



75N75

Power MOSFET

80A, 75V N-CHANNEL POWER MOSFET

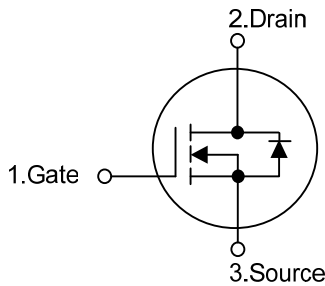
■ DESCRIPTION

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

- * $R_{DS(ON)}=11m\Omega$ @ $V_{GS}=10V$, $I_D=40A$
- * 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

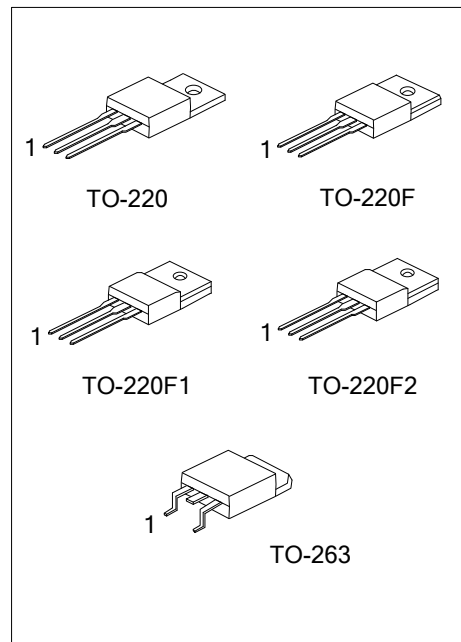


■ ORDERING INFORMATION

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>75N75L-TA3-T</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</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) L: Lead Free, G: Halogen Free</p>
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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	$^\circ\text{C}$

Note: 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	$^\circ\text{C}/\text{W}$

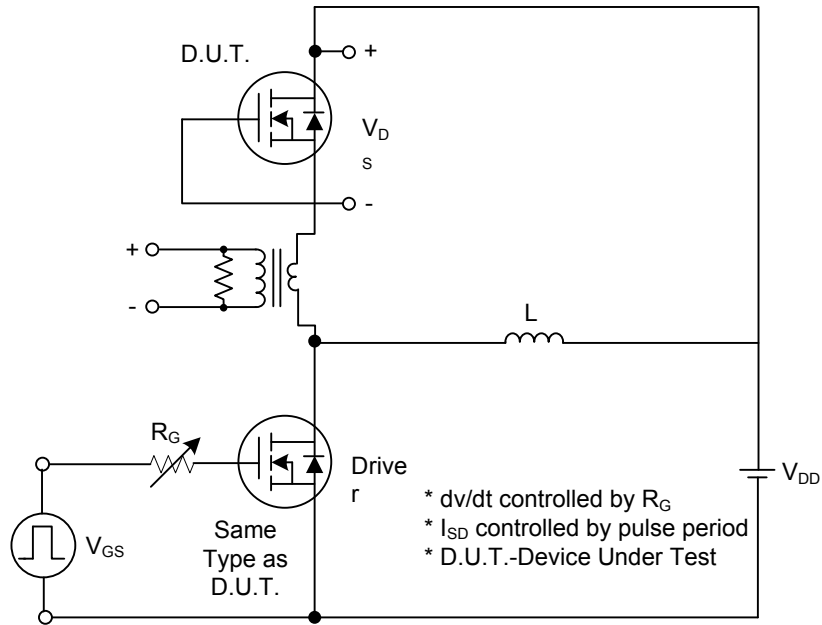
■ ELECTRICAL CHARACTERISTICS (T_C = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250 μA	75			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 75 V, V _{GS} = 0 V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}			100	nA
	Reverse					
		V _{GS} = -20V, V _{DS} = 0 V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250 μA	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10 V, I _D = 40 A		9.5	11	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, V _{DS} = 25 V f = 1MHz		3700		pF
Output Capacitance	C _{OSS}			773		pF
Reverse Transfer Capacitance	C _{RSS}			86		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 37.5V, I _D = 45A, V _{GS} = 10V, R _G = 4.7Ω		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
Total Gate Charge	Q _G	V _{DS} = 60V, V _{GS} = 10 V I _D = 80A		430	440	nC
Gate-Source Charge	Q _{GS}			70		nC
Gate-Drain Charge	Q _{GD}			102		nC
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note 2)	V _{SD}	V _{GS} = 0 V, I _S = 80A			1.5	V
Continuous Source Current	I _S				80	A
Pulsed Source Current (Note 1)	I _{SM}				320	A
Reverse Recovery Time	t _{RR}	I _S = 80A, V _{DD} = 25 V di _F / dt = 100 A/μs		132		ns
Reverse Recovery Charge	Q _{RR}				660	

