



UTT80N75

Preliminary

Power MOSFET

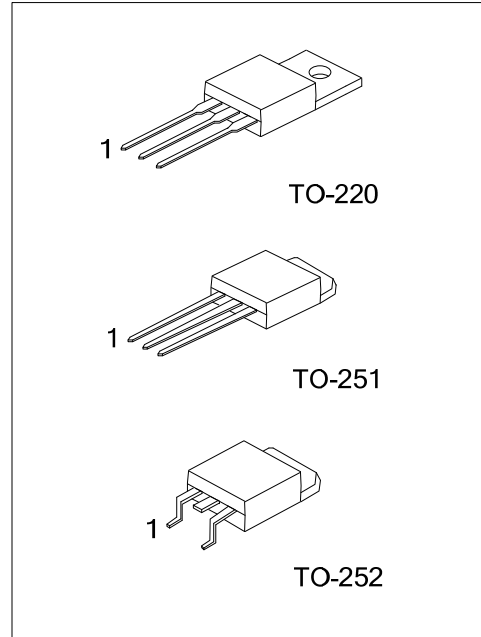
80A, 75V N-CHANNEL POWER MOSFET

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



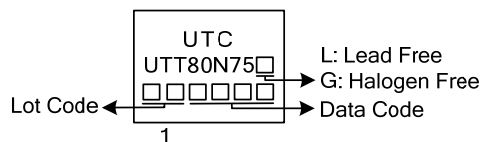
ORDERING INFORMATION

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

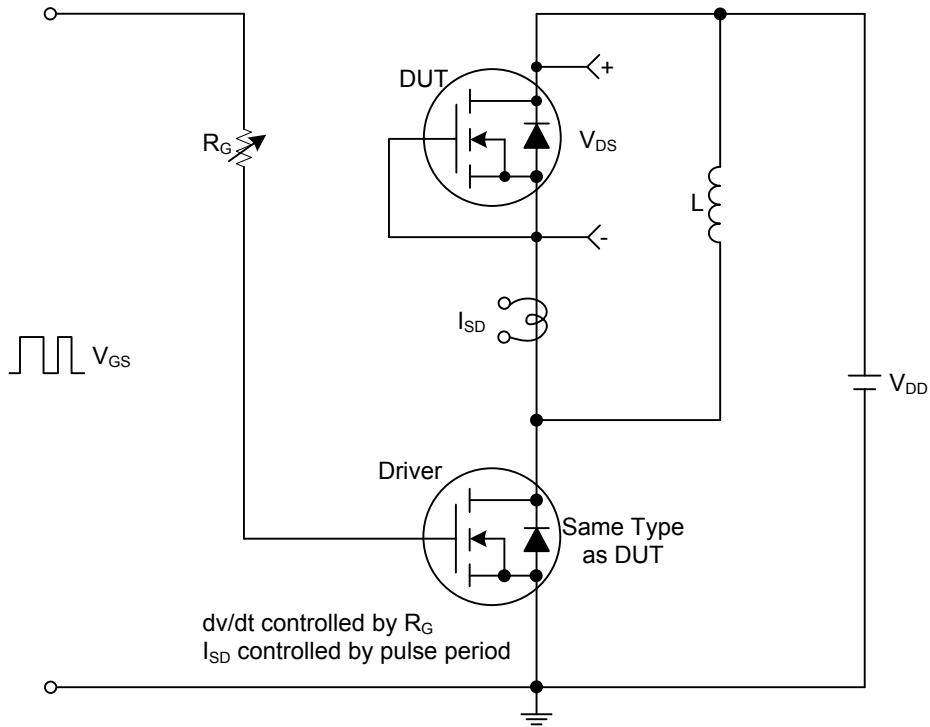
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	75			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =75V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =40A			14	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		4220		pF
Output Capacitance	C _{OSS}			426		pF
Reverse Transfer Capacitance	C _{RSS}			245		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A, I _G =100μA (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} =30V, V _{GS} =10V, I _D =0.5A, R _G =25Ω (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 =80A, V _{GS} =0V			1.5	V
Body Diode Reverse Recovery Time	t _{rr}	I _S =30A, V _{GS} =0V, dI _F /dt=100A/μs		48		ns
Reverse Recovery Charge	Q _{rr}			0.218		μC

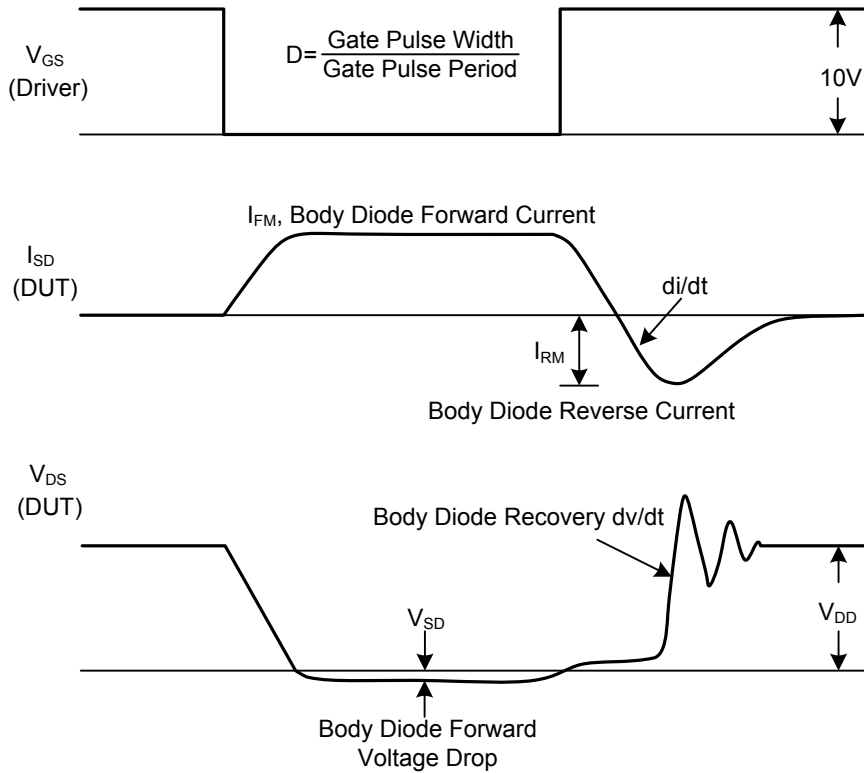
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



