

**UF03N25**

Preliminary

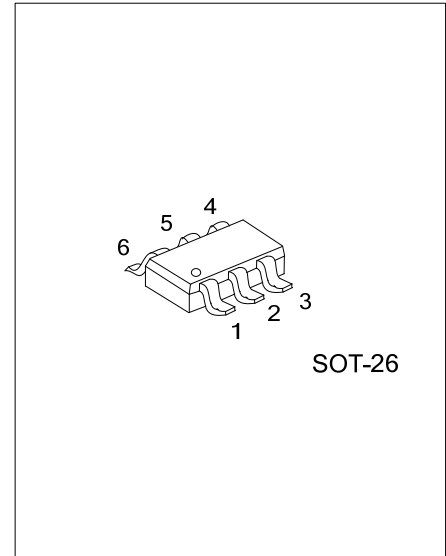
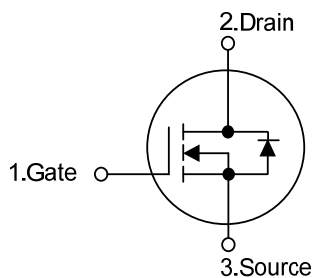
Power MOSFET

**0.3A, 250V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UF03N25** 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

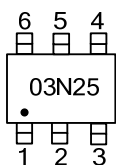
- * $R_{DS(ON)} < 6.5\Omega$ @ $V_{GS}=10V$, $I_D=0.15A$
- * High switching speed
- * 100% avalanche tested

SYMBOL**ORDERING INFORMATION**

Ordering Number	Package	Pin Assignment						Packing
		1	2	3	4	5	6	
UF03N25G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

UF03N25G-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_{DS}	250	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	Continuous I_D	0.3	A
	Pulsed I_{DM}	1.2	A
Avalanche Current (Note 2)	I_{AR}	0.6	A
Avalanche Energy	E_{AS}	10	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	1.4	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. $L=55\text{mH}$, $I_{AS}=0.6\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 0.3\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, 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	$^\circ\text{C}/\text{W}$

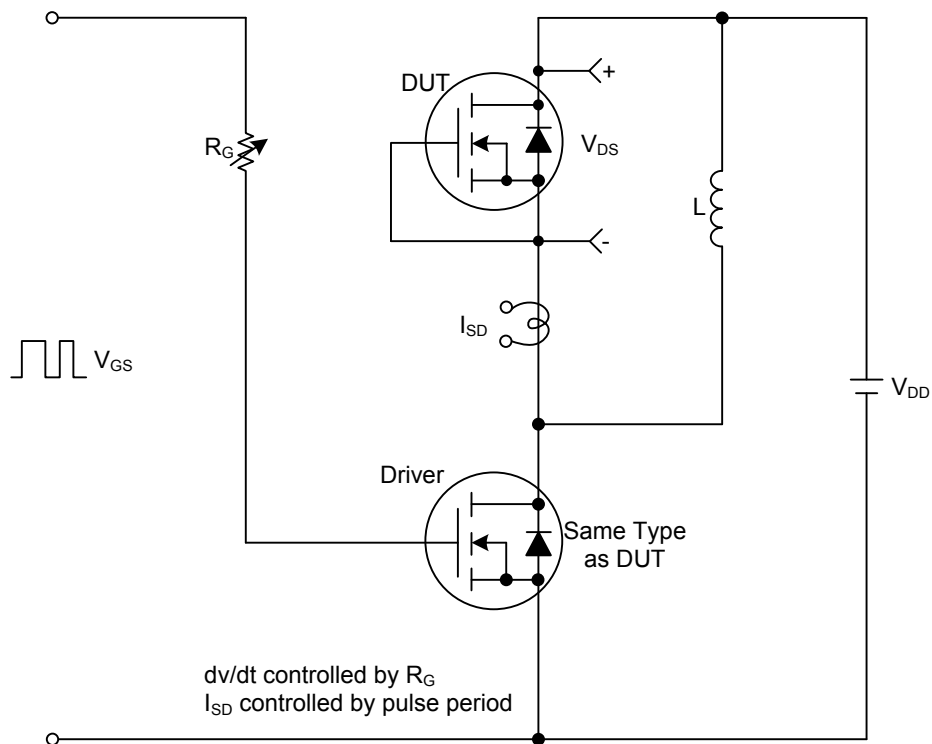
■ **ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	250			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =250V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			10	μA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-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 =0.15A			6.5	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1MHz		56.6		pF
Output Capacitance		C _{OSS}			20.2		pF
Reverse Transfer Capacitance		C _{RSS}			9		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)		5.5		nC
Gate to Source Charge		Q _{GS}			0.24		nC
Gate to Drain Charge		Q _{GD}			0.84		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)		16.8		ns
Rise Time		t _R			19.2		ns
Turn-OFF Delay Time		t _{D(OFF)}			58.8		ns
Fall-Time		t _F			50		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				0.3	A
Maximum Body-Diode Pulsed Current		I _{SM}				1.2	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =0.3A			1.3	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =0.2A, V _{GS} =0V,		100		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt = 100A/μs		104		nC

