



UTT80N75

Preliminary

Power MOSFET

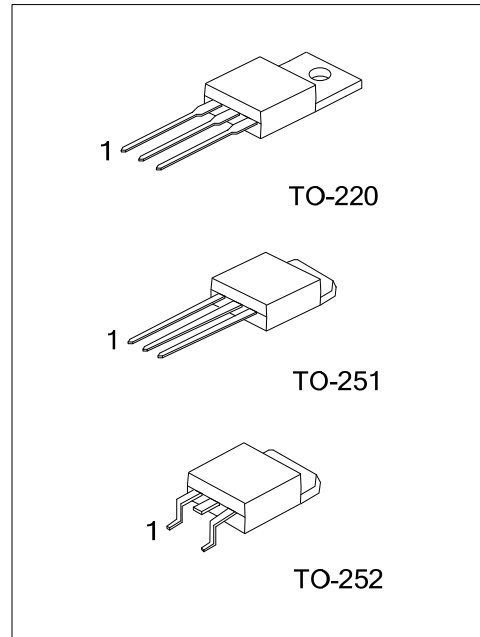
80A, 75V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UTT80N75** is a N-Channel power MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

FEATURES

- * $R_{DS(ON)} < 14\text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=40\text{A}$
- * Low gate charge (typical 117nC)
- * High switching speed



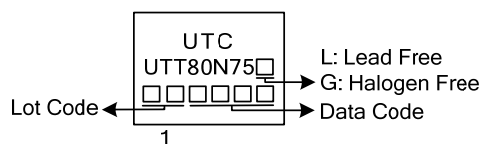
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT80N75L-TA3-T	UTT80N75G-TA3-T	TO-220	G	D	S	Tube
UTT80N75L-TM3-T	UTT80N75G-TM3-T	TO-251	G	D	S	Tube
UTT80N75L-TN3-R	UTT80N75G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT80N75G-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TM3: TO-251, TN3: TO-252</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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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_{DSS}	75	V
Gate-Source Voltage		V_{GSS}	± 25	V
Drain Current	Continuous	I_D	80	A
	Pulsed	I_{DM}	320	A
Avalanche Energy	Single Pulsed	E_{AS}	142	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	13	V/ns
Power Dissipation	TO-220	P_D	167	W
	TO-251/TO-252		55	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-50 ~ +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. $L=0.1\text{mH}$, $I_{AS}=53.2\text{A}$, $V_{DD}=25\text{V}$, $R_G=25\Omega$, starting $T_J=25^\circ\text{C}$

4. $I_{SD}\leq 30\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, starting $T_J=25^\circ\text{C}$

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		110	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.75	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		2.27	$^\circ\text{C}/\text{W}$

