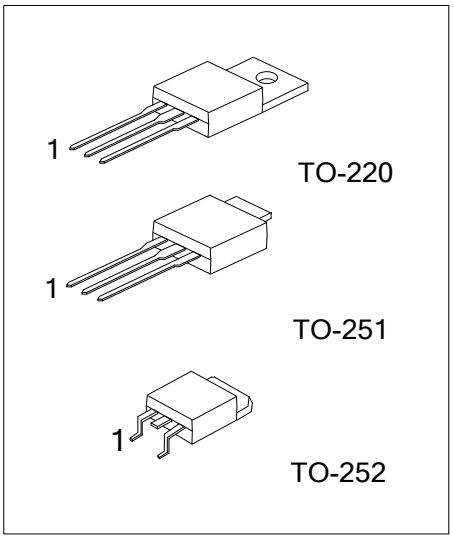
UFZ24N

Power MOSFET

28A, 60V N-CHANNEL POWER MOSFET



■ DESCRIPTION

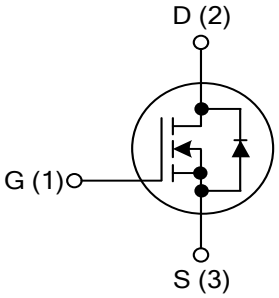
The UTC **UFZ24N** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

The UTC **UFZ24N** is suitable for all commercial-industrial applications, etc.

■ FEATURES

* $R_{DS(ON)}$<0.07Ω @V_{GS}=10V, I_D=10A
* High switching speed
* Low gate charge

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UFZ24NL-TA3-T	UFZ24NG-TA3-T	TO-220	G	D	S	Tube
UFZ24NL-TM3-T	UFZ24NG-TM3-T	TO-251	G	D	S	Tube
UFZ24NL-TN3-T	UFZ24NG-TN3-T	TO-252	G	D	S	Tube
UFZ24NL-TN3-R	UFZ24NG-TN3-R	TO-252	G	D	S	Tape Reel

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

UFZ24NL-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

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	55	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous	T_C=25°C	I_D	17	A
		T_C=100°C		12	A
	Pulsed (Note 1)		I_{DM}	68	A
Avalanche Current (Note 1)			I_{AR}	10	A
Avalanche Energy	Single Pulsed (Note 2)		E_{AS}	71	mJ
	Repetitive (Note 1)		E_{AR}	4.5	mJ
Peak Diode Recovery dv/dt (Note 3)			dv/dt	5.0	V/ns
Power Dissipation (T_C=25°C)	TO-220		P_D	73	W
	TO-251/TO-252			46	W
Linear Derating Factor				0.30	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	TO-220	θ_{JA}	62.5	°C/W
	TO-251/TO-252		100	°C/W
Junction to Case	TO-220	θ_{JC}	1.71	°C/W
	TO-251/TO-252		2.7	°C/W

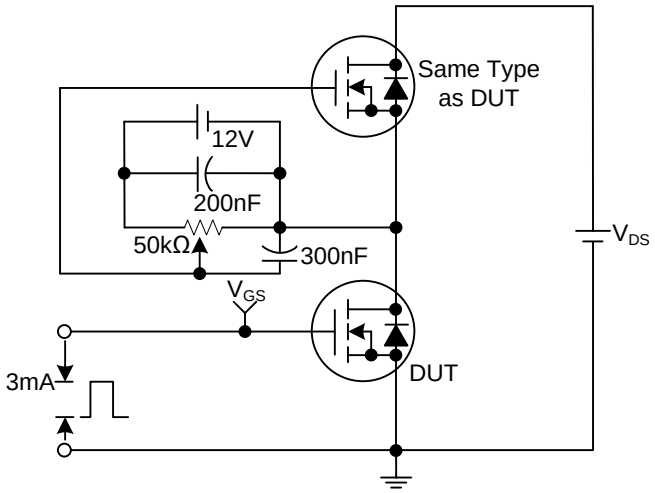
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. L=1.0mH, I_{AS}=10A, V_{DD}=25V, R_G=25Ω, Starting T_J=25°C.
3. I_{SD}≤10A, di/dt≤280A/μs, V_{DD}≤BV_{DSS}, Starting T_J≤175°C.