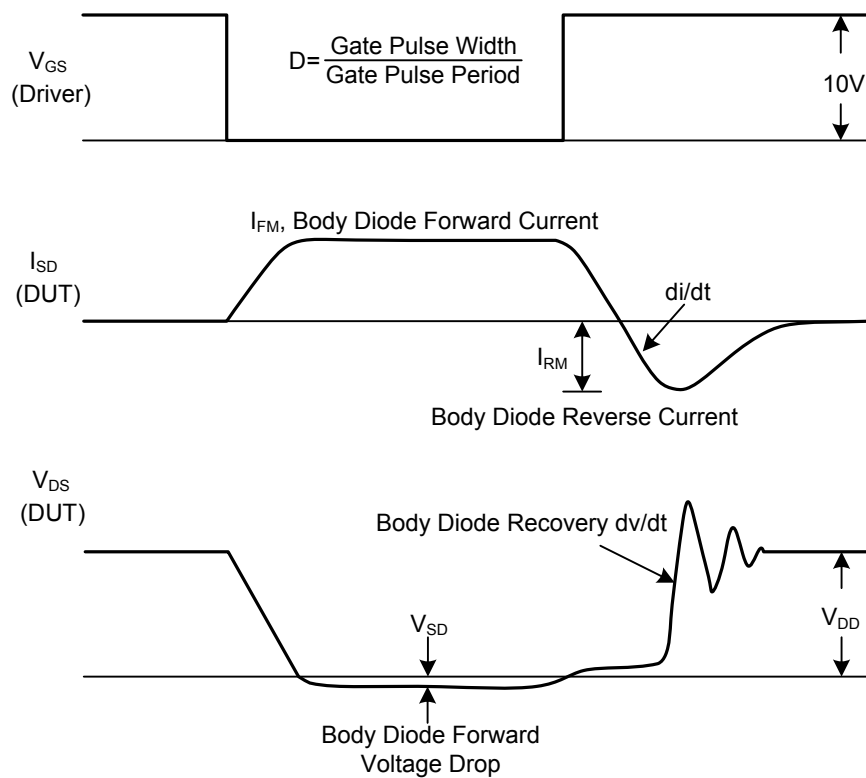
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

