



## UFZ24N

Power MOSFET

### 17A, 60V N-CHANNEL POWER MOSFET

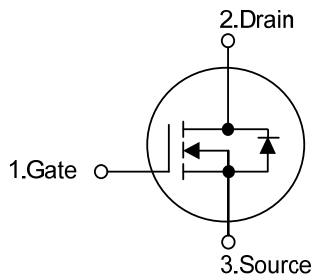
#### DESCRIPTION

The UTC **UFZ24N** is N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance and superior switching performance. The UTC **UFZ24N** is suitable for high efficiency synchronous rectification in SMPS, primary side switch and telecom bricks.

#### FEATURES

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

#### SYMBOL

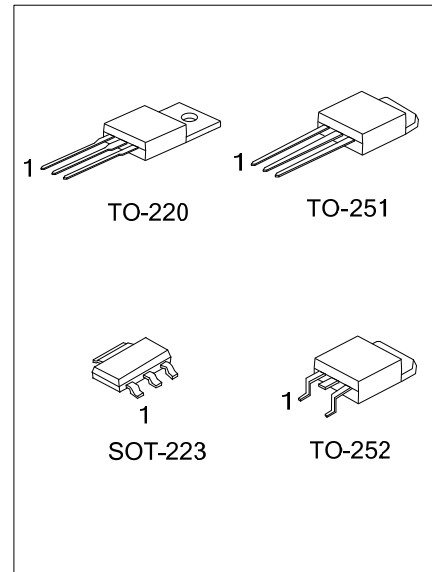


#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UFZ24NL-AA3-R	UFZ24NG-AA3-R	SOT-223	G	D	S	Tape Reel
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

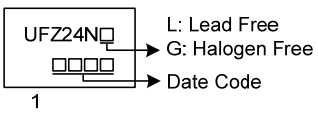
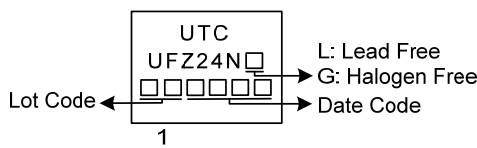
<p>UFZ24NG-AA3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) AA3: SOT-223, TA3: TO-220, TM3: TO-251, TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
--	--



# UFZ24N

Power MOSFET

## MARKING

SOT-223	TO-220 / TO-251 / TO-252
 <p>UFZ24N□ □□□□ 1</p> <p>L: Lead Free G: Halogen Free Date Code</p>	 <p>UTC UFZ24N□ □□□□□□ 1</p> <p>Lot Code ← L: Lead Free G: Halogen Free Date Code</p>

FLYING 汎翔國際有限公司  
www.flying1688.com

■ ABSOLUTE MAXIMUM RATINGS ( $T_C=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	55	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	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 ( $T_C=25^\circ\text{C}$ )	SOT-223	$P_D$	10	W	
	TO-220		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	$^\circ\text{C}$	

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. Repetitive Rating : Pulse width limited by  $T_J$ .

3.  $L=1.0\text{mH}$ ,  $I_{AS}=10\text{A}$ ,  $V_{DD}=25\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$ .

4.  $I_{SD}\leq 10\text{A}$ ,  $di/dt\leq 280\text{A}/\mu\text{s}$ ,  $V_{DD}\leq BV_{DSS}$ , Starting  $T_J\leq 175^\circ\text{C}$ .

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-223	$\theta_{JA}$	150	$^\circ\text{C}/\text{W}$
	TO-220		62.5	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		100	$^\circ\text{C}/\text{W}$
Junction to Case	SOT-223	$\theta_{JC}$	12.5	$^\circ\text{C}/\text{W}$
	TO-220		1.71	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		2.7	$^\circ\text{C}/\text{W}$