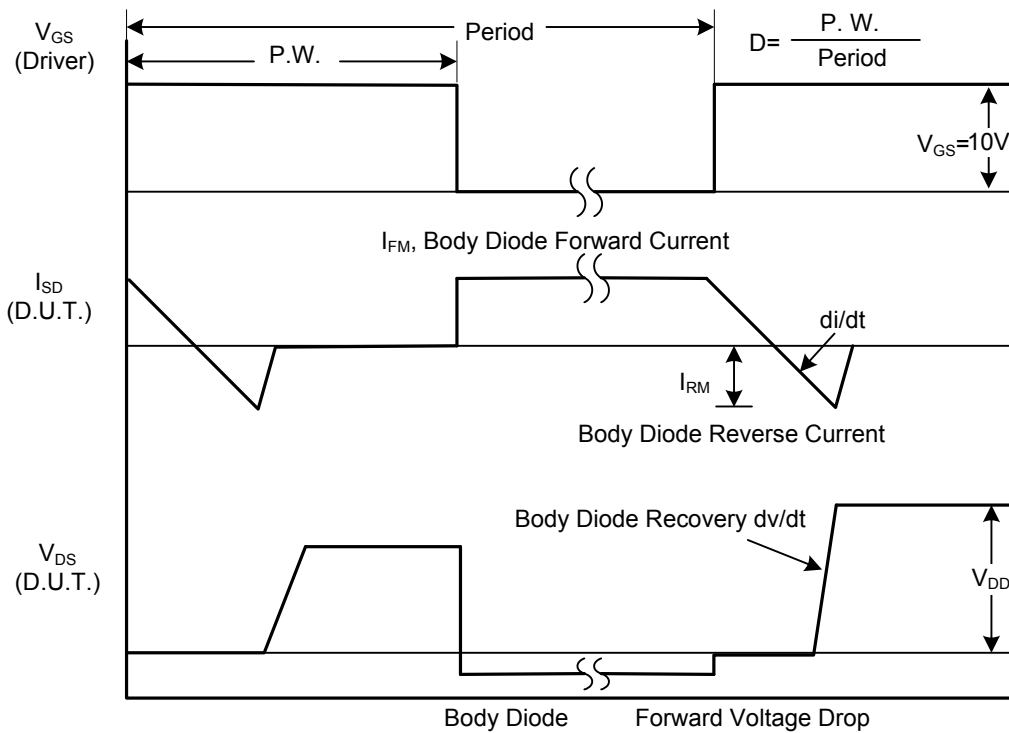
Note: 1. Pulse width limited by safe operating area