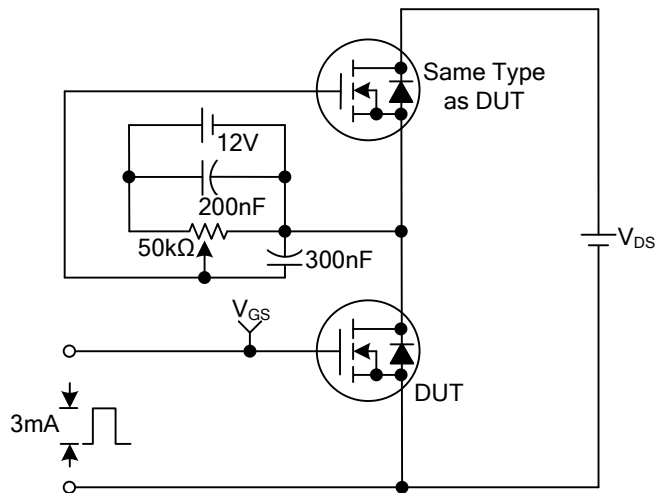


Peak Diode Recovery dv/dt Test Circuit

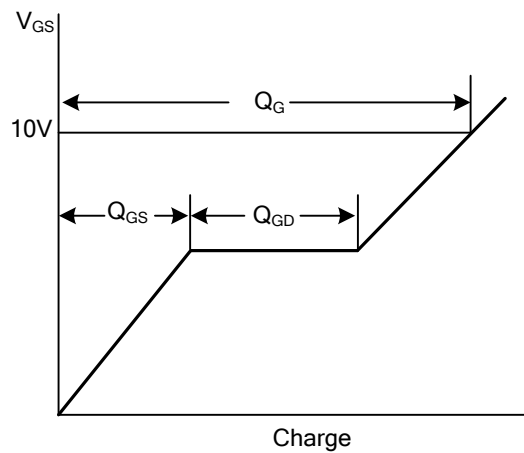


Peak Diode Recovery dv/dt Waveforms

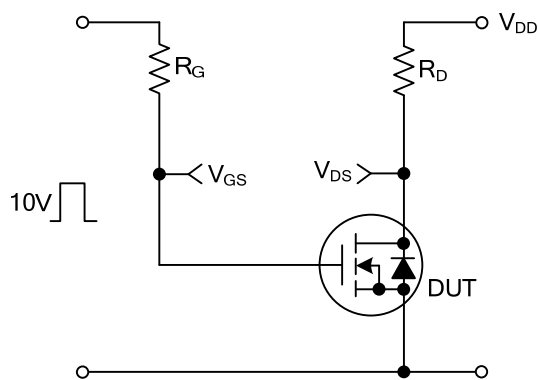
■ TEST CIRCUITS AND WAVEFORMS



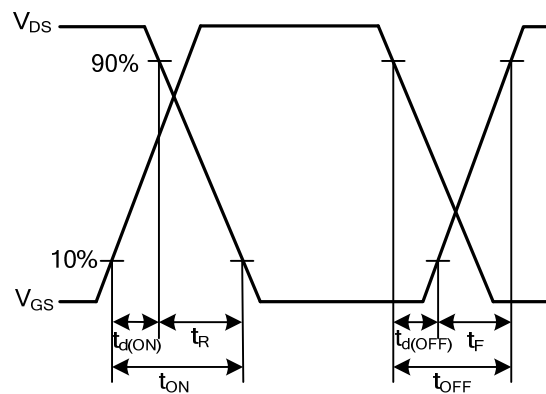
Gate Charge Test Circuit



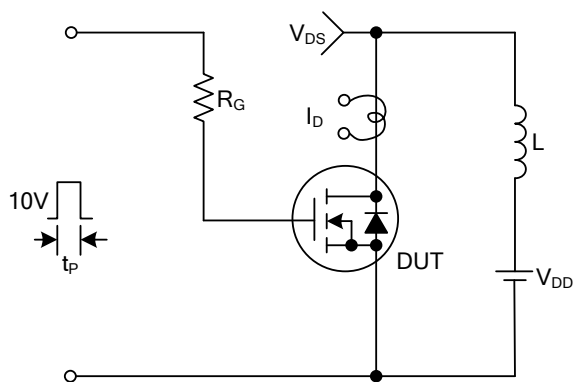
Gate Charge Waveforms



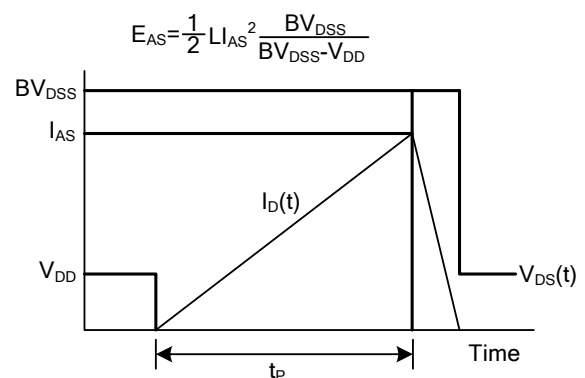
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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