



UF05N20

Preliminary

Power MOSFET

0.5A, 200V N-CHANNEL POWER MOSFET

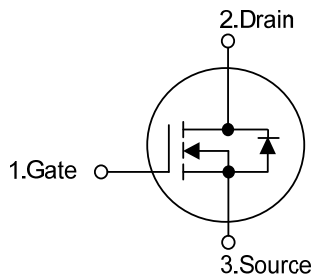
DESCRIPTION

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



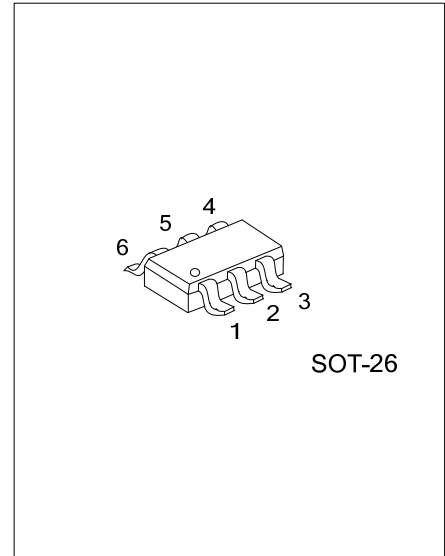
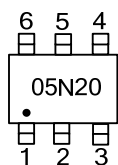
ORDERING INFORMATION

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°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	°C
Storage Temperature Range	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. Repetitive Rating: Pulse width limited by maximum junction temperature.
 3. L=55mH, I_{AS}=0.85A, V_{DD}=50V, R_G=25 Ω, Starting T_J = 25°C
 4. I_{SD} ≤ 0.5A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

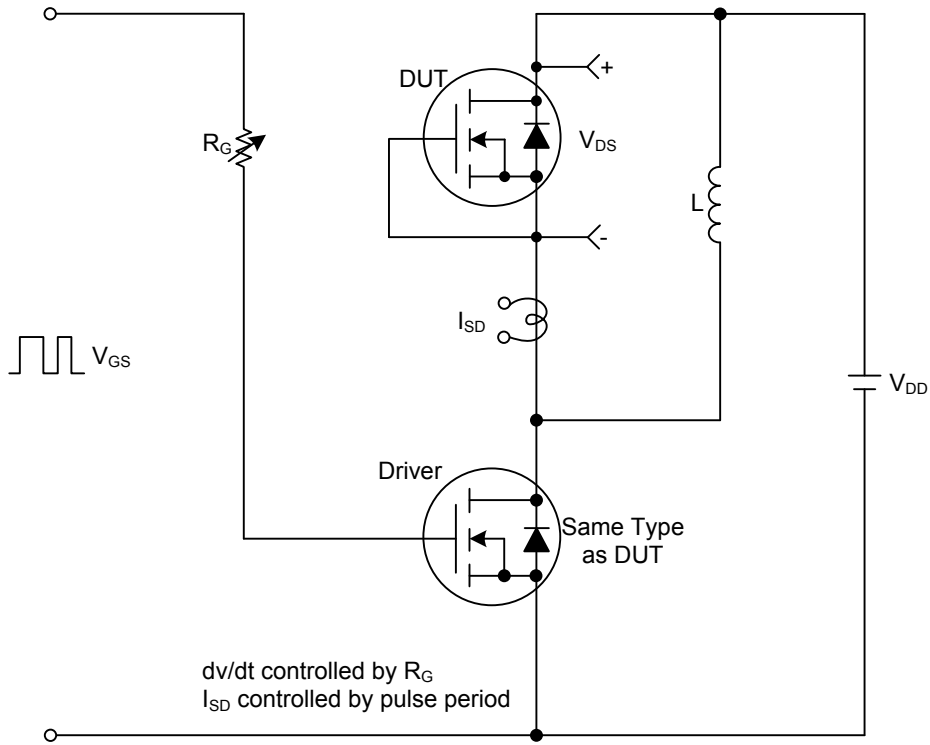
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	416	°C/W
Junction to Case	θ _{JC}	110	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A =25°C, unless otherwise specified)

