



75N75

Power MOSFET

80A, 75V N-CHANNEL POWER MOSFET

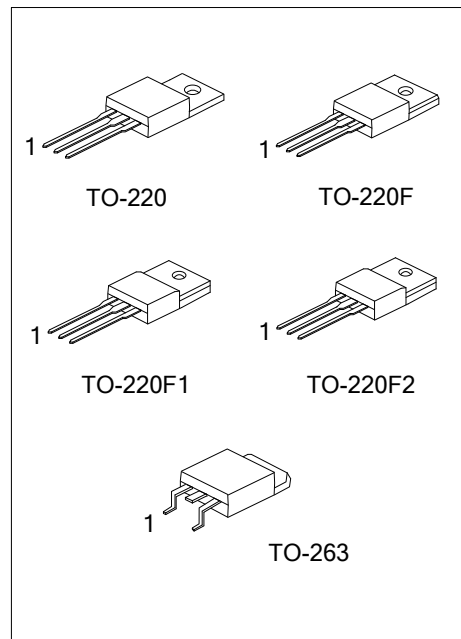
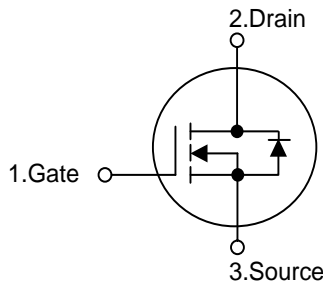
DESCRIPTION

The UTC 75N75 is n-channel enhancement mode power field effect transistors with stable off-state characteristics, fast switching speed, low thermal resistance, usually used at telecom and computer application.

FEATURES

- * $R_{DS(ON)} \leq 11 \text{ m}\Omega @ V_{GS}=10V, I_D=40A$
- * Ultra low gate charge (typical 117 nC)
- * Fast switching capability
- * Low reverse transfer Capacitance (C_{RSS} = typical 240 pF)
- * Avalanche energy Specified
- * Improved dv/dt capability, high ruggedness

SYMBOL



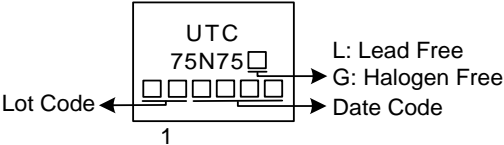
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
75N75L-TA3-T	75N75G-TA3-T	TO-220	G	D	S	Tube
75N75L-TF1-T	75N75G-TF1-T	TO-220F1	G	D	S	Tube
75N75L-TF2-T	75N75G-TF2-T	TO-220F2	G	D	S	Tube
75N75L-TF3-T	75N75G-TF3-T	TO-220F	G	D	S	Tube
75N75L-TQ2-T	75N75G-TQ2-T	TO-263	G	D	S	Tube
75N75L-TQ2-R	75N75G-TQ2-R	TO-263	G	D	S	Tape Reel

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

<p>75N75G-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F, TQ2: TO-263 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



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■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	75	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	80	A
Pulsed Drain Current (Note 2)		I_{DM}	320	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	700	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	12	V/ns
Power Dissipation	TO-220/TO-263	P_D	300	W
	TO-220F/ TO-220F1		48	W
	TO-220F2		50	W
Junction Temperature		T_J	+175	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +175	$^\circ\text{C}$

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. Pulse width limited by safe operating area

3. Starting $T_J=25^\circ\text{C}$, $I_D=40\text{A}$, $V_{DD}=37.5\text{V}$

4. $I_{SD}\leq 80\text{A}$, $di/dt\leq 300\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, $T_J\leq T_{JMAX}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220/TO-263	θ_{JC}	0.5	$^\circ\text{C}/\text{W}$
	TO-220F/ TO-220F1		2.6	$^\circ\text{C}/\text{W}$
	TO-220F2		2.5	$^\circ\text{C}/\text{W}$

