



UTT10N10

Power MOSFET

10A, 100V N-CHANNEL MOSFET

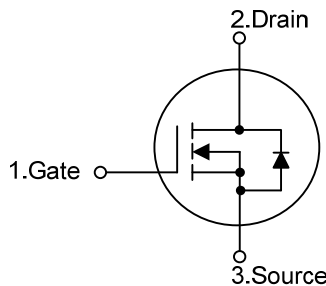
■ DESCRIPTION

The UTC **UTT10N10** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide the customers with a minimum on-state resistance, high switching speed and ultra low gate charge. It also can withstand high energy pulse in the avalanche and commutation mode.

■ FEATURES

- * $R_{DS(on)} \leq 143m\Omega @ V_{GS}=10V, I_D=6.4A$
- $R_{DS(on)} \leq 156m\Omega @ V_{GS}=4.5V, I_D=6.4A$
- * High Switching Speed

■ SYMBOL

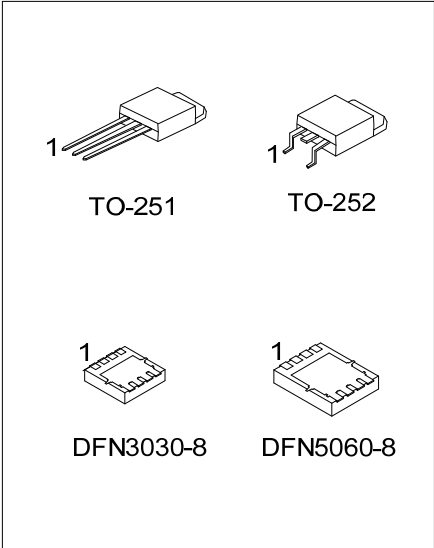


■ ORDERING INFORMATION

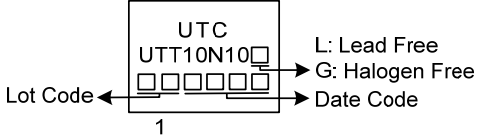
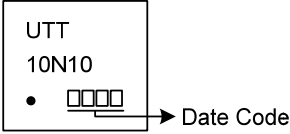
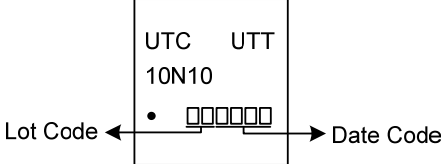
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT10N10L-TM3-T	UTT10N10G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UTT10N10L-TN3-R	UTT10N10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT10N10L-K08-3030-R	UTT10N10G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel
UTT10N10L-K08-5060-R	UTT10N10G-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>UTT10N10G-TM3-T</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TM3: TO-251, TN3: TO-252</p> <p>K08-3030: DFN3030-8, 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 UTT10N10 Lot Code ← [] [] [] [] [] → Date Code 1</p> <p>L: Lead Free G: Halogen Free</p>
DFN3030-8	 <p>UTT 10N10 • [] [] [] [] → Date Code</p>
DFN5060-8	 <p>UTC UTT 10N10 Lot Code ← • [] [] [] [] [] → Date Code</p>

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■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 25	V
Drain Current	Continuous	I_D	10	A
	Pulsed	I_{DM}	30	A
Avalanche Energy	Single Pulsed	E_{AS}	13	mJ
Peak Diode Recovery dv/dt		dv/dt	13	V/ns
Power Dissipation	TO-252	P_D	45	W
	DFN3030-8		15	W
	DFN5060-8		31	W
Junction Temperature		T_J	-25 ~ +150	$^{\circ}C$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}C$

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 max. junction temperature.

3. $L=0.1mH$, $I_{AS}=16.4A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}C$

4. $I_{SD} \leq 10A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, starting $T_J=25^{\circ}C$