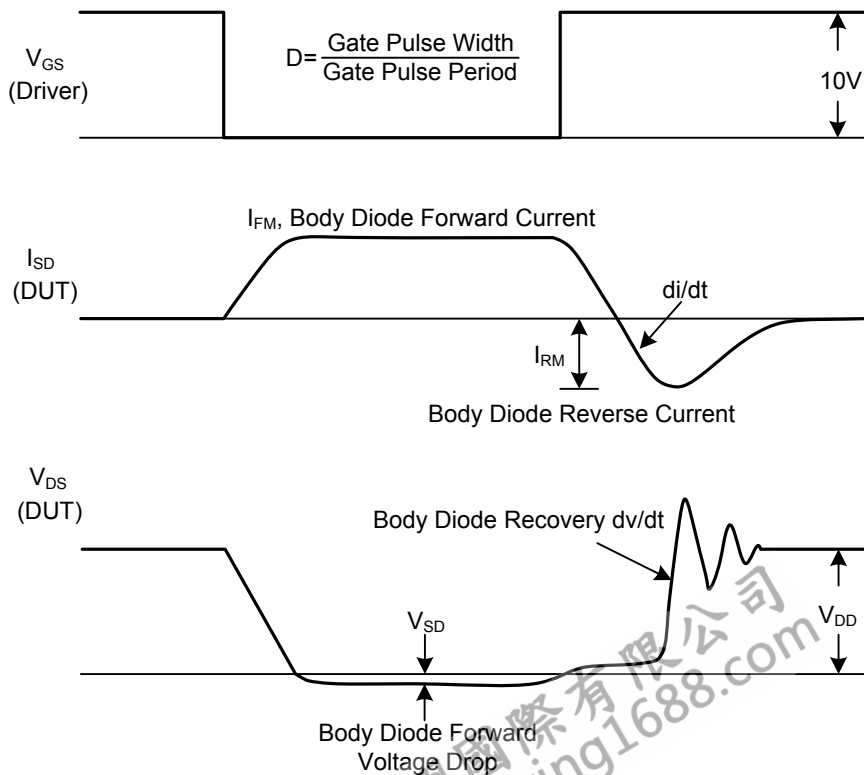
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	200			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =200V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS} V _{GS} =+20V, V _{DS} =0V V _{GS} =-20V, V _{DS} =0V			10	μA
	Reverse				-10	μA
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 =0.25A			2.8	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1MHz		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} =10V, V _{DS} =50V, I _D =1.3A I _G =100μA (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} =10V, V _{DD} =30V, R _G =25Ω, I _D =0.5A (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 =0.5A			1.3	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =0.5A, V _{GS} =0V,		15.2		ns
Body Diode Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs		24		nC

- Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
 2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

