



UFZ24N

Power MOSFET

28A, 60V N-CHANNEL POWER MOSFET

DESCRIPTION

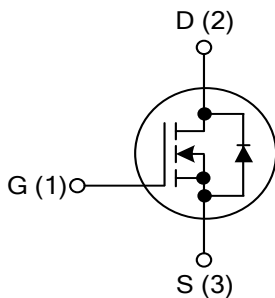
The UTC **UFZ24N** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

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

FEATURES

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

SYMBOL

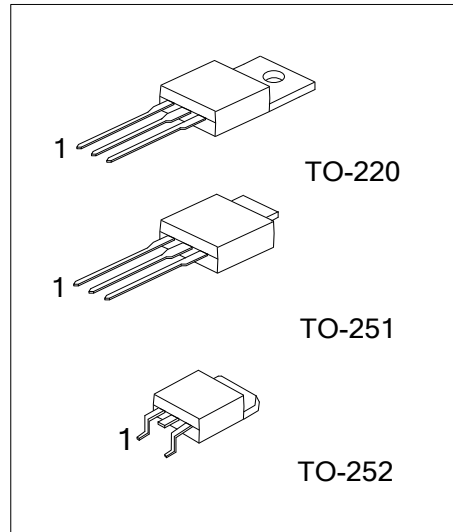


ORDERING INFORMATION

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

<p>UFZ24NL-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>
---	--



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V_{DSS}	55	V	
Gate-Source Voltage		V_{GSS}	± 20	V	
Drain Current	Continuous	I_D	$T_C=25^\circ\text{C}$	17	A
			$T_C=100^\circ\text{C}$	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 ($T_C=25^\circ\text{C}$)	TO-220	P_D	73	W	
	TO-251/TO-252		46	W	
Linear Derating Factor			0.30	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	TO-220	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-251/TO-252		100	$^\circ\text{C/W}$
Junction to Case	TO-220	θ_{JC}	1.71	$^\circ\text{C/W}$
	TO-251/TO-252		2.7	$^\circ\text{C/W}$

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 2. $L=1.0\text{mH}$, $I_{AS}=10\text{A}$, $V_{DD}=25\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.
 3. $I_{SD}\leq 10\text{A}$, $di/dt\leq 280\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J\leq 175^\circ\text{C}$.

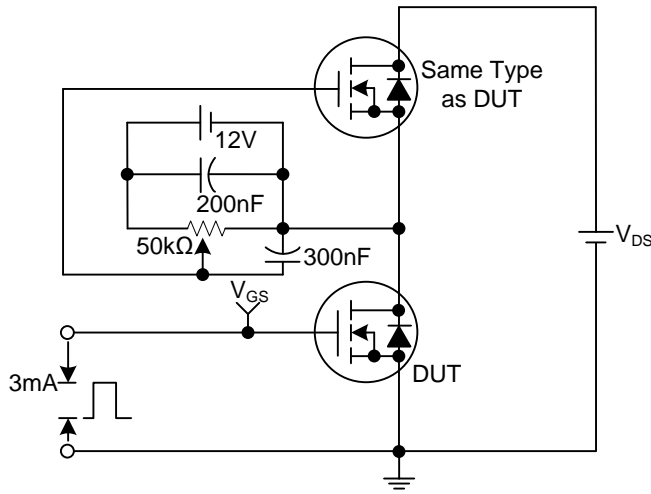
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

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	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse				-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

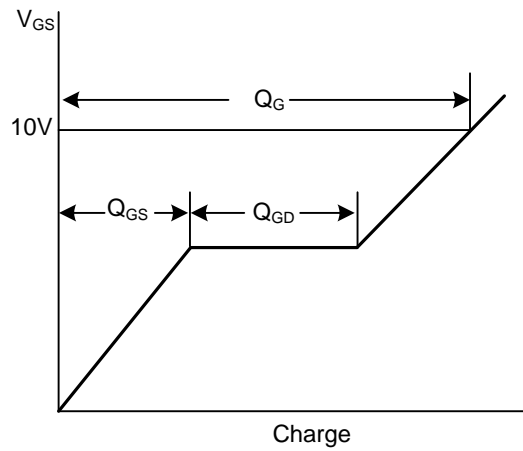
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Pulse Test: Pulse width≤300μs, Duty cycle≤2%.