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

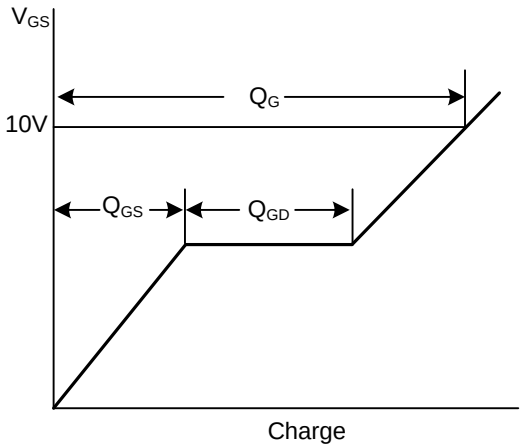
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	55			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=55V, V_{GS}=0V			25	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		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=10A			0.07	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		370		pF
Output Capacitance		C_{OSS}			140		pF
Reverse Transfer Capacitance		C_{RSS}			65		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DS}=44V, I_D=10A (Note 4)			20	nC
Gate to Source Charge		Q_{GS}				5.3	nC
Gate to Drain Charge		Q_{GD}				7.6	nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=28V, I_D=10A, R_G=24Ω, R_D=2.6 Ω (Note 4)		4.9		ns
Rise Time		t_R			34		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			19		ns
Fall-Time		t_F			27		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				17	A
Maximum Body-Diode Pulsed Current (Note 1)		I_{SM}				68	A
Drain-Source Diode Forward Voltage (Note 2)		V_{SD}	T_J=25°C, I_S=10A, V_{GS}=0V			1.3	V
Body Diode Reverse Recovery Time		t_{RR}	I_F=10A, T_J=25°C, di/dt=100A/μs		56	83	ns
Body Diode Reverse Recovery Charge (Note 2)		Q_{RR}			120	180	nC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse width≤300μs, Duty cycle≤2%.

