



25N20

Power MOSFET

25A, 200V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

■ DESCRIPTION

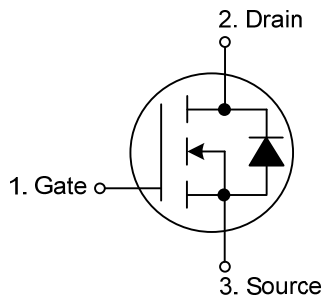
The UTC **25N20** is an N-channel enhancement mode power MOSFET and it uses UTC's perfect technology to provide designers with fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

It is generally suitable for all commercial-industrial applications and DC/DC converters requiring low voltage.

■ FEATURES

- * $R_{DS(ON)} < 160 \text{ m}\Omega @ V_{GS} = 10V, I_D = 16A$
- * Single Drive Requirement
- * Low Gate Charge
- * RoHS Compliant

■ SYMBOL



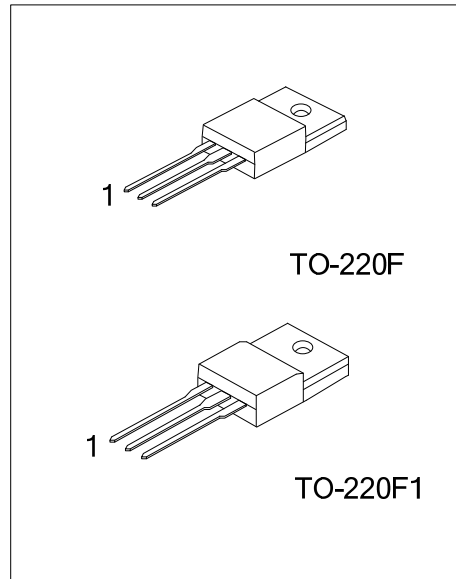
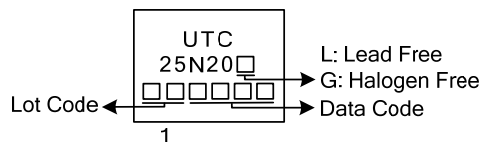
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
25N20L-TF3-T	25N20G-TF3-T	TO-220F	G	D	S	Tube
25N20L-TF1-T	25N20G-TF1-T	TO-220F1	G	D	S	Tube

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

<p>25N20L-TF3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube</p> <p>(2) TF3: TO-220F, TF1: TO-220F1</p> <p>(3) L: Lead Free, 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}	± 20	V
Continuous Drain Current ($V_{GS}=10V$)	$T_C=25^\circ C$	I_D	25
	$T_C=100^\circ C$	I_D	15.86
Pulsed Drain Current (Note 2)	I_{DM}	80	A
Total Power Dissipation ($T_C=25^\circ C$)	P_D	50	W
Operating Junction Temperature	T_J	-55 ~ +150	$^\circ C$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ C$

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. Pulse width limited by max. junction temperature.

■ THERMAL DATA

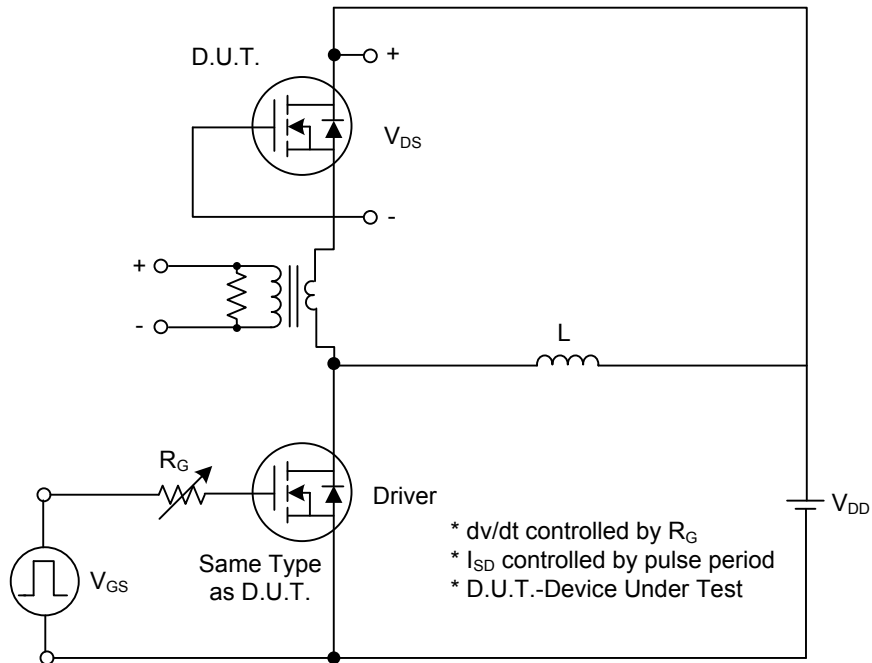
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^\circ C/W$
Junction to Case	θ_{JC}	2.5	$^\circ C/W$

