



UF05N20

Preliminary

Power MOSFET

0.5A, 200V N-CHANNEL POWER MOSFET

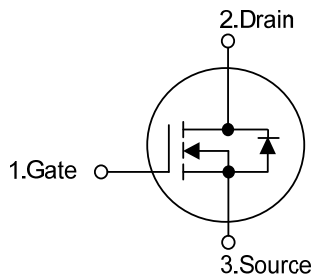
DESCRIPTION

The UTC **UF05N20** 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

- * $R_{DS(ON)} < 2.8\Omega @ V_{GS}=10V, I_D=0.25A$
- * High switching speed
- * 100% avalanche tested

SYMBOL



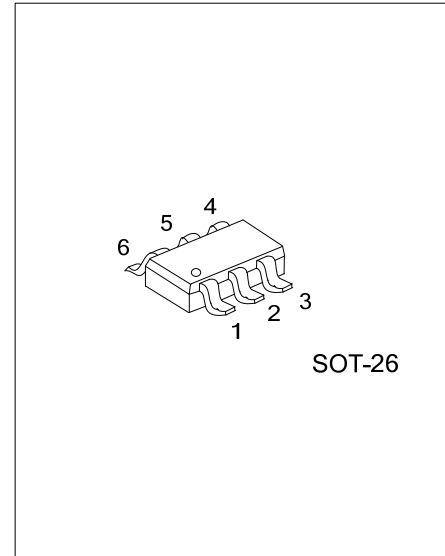
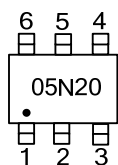
ORDERING INFORMATION

Ordering Number	Package	Pin Assignment						Packing
		1	2	3	4	5	6	
UF05N20G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

UF05N20G-AG6-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AG6: SOT-26 (3) G: Halogen Free and Lead Free
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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	0.5
	Pulsed	I_{DM}	2.0
Avalanche Current (Note 2)	I_{AR}	0.85	A
Avalanche Energy	E_{AS}	19.86	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	2.3	V/ns
Power Dissipation	P_D	0.3	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. $L=55\text{mH}$, $I_{AS}=0.85\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$
 4. $I_{SD} \leq 0.5\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

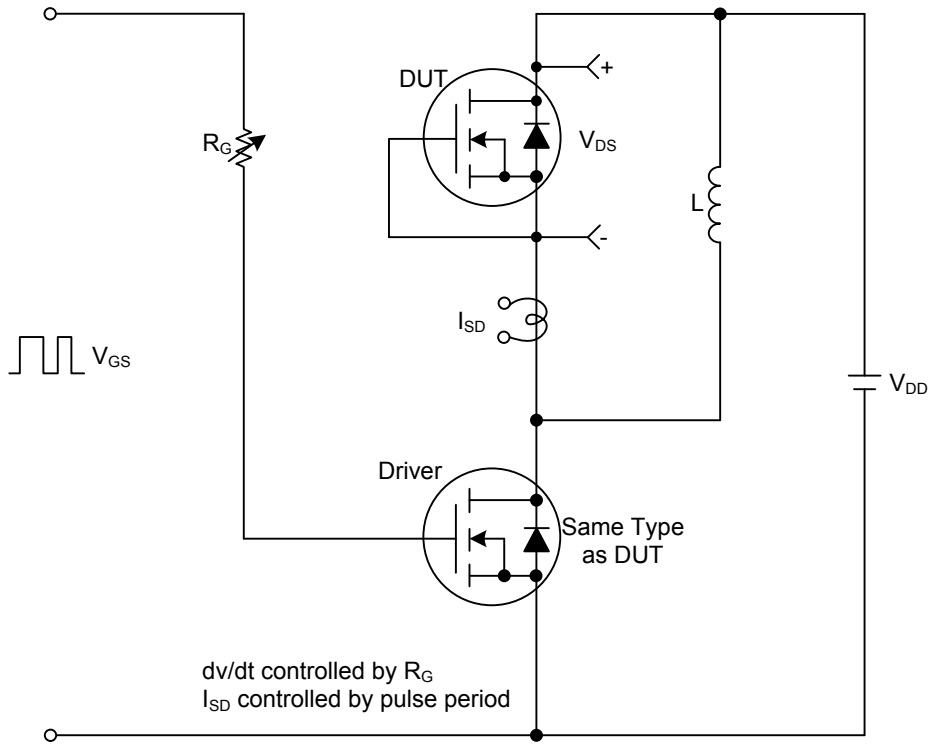
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	416	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	110	$^\circ\text{C}/\text{W}$

