



**UT8NN10**

Preliminary

Power MOSFET

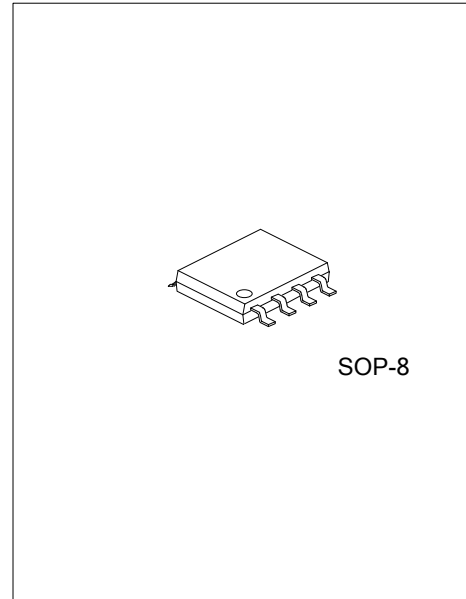
**4A, 100V DUAL N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

■ **DESCRIPTION**

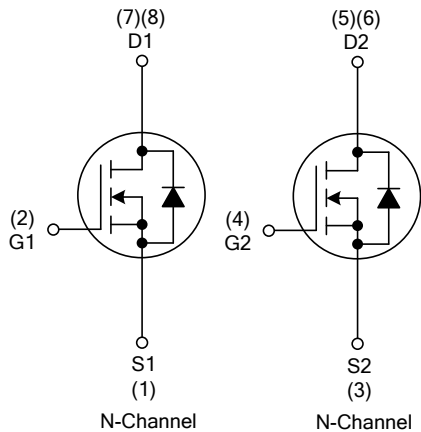
The UTC **UT8NN10** is a dual N-Channel enhancement mode power MOSFET, it provides designer with fast switching speed, ruggedized device design, low on-resistance and cost-effectiveness.

■ **FEATURES**

- \*  $R_{DS(ON)} \leq 110 \text{ m}\Omega$  @  $V_{GS}=10\text{V}$ ,  $I_D=2.0\text{A}$
- \*  $R_{DS(ON)} \leq 130 \text{ m}\Omega$  @  $V_{GS}=4.5\text{V}$ ,  $I_D=2.0\text{A}$
- \* Fast Switching Speed
- \* Simple Drive Requirement



■ **SYMBOL**



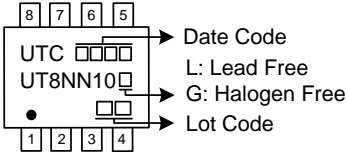
■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment						Packing		
Lead Free	Halogen Free		1	2	3	4	5	6		7	8
UT8NN10L-S08-R	UT8NN10G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

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

<p>UT8NN10G-S08-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) S08: SOP-8</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
---	---

■ MARKING



### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</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(Note 3)	I <sub>D</sub>	4	A
	Pulsed(Note 2)	I <sub>DM</sub>	8	A
Avalanche Energy	Single Pulsed (Note 3)	E <sub>AS</sub>	2.7	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.5	V/ns
Power Dissipation		P <sub>D</sub>	2	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. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. L = 0.1mH, I<sub>AS</sub> = 7.4A, V<sub>DD</sub> = 25V, R<sub>G</sub> = 25 Ω Starting T<sub>J</sub> = 25°C

4. I<sub>SD</sub> ≤ 8.0A, di/dt ≤ 200A/μs, V<sub>DD</sub> ≤ BV<sub>DSS</sub>, Starting T<sub>J</sub> = 25°C

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	62.5	°C/W

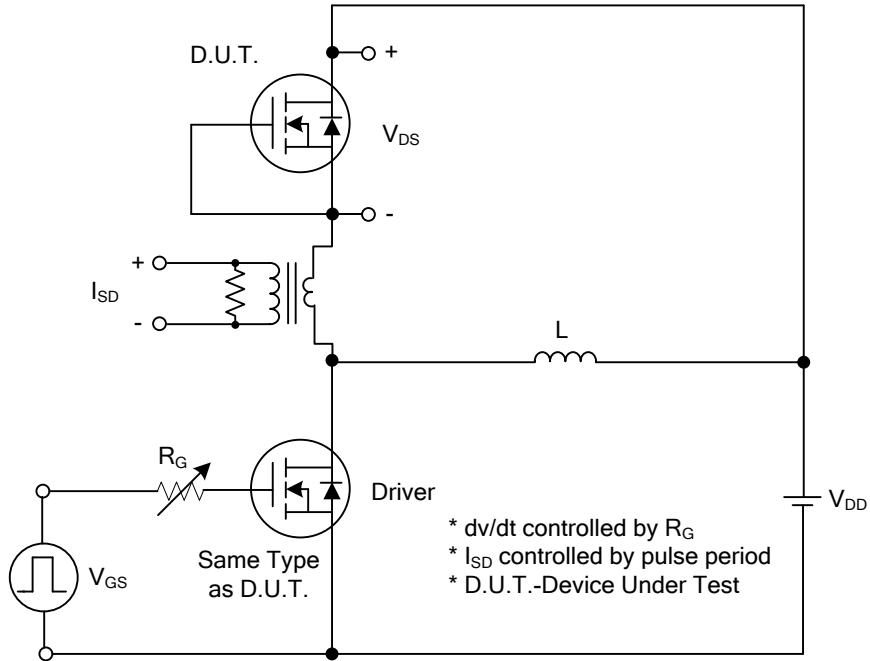
Note: Device mounted on FR-4 substrate P<sub>c</sub> board, 2oz copper, with 1inch square copper plate.

