



## UT25N10

Power MOSFET

### 25A, 100V N-CHANNEL POWER MOSFET

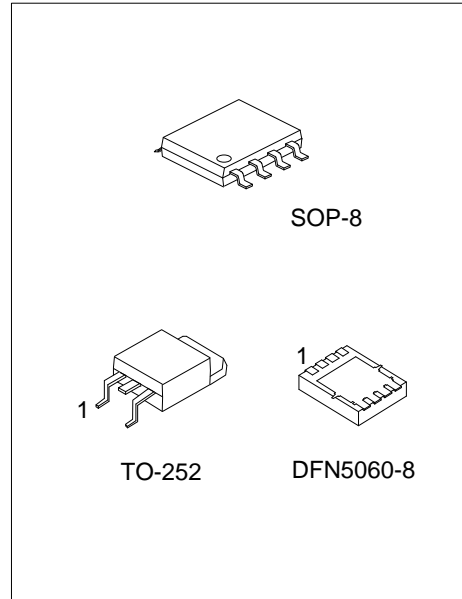
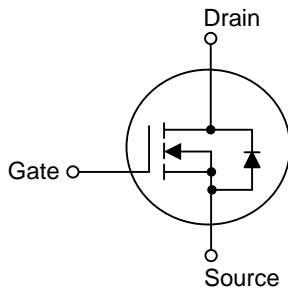
#### DESCRIPTION

The UTC **UT25N10** is a N-channel power MOSFET providing very low on-resistance. It has high efficiency and perfect cost-effectiveness. It can be generally applied in the commercial and industrial fields.

#### FEATURES

- \*  $R_{DS(ON)} \leq 60 \text{ m}\Omega$  @  $V_{GS}=10\text{V}$ ,  $I_D=10\text{A}$
- $R_{DS(ON)} \leq 75 \text{ m}\Omega$  @  $V_{GS}=4.5\text{V}$ ,  $I_D=10\text{A}$
- \* Simple drive requirement

#### SYMBOL



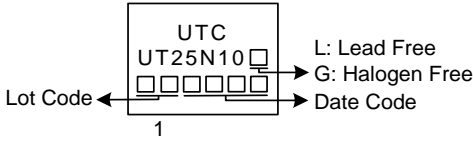
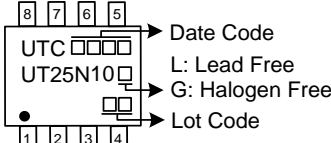
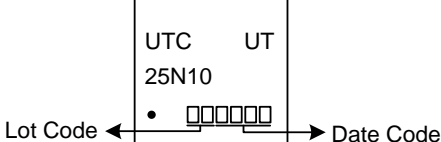
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT25N10L-TN3-R	UT25N10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT25N10L-S08-R	UT25N10G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT25N10L-K08-5060-R	UT25N10G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT25N10G-TN3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252, S08: SOP-8, K08-5060: DFN5060-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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## MARKING

Package	Marking
TO-252	 <p>UTC UT25N10 Lot Code → [ ] [ ] [ ] [ ] [ ] → Date Code 1</p> <p>L: Lead Free G: Halogen Free</p>
SOP-8	 <p>[8] [7] [6] [5] → Date Code UTC [ ] [ ] [ ] [ ] UT25N10 [ ] [ ] [ ] [ ] [ ] [ ] → Lot Code [1] [2] [3] [4]</p> <p>L: Lead Free G: Halogen Free</p>
DFN5060-8	 <p>UTC UT 25N10 Lot Code ← [ ] [ ] [ ] [ ] [ ] → Date Code</p>

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### ■ ABSOLUTE MAXIMUM RATING (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>	25	A
	Pulsed (Note 2)	I <sub>DM</sub>	50	A
Power Dissipation	TO-252	P <sub>D</sub>	50	W
	SOP-8		6	W
	DFN5060-8		14	W
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature Range		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.

### ■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ <sub>JA</sub>	40	°C/W
	SOP-8		50	°C/W
	DFN5060-8		40.3	°C/W
Junction to Case	TO-252	θ <sub>JC</sub>	2.5	°C/W
	SOP-8		20.58	°C/W
	DFN5060-8		8.9	°C/W

