



## UF3N20

Preliminary

Power MOSFET

### 3A, 200V N-CHANNEL POWER MOSFET

#### DESCRIPTION

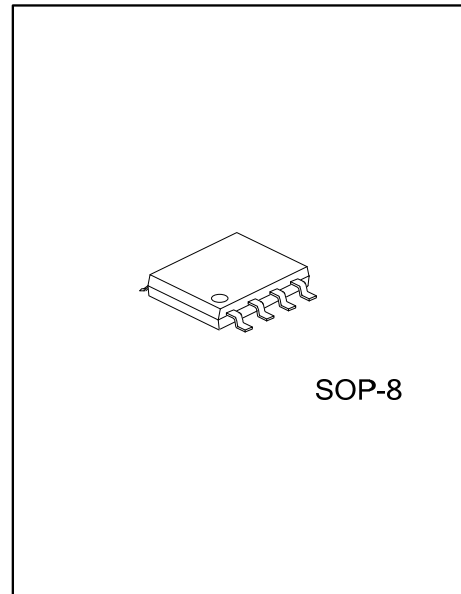
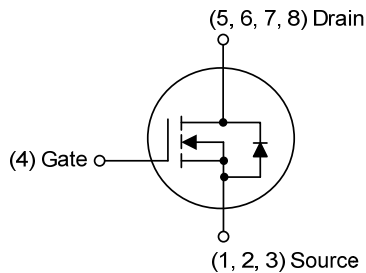
The UTC **UF3N20** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **UF3N20** is generally applied in high efficiency switch mode power supplies, active power factor correction and electronic lamp ballasts based on half bridge topology.

#### FEATURES

- \*  $R_{DS(ON)} < 200m\Omega$  @  $V_{GS}=10V, I_D=1.5A$
- \* High switching speed
- \* 100% avalanche tested

#### SYMBOL



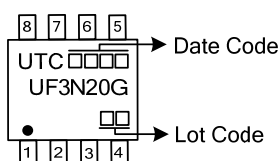
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UF3N20G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UF3N20G-S08-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free</p>
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#### MARKING



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	200	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	Continuous	$I_D$	3	A
	Pulsed	$I_{DM}$	12	A
Avalanche Energy		$E_{AS}$	52	mJ
Power Dissipation		$P_D$	4.5	mW
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  $T_J$ .

3.  $L=55\text{mH}$ ,  $I_{AS}=2.0\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\ \Omega$ , Starting  $T_J = 25^{\circ}\text{C}$

4.  $I_{SD} \leq 2.4\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25^{\circ}\text{C}$

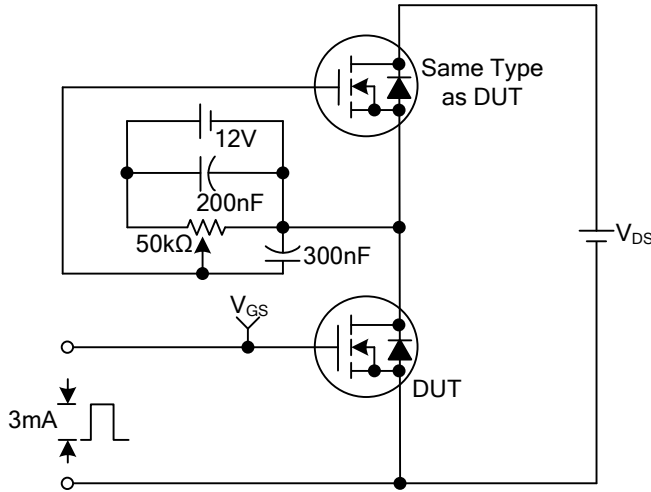
### ■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>								
Drain-Source Breakdown Voltage		$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	200			V	
Drain-Source Leakage Current		$I_{DSS}$	$V_{DS}=200\text{V}$			1	$\mu\text{A}$	
Gate-Source Leakage Current	Forward	$I_{GSS}$	$V_{GS}=+20\text{V}$ , $V_{DS}=0\text{V}$			10	$\mu\text{A}$	
	Reverse		$V_{GS}=-20\text{V}$ , $V_{DS}=0\text{V}$			-10	$\mu\text{A}$	
<b>ON CHARACTERISTICS</b>								
Gate Threshold Voltage		$V_{GS(TH)}$	$I_D=250\mu\text{A}$	1.0		3.0	V	
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=1.5\text{A}$			200	m $\Omega$	
<b>DYNAMIC PARAMETERS</b>								
Input Capacitance		$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1\text{MHz}$		1530		pF	
Output Capacitance		$C_{OSS}$				145		pF
Reverse Transfer Capacitance		$C_{RSS}$				8		pF
<b>SWITCHING PARAMETERS</b>								
Total Gate Charge		$Q_G$	$V_{GS}=10\text{V}$ , $V_{DS}=50\text{V}$ , $I_D=1.3\text{A}$ $I_G=100\mu\text{A}$ (Note 1, 2)		160		nC	
Gate to Source Charge		$Q_{GS}$				6.0		nC
Gate to Drain Charge		$Q_{GD}$				3.2		nC
Turn-ON Delay Time		$t_{D(ON)}$	$V_{GS}=10\text{V}$ , $V_{DD}=30\text{V}$ , $R_G=25\Omega$ , $I_D=0.5\text{A}$ (Note 1, 2)		36		ns	
Rise Time		$t_R$				28		ns
Turn-OFF Delay Time		$t_{D(OFF)}$				490		ns
Fall-Time		$t_F$				64		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>								
Maximum Body-Diode Continuous Current		$I_S$				3	A	
Maximum Body-Diode Pulsed Current		$I_{SM}$				12	A	
Drain-Source Diode Forward Voltage		$V_{SD}$	$I_S=3\text{A}$			1.3	V	

