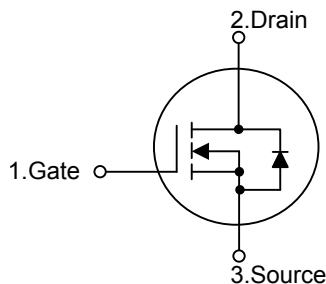


**UFZ44****Power MOSFET****50A, 60V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UFZ44** is an N-channel mode Power MOSFET, using UTC's advanced technology to provide customers with a minimum on-state resistance, superior switching performance, cost-effectiveness and ruggedized device design.

FEATURES

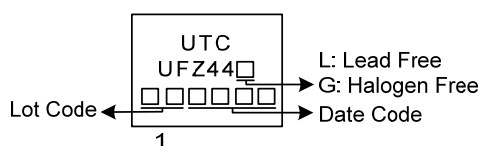
- * $R_{DS(ON)} \leq 28 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=31\text{A}$
- * High Switching Speed
- * Improved dv/dt Capability

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UFZ44L-TA3-T	UFZ44G-TA3-T	TO-220	G	D	S	Tube
UFZ44L-TF1-T	UFZ44G-TF1-T	TO-220F1	G	D	S	Tube
UFZ44L-TN3-R	UFZ44G-TN3-R	TO-252	G	D	S	Tape Reel

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

UFZ44G-TA3-T (1) Packing Type (2) Package Type (3) Green Package		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	60	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous, V _{GS} at 10V	T _C =25°C (Note 2)	I _D	50	A
		T _C =100°C		36	A
	Pulsed (Note 3)		I _{DM}	200	A
Single Pulsed Avalanche Energy (Note 4)			E _{AS}	100	mJ
Peak Diode Recovery dv/dt (Note 5)			dv/dt	4.5	V/ns
Power Dissipation	T _C =25°C	TO-220	P _D	150	W
		TO-220F1		70	W
		TO-252		90	W
Linear De-rating Factor				1.0	W/°C
Junction Temperature			T _J	150	°C
Storage Temperature			T _{STG}	-55 ~ +150	°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. Current limited by the package, (die current = 51 A).

3. Repetitive rating; pulse width limited by maximum junction temperature.

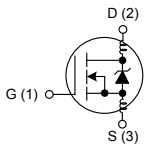
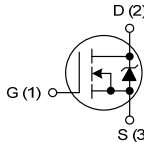
4. $V_{DD} = 25\text{ V}$, starting $T_J = 25^{\circ}\text{C}$, $L = 44\text{ }\mu\text{H}$, $R_G = 25\text{ }\Omega$, $I_{AS} = 51\text{ A}$.

5. $I_{SD} \leq 51\text{ A}$, $dI/dt \leq 250\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DS}$, $T_J \leq 175^{\circ}\text{C}$.

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F1	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-252		110	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.83	$^{\circ}\text{C}/\text{W}$
	TO-220F1		1.78	$^{\circ}\text{C}/\text{W}$
	TO-252		1.38	$^{\circ}\text{C}/\text{W}$