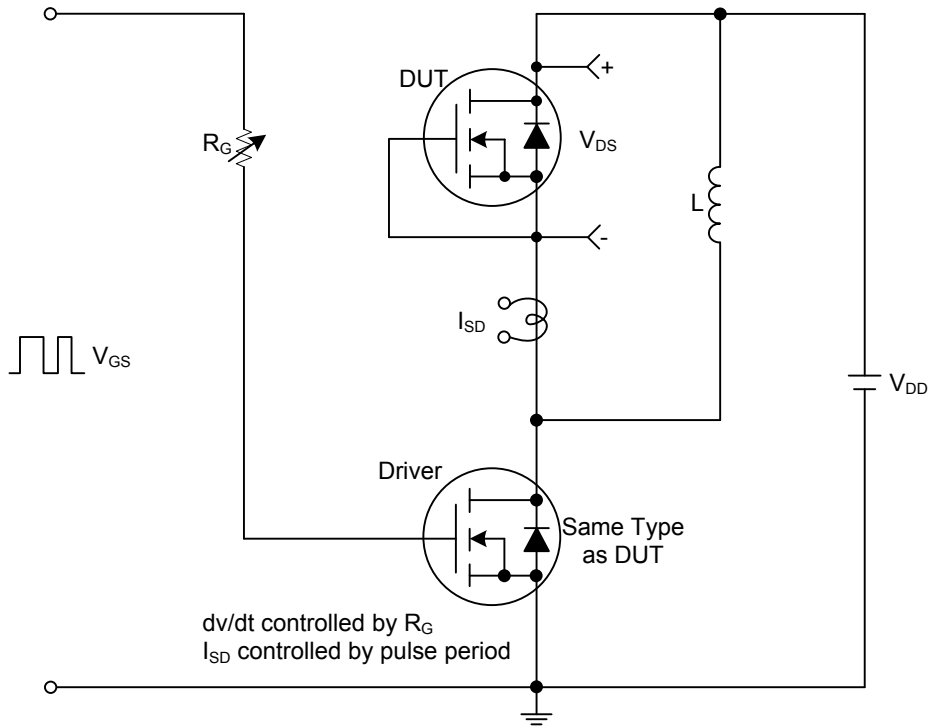
■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	75			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=75\text{V}$, $V_{GS}=0\text{V}$			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}			+100	nA
	Reverse					
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=40\text{A}$			14	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		4220		pF
Output Capacitance	C_{OSS}			426		pF
Reverse Transfer Capacitance	C_{RSS}			245		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$, $I_D=1.3\text{A}$, $I_G=100\mu\text{A}$ (Note 1, 2)		250		nC
Gate to Source Charge	Q_{GS}			17		nC
Gate to Drain Charge	Q_{GD}			28		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}$, $V_{GS}=10\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ (Note 1, 2)		96		ns
Rise Time	t_R			116		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			880		ns
Fall-Time	t_F			210		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				80	A
Maximum Body-Diode Pulsed Current	I_{SM}				320	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=80\text{A}$, $V_{GS}=0\text{V}$			1.5	V
Body Diode Reverse Recovery Time	t_{rr}	$I_S=30\text{A}$, $V_{GS}=0\text{V}$, $di_F/dt=100\text{A}/\mu\text{s}$		48		ns
Reverse Recovery Charge	Q_{rr}			0.218		μC

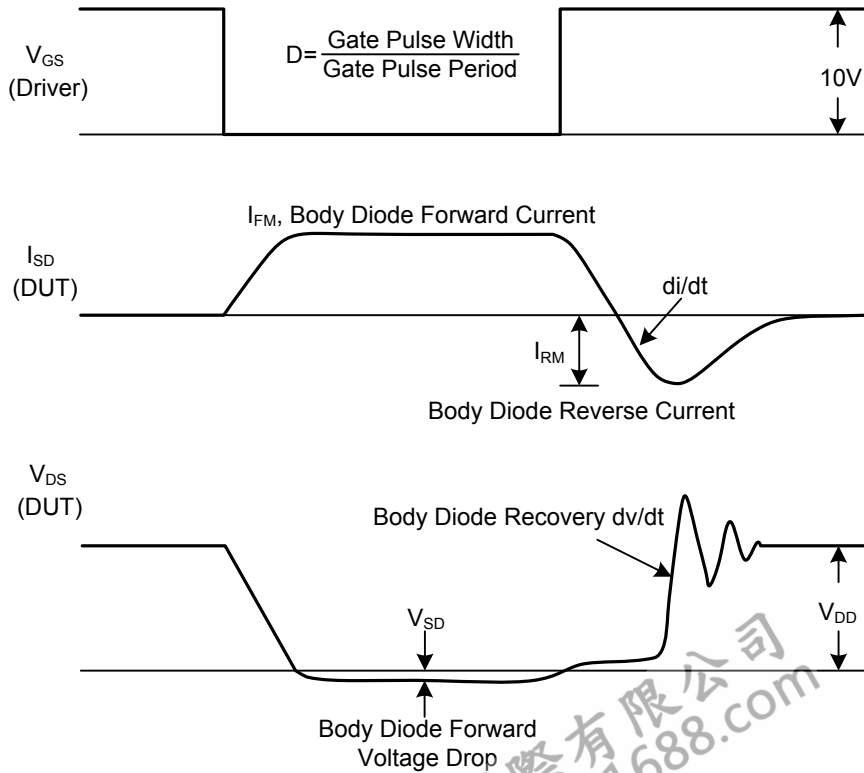
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



