



75N75

Power MOSFET

80Amps, 75Volts N-CHANNEL POWER MOSFET

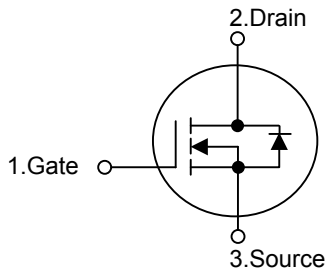
■ DESCRIPTION

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

- * $R_{DS(ON)} = 9.5m\Omega @ V_{GS} = 10 V$
- * 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

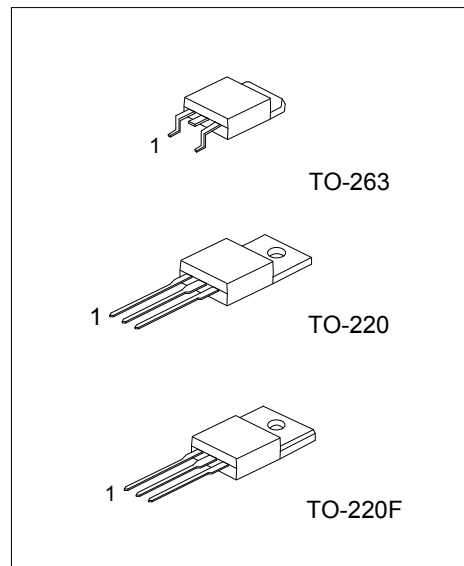


■ ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free Plating	Halogen Free		1	2	3	
75N75-TA3-T	75N75L-TA3-T	75N75G-TA3-T	TO-220	G	D	S	Tube
75N75-TF3-T	75N75L-TF3-T	75N75G-TF3-T	TO-220F	G	D	S	Tube
75N75-TQ2-T	75N75L-TQ2-T	75N75G-TQ2-T	TO-263	G	D	S	Tube
75N75-TQ2-R	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-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) TA3: TO-220, TF3: TO-220F, TQ2: TO-263 (3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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Lead-free: 75N75L
Halogen-free:75N75G

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	75	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	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	300	W
	TO-220F	45	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.

- Pulse width limited by safe operating area
- Starting $T_J=25^{\circ}\text{C}$, $I_D=40\text{A}$, $V_{DD}=37.5\text{V}$
- $I_{SD} \leq 80\text{A}$, $di/dt \leq 300\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, $T_J \leq T_{JMAX}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	62.5	$^{\circ}\text{C}/\text{W}$
	TO-220F	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220/TO-263	0.5	$^{\circ}\text{C}/\text{W}$
	TO-220F	3.33	$^{\circ}\text{C}/\text{W}$

■ 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	I_{GSS}	Forward			100	nA
		Reverse			-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}			730		pF
Reverse Transfer Capacitance	C_{RSS}			240		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 37.5\text{V}$, $I_D = 45\text{A}$, $V_{GS} = 10\text{V}$, $R_G = 4.7\ \Omega$		25		ns
Turn-On Rise Time	t_R			100		ns
Turn-Off Delay Time	$t_{D(OFF)}$			66		ns
Turn-Off Fall Time	t_F			30		ns
Total Gate Charge	Q_G	$V_{DS} = 60\text{V}$, $V_{GS} = 10\text{V}$ $I_D = 80\text{A}$		117	160	nC
Gate-Source Charge	Q_{GS}			27		nC
Gate-Drain Charge	Q_{GD}			47		nC

