



UF15N20

Power MOSFET

15A, 200V N-CHANNEL POWER MOSFET

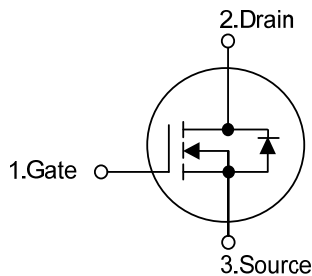
DESCRIPTION

The UTC **UF15N20** is a high voltage power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

FEATURES

- * $R_{DS(ON)} < 0.12 \Omega$ @ $V_{GS}=10V$, $I_D=7.5A$
- * High switching speed
- * 100% avalanche tested

SYMBOL



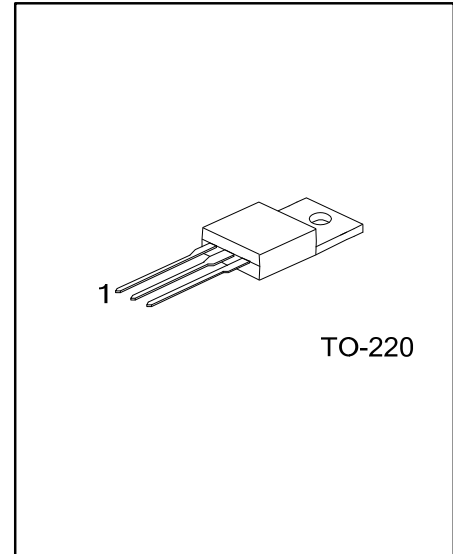
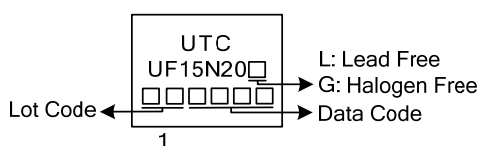
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF15N20L-TA3-T	UF15N20G-TA3-T	TO-220	G	D	S	Tube

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

UF15N20G-TA3-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) TA3: TO-220
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	Continuous	I_D	15	A
	Pulsed	I_{DM}	60	A
Avalanche Energy (Note 3)		E_{AS}	540	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	18.4	V/ns
Power Dissipation		P_D	104	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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 maximum junction temperature.

3. $L=4.8\text{mH}$, $I_{AS}=15\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 15\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case		θ_{JC}	1.2	$^\circ\text{C}/\text{W}$

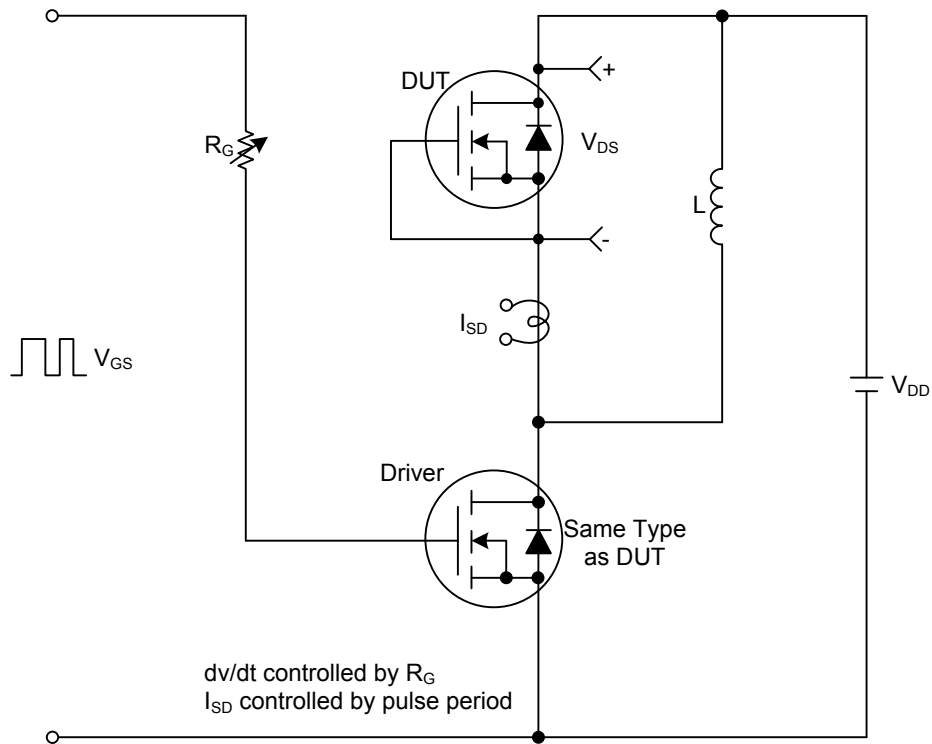
■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	200			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =200V			1	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)}	I _D =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =7.5A			0.12	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1MHz		2684		pF
Output Capacitance		C _{OSS}			243		pF
Reverse Transfer Capacitance		C _{RSS}			21		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{GS} =10V, V _{DS} =150V, I _D =15A I _G =1mA (Note 1, 2)		66.8		nC
Gate to Source Charge		Q _{GS}			18.6		nC
Gate to Drain Charge		Q _{GD}			15.4		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{GS} =10V, V _{DD} =100V, R _G =25Ω, I _D =10A (Note 1, 2)		3.8		ns
Rise Time		t _R			6.4		ns
Turn-OFF Delay Time		t _{D(OFF)}			1500		ns
Fall-Time		t _F			580		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				15	A
Maximum Body-Diode Pulsed Current		I _{SM}				60	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =15A			1.2	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =15A, V _{GS} =0V,		154		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt = 100A/μs		990		nC

