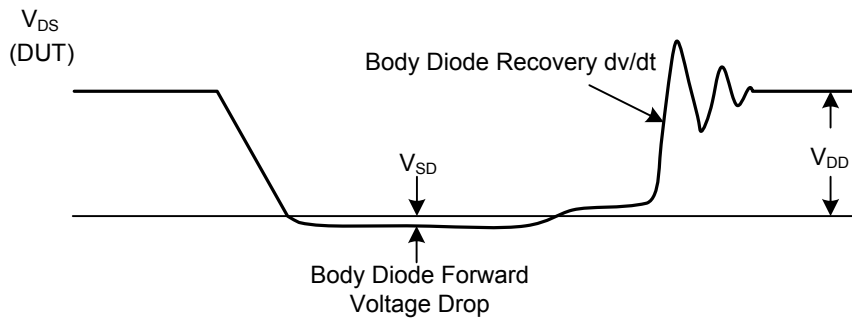
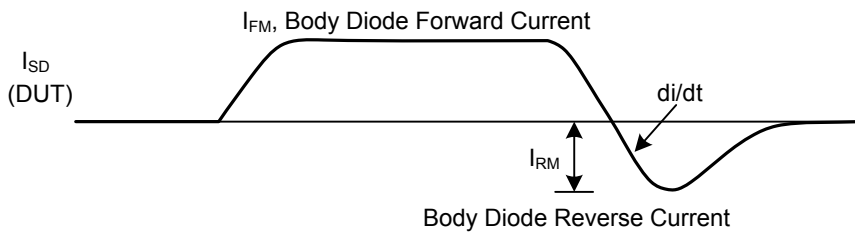
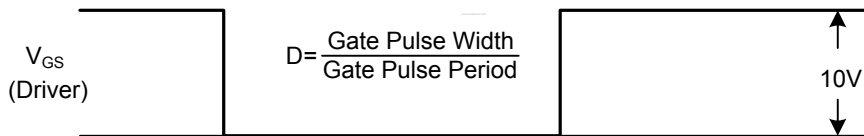
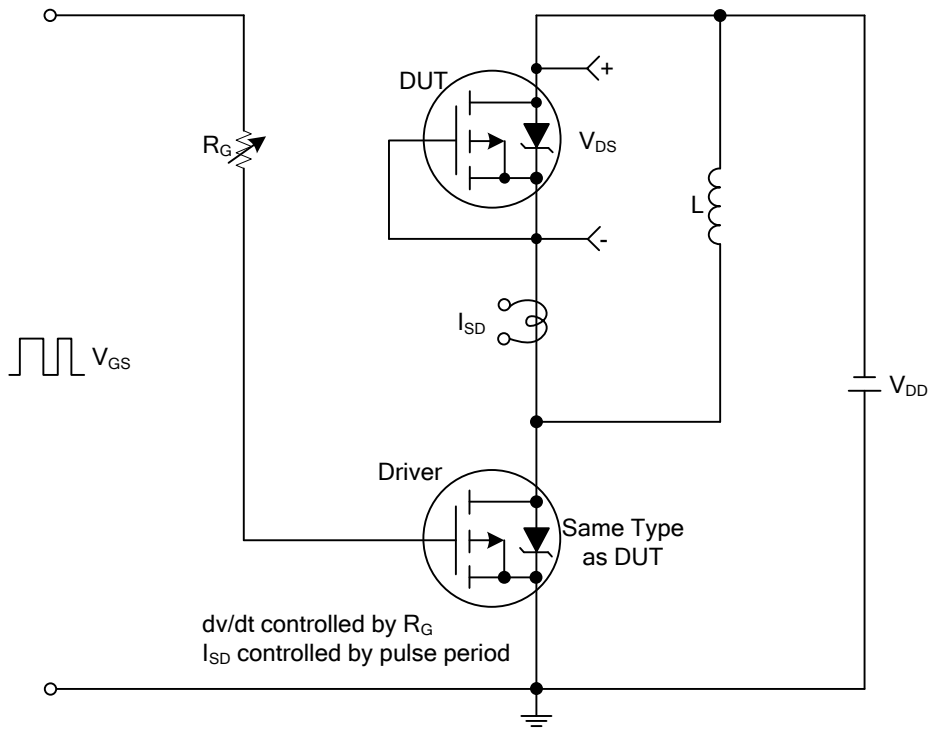


Resistive Switching Test Circuit



Resistive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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