■ THERMAL DATA

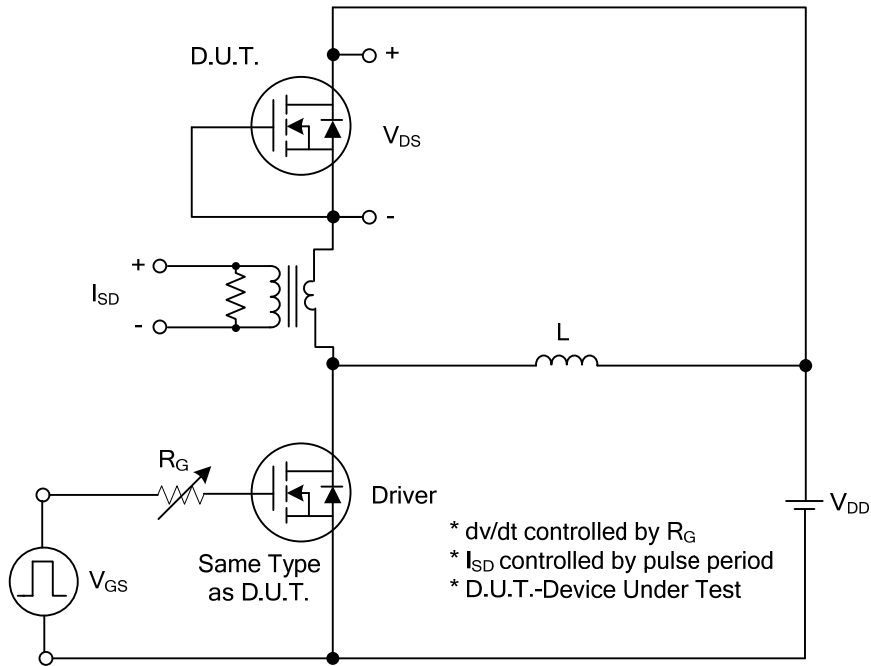
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ_{JA}	62.5	$^{\circ}C/W$
	DFN3030-8		60	$^{\circ}C/W$
	DFN5060-8		35	$^{\circ}C/W$
Junction to Case	TO-252	θ_{JC}	2.77	$^{\circ}C/W$
	DFN3030-8		8.06	$^{\circ}C/W$
	DFN5060-8		4.03	$^{\circ}C/W$

Note: Surface mounted on 1 in² copper pad of FR4 board.

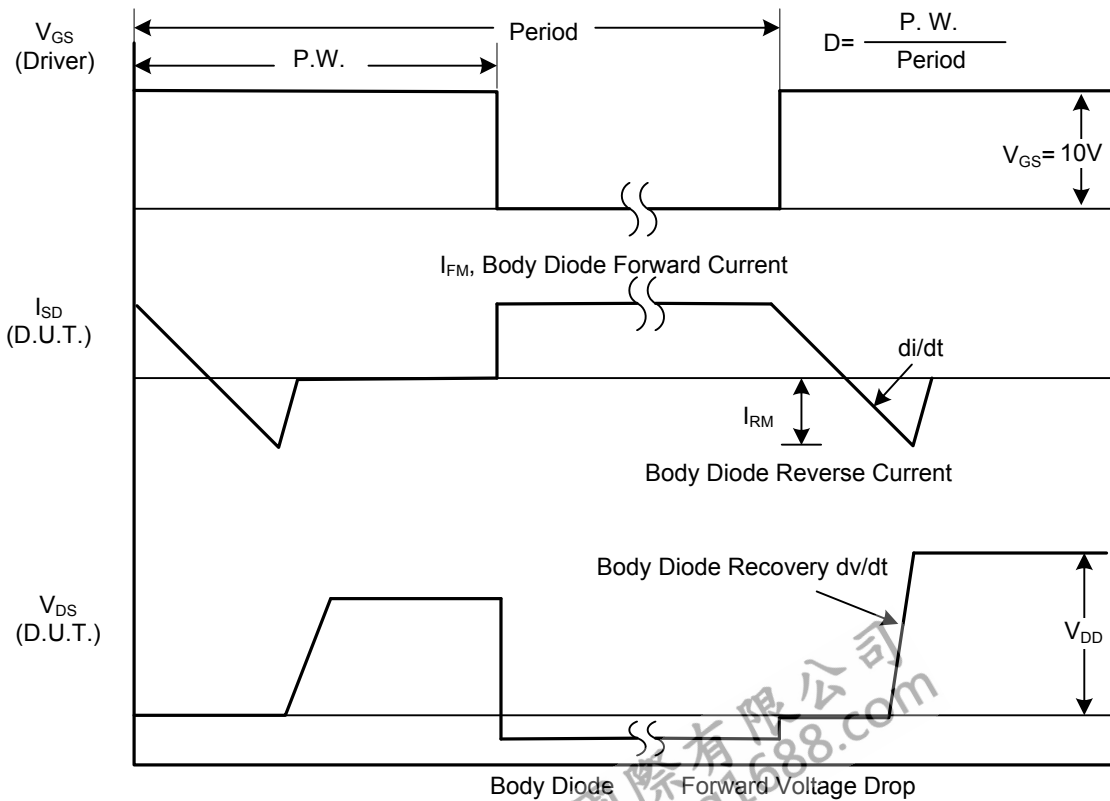
■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	100			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
Gate-Source Leakage Current	Forward	$V_{GS}=+25V, V_{DS}=0V$			+100	nA
	Reverse	$V_{GS}=-25V, V_{DS}=0V$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6.4A$			143	m Ω
		$V_{GS}=4.5V, I_D=6.4A$			156	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$		860		pF
Output Capacitance	C_{OSS}			56		pF
Reverse Transfer Capacitance	C_{RSS}			44		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=80V, V_{GS}=10V, I_D=10A$ $I_G=1mA$		26		nC
Gate to Source Charge	Q_{GS}			7		nC
Gate to Drain Charge	Q_{GD}			5.4		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=50V, V_{GS}=10V, I_D=10A,$ $R_G=25\Omega$		4.8		ns
Rise Time	t_R			4.5		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			67		ns
Fall-Time	t_F			34		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				10	A
Maximum Body-Diode Pulsed Current	I_{SM}				30	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$			1.5	V
Body Diode Reverse Recovery Time	t_{rr}	$I_S=10A, dI/dt=100A/\mu s$		50		ns
Body Diode Reverse Recovery Charge	Q_{rr}	(Note)		80		nC

