



UFZ24N

Power MOSFET

28A, 60V N-CHANNEL POWER MOSFET

DESCRIPTION

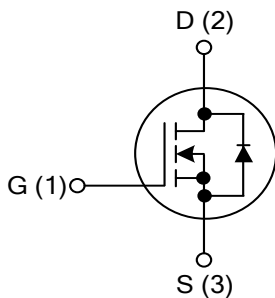
The UTC **UFZ24N** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, high switching speed and low gate charge.

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

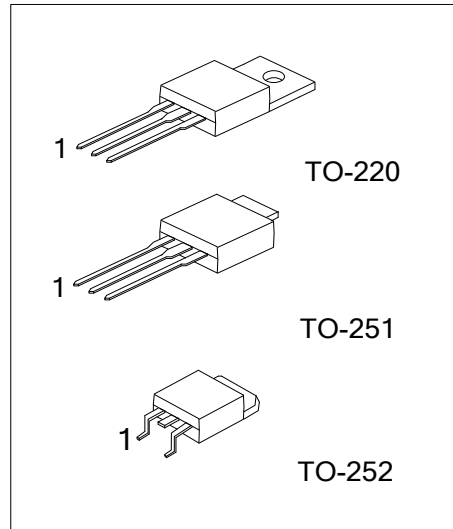


ORDERING INFORMATION

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>
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■ 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/°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. $L=1.0\text{mH}$, $I_{AS}=10\text{A}$, $V_{DD}=25\text{V}$, $R_G=25\Omega$, 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 $T_J\leq 175^\circ\text{C}$.

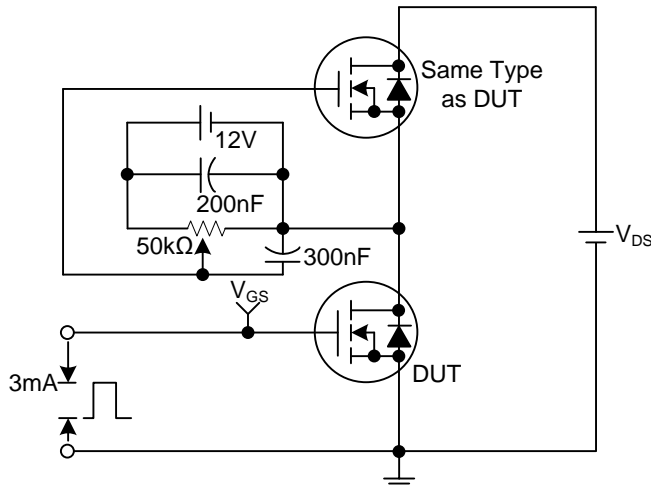
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

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

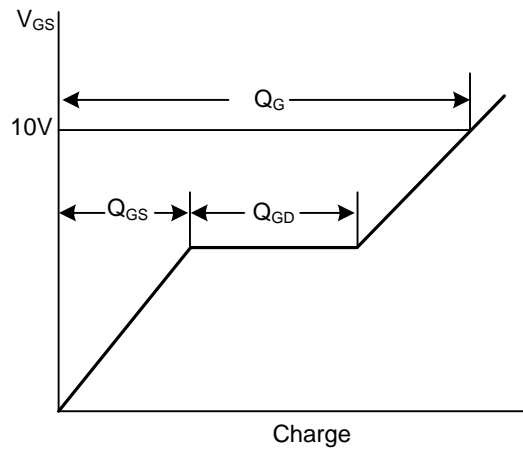
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