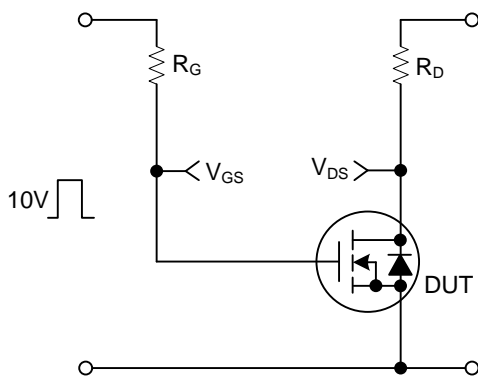
TEST CIRCUITS AND WAVEFORMS



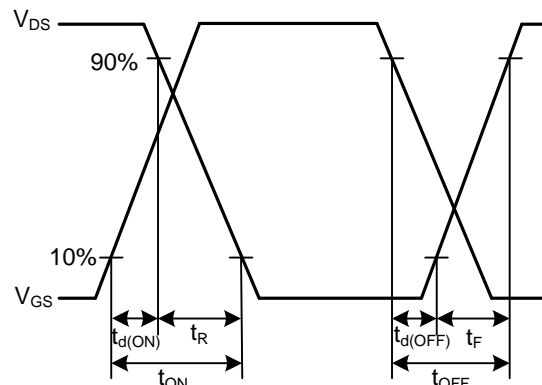
Gate Charge Test Circuit



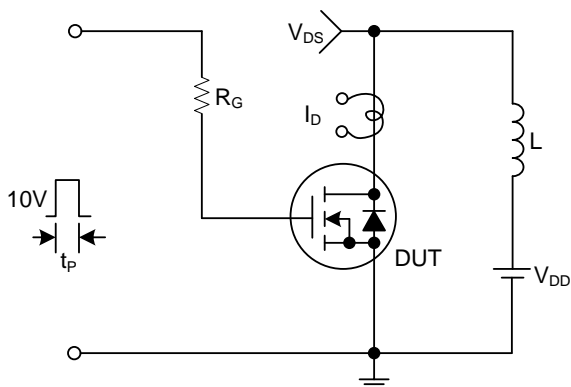
Gate Charge Waveforms



