



# UTT80N10

*Power MOSFET*

## 80A, 100V N-CHANNEL POWER MOSFET

■ DESCRIPTION

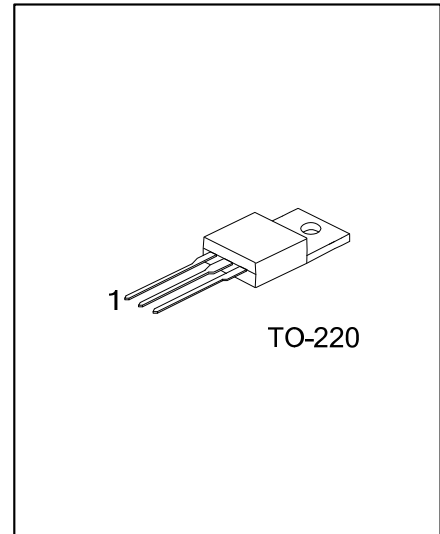
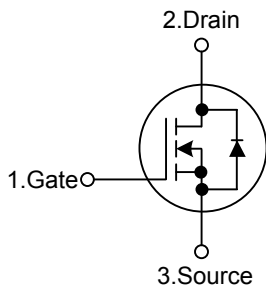
The UTC **UTT80N10** is an N-channel power MOSFET using UTC's advanced technology to provide the customers with perfect  $R_{DS(ON)}$ , high switching speed, high current capacity and low gate charge.

The UTC **UTT80N10** is suitable for DC-DC converters, Off-Line UPS, High Voltage Synchronous Rectifier, Primary Switch for 48V and 24V Systems, etc.

■ FEATURES

- \*  $R_{DS(ON)} < 18m\Omega @ V_{GS}=10V, I_D=80A$
- \* High Switching Speed
- \* High Current Capacity
- \* Low Gate Charge (typical 49nC)

■ SYMBOL



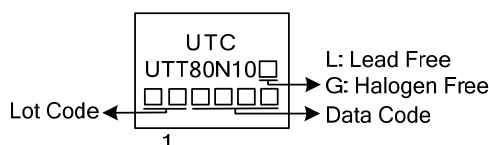
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT80N10L-TA3-T	UTT80N10G-TA3-T	TO-220	G	D	S	Tube

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

<p>UTT80N10L-TA3-T</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>c</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V <sub>DSS</sub>	100	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Drain Current	Continuous	I <sub>D</sub>	80	A
	Pulsed (Note 2)	I <sub>DM</sub>	320	A
Single Pulsed Avalanche Energy (Note 3)		E <sub>AS</sub>	416	mJ
Power Dissipation		P <sub>D</sub>	211	W
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature		T <sub>STG</sub>	-55 ~ +150	°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 Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

3. L = 0.13mH, I<sub>AS</sub> = 80A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25Ω, Starting T<sub>J</sub> = 25°C

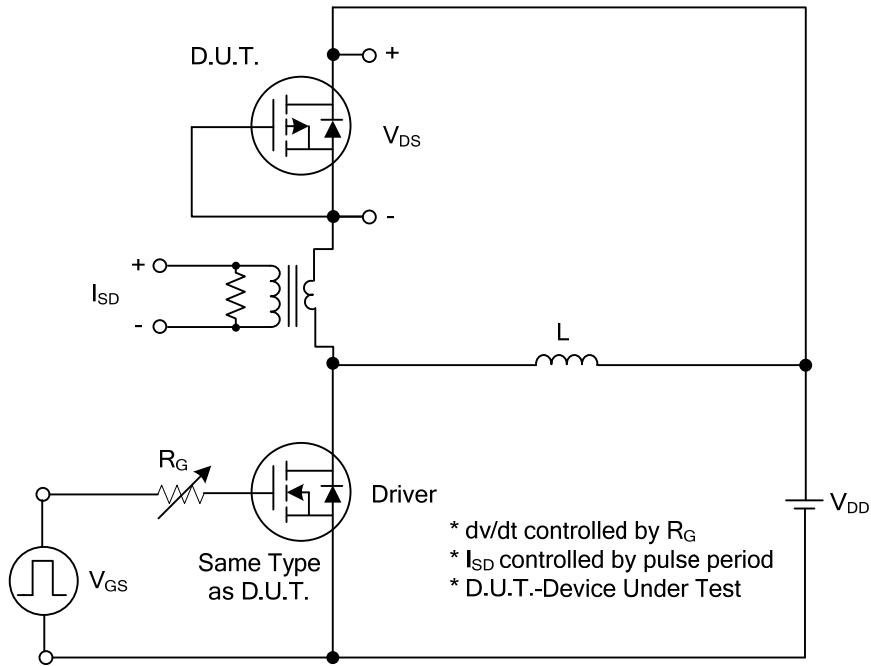
### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	62	°C/W
Junction to Case	θ <sub>JC</sub>	0.59	°C/W