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

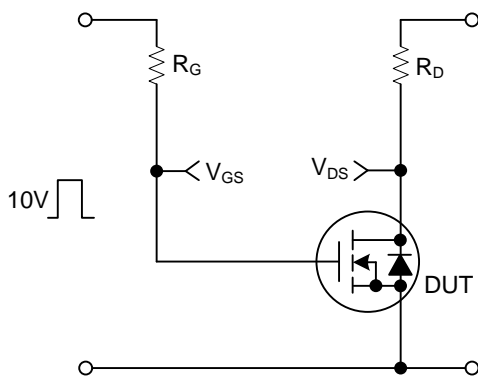
TEST CIRCUITS AND WAVEFORMS



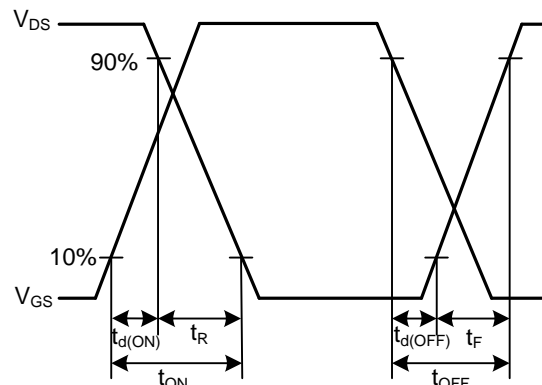
Gate Charge Test Circuit



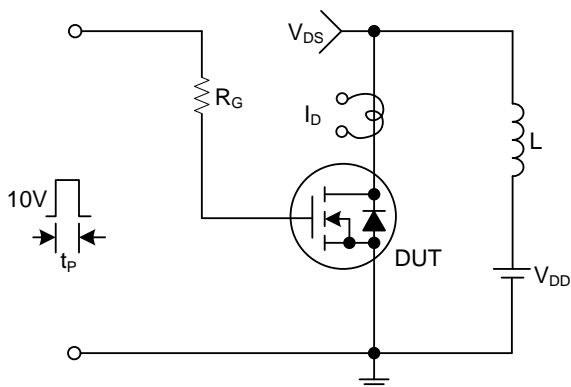
Gate Charge Waveforms



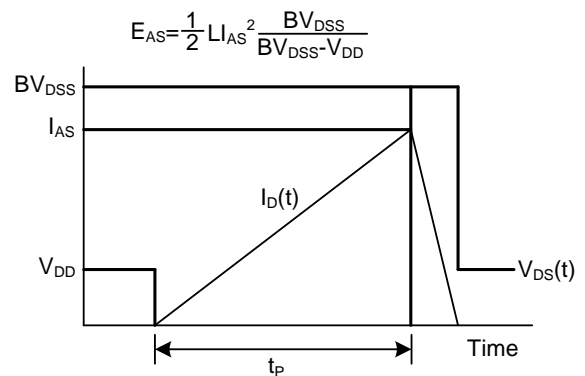
Resistive Switching Test Circuit



Resistive Switching Waveforms

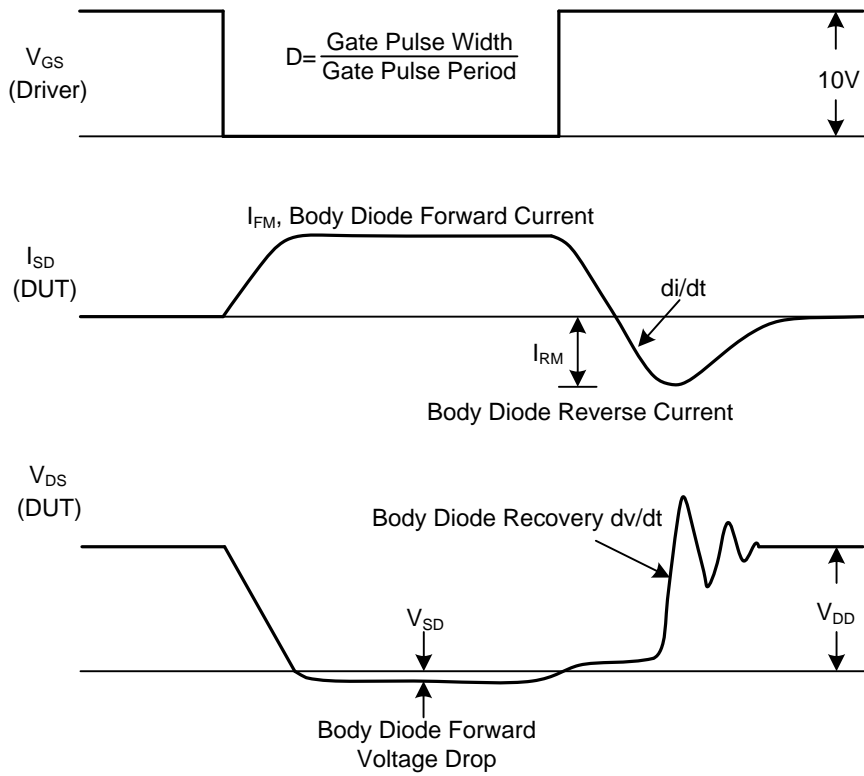
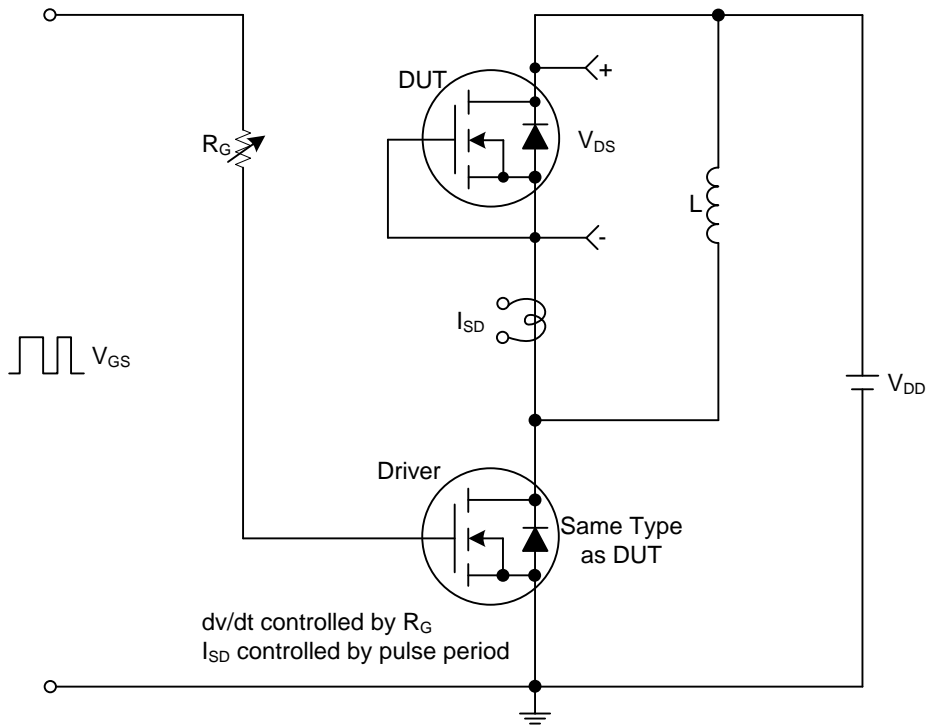