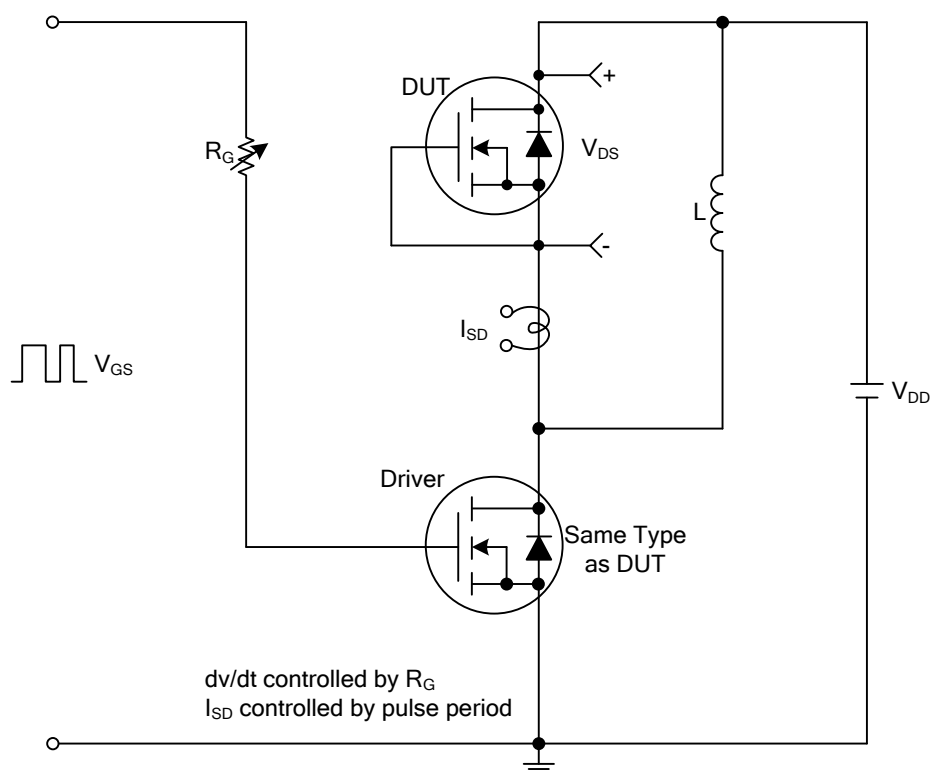
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	60			V
Breakdown Voltage Temperature Coefficient		△BV _{DSS} /△T _J	Reference to 25°C, I _D =1mA		0.060		V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =60V, V _{GS} =0V			25	μA
			V _{DS} =48V, V _{GS} =0V, T _J =125°C			250	
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V			+100	nA
	Reverse		V _{GS} =-20V,			-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 =31A (Note 2)			28	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1900		pF
Output Capacitance		C _{OSS}			920		pF
Reverse Transfer Capacitance		C _{RSS}			170		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{GS} =10V, V _{DS} =48V, I _D =51A (Note 2)			67	nC
Gate to Source Charge		Q _{GS}				18	nC
Gate to Drain Charge		Q _{GD}				25	nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =30V, I _D =51A, R _G =9.1Ω, R _D =0.55 Ω (Note 2)		14		ns
Rise Time		t _R			110		ns
Turn-OFF Delay Time		t _{D(OFF)}			45		ns
Fall-Time		t _F			92		ns
Internal Drain Inductance		L _D	Between lead, 6 mm (0.25") from package and center of die contact			4.5	nH
Internal Source Inductance		L _S				7.5	nH
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S	MOSFET symbol showing the integral reverse p - n junction diode			50	A
Maximum Body-Diode Pulsed Current		I _{SM}				200	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =51A, V _{GS} =0V, T _J =25°C(Note 2)			2.5	V
Body Diode Reverse Recovery Time		t _{rr}	I _F =51A, dI/dt=100A/μs, T _J =25°C		120	180	ns
Body Diode Reverse Recovery Charge		Q _{rr}			0.53	0.80	nC
Forward Turn-On Time		t _{ON}	Intrinsic turn-on time is negligible (turn-on is dominated by L _S and L _D)				

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

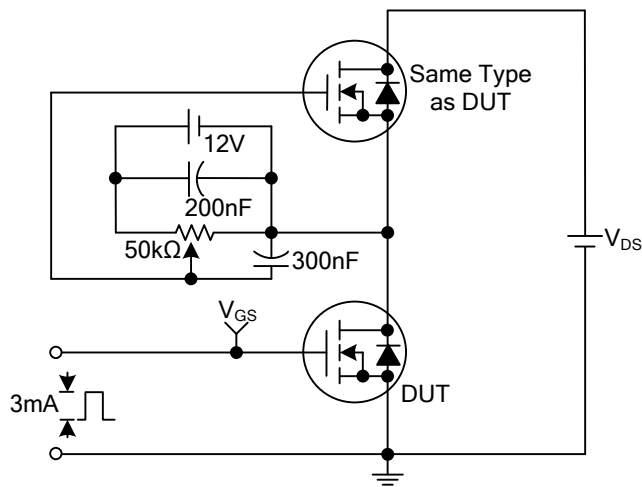
2. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