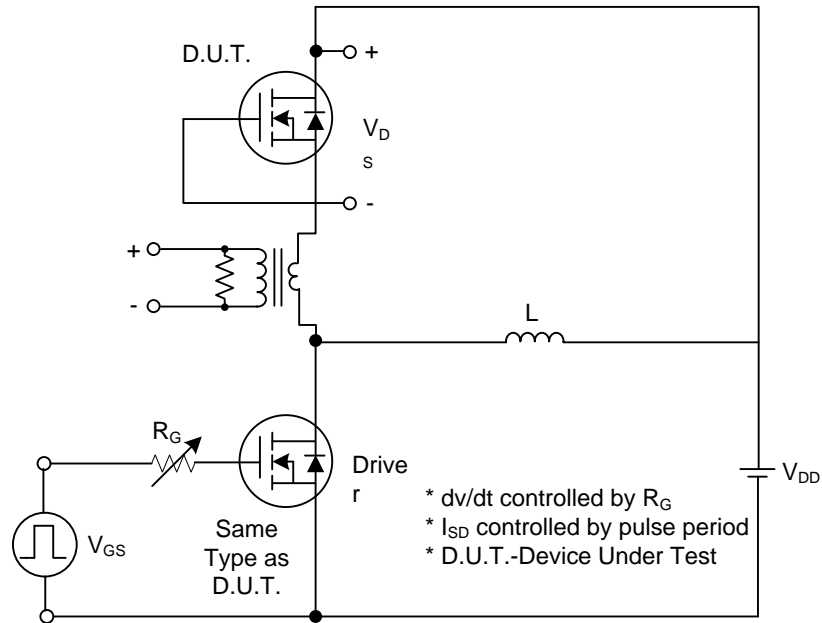
■ **ELECTRICAL CHARACTERISTICS** ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	75			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}$			1	μA
Gate-Source Leakage Current	Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			100	nA
	Reverse	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		9.5	11	m Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}$ $f = 1\text{ MHz}$		3700		pF
Output Capacitance	C_{OSS}			773		pF
Reverse Transfer Capacitance	C_{RSS}			86		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_G	$V_{DS} = 60\text{ V}, V_{GS} = 10\text{ V}$ $I_D = 80\text{ A}$		430	440	nC
Gate-Source Charge	Q_{GS}			70		nC
Gate-Drain Charge	Q_{GD}			102		nC
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 37.5\text{ V}, I_D = 45\text{ A},$ $V_{GS} = 10\text{ V}, R_G = 4.7\ \Omega$		133	150	ns
Turn-On Rise Time	t_R			208	232	ns
Turn-Off Delay Time	$t_{D(OFF)}$			354	370	ns
Turn-Off Fall Time	t_F			246	260	ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Source Current	I_S				80	A
Pulsed Source Current (Note 1)	I_{SM}				320	A
Drain-Source Diode Forward Voltage (Note 2)	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 80\text{ A}$			1.5	V
Reverse Recovery Time	t_{rr}	$I_S = 80\text{ A}, V_{DD} = 25\text{ V}$ $di_F / dt = 100\text{ A}/\mu\text{s}$		132		ns
Reverse Recovery Charge	Q_{rr}			660		μC

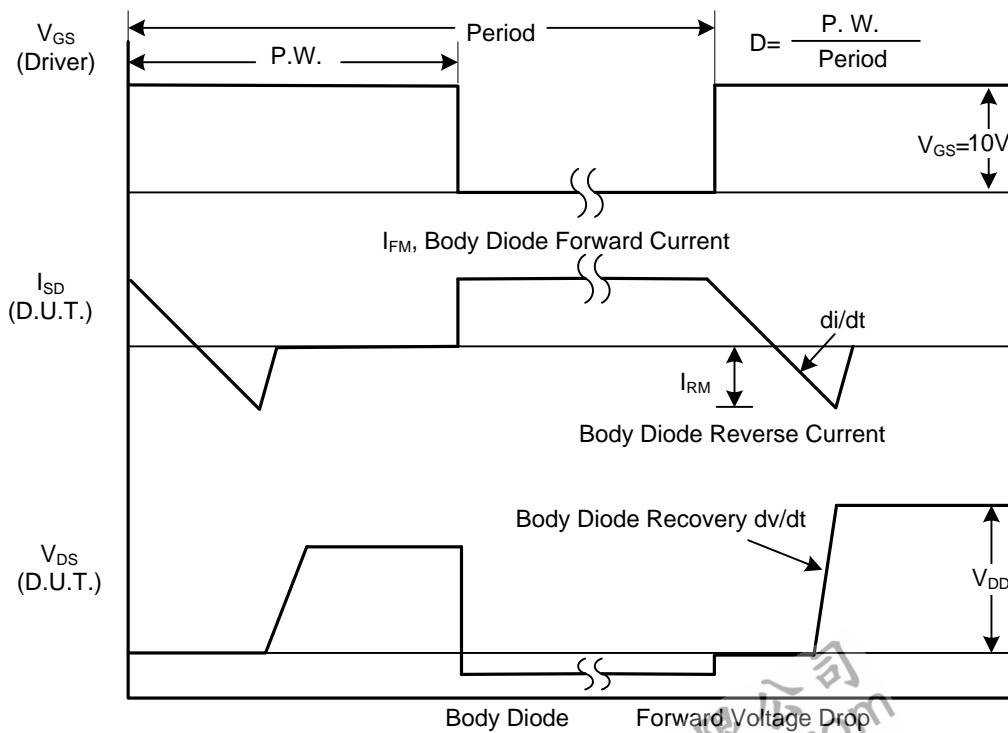
Notes: 1. Pulse Test : Pulse width $\leq 300\ \mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