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

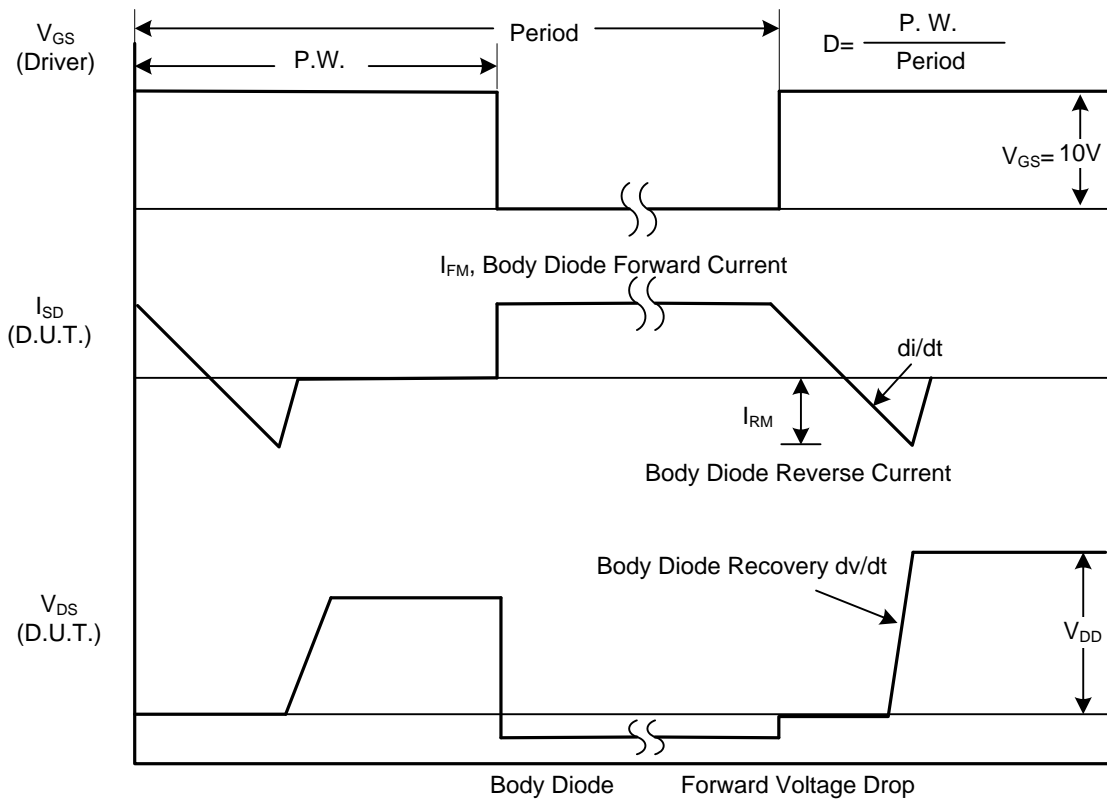
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>								
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100			V	
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	μA	
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =20V			100	nA	
	Reverse		V <sub>DS</sub> =0V, V <sub>GS</sub> =-20V			-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	
Drain-Source On-State Resistance (Note 1)		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.0A			110	mΩ	
			V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.0A			130	mΩ	
<b>DYNAMIC PARAMETERS</b>								
Input Capacitance		C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		355		pF	
Output Capacitance		C <sub>OSS</sub>				50		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>				37		pF
<b>SWITCHING PARAMETERS</b>								
Total Gate Charge (Note 1)	10V	Q <sub>G</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =10V, I <sub>D</sub> =4A		11.7		nC	
	4.5V			I <sub>G</sub> =1mA (Note 1, 2)		5.7		nC
Gate-Source Charge		Q <sub>GS</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =4A, R <sub>G</sub> =25Ω (Note 1, 2)		1.8		nC	
Gate-Drain Charge		Q <sub>GD</sub>			2.2		nC	
Turn-ON Delay Time (Note 1)		t <sub>D(ON)</sub>			10		ns	
Turn-ON Rise Time		t <sub>R</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =4A, R <sub>G</sub> =25Ω (Note 1, 2)		15		ns	
Turn-OFF Delay Time		t <sub>D(OFF)</sub>			44		ns	
Turn-OFF Fall Time		t <sub>F</sub>			31		ns	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>								
Maximum Continuous Drain-Source Diode Forward Current		I <sub>S</sub>				4	A	
Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>				8	A	
Drain-Source Diode Forward Voltage (Note 1)		V <sub>SD</sub>	I <sub>S</sub> =4A, V <sub>GS</sub> =0V			1.2	V	
Body Diode Reverse Recovery Time (Note 1)		t <sub>rr</sub>	I <sub>S</sub> =4A, V <sub>GS</sub> =0V,		21		ns	
Body Diode Reverse Recovery Charge		Q <sub>rr</sub>	di <sub>F</sub> /dt=100A/μs		62		nC	

Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.  
 2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

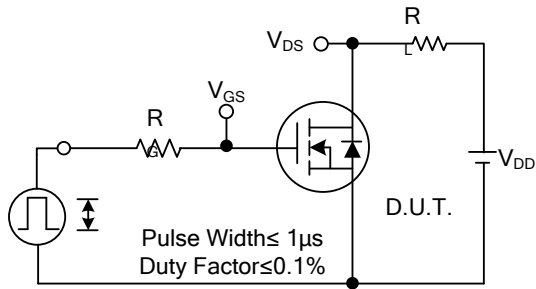


Peak Diode Recovery dv/dt Test Circuit

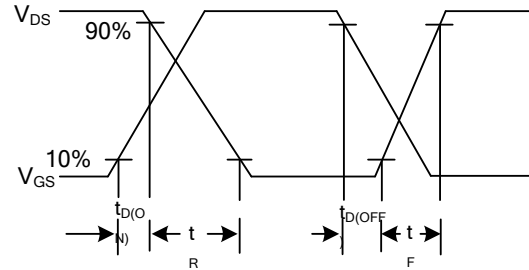


Peak Diode Recovery dv/dt Waveforms

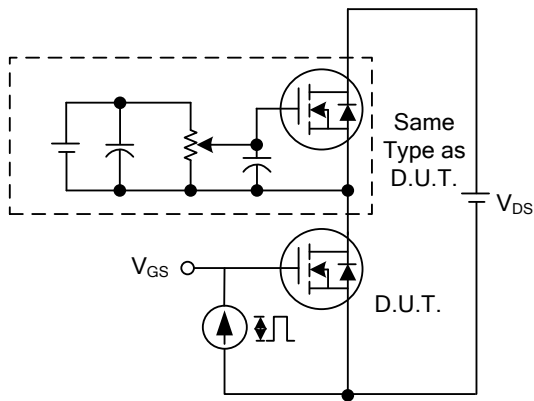
■ TEST CIRCUITS AND WAVEFORMS



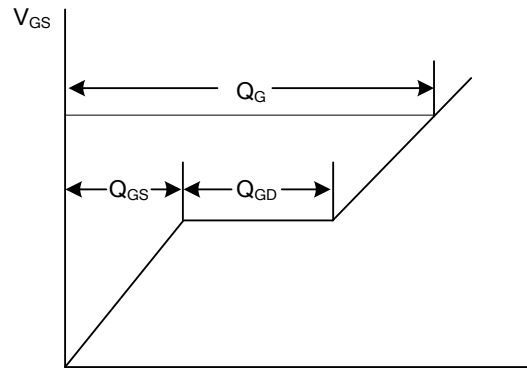
Switching Test Circuit



Switching Waveforms

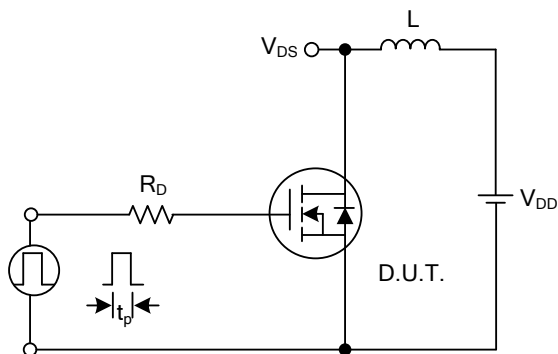


Gate Charge Test Circuit

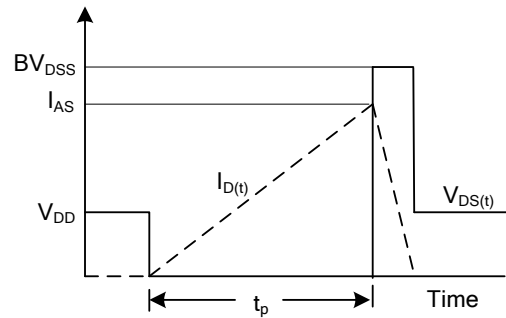


Charge

Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.