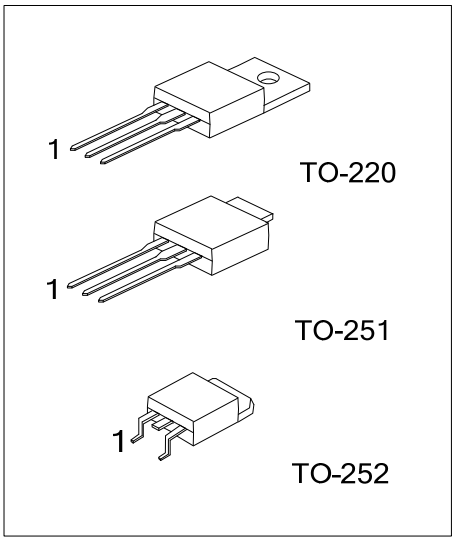
28A, 60V N-CHANNEL POWER MOSFET



■ DESCRIPTION

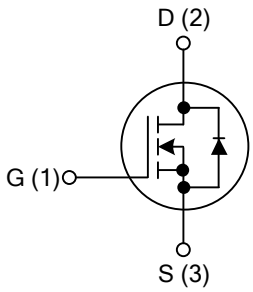
The UTC **UFZ34** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

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

■ FEATURES

* $R_{DS(ON)}$<0.042Ω @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

UFZ34L-TA3-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TM3: TO-251, TN3: TO-252 (3) L: Lead Free, G: Halogen Free

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■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous	T_C=25°C	I_D	28	A
		T_C=100°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		T_C=25°C	P_D	68	W
Linear Derating Factor				0.46	W/°C
Junction Temperature			T_J	-55~+175	°C
Storage Temperature Range			T_{STG}	-55~+175	°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	θ_{JA}	62	°C/W
Junction to Case	θ_{JC}	3.3	°C/W

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. L=670μH, I_{AS}=17A, R_G=25Ω, Starting T_J=25°C.
3. I_{SD}≤17A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_J≤175°C.

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■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=60V, V_{GS}=0V			25	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance (Note 2)		$R_{DS(ON)}$	V_{GS}=10V, I_D=17A			0.042	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		680		pF
Output Capacitance		C_{OSS}			220		pF
Reverse Transfer Capacitance		C_{RSS}			80		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DS}=48V, I_D=17A (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}=30V, I_D=17A, R_G=13Ω, R_D=1.8Ω (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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
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°C, I_S=17A, V_{GS}=0V			1.3	V
Body Diode Reverse Recovery Time		t_{RR}	T_J=25°C, I_F=17A, di/dt=100A/μs		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≤300μs, Duty cycle≤2%.

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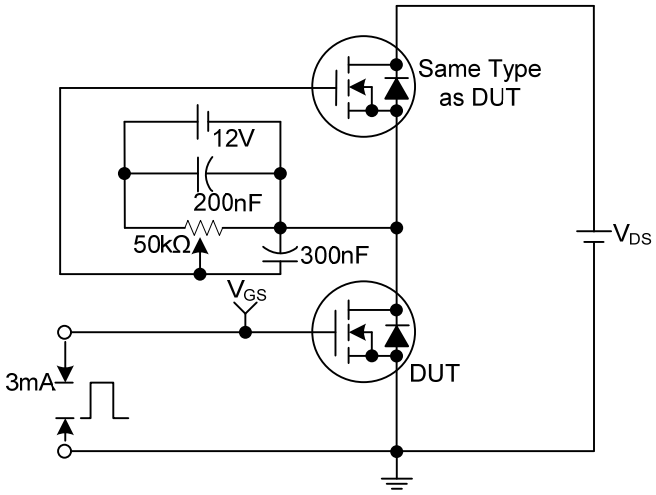
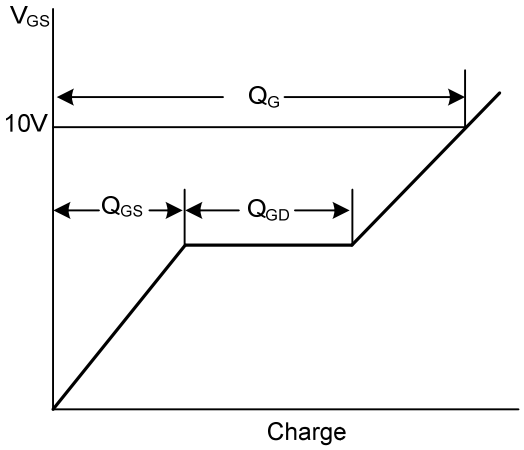
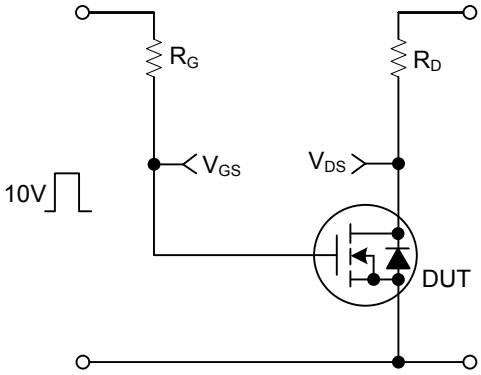
■ TEST CIRCUITS AND WAVEFORMS