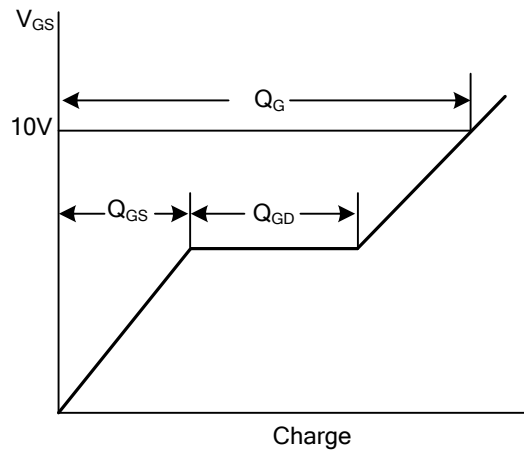
Notes: 1. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .

2. Essentially independent of operating temperature.

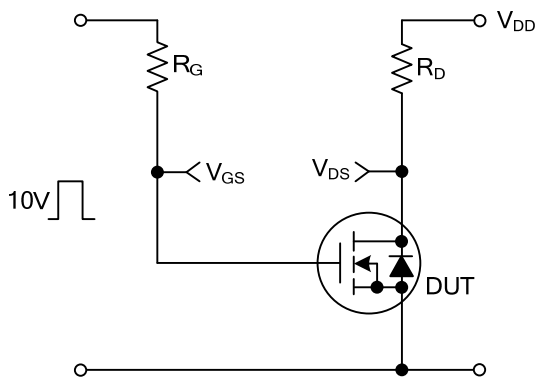
■ TEST CIRCUITS AND WAVEFORMS



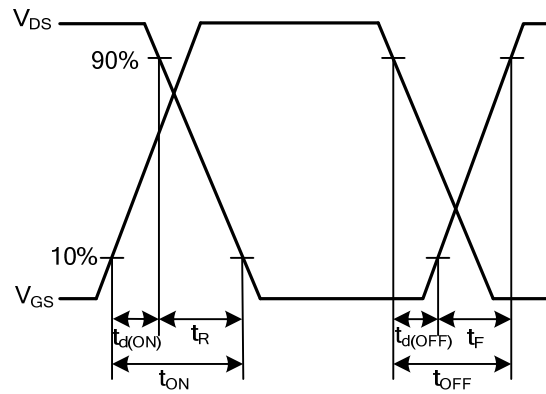
Gate Charge Test Circuit



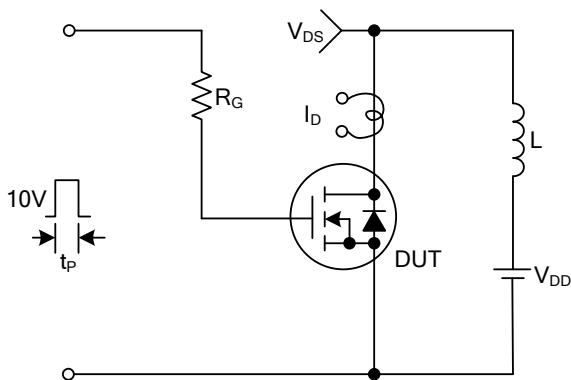
Gate Charge Waveforms