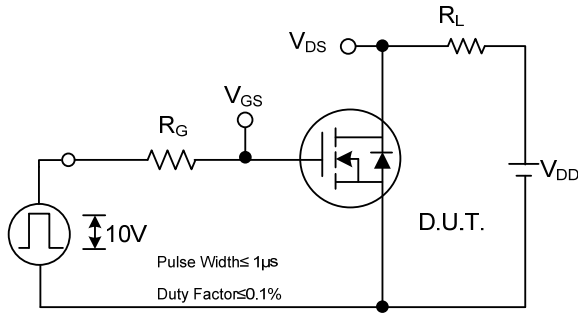
Peak Diode Recovery dv/dt Test Circuit



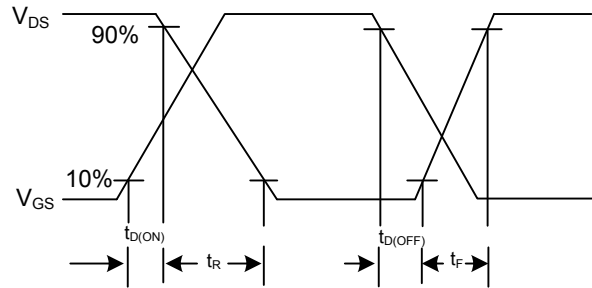
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

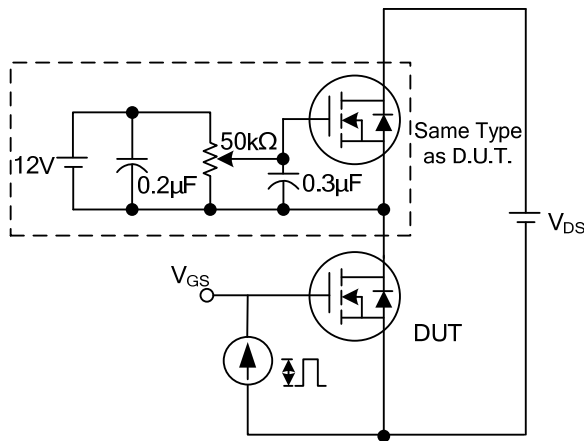
TEST CIRCUITS AND WAVEFORMS



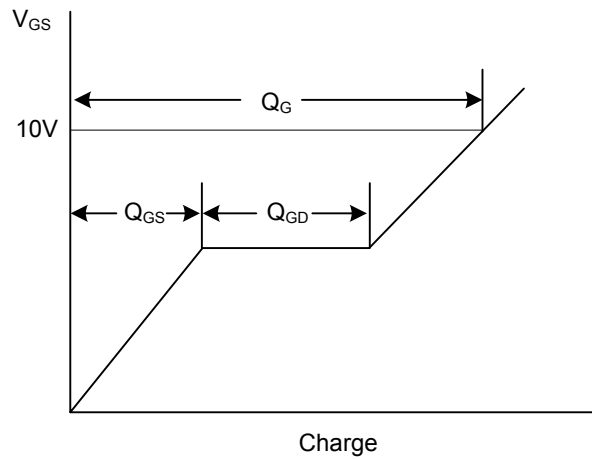
Switching Test Circuit



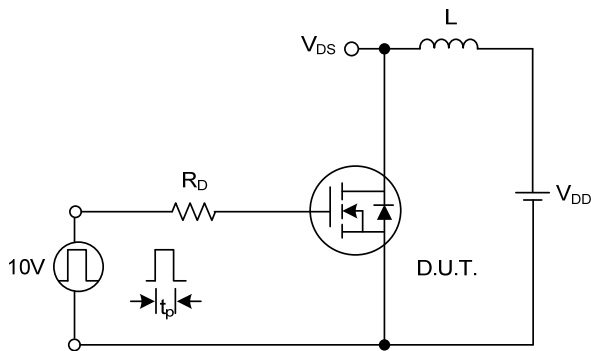
Switching Waveforms



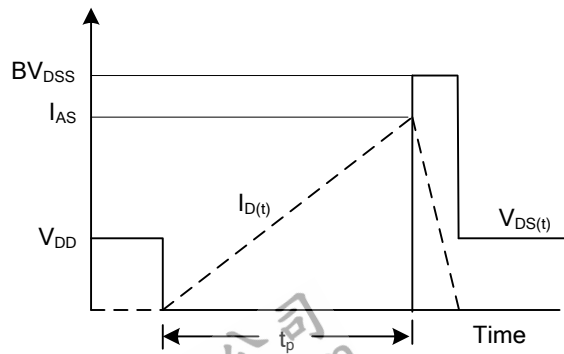
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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