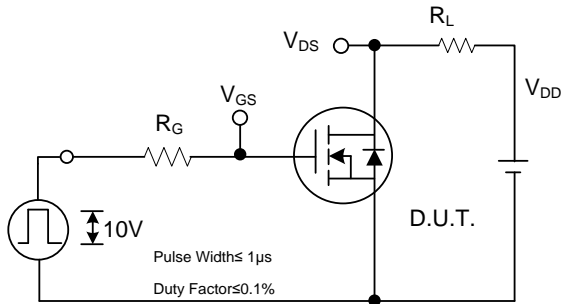


1A Peak Diode Recovery dv/dt Test Circuit

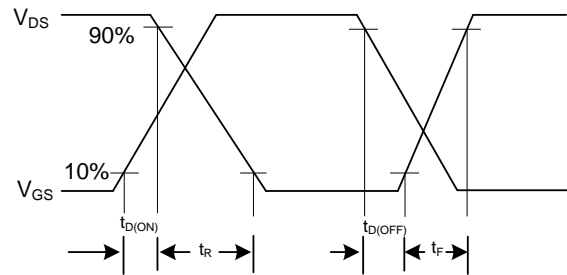


1B Peak Diode Recovery dv/dt Waveforms

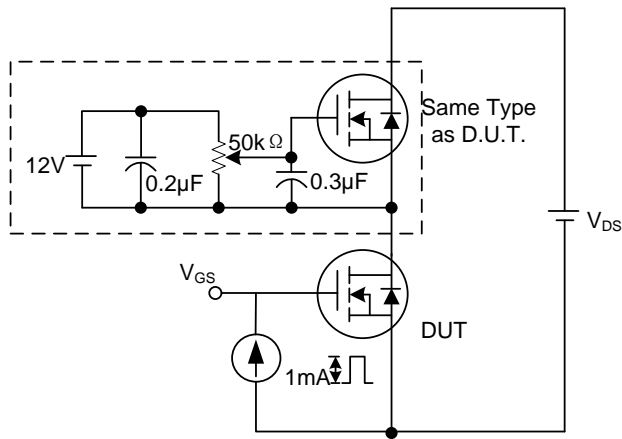
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