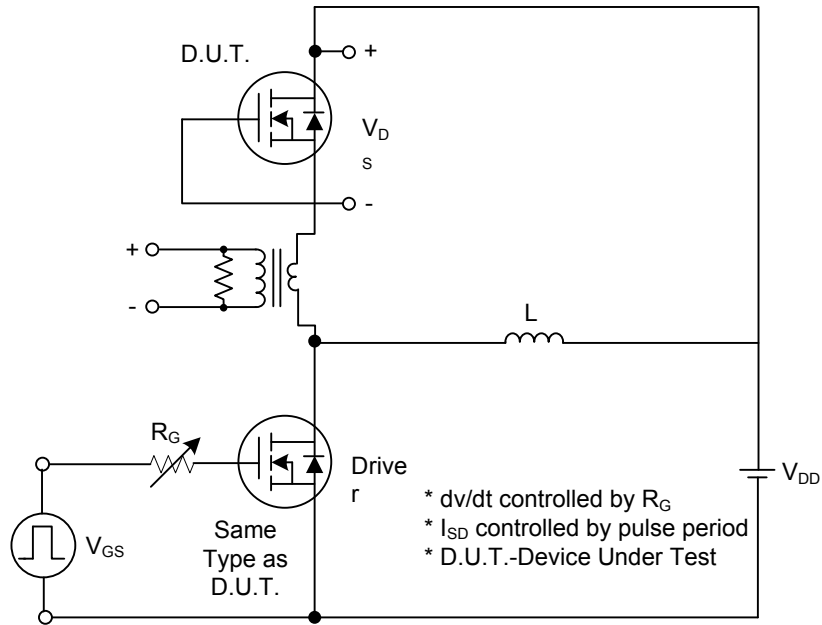
■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note 2)	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 80\text{ A}$			1.5	V
Continuous Source Current	I_S				80	A
Pulsed Source Current (Note 1)	I_{SM}				320	A
Reverse Recovery Time	t_{RR}	$I_S = 80\text{ A}, V_{DD} = 25\text{ V}$		132		ns
Reverse Recovery Charge	Q_{RR}	$di_F / dt = 100\text{ A}/\mu\text{s}$		660		μC

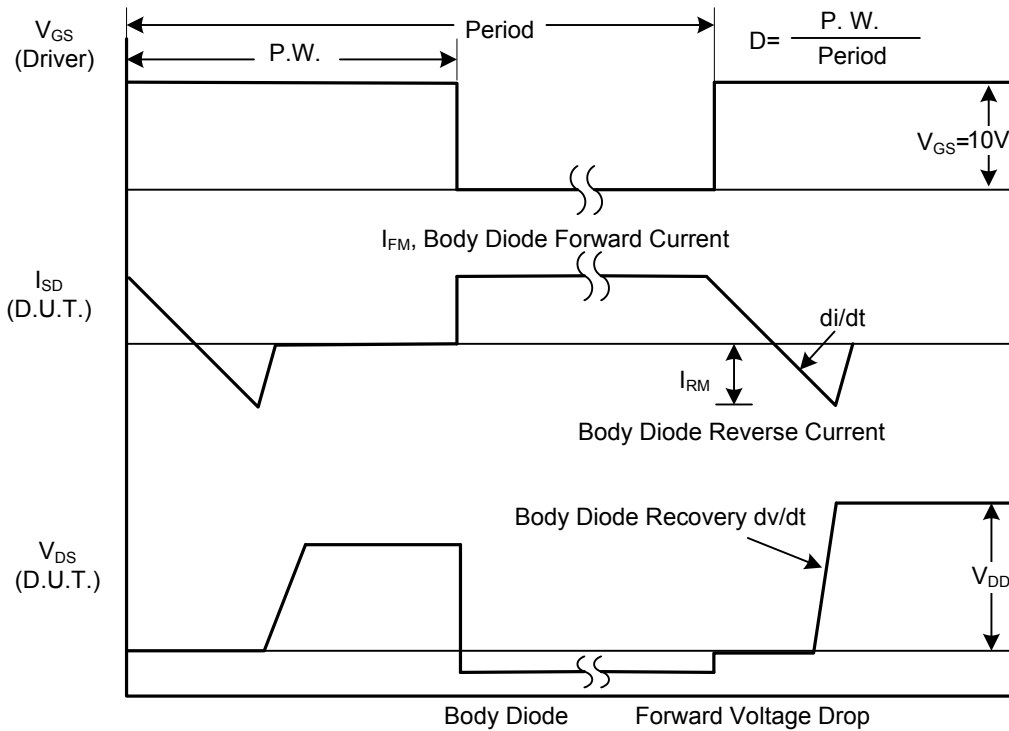
Note: 1. Pulse width limited by safe operating area

