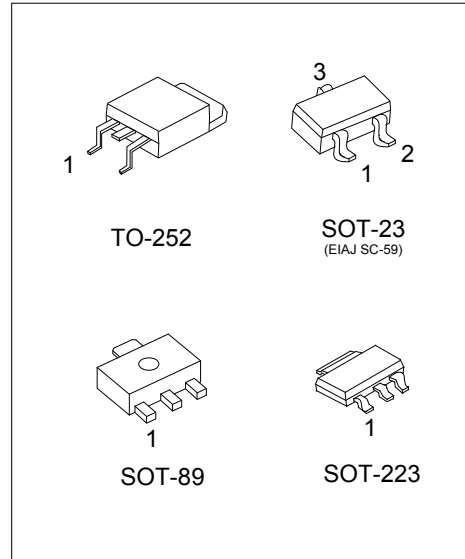




UTT4N10

Power MOSFET

4.0A, 100V N-CHANNEL ENHANCEMENT MODE POWER MOSFET



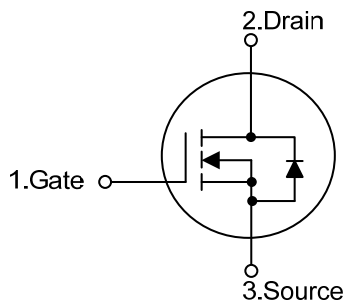
■ DESCRIPTION

The UTC **UTT4N10** 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

- * $R_{DS(ON)} \leq 250 \text{ m}\Omega$ @ $V_{GS}=5.0V, I_D=1.75A$
- * Simple drive requirement

■ SYMBOL



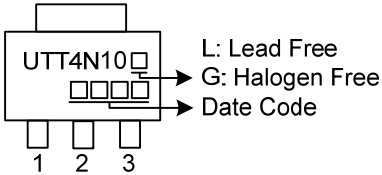
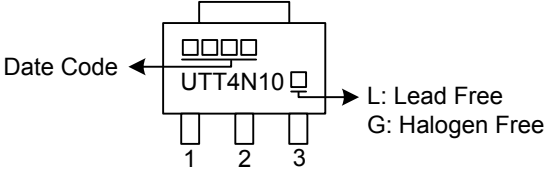
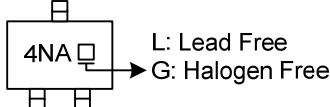
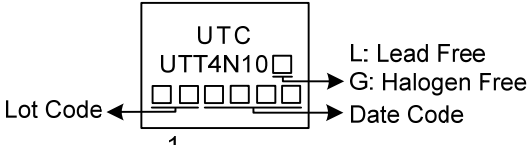
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT4N10L-AA3-R	UTT4N10G-AA3-R	SOT-223	G	D	S	Tape Reel
UTT4N10L-AE3-R	UTT4N10G-AE3-R	SOT-23	G	S	D	Tape Reel
UTT4N10L-AB3-R	UTT4N10G-AB3-R	SOT-89	G	D	S	Tape Reel
UTT4N10L-TN3-R	UTT4N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT4N10G-AA3-R</p>	<p>(1) R: Tape Reel (2) AA3: SOT-223, AB3: SOT-89, AE3: SOT-23 TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
-----------------------	---

MARKING

PACKAGE	MARKING
SOT-223	 <p>UTT4N10 □ □ □ □ □ → L: Lead Free → G: Halogen Free → Date Code</p> <p>1 2 3</p>
SOT-89	 <p>□ □ □ □ ← Date Code UTT4N10 □ → L: Lead Free → G: Halogen Free</p> <p>1 2 3</p>
SOT-23	 <p>4NA □ → L: Lead Free → G: Halogen Free</p>
TO-252	 <p>UTC UTT4N10 □ → L: Lead Free → G: Halogen Free □ □ □ □ □ □ ← Lot Code → Date Code</p> <p>1</p>

■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 16	V
Drain Current	Continuous	I_D	4	A
	Pulsed (Note 2)	I_{DM}	8	A
Avalanche Energy (Note 3)	Single Pulsed (Note 3)	E_{AS}	2.5	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.8	V/ns
Power Dissipation	SOT-223	P_D	0.89	W
	SOT-89		0.7	W
	SOT-23		0.3	W
	TO-252		1.14	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +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. $L = 0.1\text{mH}$, $I_{AS} = 3.5\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.

4. $I_{SD} \leq 4.0\text{A}$, $di/dt \leq 200\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140 (Note)	$^\circ\text{C}/\text{W}$
	SOT-89		180 (Note)	$^\circ\text{C}/\text{W}$
	SOT-23		416 (Note)	$^\circ\text{C}/\text{W}$
	TO-252		110 (Note)	$^\circ\text{C}/\text{W}$

Note: Surface mounted on 1 in² copper pad of FR4 board; 270 $^\circ\text{C}/\text{W}$ when mounted on min. copper pad.

