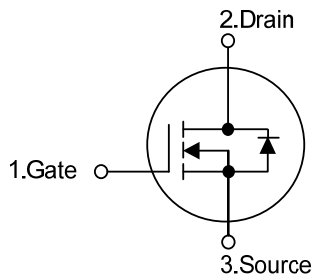


**UFZ24N****Power MOSFET****17A, 60V N-CHANNEL
POWER MOSFET****DESCRIPTION**

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

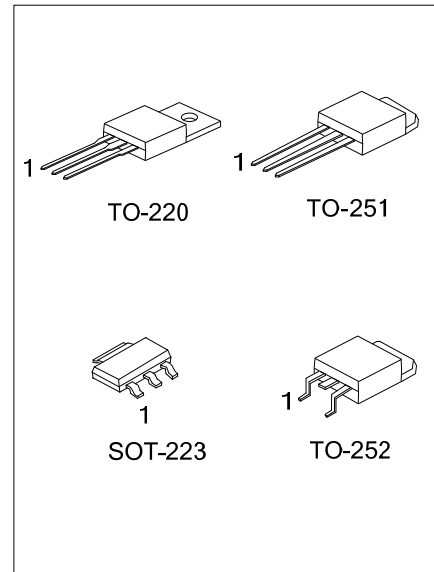
- * $R_{DS(ON)} < 0.07\Omega$ @ $V_{GS}=10V$, $I_D=10A$
- * High switching speed
- * Low gate charge

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

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



UFZ24N

Power MOSFET

■ MARKING

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

■ **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}	±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)	SOT-223		P _D	10	W
	TO-220			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

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. $L=1.0\text{mH}$, $I_{\text{AS}}=10\text{A}$, $V_{\text{DD}}=25\text{V}$, $R_{\text{G}}=25\Omega$, Starting $T_{\text{J}}=25^{\circ}\text{C}$.

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

■ **THERMAL CHARACTERISTICS**

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

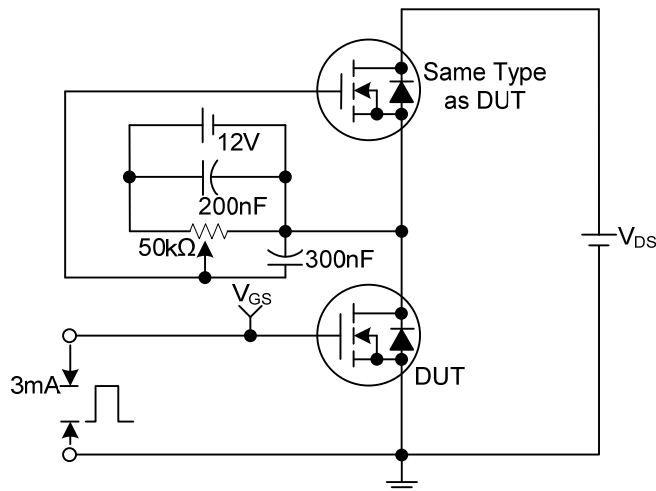
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

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		R _{DS(ON)}	V _{GS} =10V, I _D =10A			0.07	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		800		pF
Output Capacitance		C _{OSS}			160		pF
Reverse Transfer Capacitance		C _{RSS}			23		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A , I _G =100μA(Note 1, 2)		65		nC
Gate to Source Charge		Q _{GS}			4		nC
Gate to Drain Charge		Q _{GD}			7		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =0.5A, R _G =25Ω (Note 1, 2)		40		ns
Rise Time		t _R			40		ns
Turn-OFF Delay Time		t _{D(OFF)}			250		ns
Fall-Time		t _F			70		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				17	A
Maximum Body-Diode Pulsed Current		I _{SM}				68	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =10A, V _{GS} =0V			1.3	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =10A, V _{GS} =0V,		56	83	ns
Reverse Recovery Charge		Q _{rr}	dl _F /dt =100A/μs		120	180	nC