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

■ TEST CIRCUITS AND WAVEFORMS

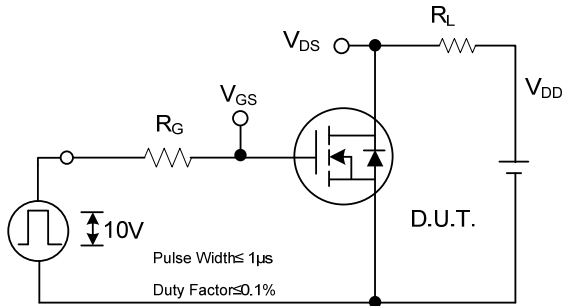


1A Peak Diode Recovery dv/dt Test Circuit

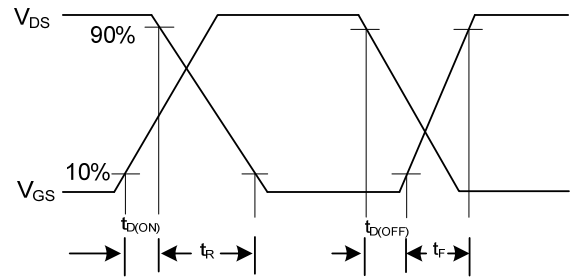


1B Peak Diode Recovery dv/dt Waveforms

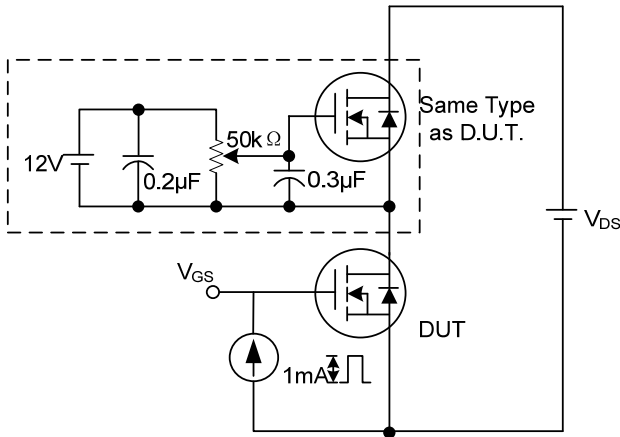
TEST CIRCUITS AND WAVEFORMS (Cont.)