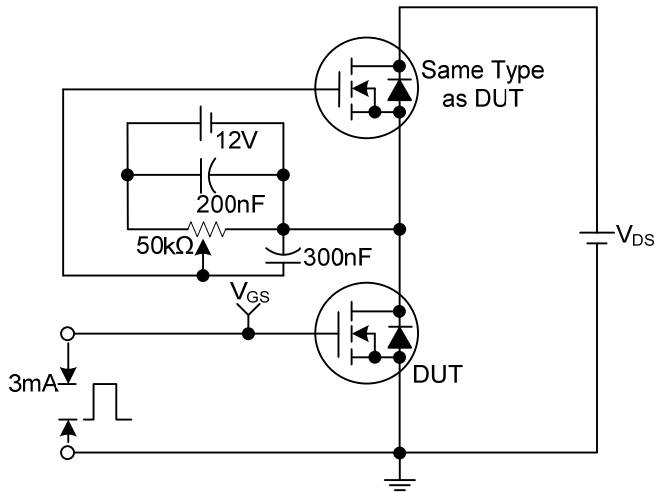
■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	55			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =55V, V <sub>GS</sub> =0V			25	μA
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>			+100	nA
	Reverse				-100	nA
<b>ON CHARACTERISTICS</b>						
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
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A			0.07	Ω
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		800		pF
Output Capacitance	C <sub>OSS</sub>			160		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			23		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	Q <sub>G</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =1.3A, I <sub>G</sub> =100μA (Note 1, 2)		65		nC
Gate to Source Charge	Q <sub>GS</sub>			4		nC
Gate to Drain Charge	Q <sub>GD</sub>			7		nC
Turn-ON Delay Time (Note 1)	t <sub>D(ON)</sub>	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =0.5A, R <sub>G</sub> =25Ω (Note 1, 2)		40		ns
Rise Time	t <sub>R</sub>			40		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			250		ns
Fall-Time	t <sub>F</sub>			70		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	I <sub>S</sub>				17	A
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				68	A
Drain-Source Diode Forward Voltage (Note 1)	V <sub>SD</sub>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V			1.3	V
Reverse Recovery Time (Note 1)	t <sub>rr</sub>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V, dI <sub>F</sub> /dt =100A/μs		56	83	ns
Reverse Recovery Charge	Q <sub>rr</sub>			120	180	nC

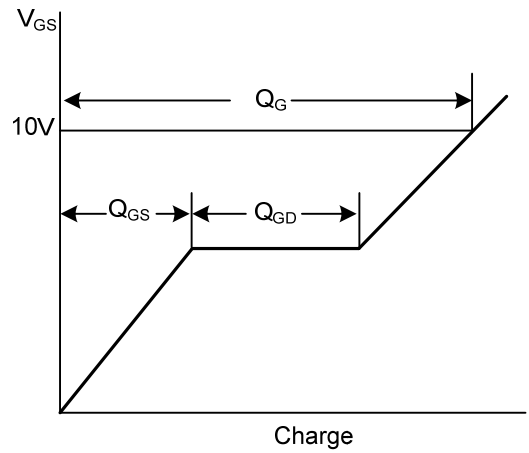
Note: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