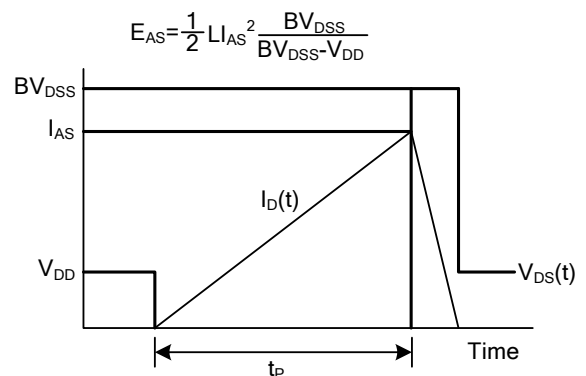
Resistive Switching Test Circuit



Resistive Switching Waveforms

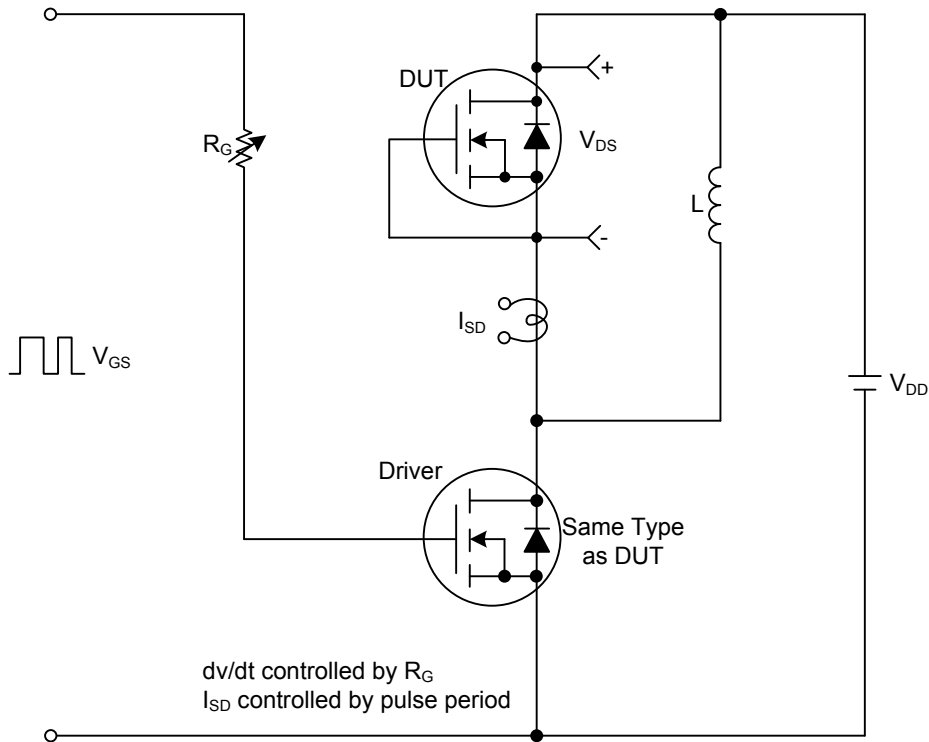


Unclamped Inductive Switching Test Circuit

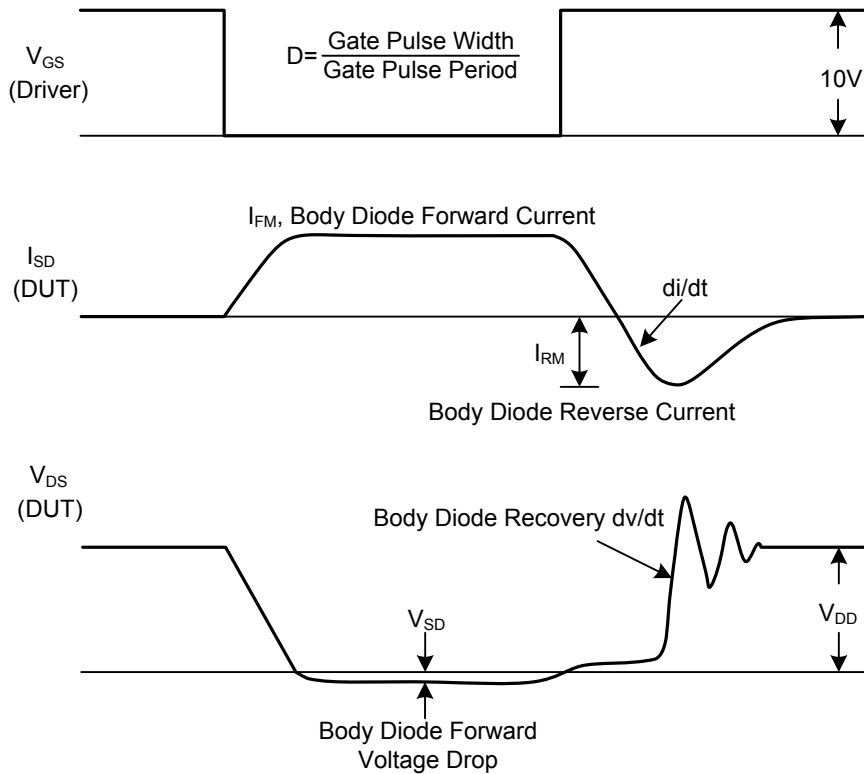


Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit & Waveforms



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