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

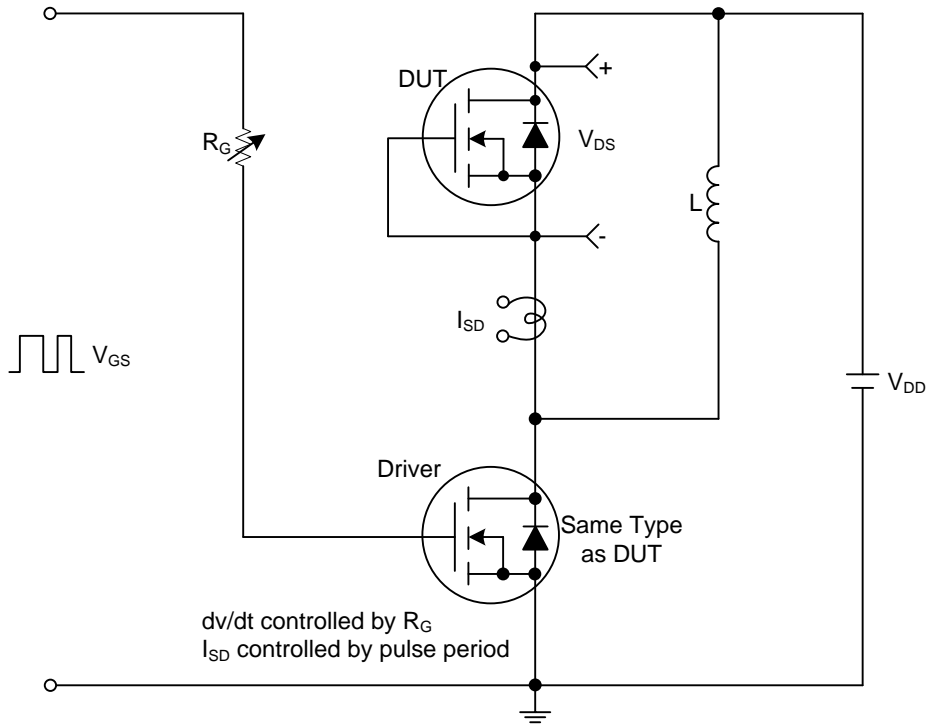
### ■ ELECTRICAL CHARACTERISTICS (T<sub>J</sub> =25°C, unless otherwise specified)

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	I <sub>GSS</sub>	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 to Source On-state Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A			60	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A			75	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1.0MHz		1750		pF
Output Capacitance	C <sub>OSS</sub>			120		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			90		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge (Note 1)	Q <sub>G</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =25A, I <sub>G</sub> =1mA (Note 1, 2)		44		nC
Gate Source Charge	Q <sub>GS</sub>			5		nC
Gate Drain Charge	Q <sub>GD</sub>			9		nC
Turn-ON Delay Time (Note 1)	t <sub>D(ON)</sub>	V <sub>DD</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =25A, R <sub>G</sub> =25Ω (Note 1, 2)		8		ns
Turn-ON Rise Time	t <sub>R</sub>			16		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			44		ns
Turn-OFF Fall-Time	t <sub>F</sub>			17		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>				25	A
Maximum Pulsed Drain-Source Diode Forward Current	I <sub>SM</sub>				50	A
Drain-Source Diode Forward Voltage (Note 1)	V <sub>SD</sub>	I <sub>S</sub> =25A, V <sub>GS</sub> =0V			1.4	V
Reverse Recovery Time (Note 1)	t <sub>rr</sub>	I <sub>S</sub> =25A, V <sub>GS</sub> =0V, di/dt=100A/μs		53		ns
Reverse Recovery Charge	Q <sub>rr</sub>				83.4	

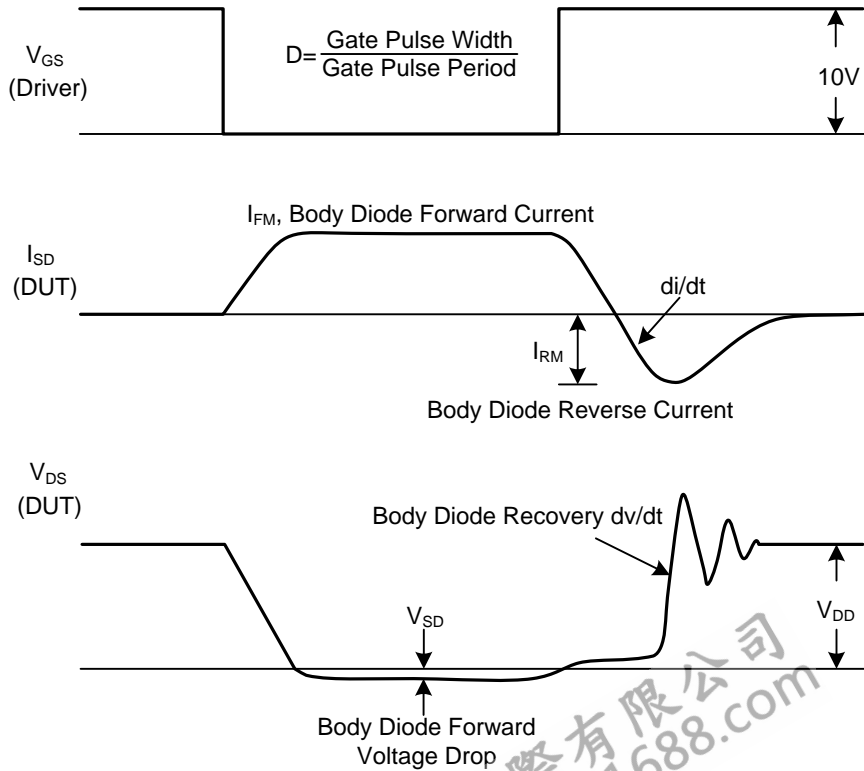
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