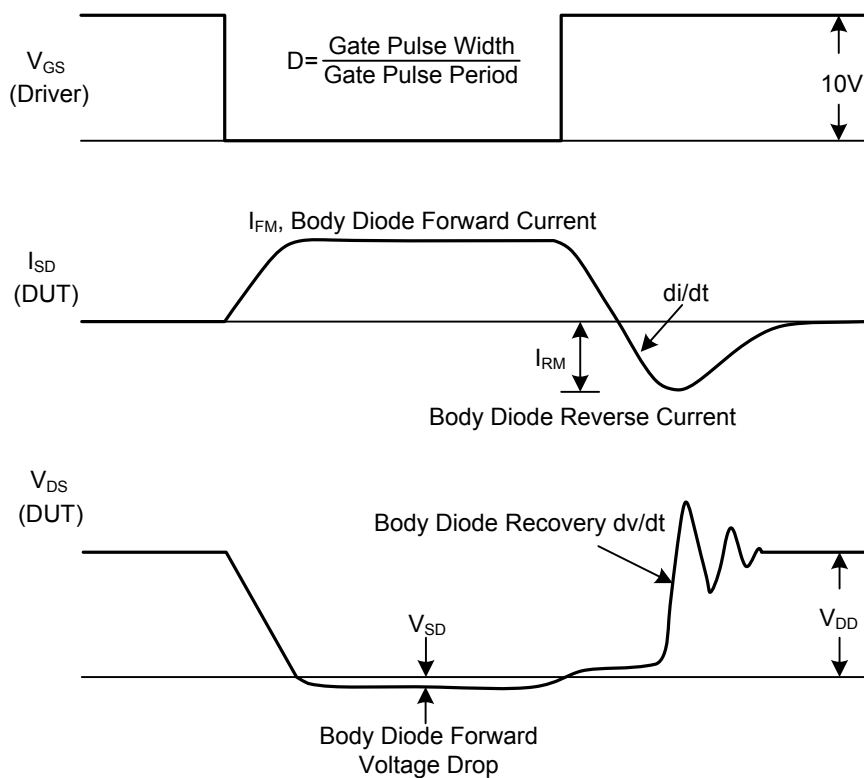
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