■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ C$, unless otherwise specified)

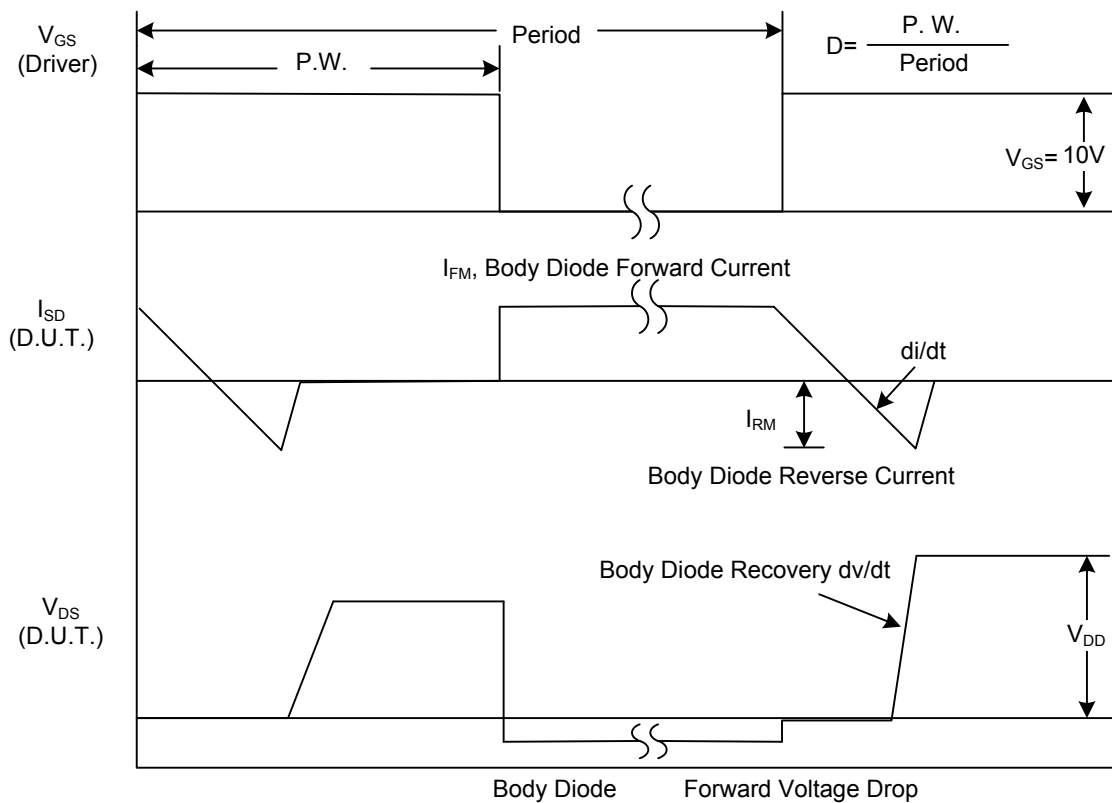
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	200			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ C, I_D=1mA$		0.14		$V/^\circ C$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ C$			1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=150^\circ C$			100	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2		4	V
Static Drain-Source On-Resistance (Note)	$R_{DS(ON)}$	$V_{GS}=10V, I_D=16A$		112	160	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=16A$		14		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$		1000	1700	pF
Output Capacitance	C_{OSS}			240		pF
Reverse Transfer Capacitance	C_{RSS}			25		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time ¹	$t_{D(ON)}$	$V_{DD}=30V, I_D=0.5A, R_G=25m\Omega, V_{GS}=10V, R_D=3.125\Omega$		56		ns
Turn-ON Rise Time	t_R			75		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			240		ns
Turn-OFF Fall-Time	t_F			100		ns
Total Gate Charge (Note)	Q_G	$V_{GS}=10V, V_{DS}=50V, I_D=1.3A$		35	40	nC
Gate Source Charge	Q_{GS}			8		nC
Gate Drain Charge	Q_{GD}			9.7		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note)	V_{SD}	$I_S=25A, V_{GS}=0V$			1.3	V
Reverse Recovery Time	t_{RR}	$I_S=25A, V_{GS}=0V,$		90		ns
Reverse Recovery Charge	Q_{RR}	$dI/dt=100A/\mu s$		380		nC