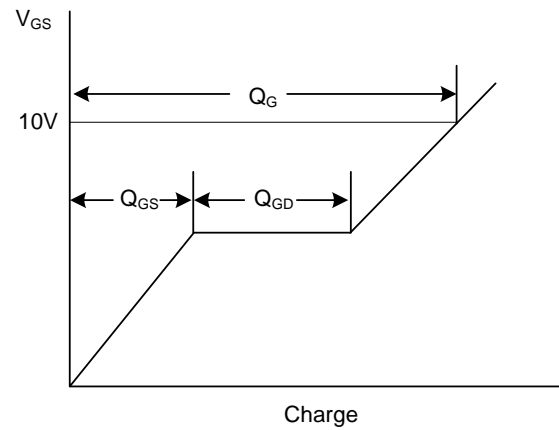
2A Switching Test Circuit



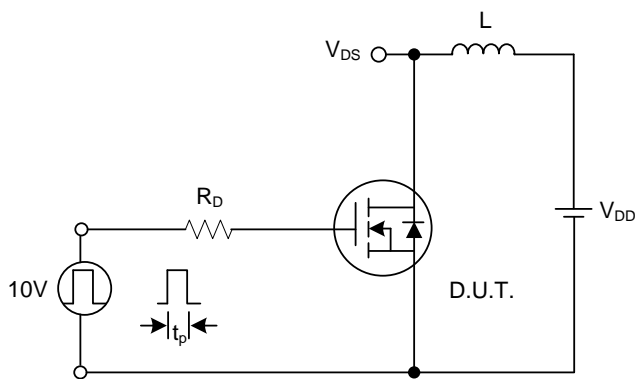
2B Switching Waveforms



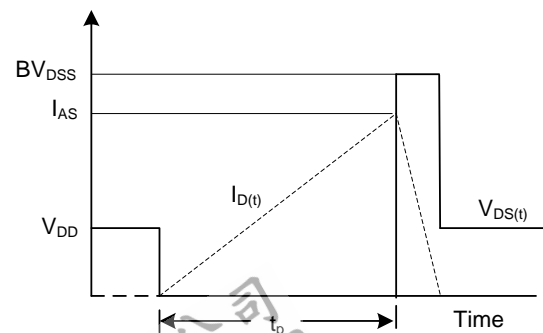
3A Gate Charge Test Circuit



3B Gate Charge Waveform

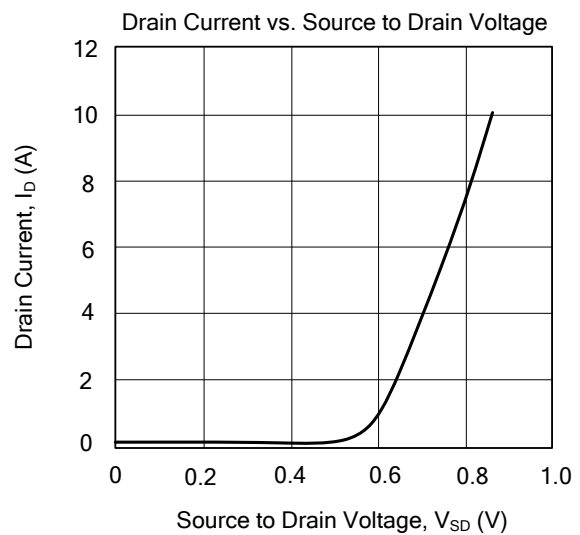
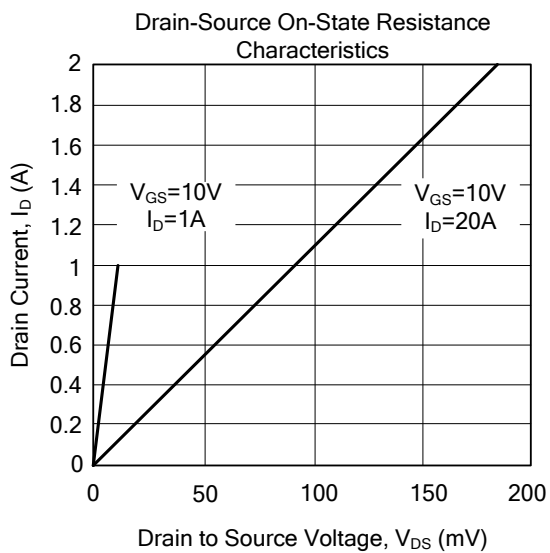
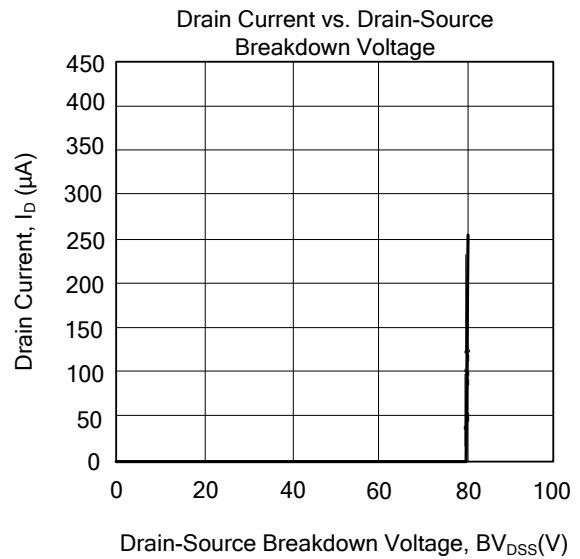
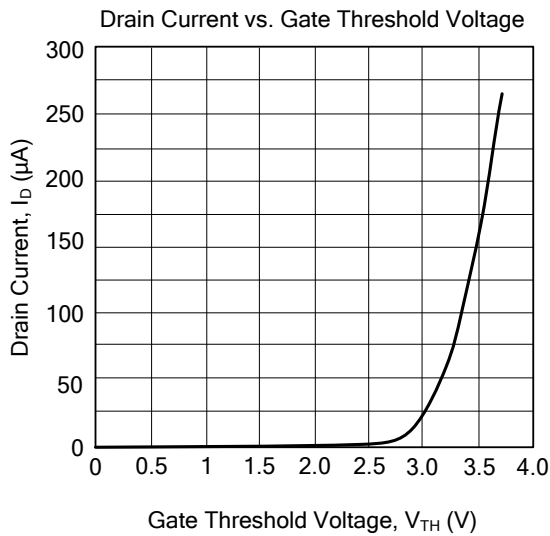


4A Unclamped Inductive Switching Test Circuit



4B Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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