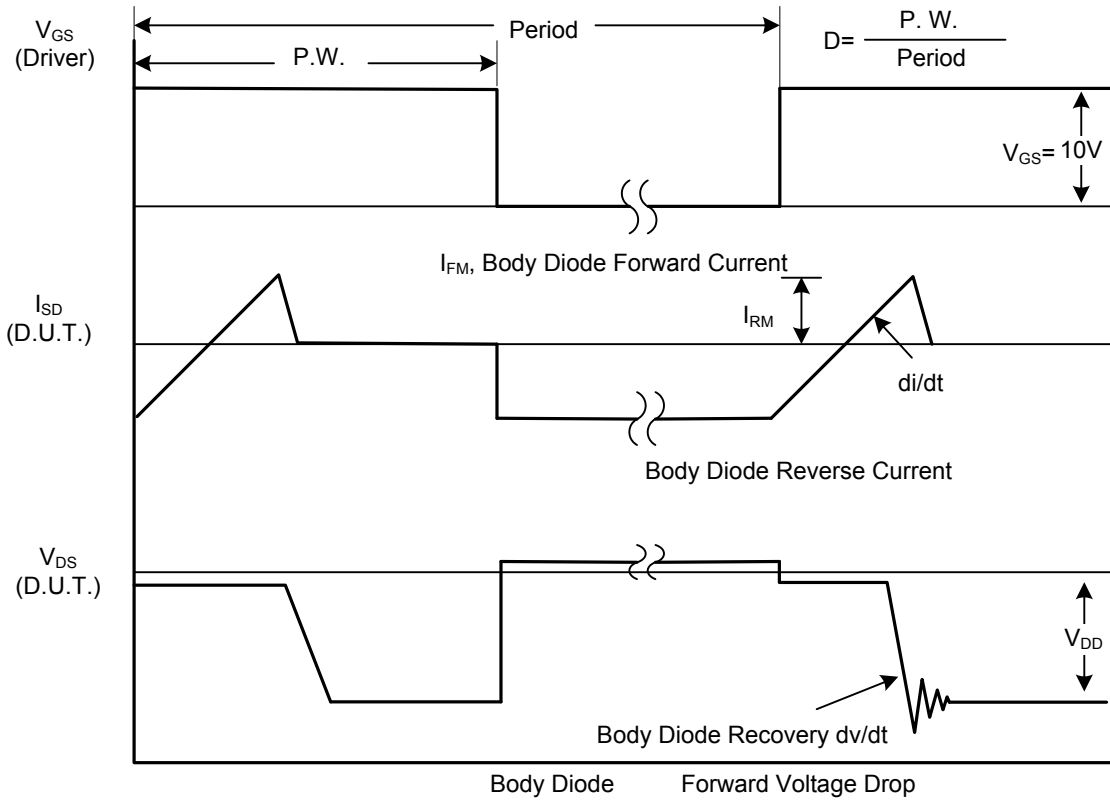
### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	100			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	Forward			+100	nA
		Reverse			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =80A		15	18	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		4152		pF
Output Capacitance	C <sub>OSS</sub>			485		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			220		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, I <sub>D</sub> =80A		350		nC
Gate to Source Charge	Q <sub>GS</sub>			23		nC
Gate to Drain Charge	Q <sub>GD</sub>			16		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =80A, V <sub>GS</sub> =10V, R <sub>GS</sub> =5.0Ω		90		ns
Rise Time	t <sub>R</sub>			100		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			450		ns
Fall-Time	t <sub>F</sub>			200		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	I <sub>S</sub>				80	A
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				320	A
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>SD</sub> =80A		0.99	1.25	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> =40A, di/dt=100A/μs		70	105	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>				202	303