2. Essentially independent of operating temperature.

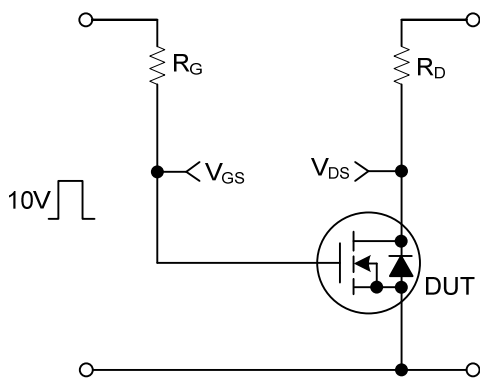
## TEST CIRCUITS AND WAVEFORMS



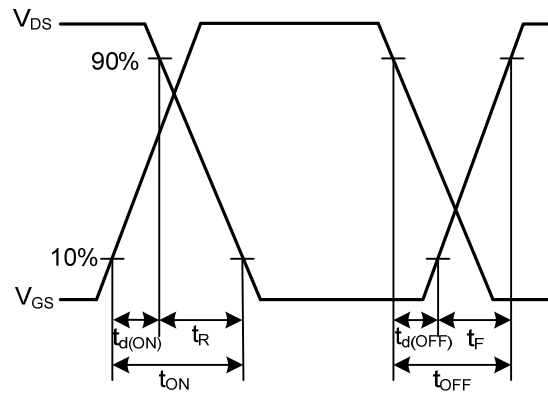
Gate Charge Test Circuit



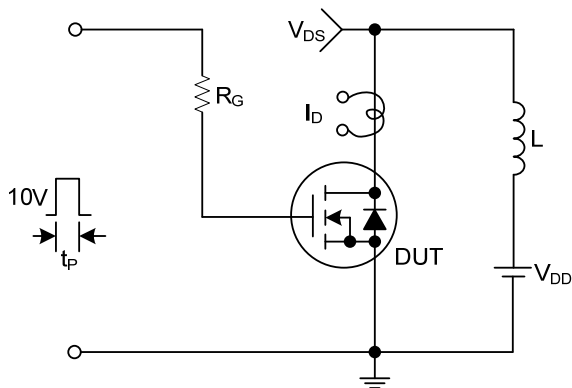
Gate Charge Waveforms



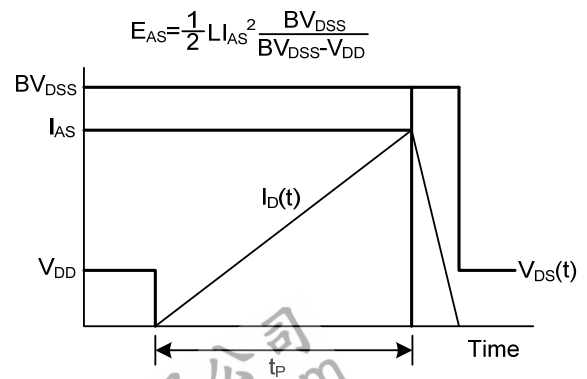
Resistive Switching Test Circuit



Resistive Switching Waveforms

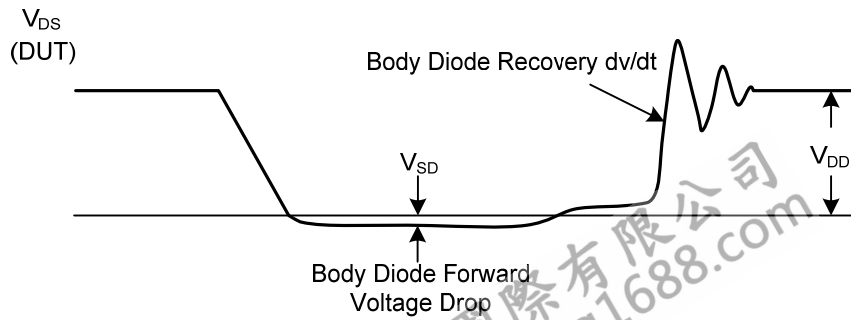
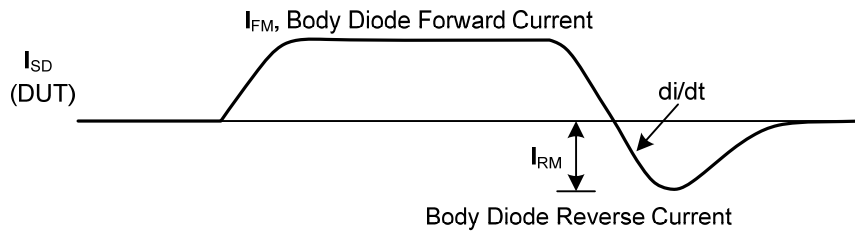
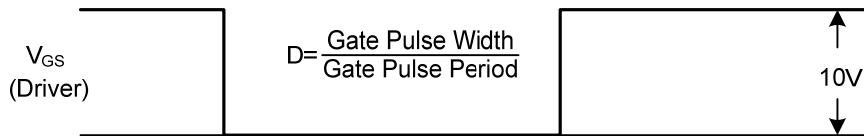
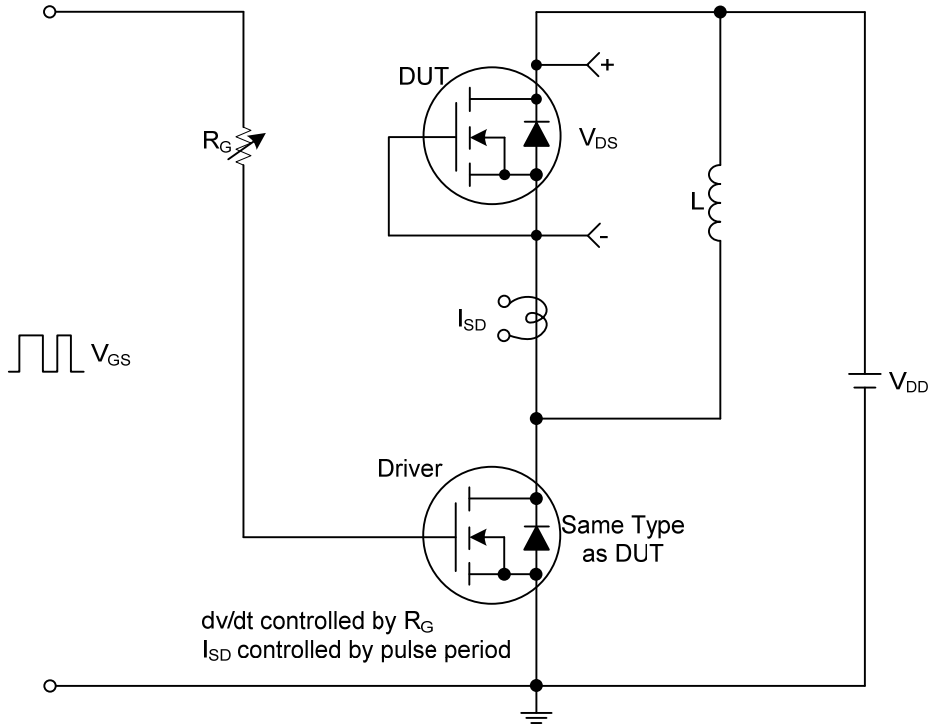