Note: Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

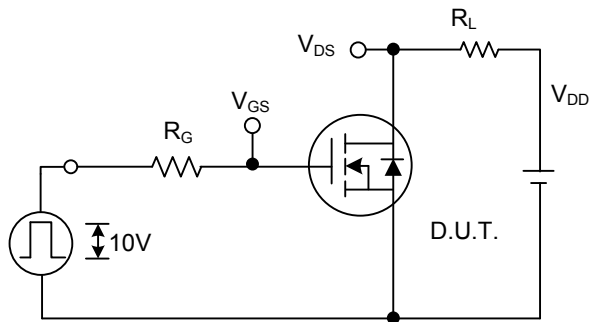


Peak Diode Recovery dv/dt Test Circuit

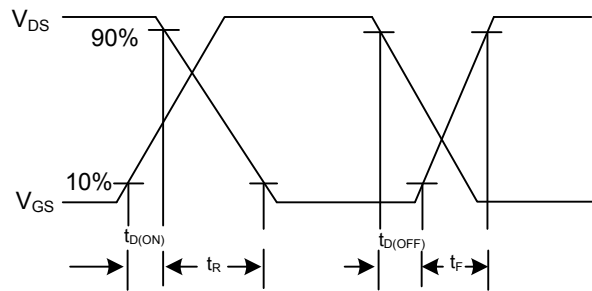


Peak Diode Recovery dv/dt Waveforms

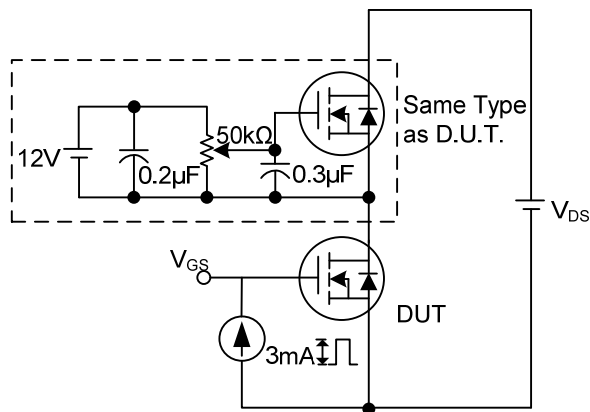
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