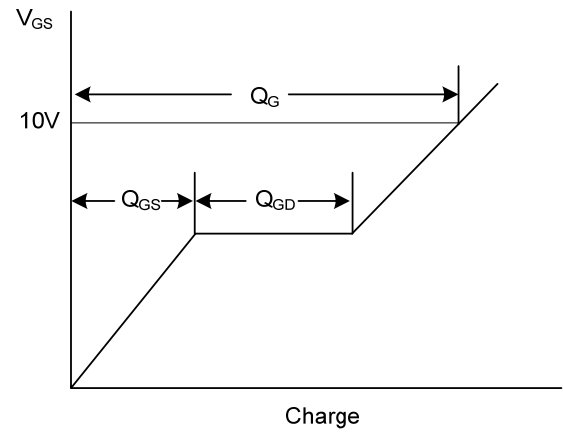
2A Switching Test Circuit



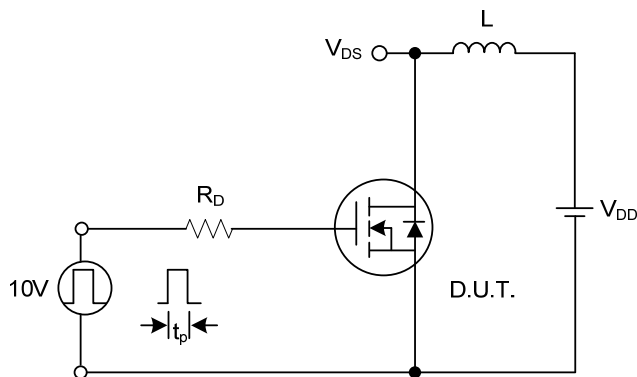
2B Switching Waveforms



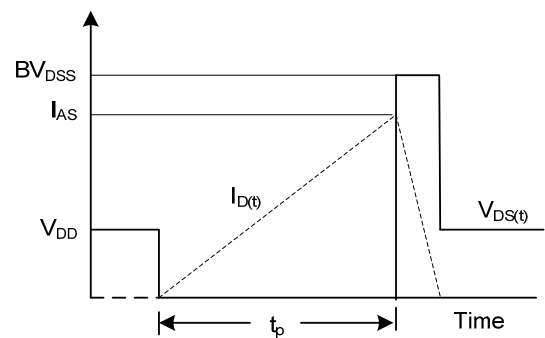
3A Gate Charge Test Circuit



3B Gate Charge Waveform

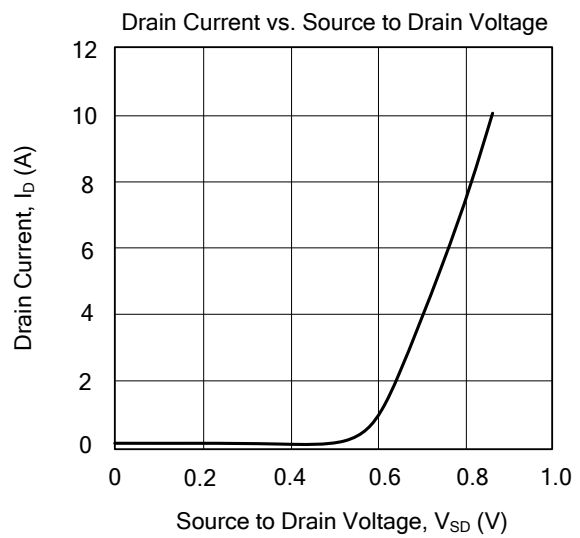
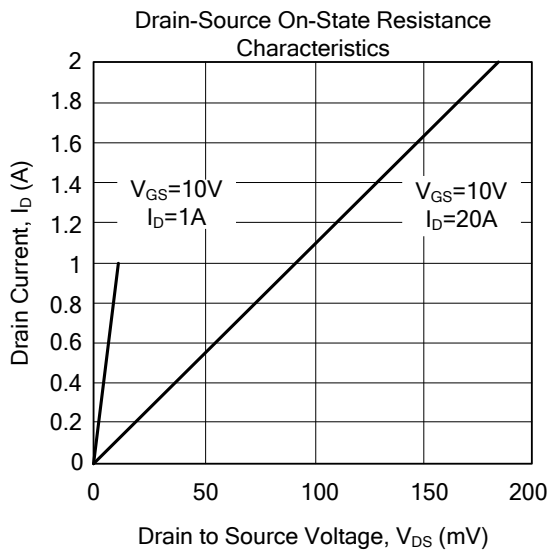
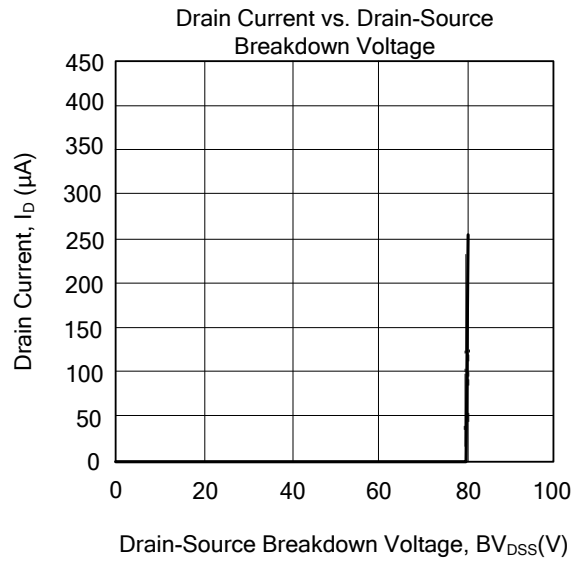
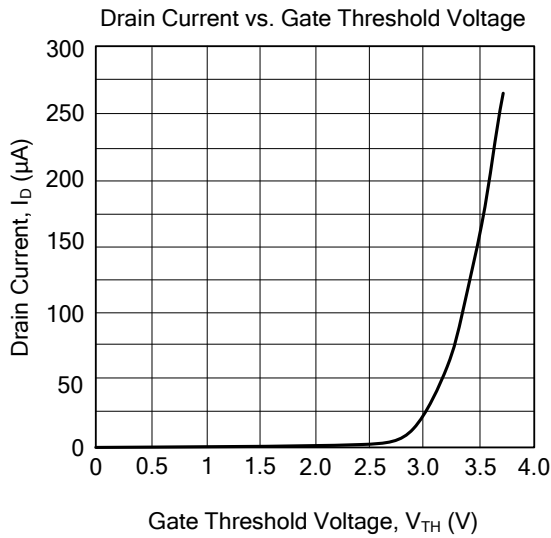


4A Unclamped Inductive Switching Test Circuit



4B Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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