Unclamped Inductive Switching Test Circuit

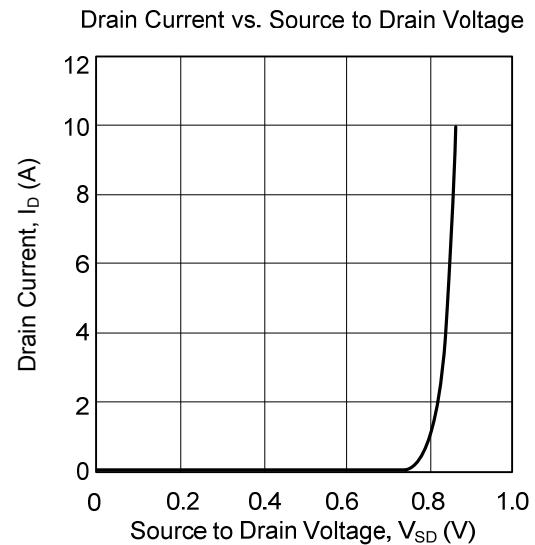
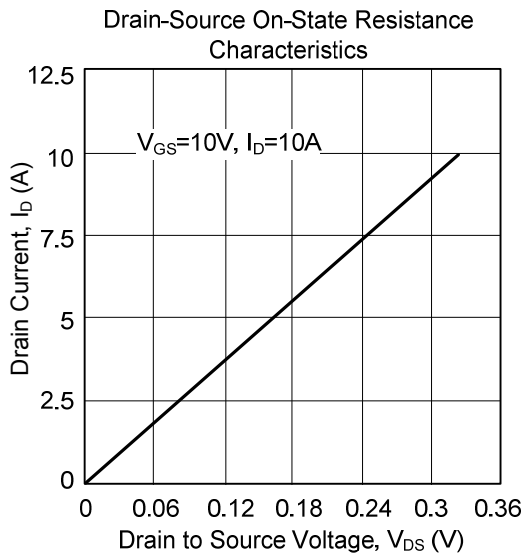
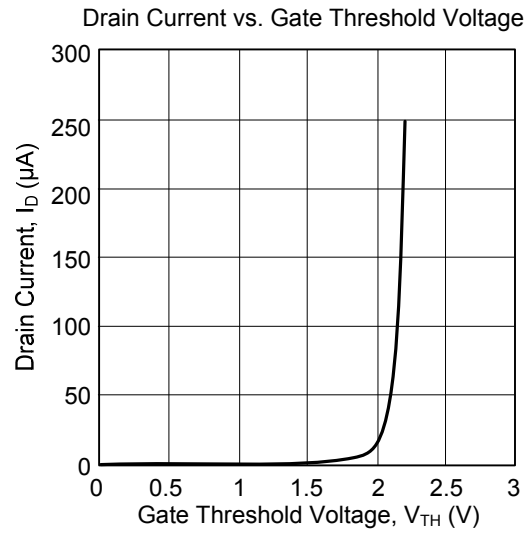
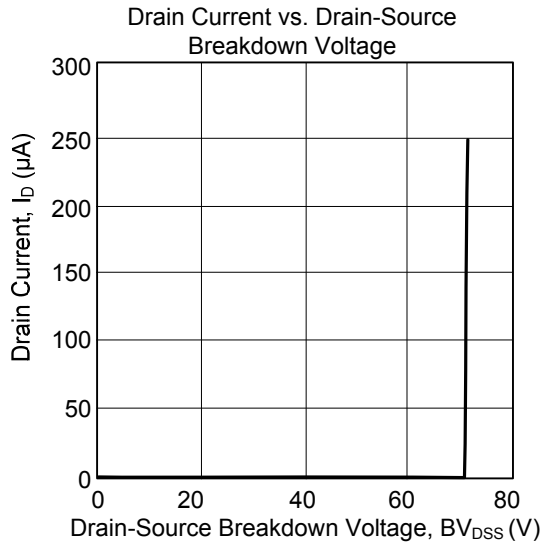


Unclamped Inductive Switching Waveforms

## TEST CIRCUITS AND WAVEFORMS (Cont.)



### 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. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.