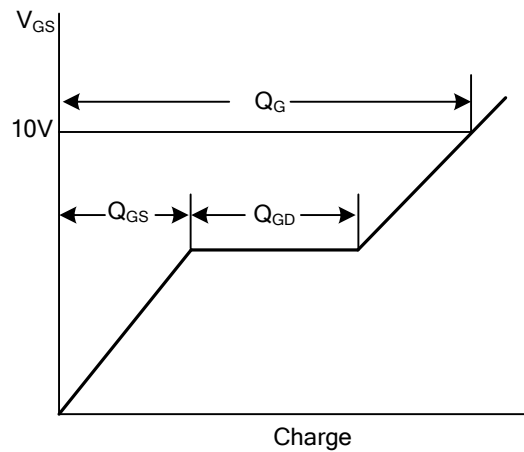
Peak Diode Recovery dv/dt Test Circuit & Waveforms

■ TEST CIRCUITS AND WAVEFORMS

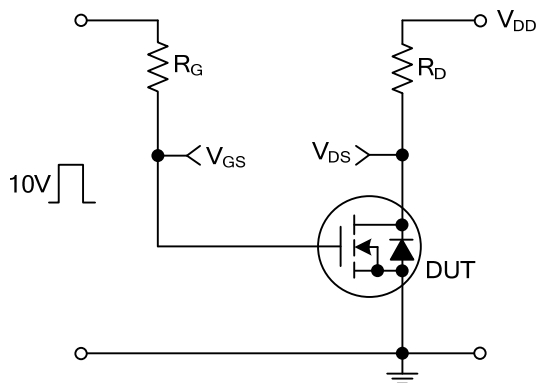
Gate Charge Test Circuit



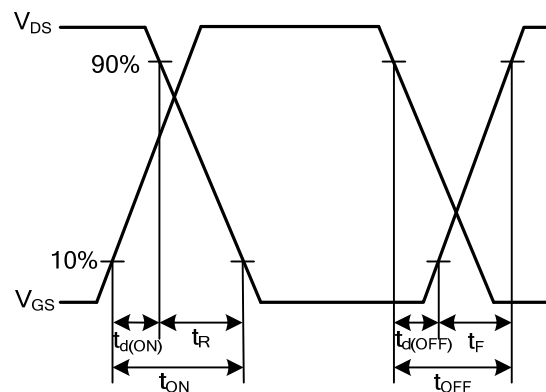
Gate Charge Waveforms



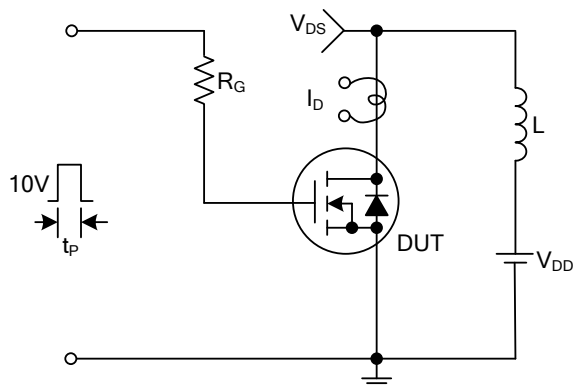
Resistive Switching Test Circuit