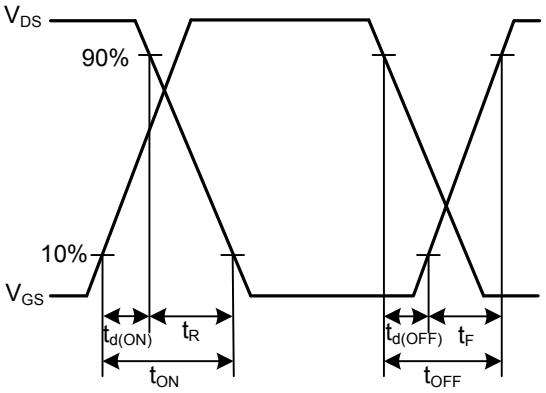
Gate Charge Test Circuit



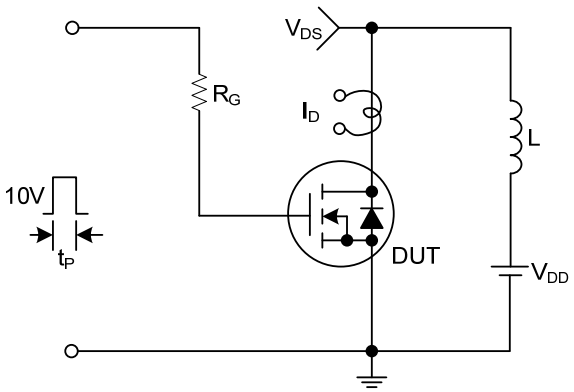
Gate Charge Waveforms



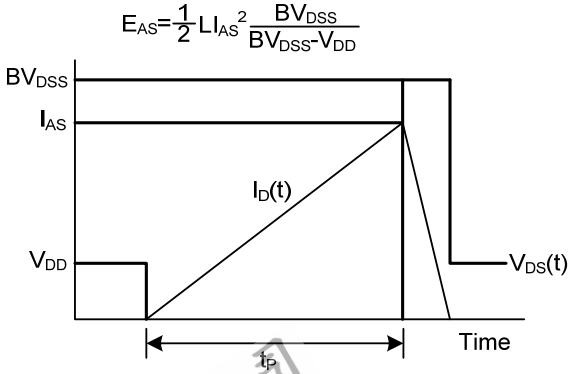
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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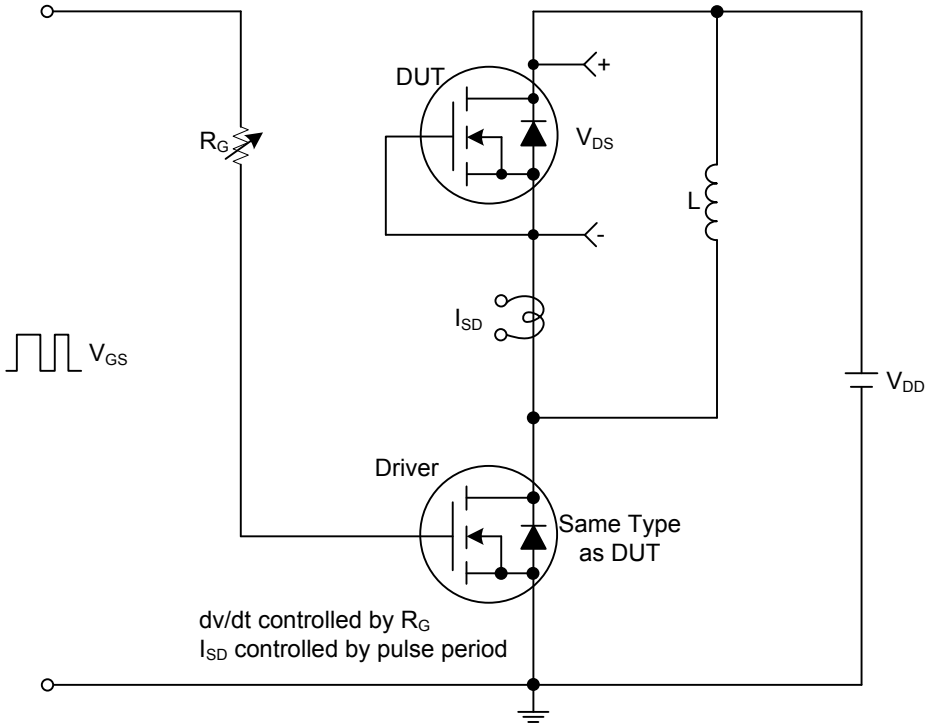