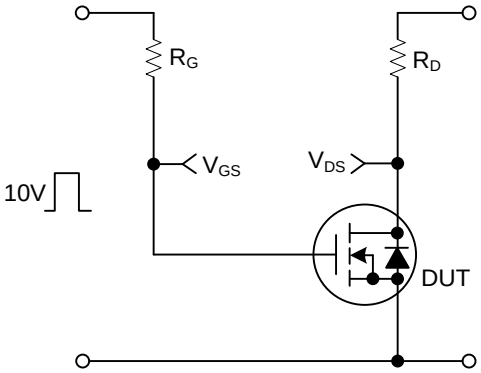
■ TEST CIRCUITS AND WAVEFORMS



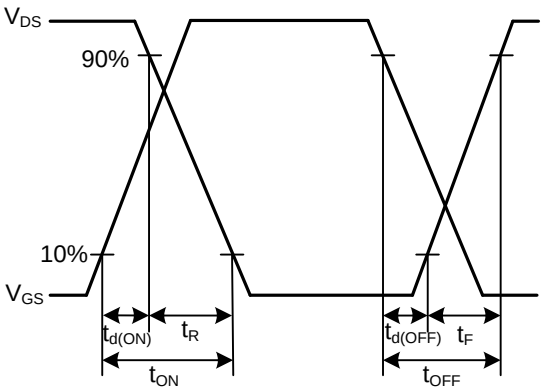
Gate Charge Test Circuit



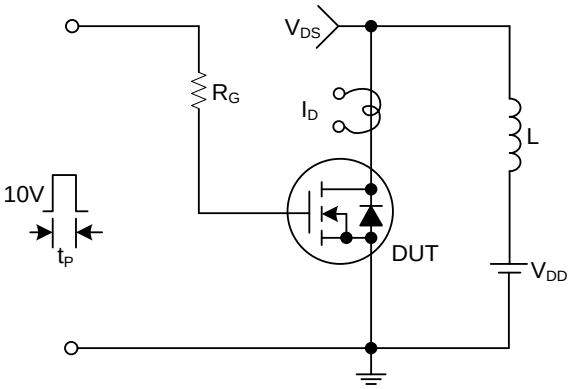
Gate Charge Waveforms



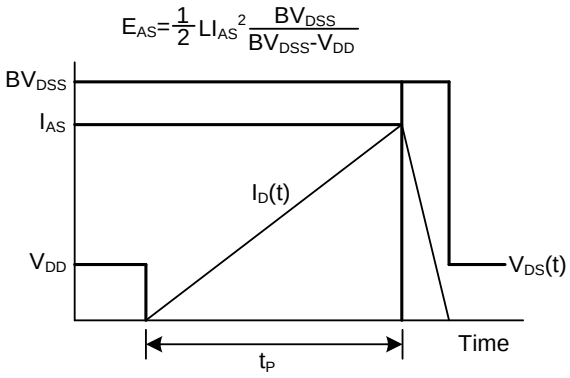
Resistive Switching Test Circuit



Resistive Switching Waveforms

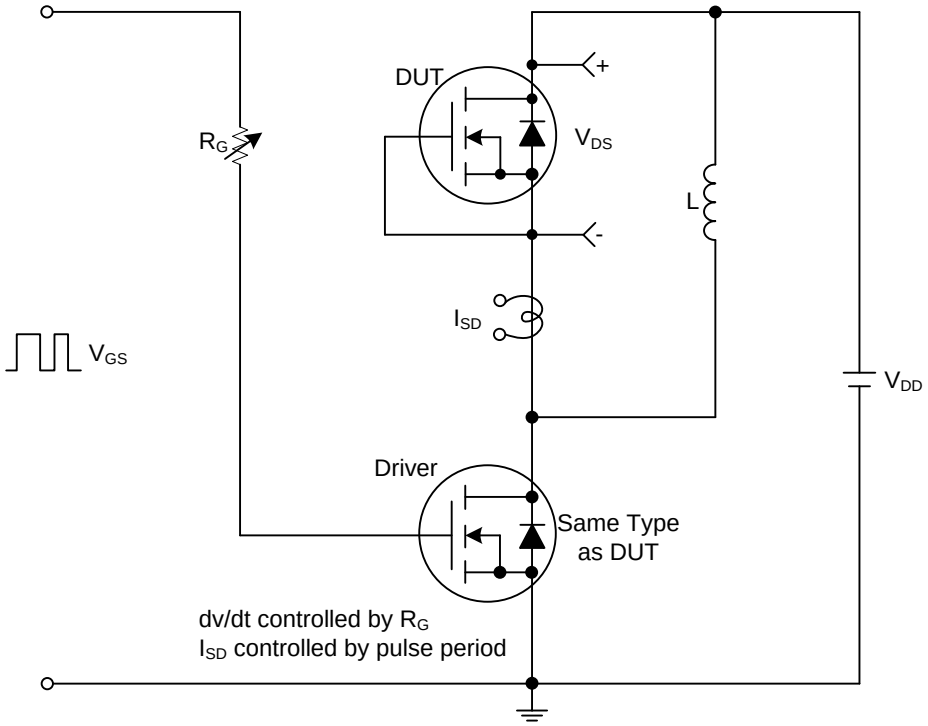


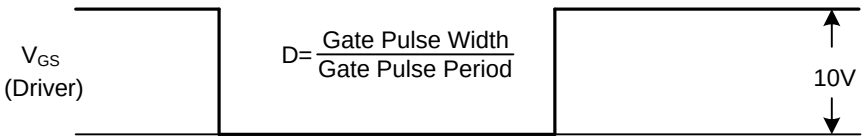
Unclamped Inductive Switching Test Circuit