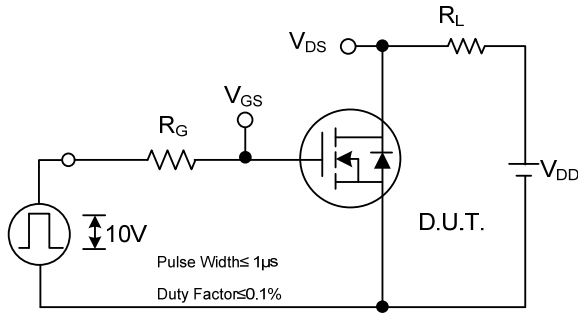
Peak Diode Recovery dv/dt Test Circuit



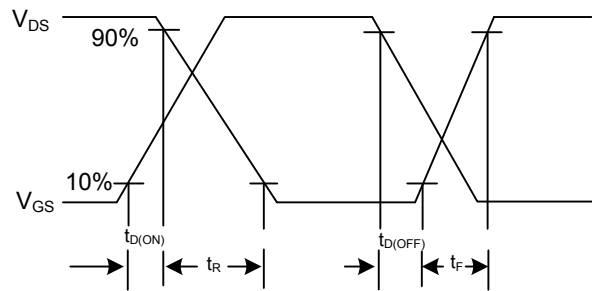
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

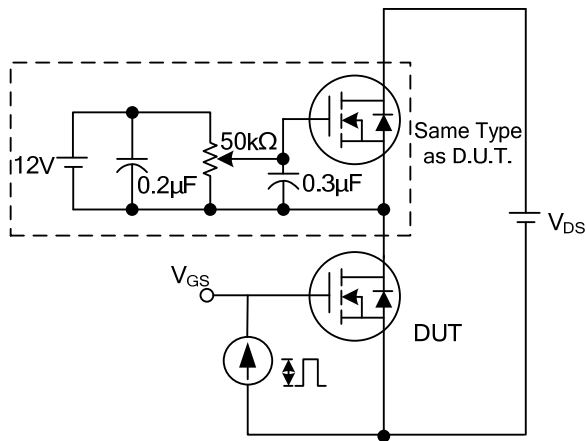
■ TEST CIRCUITS AND WAVEFORMS



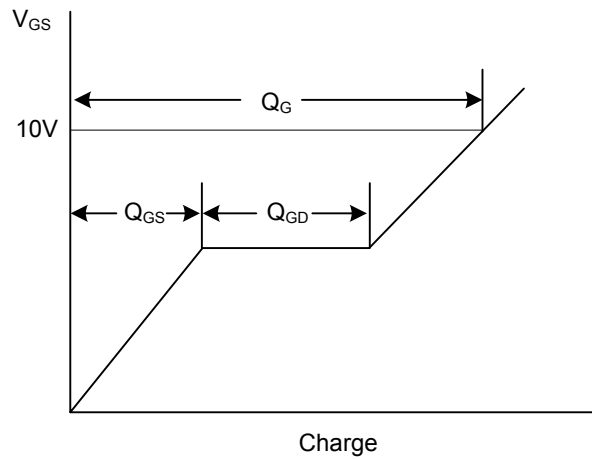
Switching Test Circuit



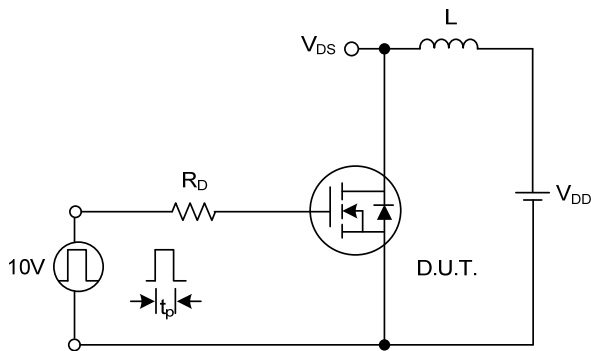
Switching Waveforms



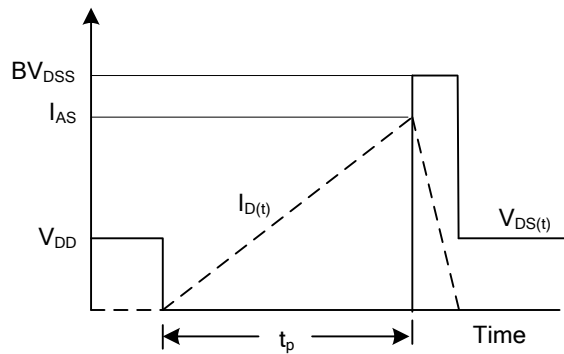
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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