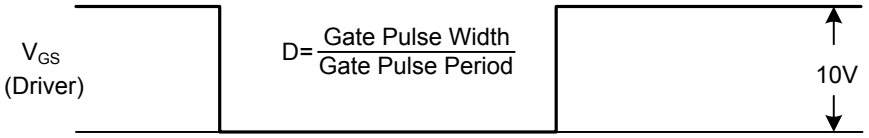
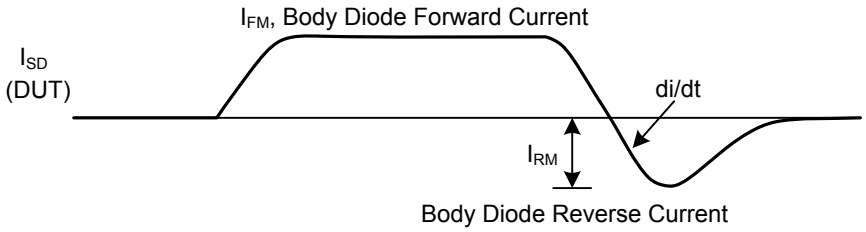
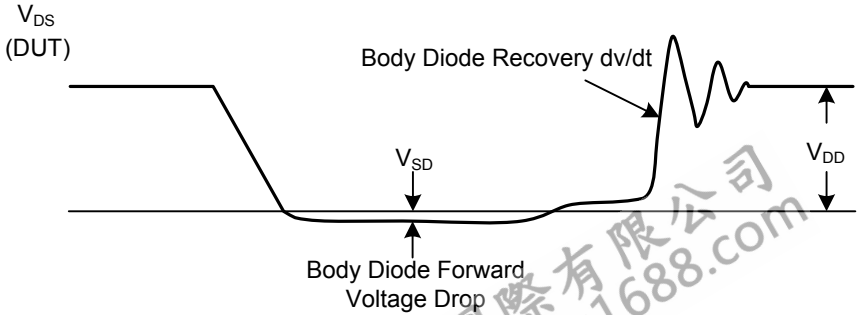
■ TEST CIRCUITS AND WAVEFORMS









Peak Diode Recovery dv/dt Test Circuit and Waveforms

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