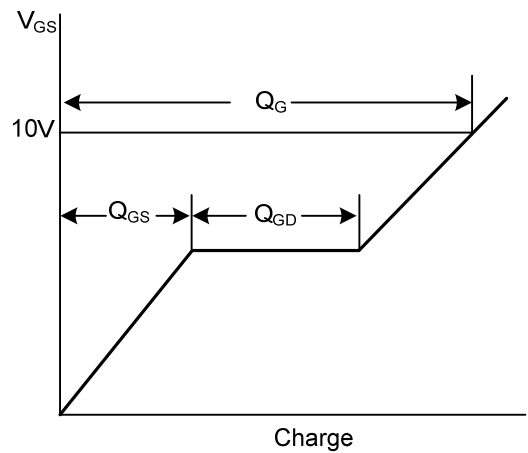
Note: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature.

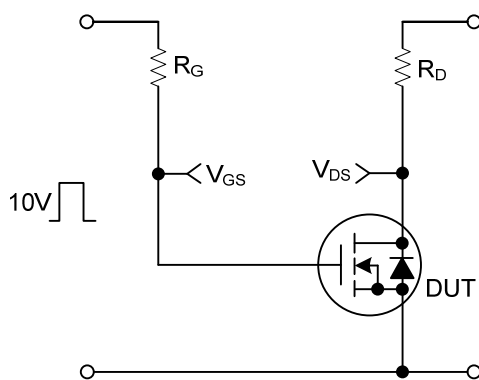
■ TEST CIRCUITS AND WAVEFORMS



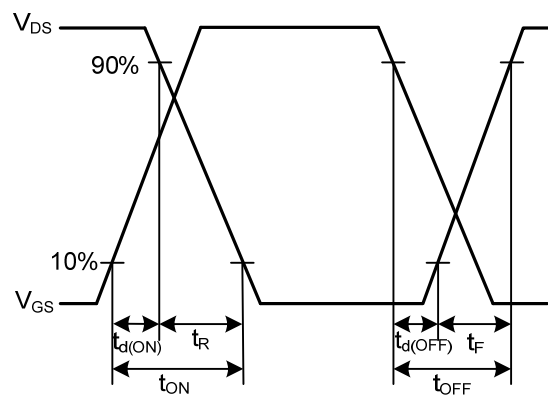
Gate Charge Test Circuit