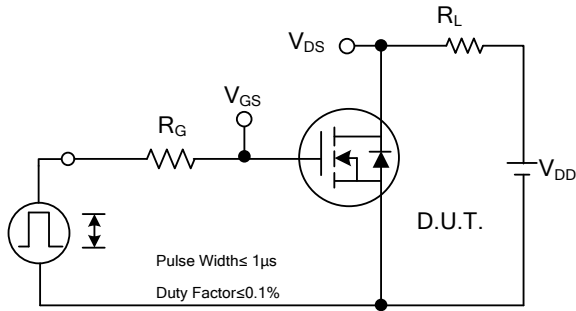
Peak Diode Recovery dv/dt Test Circuit



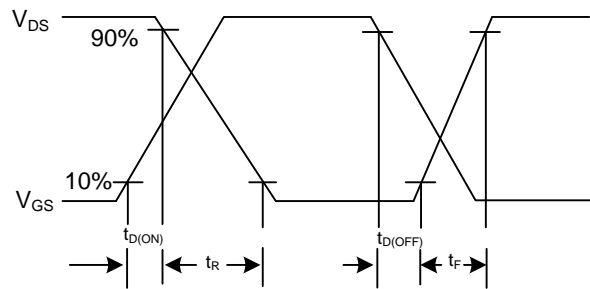
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

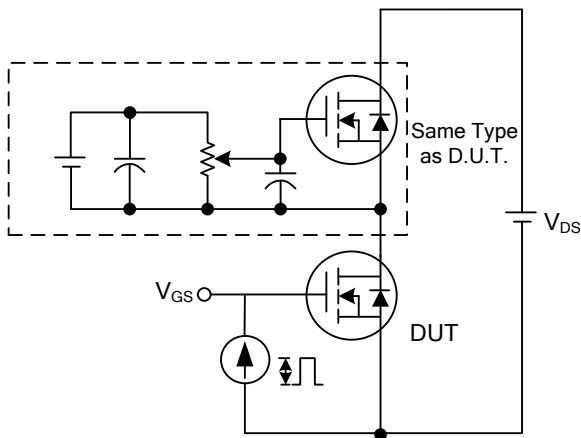
## TEST CIRCUITS AND WAVEFORMS



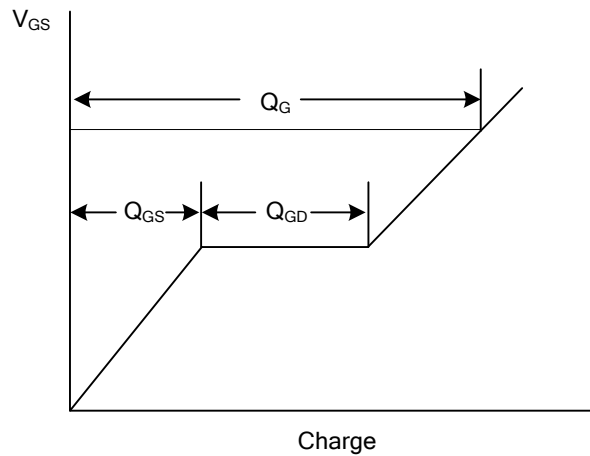
Switching Test Circuit



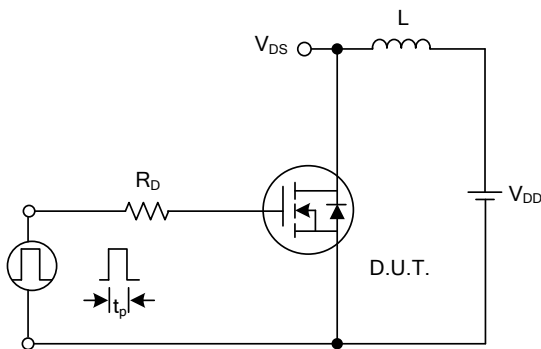
Switching Waveforms



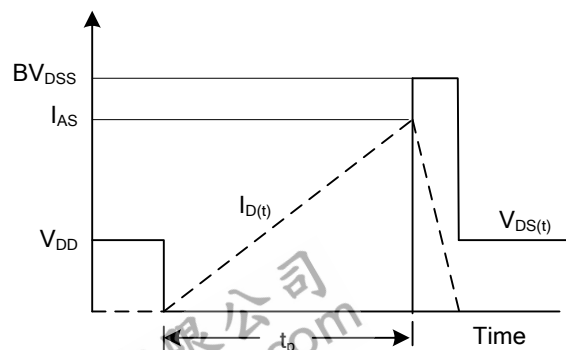
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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