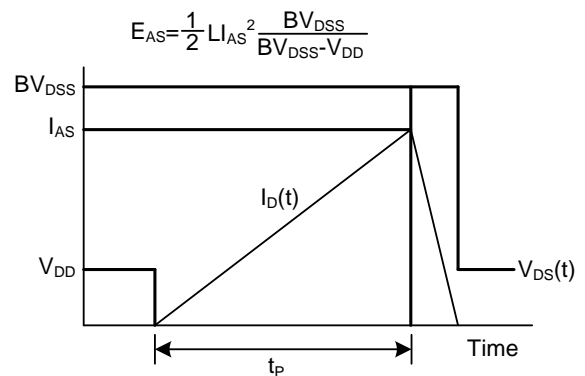
Resistive Switching Test Circuit



Resistive Switching Waveforms

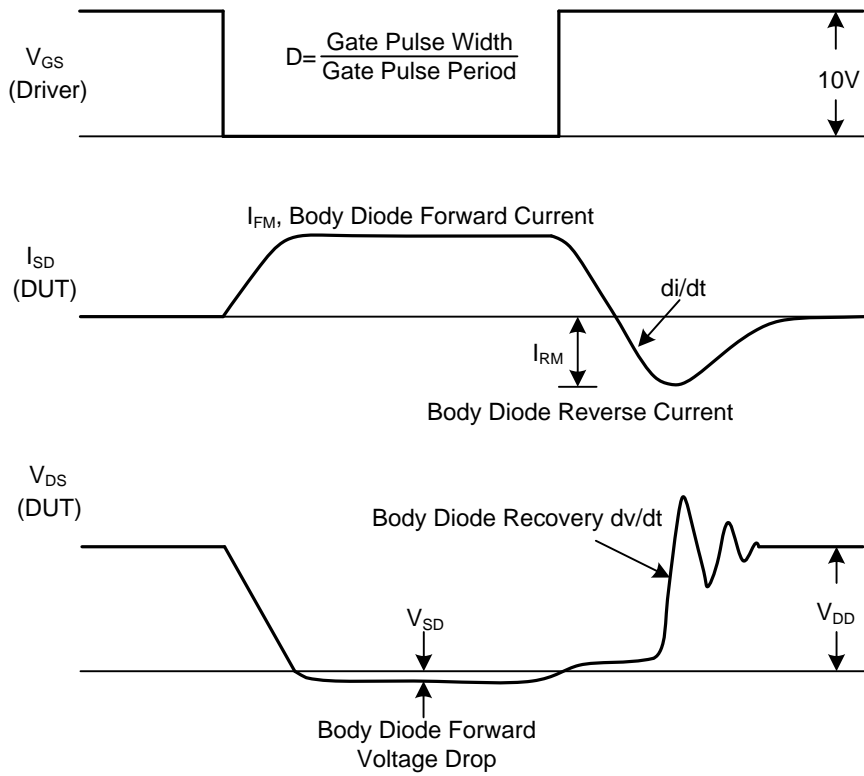
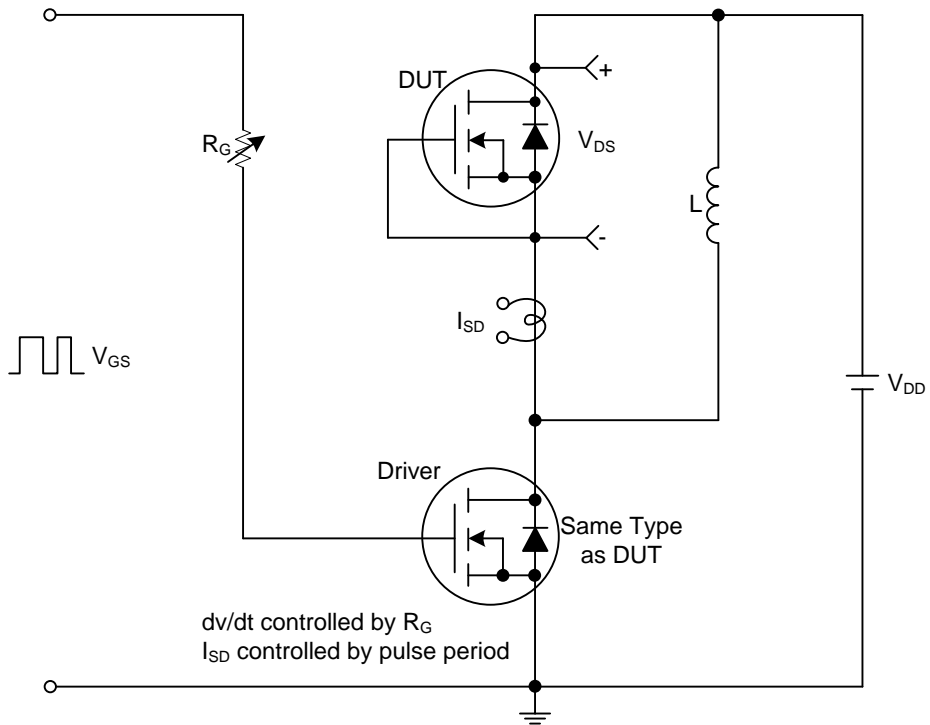