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

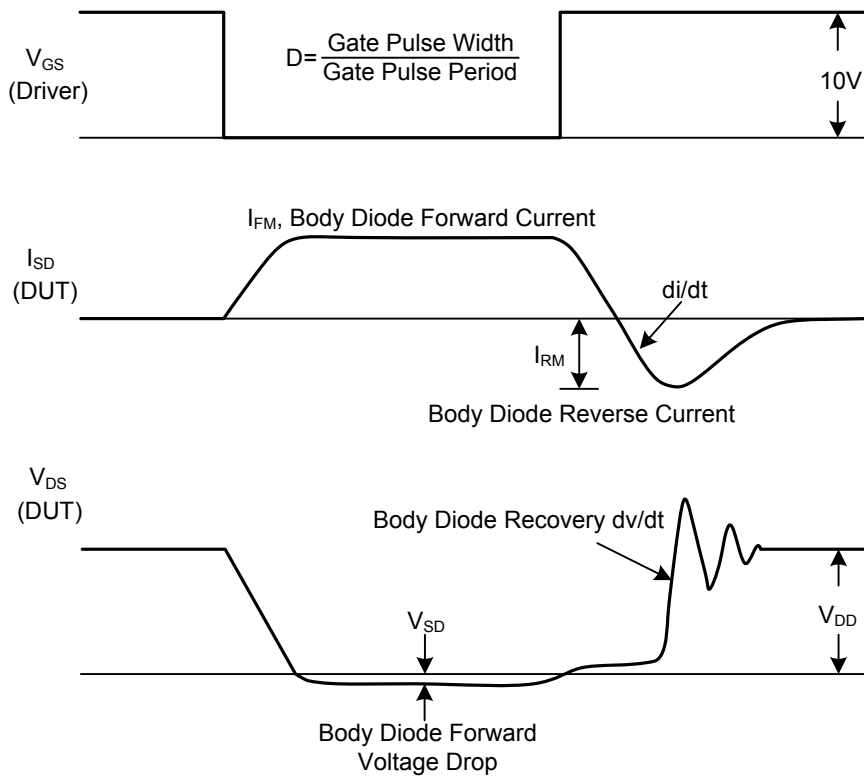
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	200			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=200\text{V}$			1	μA
Gate-Source Leakage Current	Forward	$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			10	μA
	Reverse	$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$I_D=250\mu\text{A}$	1.0		3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=0.25\text{A}$			2.8	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1\text{MHz}$		102		pF
Output Capacitance	C_{OSS}			28		pF
Reverse Transfer Capacitance	C_{RSS}			10		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	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)		3.7		nC
Gate to Source Charge	Q_{GS}			0.18		nC
Gate to Drain Charge	Q_{GD}			0.4		nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	$V_{GS}=10\text{V}$, $V_{DD}=30\text{V}$, $R_G=25\Omega$, $I_D=0.5\text{A}$ (Note 1, 2)		13.6		ns
Rise Time	t_R			19		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			69.6		ns
Fall-Time	t_F			53.6		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				0.5	A
Maximum Body-Diode Pulsed Current	I_{SM}				2.0	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=0.5\text{A}$			1.3	V
Body Diode Reverse Recovery Time (Note 1)	t_{rr}	$I_S=0.5\text{A}$, $V_{GS}=0\text{V}$,		15.2		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$dI_F/dt = 100\text{A}/\mu\text{s}$		24		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