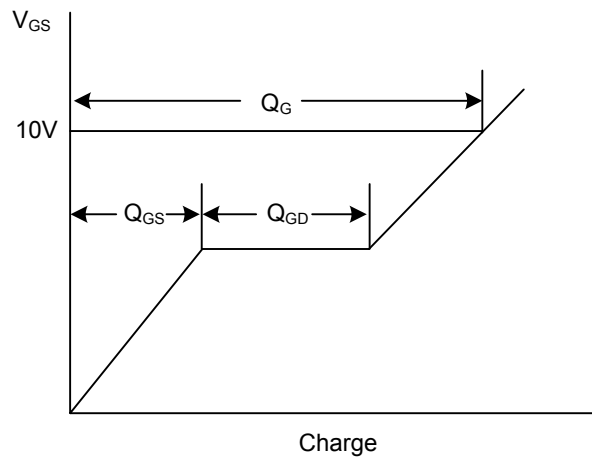
Switching Test Circuit



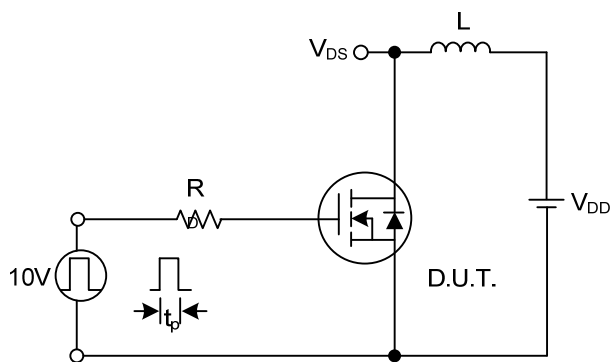
Switching Waveforms



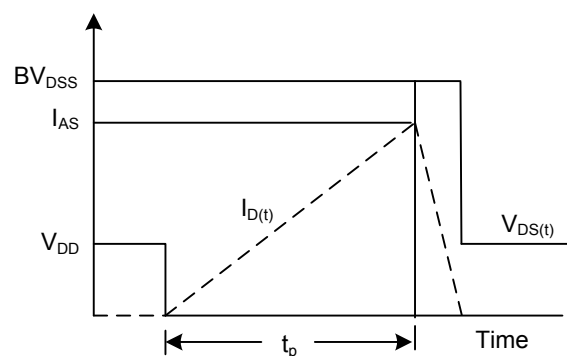
Gate Charge Test Circuit



Gate Charge Waveform

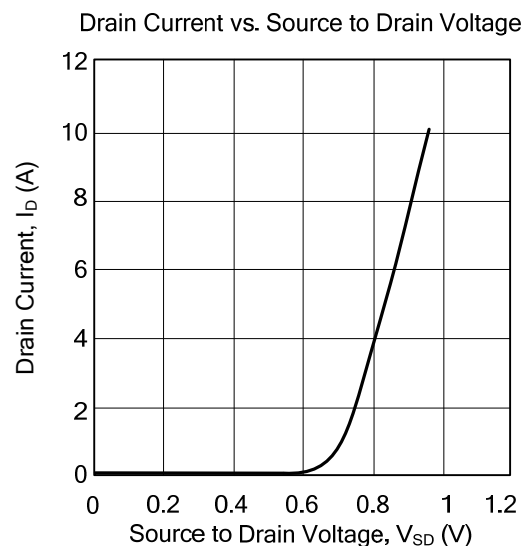
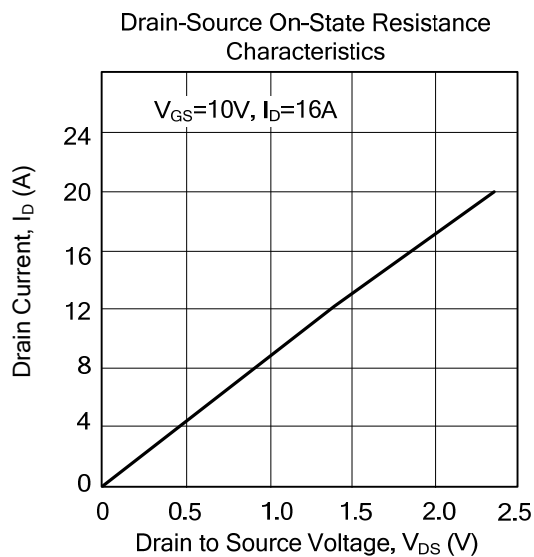
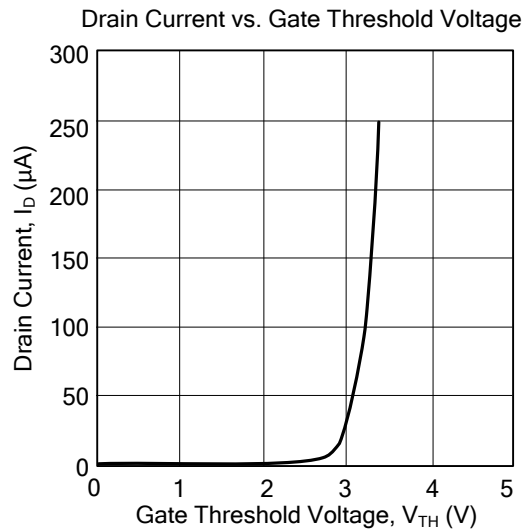
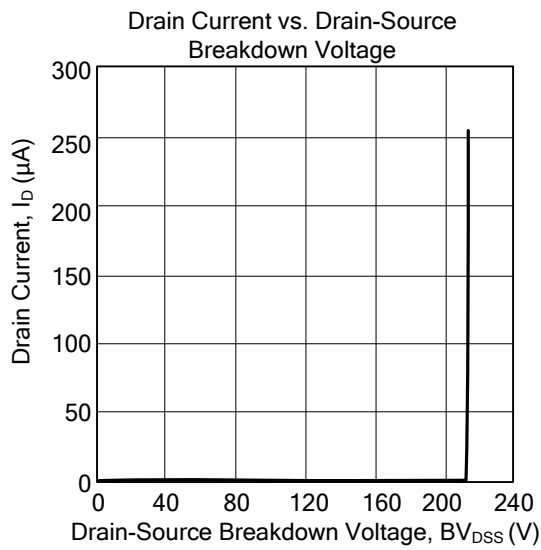


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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