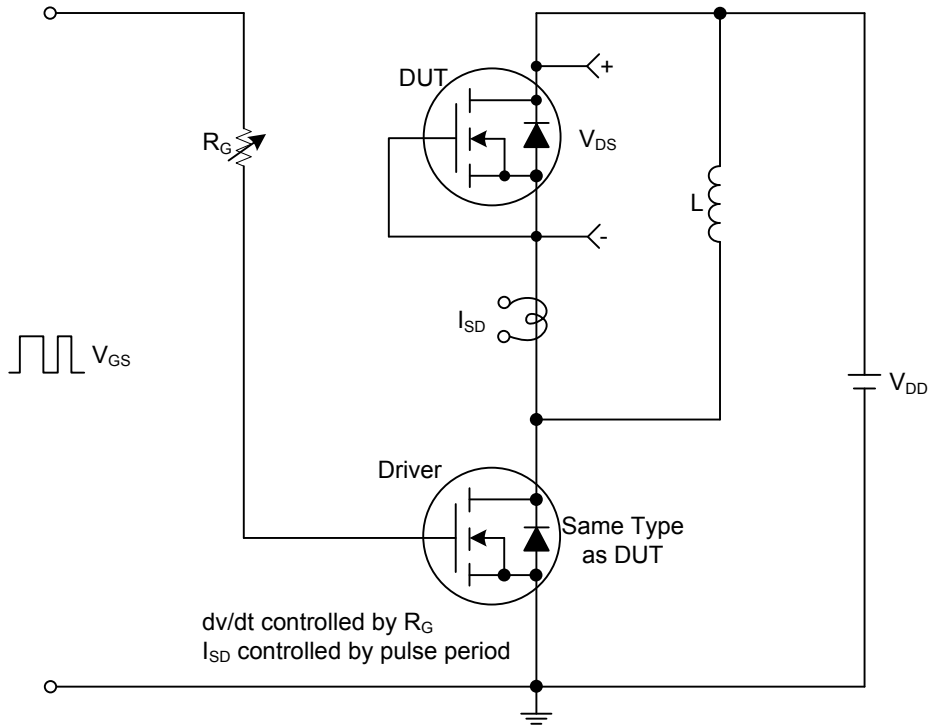
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 10V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
Drain to Source On-state Resistance	$R_{DS(ON)}$	$V_{GS}=5.0V, I_D=1.75A$			250	m Ω
		$V_{GS}=5.0V, I_D=1.75A, T_J=150^\circ\text{C}$			575	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$		530		pF
Output Capacitance	C_{OSS}			30		pF
Reverse Transfer Capacitance	C_{RSS}			20		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=80V, V_{GS}=10V, I_D=4.0A, I_G=1\text{mA}$ (Note 1, 2)		19		nC
Gate Source Charge	Q_{GS}			4		nC
Gate Drain Charge	Q_{GD}			3.5		nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	$V_{DD}=15V, V_{GS}=10V, I_D=4.0A, R_G=25\Omega$ (Note 1, 2)		4		ns
Turn-ON Rise Time	t_R			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			16		ns
Turn-OFF Fall-Time	t_F			17		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				4	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				8	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=4.0A, V_{GS}=0V$			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=4.0A, V_{GS}=0V, di/dt=100A/\mu s$		36		ns
Reverse Recovery Charge	Q_{rr}				43	

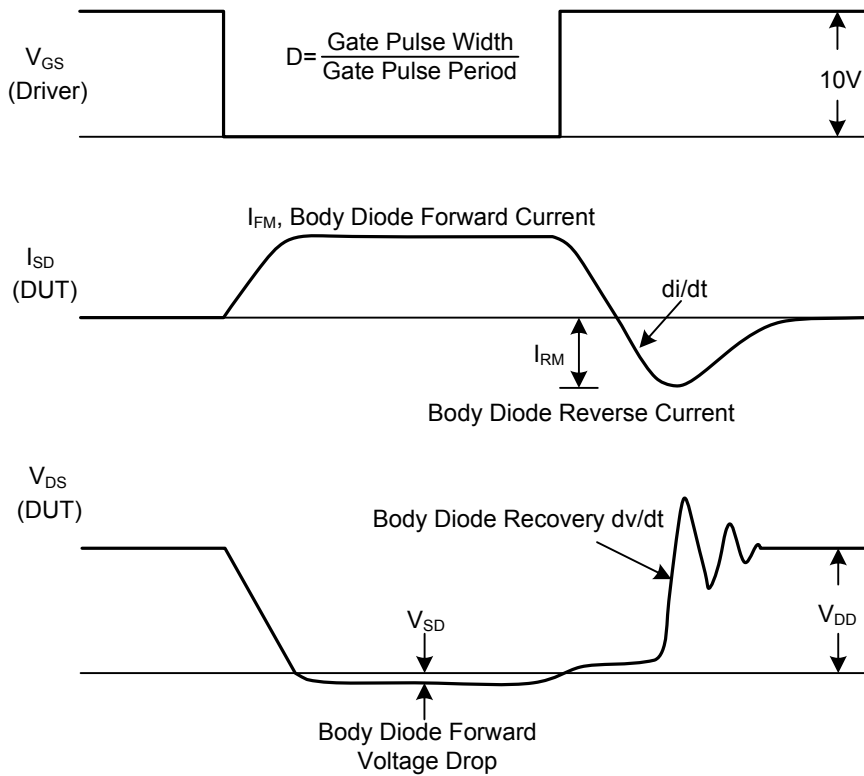
Notes: 1. Pulse Test : Pulse width $\leq 1000\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