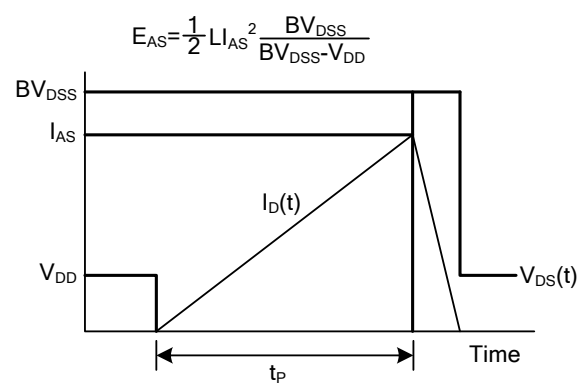
Resistive Switching Waveforms



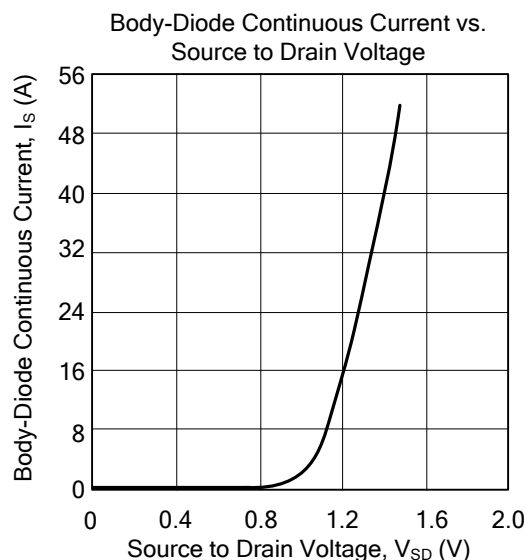
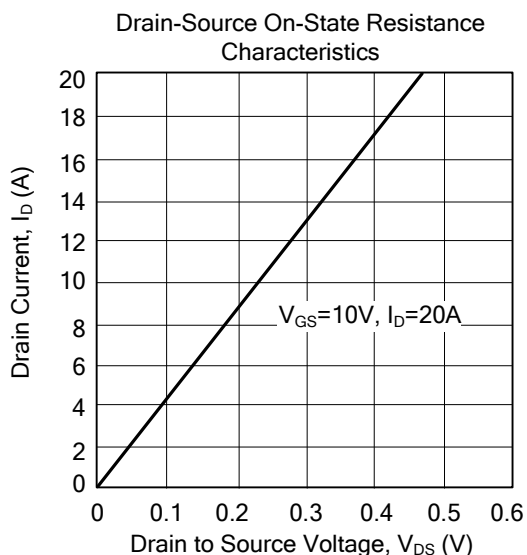
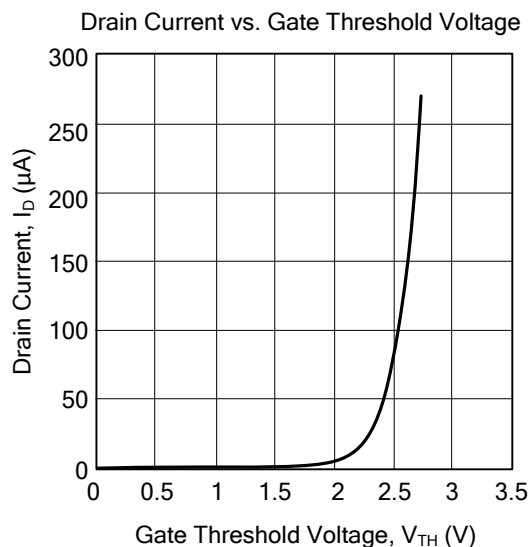
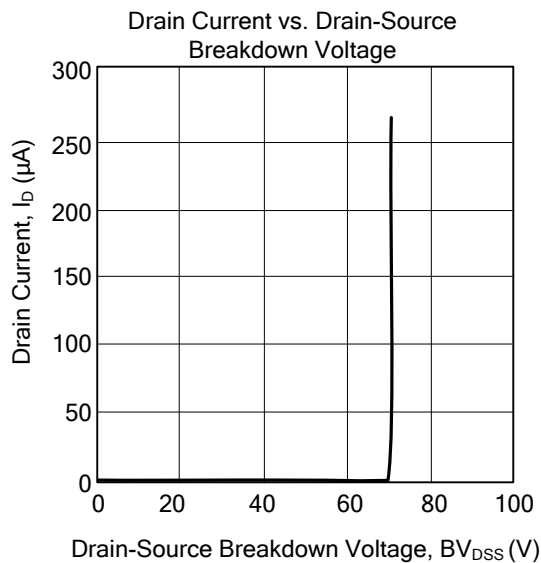
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



■ TYPICAL CHARACTERISTICS



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