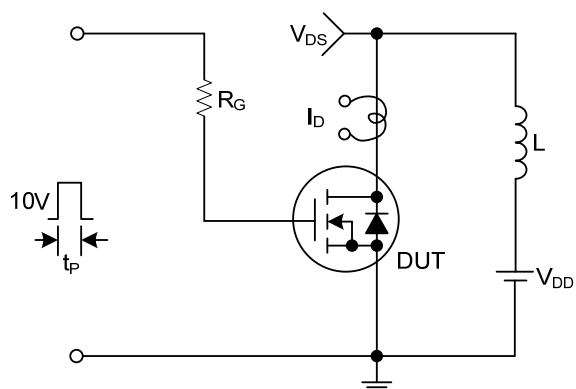
Gate Charge Waveforms



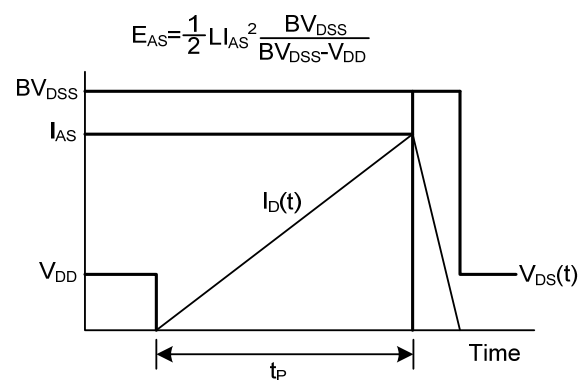
Resistive Switching Test Circuit



Resistive Switching Waveforms

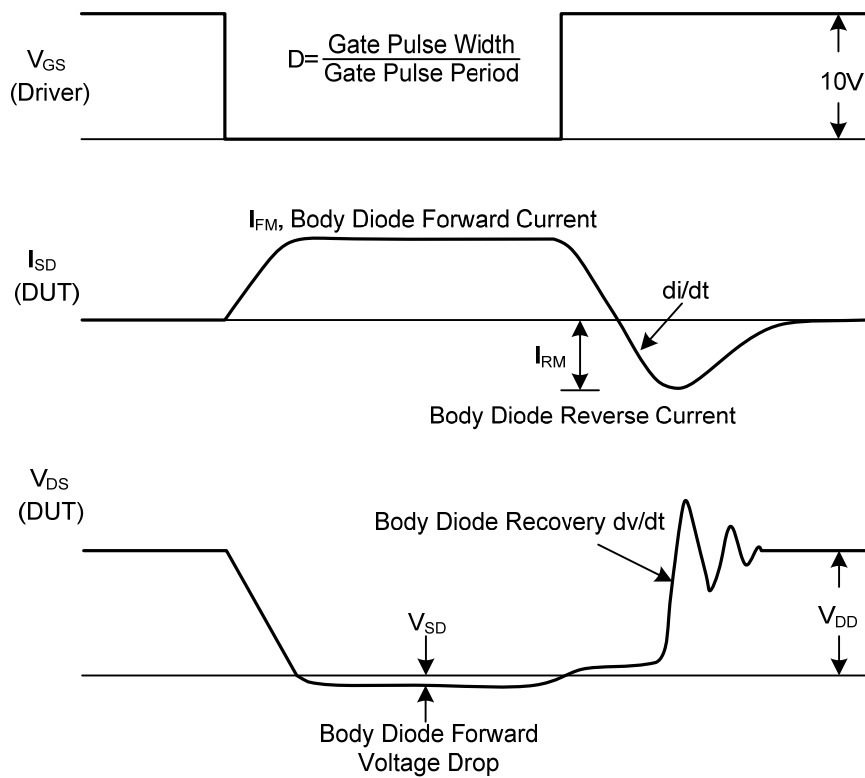
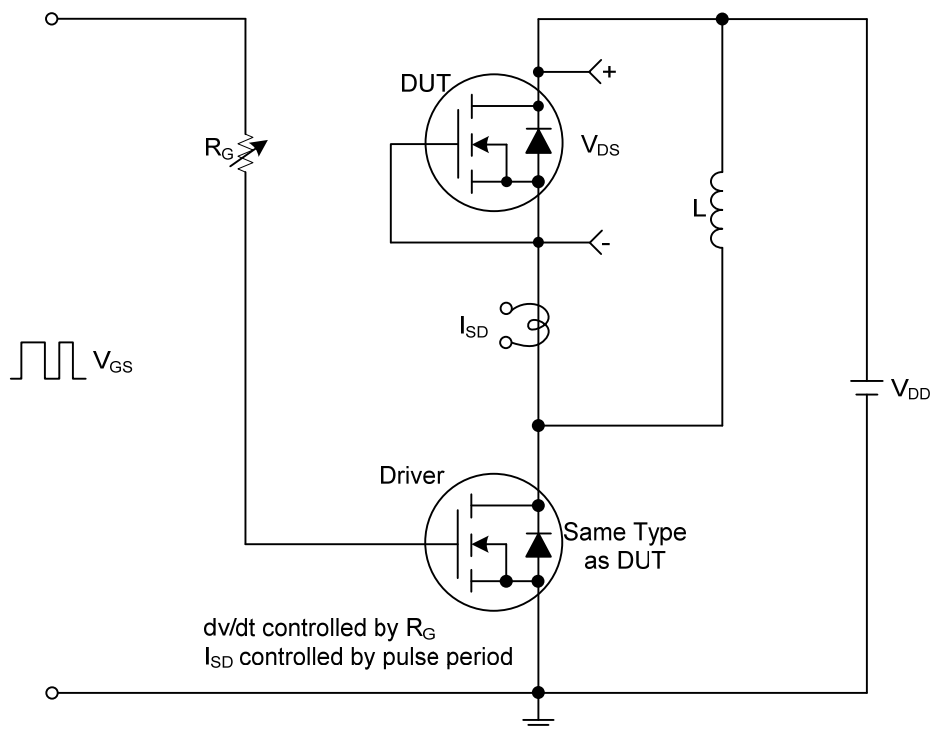