Unclamped Inductive Switching Test Circuit



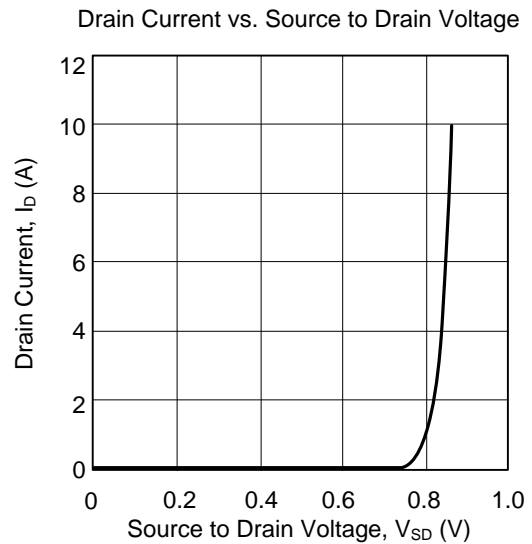
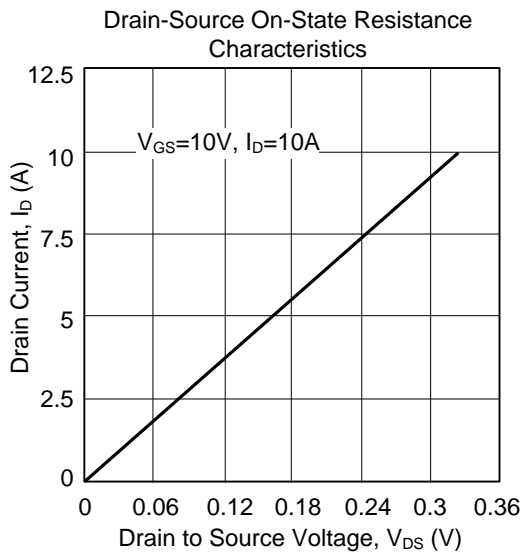
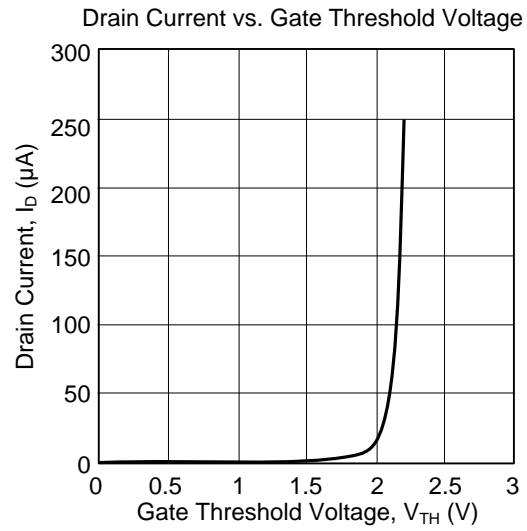
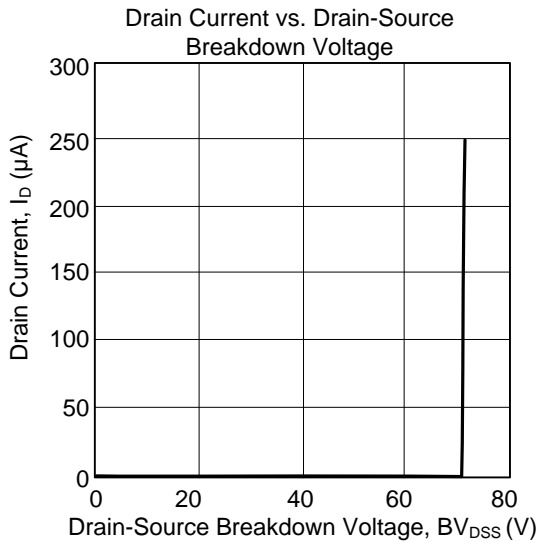
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

TYPICAL CHARACTERISTICS



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.