## TEST CIRCUITS AND WAVEFORMS

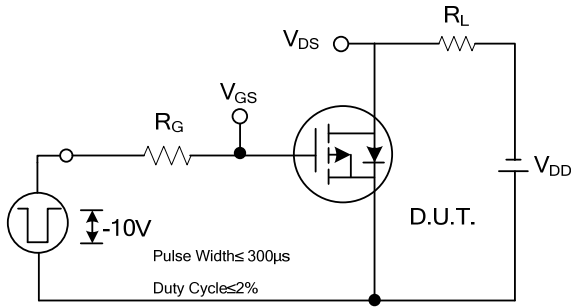


**Peak Diode Recovery dv/dt Test Circuit**

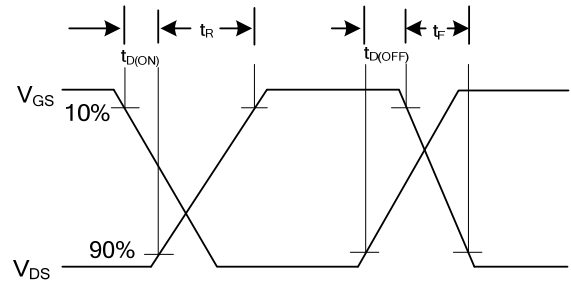


**Peak Diode Recovery dv/dt Waveforms**

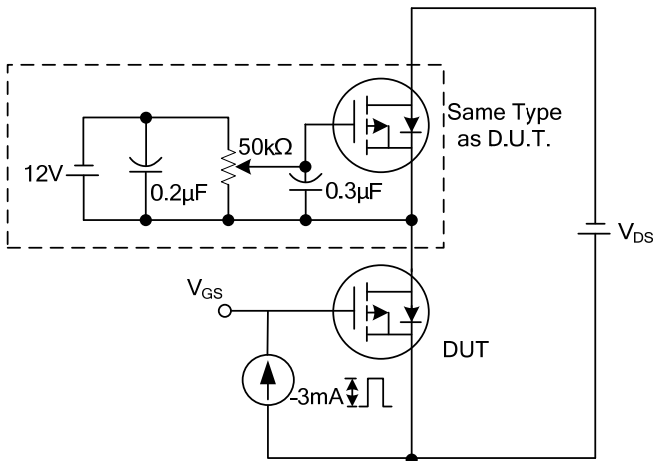
### TEST CIRCUITS AND WAVEFORMS (Cont.)



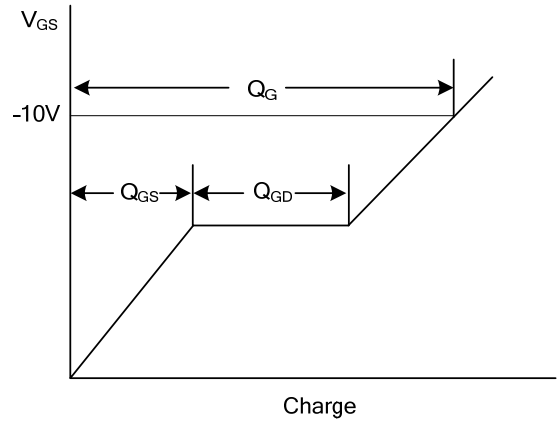
**Switching Test Circuit**



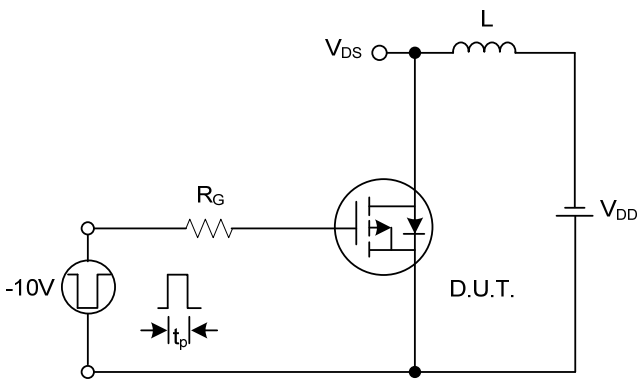
**Switching Waveforms**



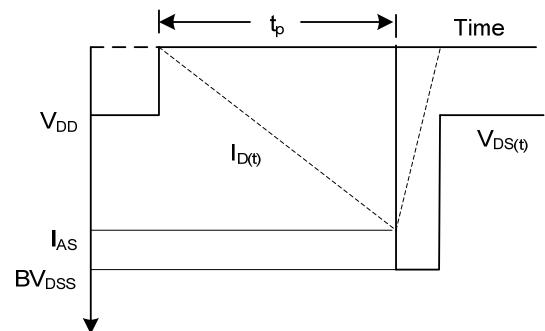
**Gate Charge Test Circuit**



**Gate Charge Waveform**



**Unclamped Inductive Switching Test Circuit**



**Unclamped Inductive Switching Waveforms**

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