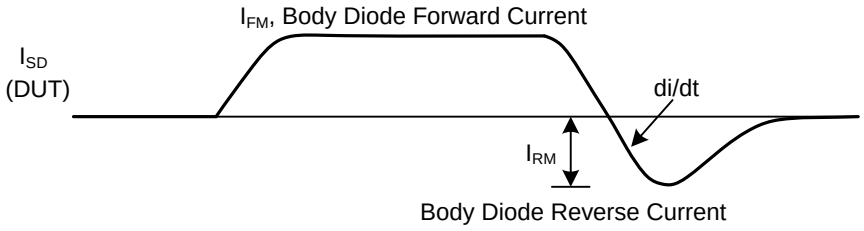


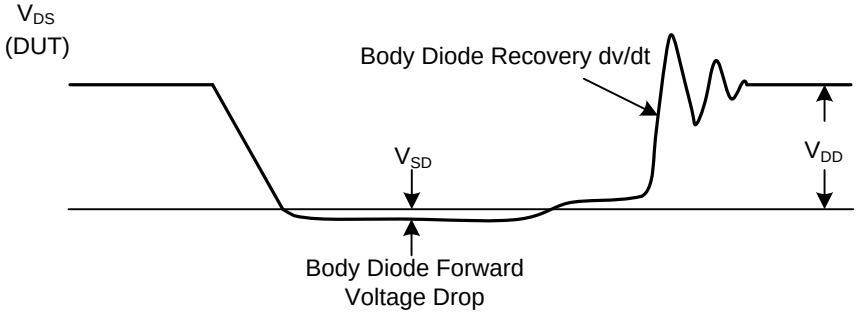
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)





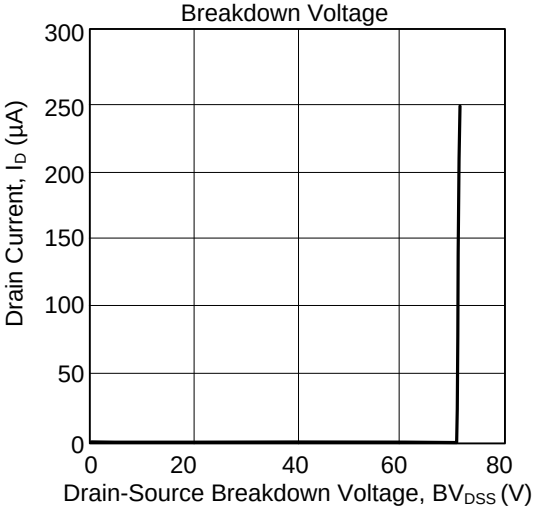




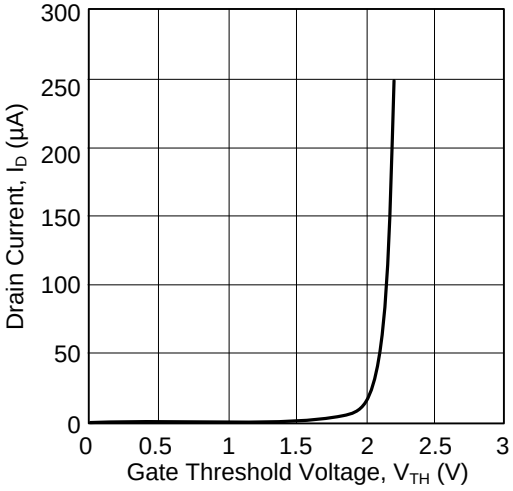
Peak Diode Recovery dv/dt Test Circuit and Waveforms

■ TYPICAL CHARACTERISTICS

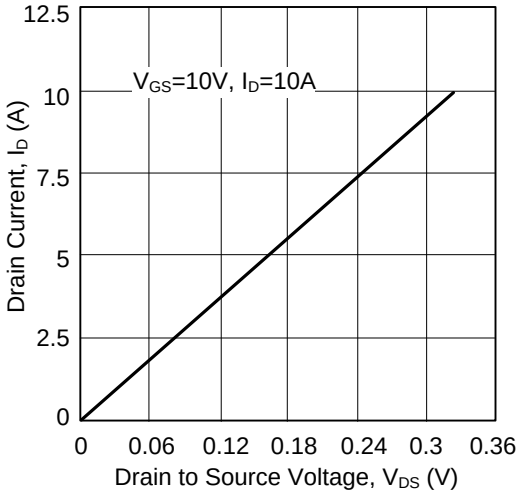
Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics



Drain Current vs. Source to Drain Voltage