TEST CIRCUITS AND WAVEFORMS

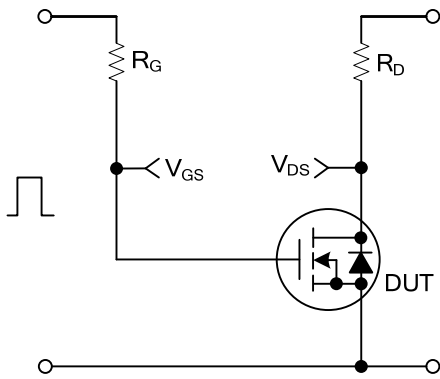


Peak Diode Recovery dv/dt Test Circuit

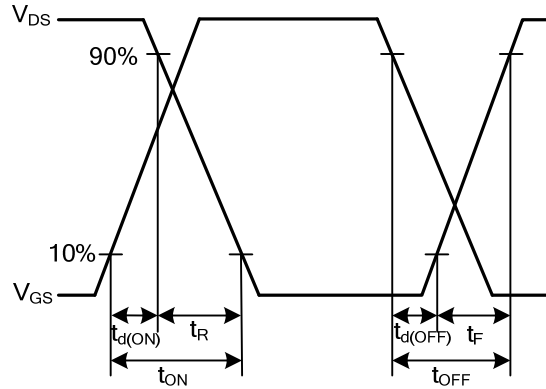


Peak Diode Recovery dv/dt Waveforms

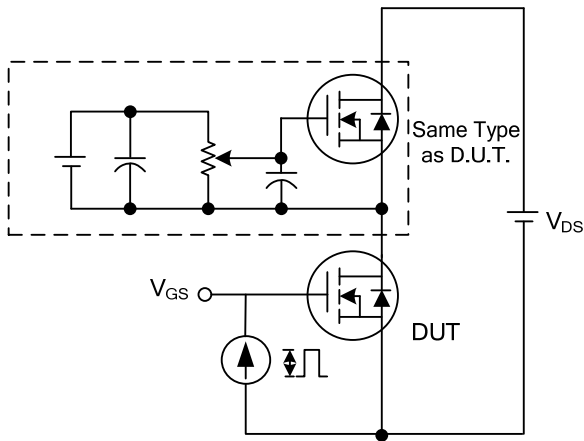
TEST CIRCUITS AND WAVEFORMS (Cont.)