2. Pulsed: pulse duration=300μs, duty cycle 1.5%

■ TEST CIRCUITS AND WAVEFORMS

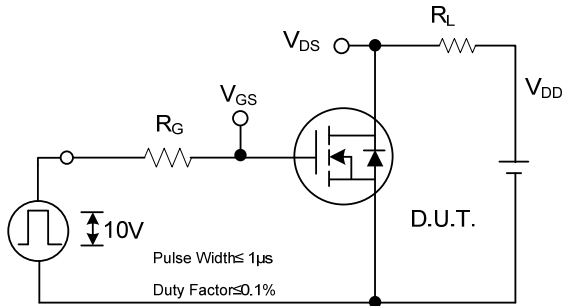


1A Peak Diode Recovery dv/dt Test Circuit

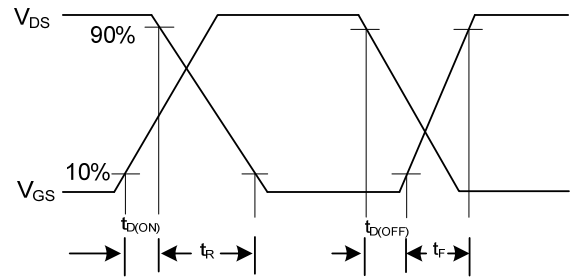


1B Peak Diode Recovery dv/dt Waveforms

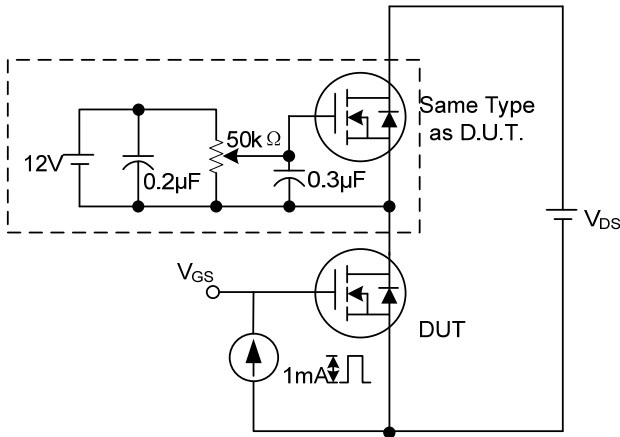
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