Unclamped Inductive Switching Test Circuit



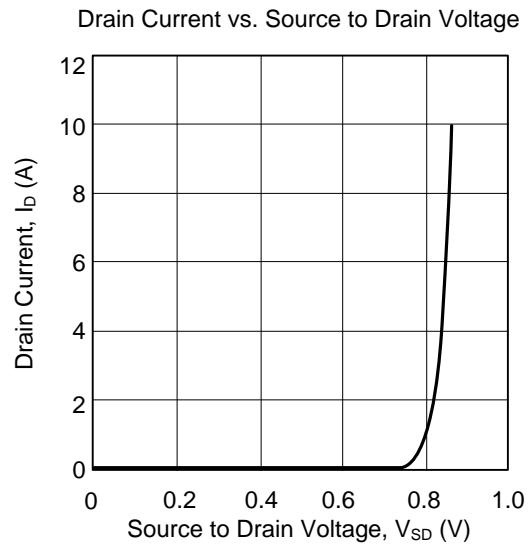
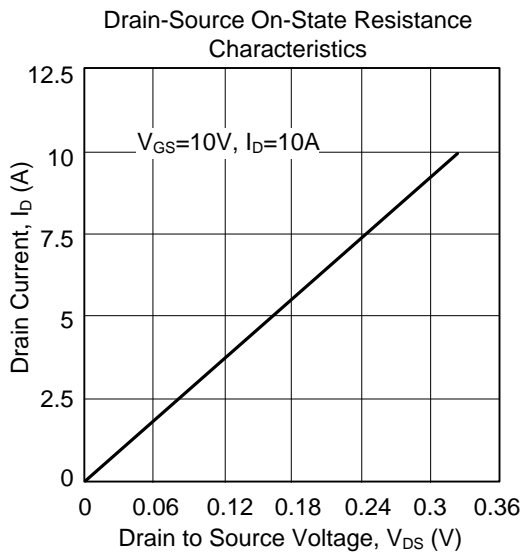
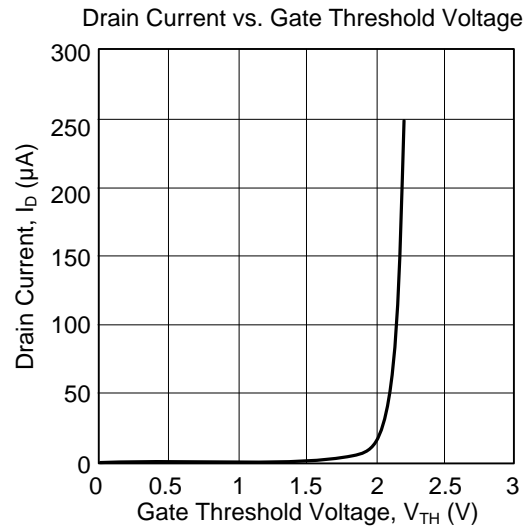
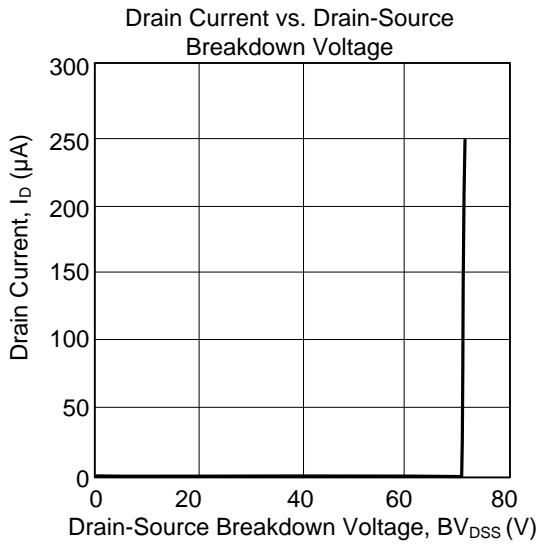
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

■ TYPICAL CHARACTERISTICS



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