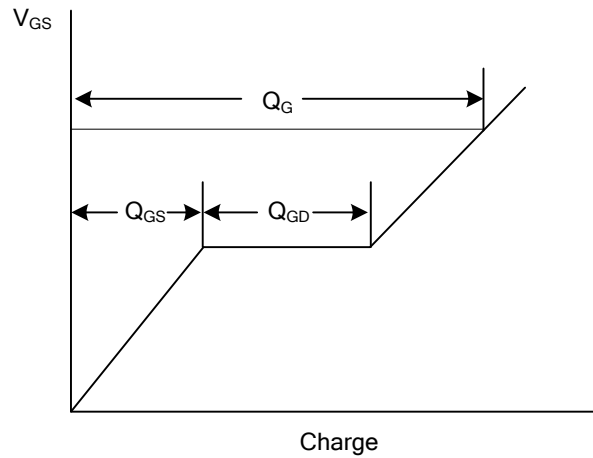
Switching Test Circuit



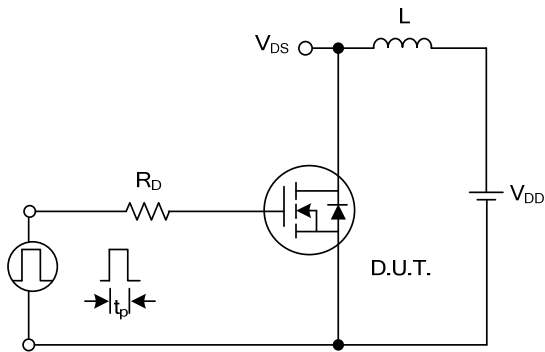
Switching Waveforms



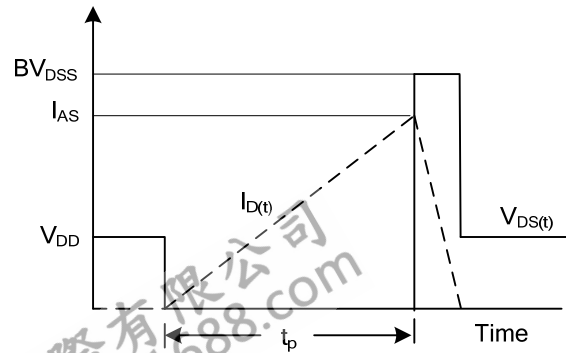
Gate Charge Test Circuit



Gate Charge Waveform

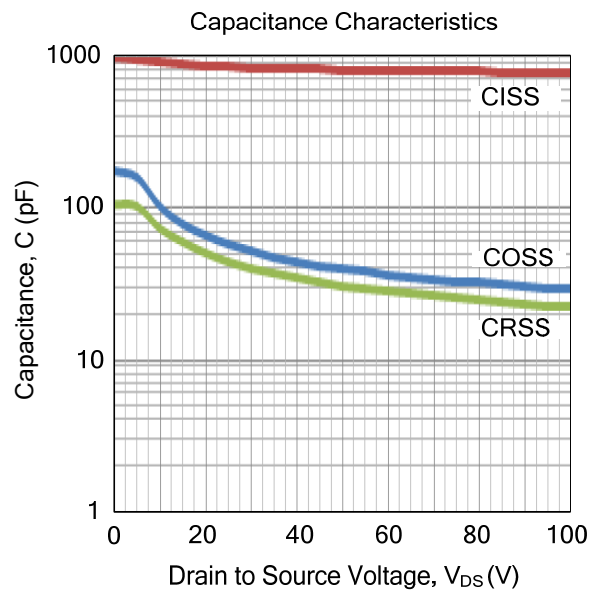
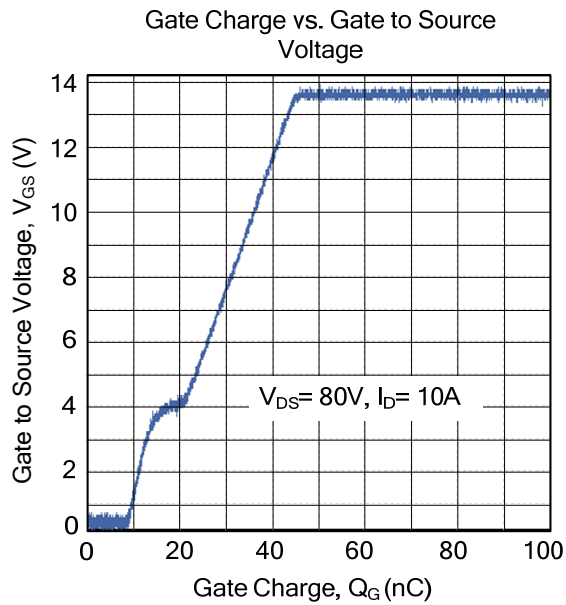


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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