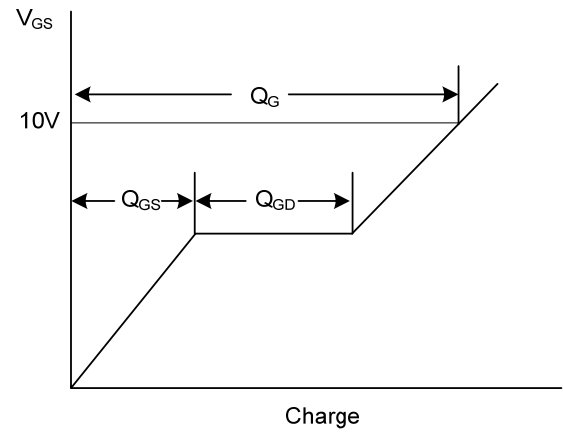
2A Switching Test Circuit



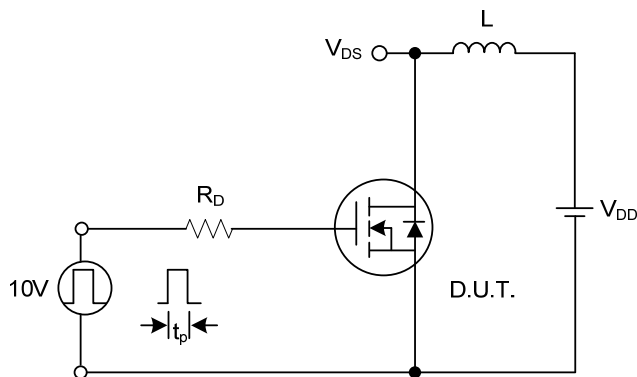
2B Switching Waveforms



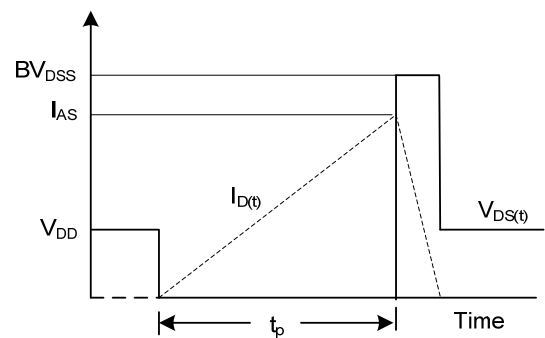
3A Gate Charge Test Circuit



3B Gate Charge Waveform

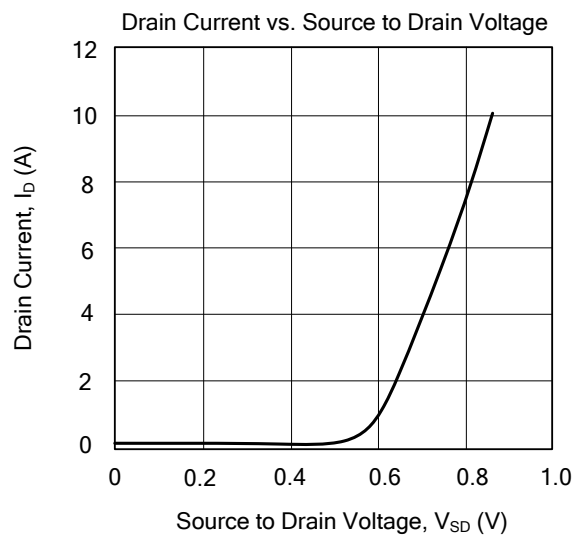
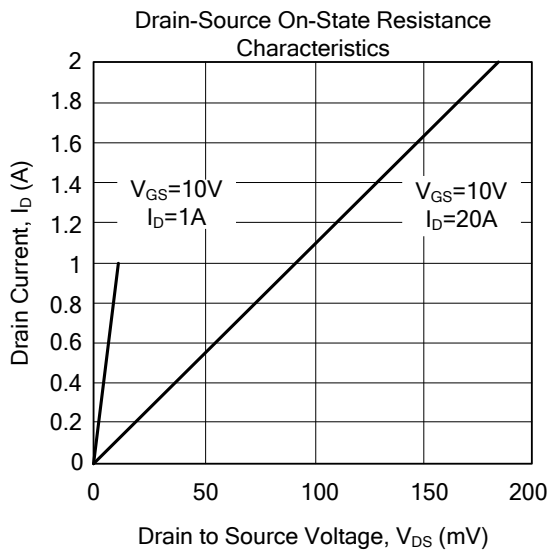
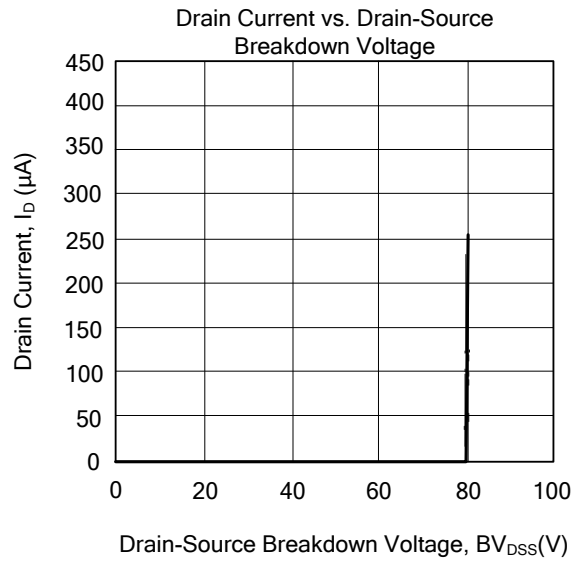
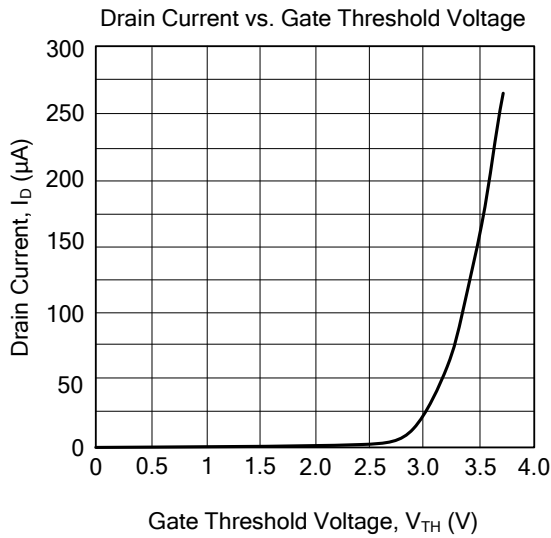


4A Unclamped Inductive Switching Test Circuit



4B Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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