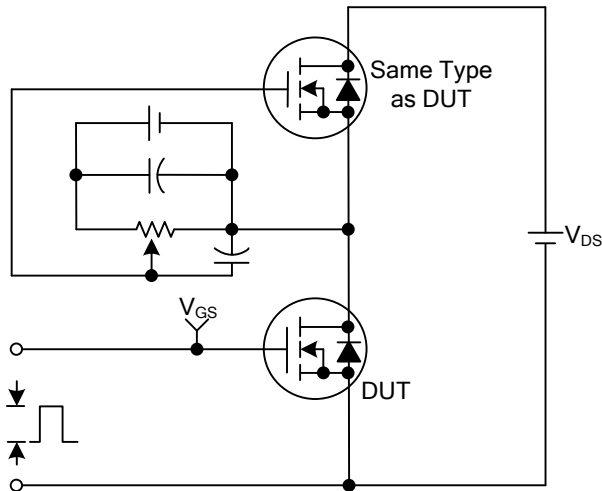


Peak Diode Recovery dv/dt Test Circuit

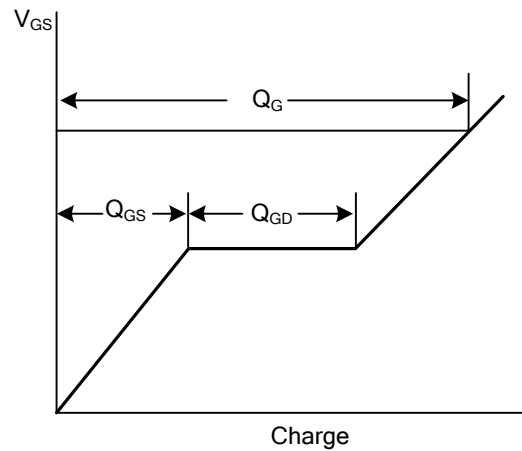


Peak Diode Recovery dv/dt Waveforms

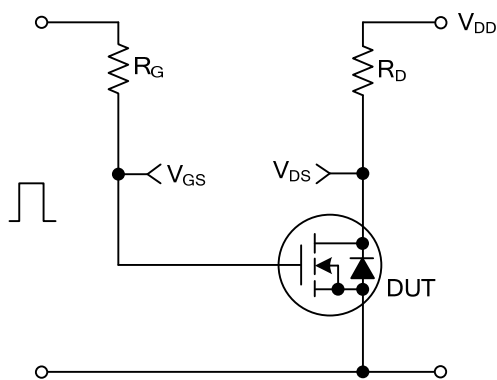
■ TEST CIRCUITS AND WAVEFORMS



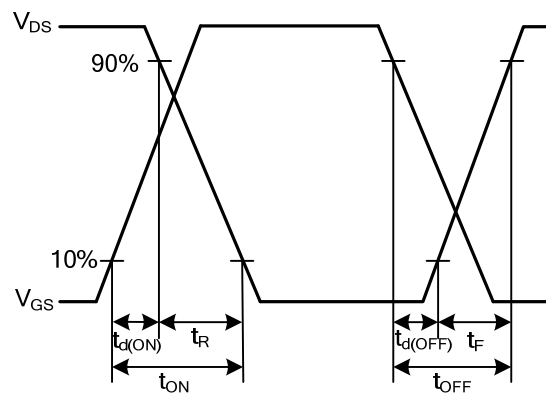
Gate Charge Test Circuit



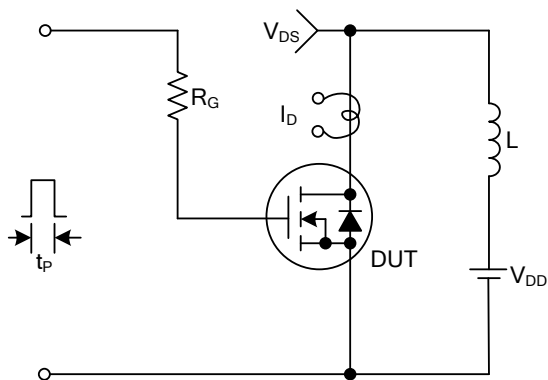
Gate Charge Waveforms



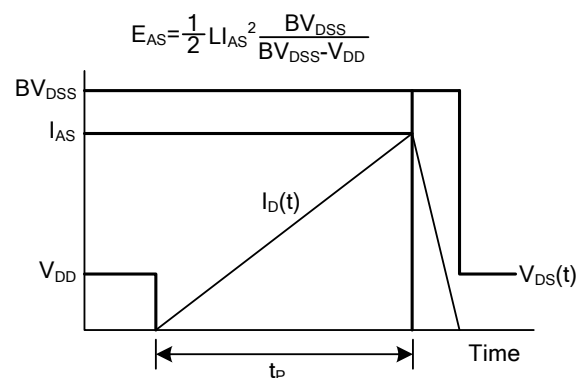
Resistive Switching Test Circuit



Resistive Switching Waveforms

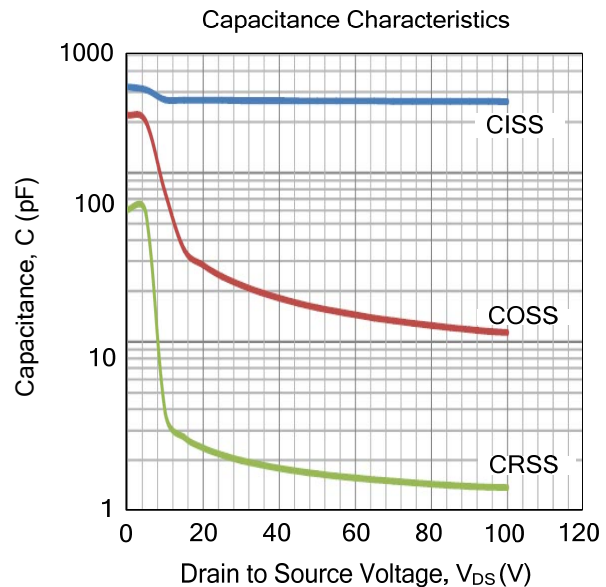
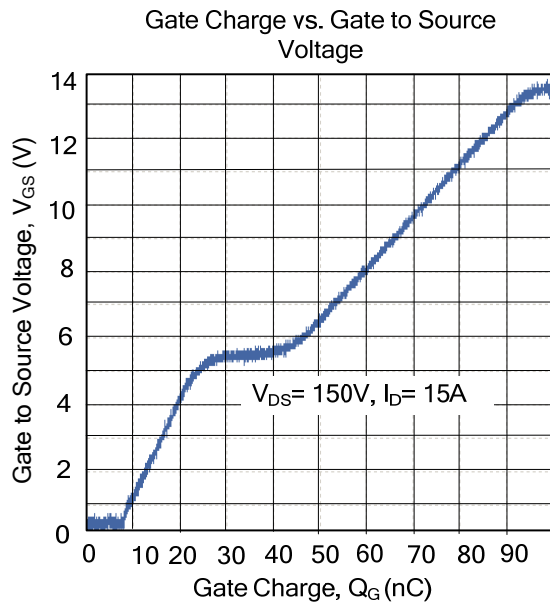


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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