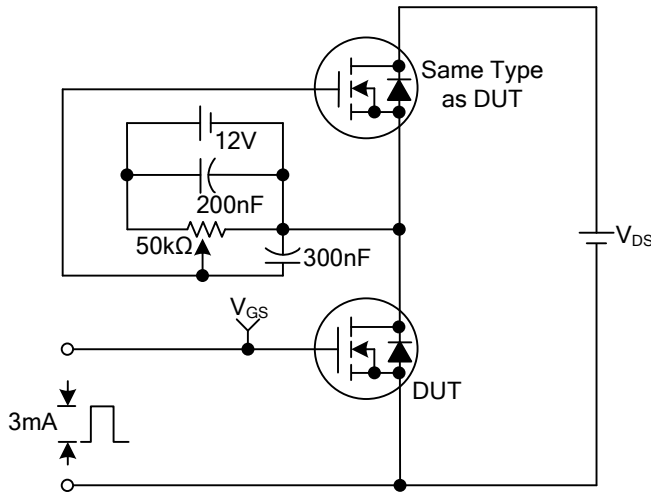


Peak Diode Recovery dv/dt Test Circuit

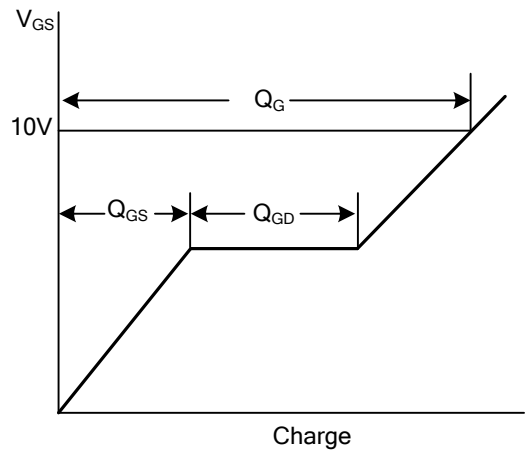


Peak Diode Recovery dv/dt Waveforms

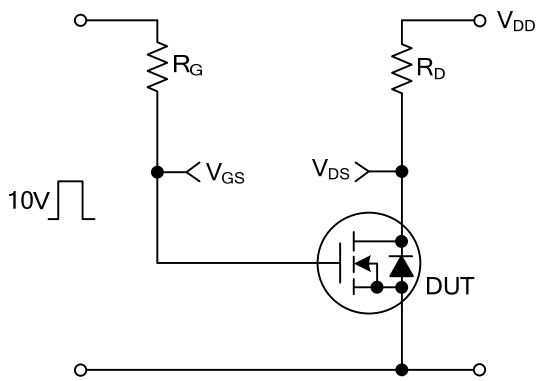
■ TEST CIRCUITS AND WAVEFORMS



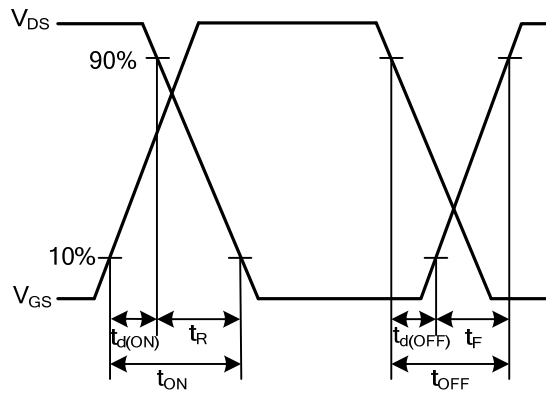
Gate Charge Test Circuit



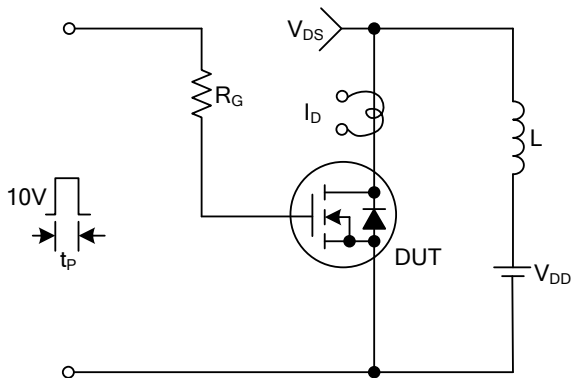
Gate Charge Waveforms



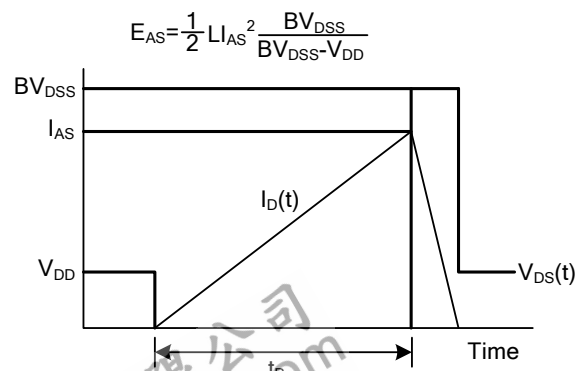
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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