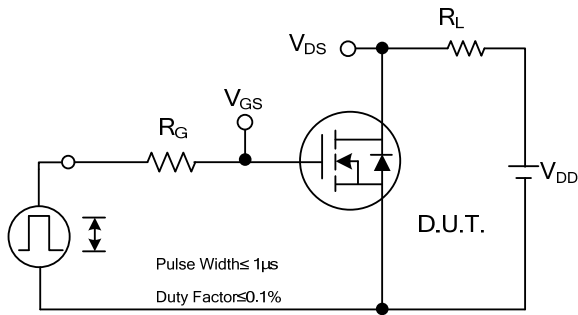
Peak Diode Recovery dv/dt Test Circuit



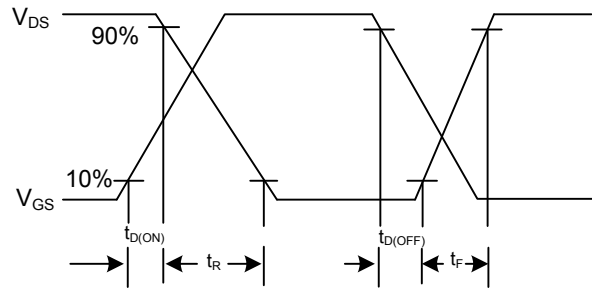
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

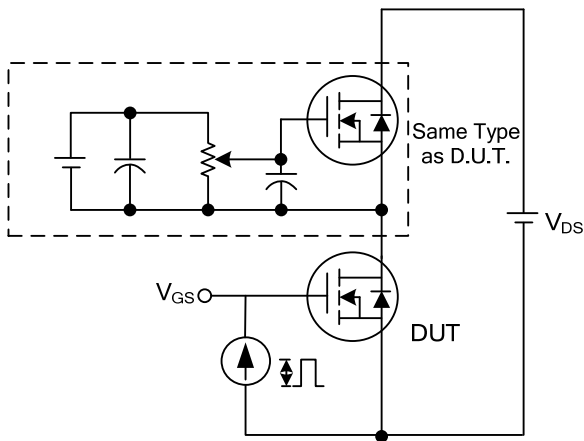
TEST CIRCUITS AND WAVEFORMS



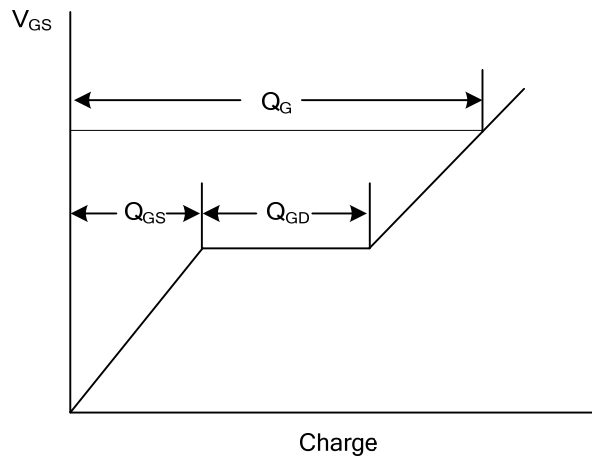
Switching Test Circuit



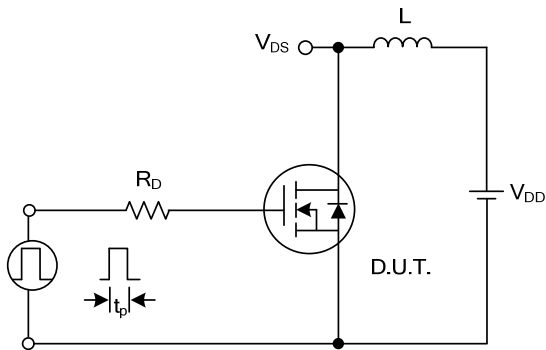
Switching Waveforms



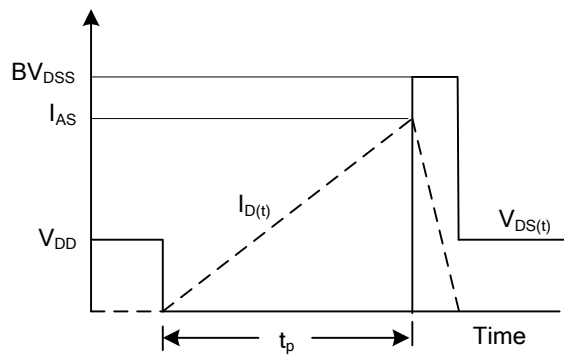
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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.