Unclamped Inductive Switching Test Circuit



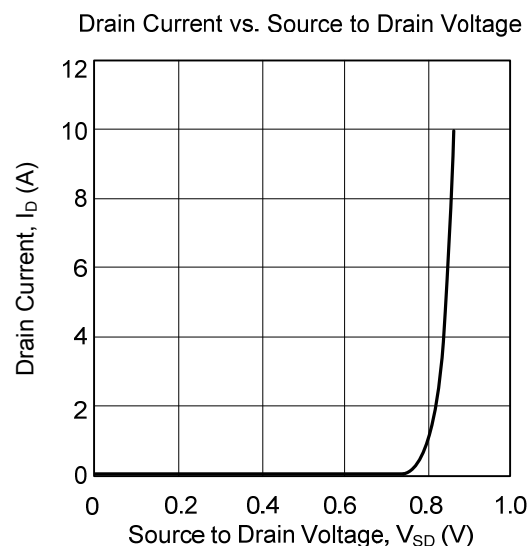
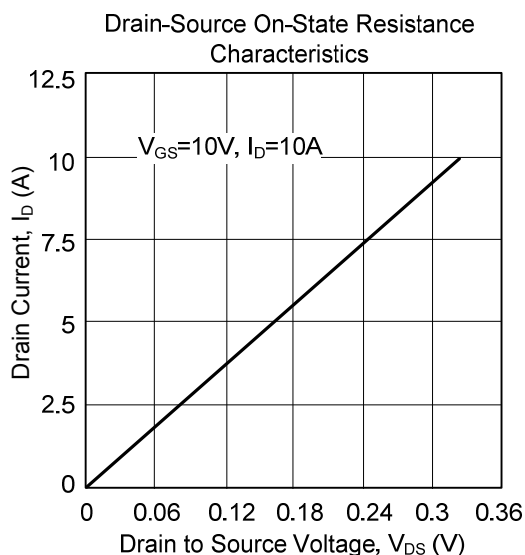
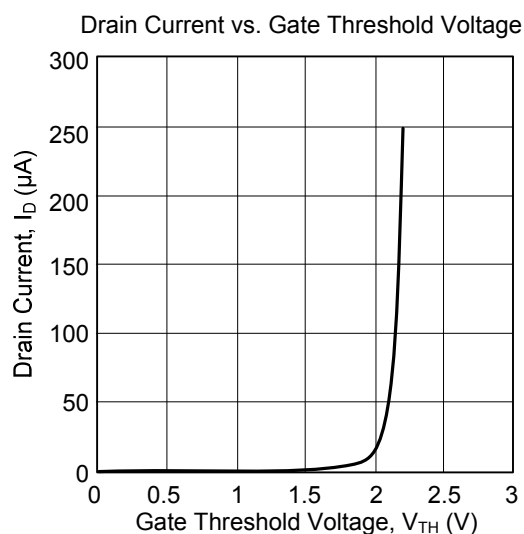
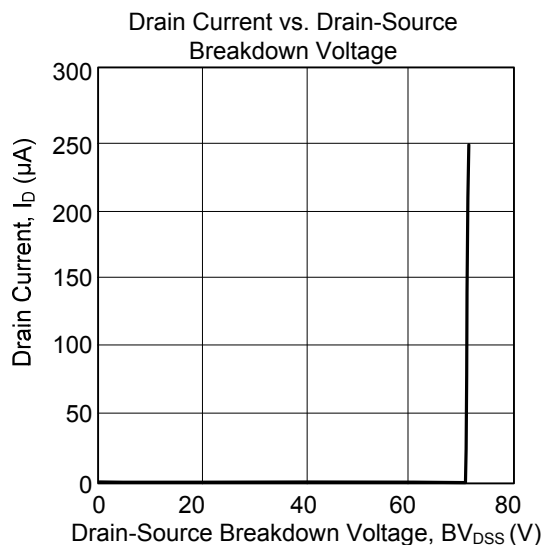
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

■ TYPICAL CHARACTERISTICS



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