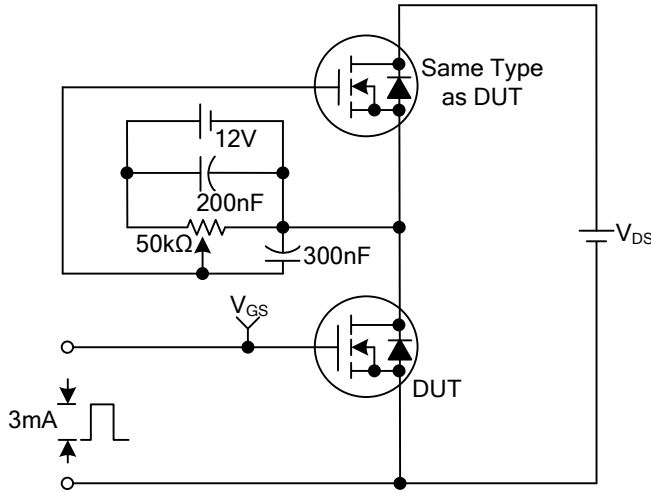


Peak Diode Recovery dv/dt Test Circuit

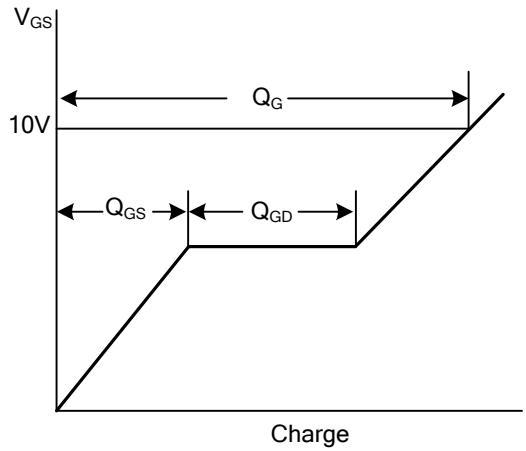


Peak Diode Recovery dv/dt Waveforms

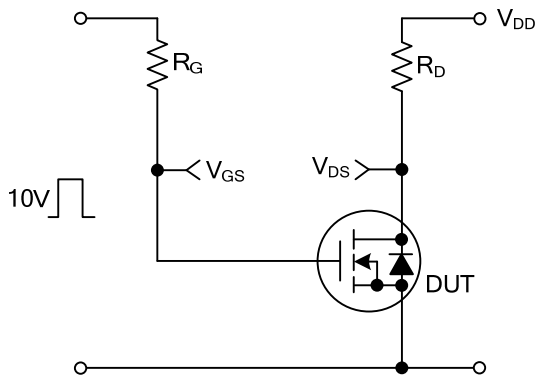
■ TEST CIRCUITS AND WAVEFORMS



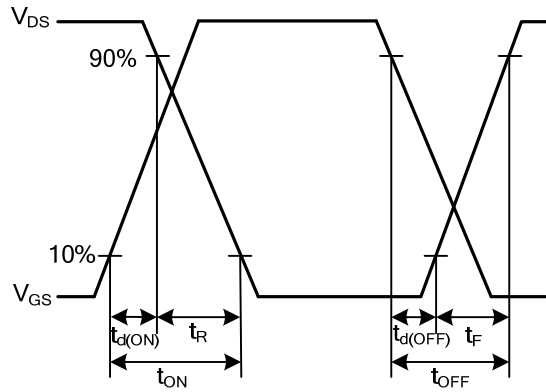
Gate Charge Test Circuit



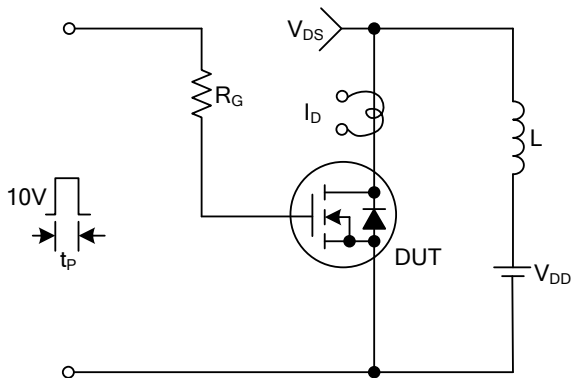
Gate Charge Waveforms



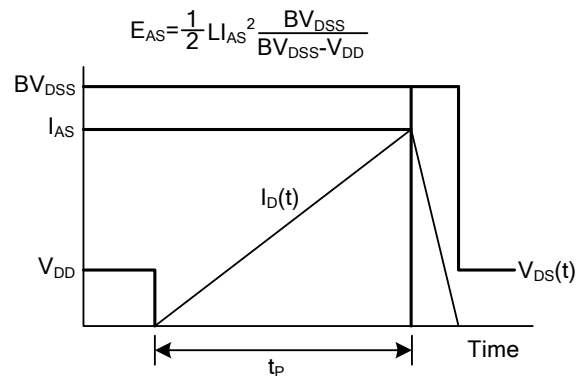
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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