



## UTT14P02

Preliminary

Power MOSFET

### -8A, -20V P-CHANNEL POWER MOSFET

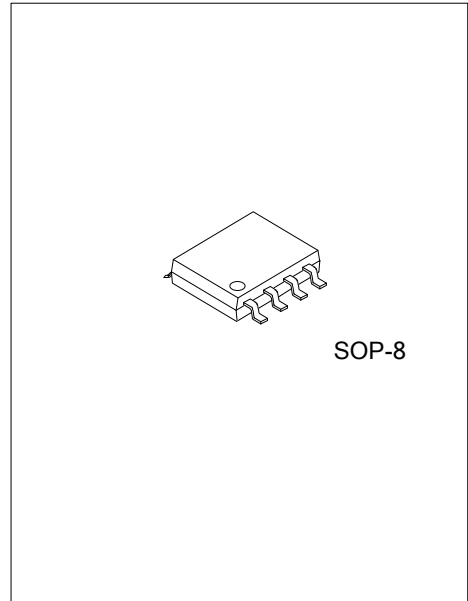
#### DESCRIPTION

The UTC **UTT14P02** is a P-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and low gate charge, etc.

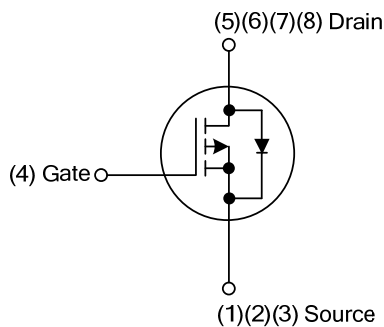
The UTC **UTT14P02** is suitable for load switch and battery protection applications.

#### FEATURES

- \*  $R_{DS(ON)} \leq 8.5 \text{ m}\Omega @ V_{GS}=-4.5\text{V}, I_D=-8.0\text{A}$
- \*  $R_{DS(ON)} \leq 12 \text{ m}\Omega @ V_{GS}=-2.5\text{V}, I_D=-5.0\text{A}$
- \*  $R_{DS(ON)} \leq 17 \text{ m}\Omega @ V_{GS}=-1.8\text{V}, I_D=-3.0\text{A}$
- \* Improved dv/dt capability
- \* Fast switching
- \* Suit for -1.8V gate drive applications



#### SYMBOL



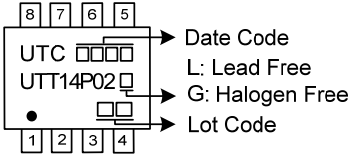
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT14P02L-S08-R	UTT14P02G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT14P02G-S08-R └── (1)Packing Type └── (2)Package Type └── (3)Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		$V_{DSS}$	-20	V
Gate-Source Voltage		$V_{GSS}$	$\pm 12$	V
Drain Current	Continuous	$T_C = 25^\circ\text{C}$	-14	A
		$T_C = 100^\circ\text{C}$	-8.8	A
	Pulsed (Note 2)		$I_{DM}$	-56
Power Dissipation ( $T_A = 25^\circ\text{C}$ )		$P_D$	2	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-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.  $L=0.1\text{mH}$ ,  $I_{AS}=65\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\ \Omega$ , Starting  $T_J = 25^\circ\text{C}$

■ THERMAL DATA

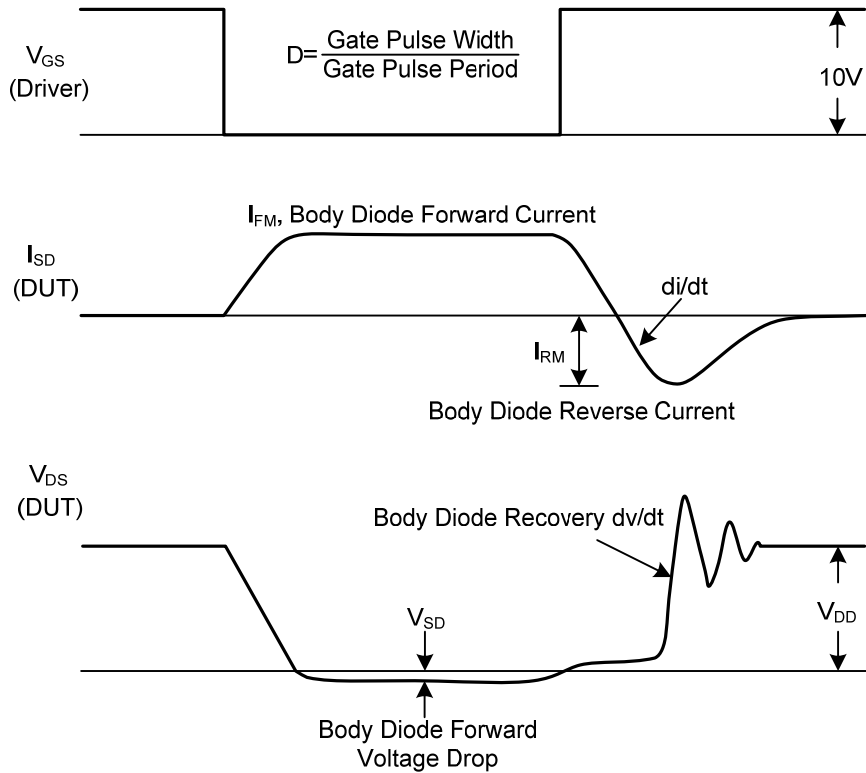
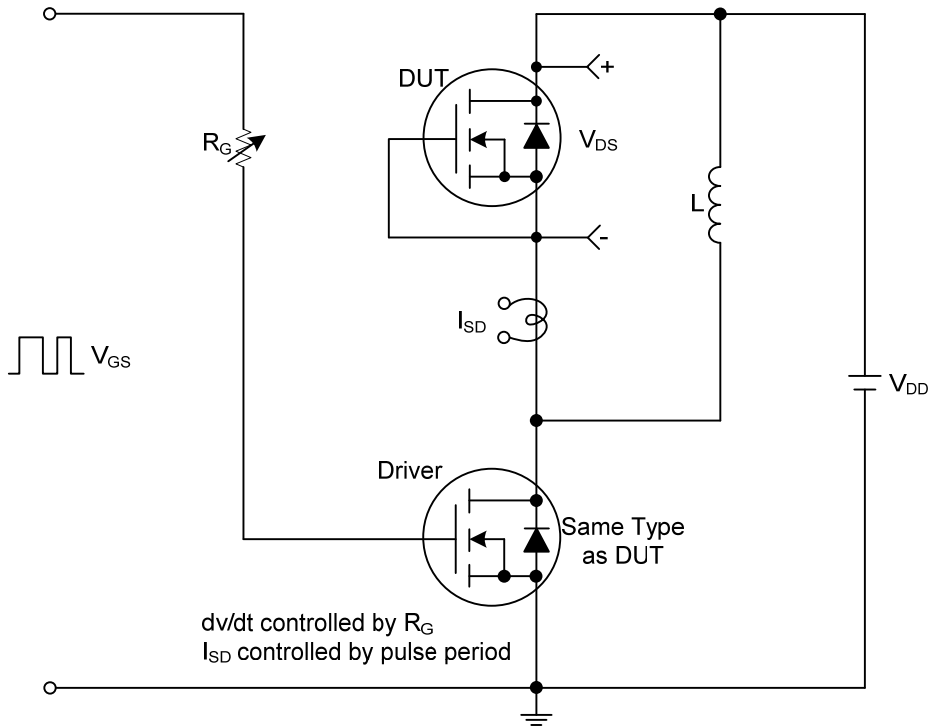
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	62	$^\circ\text{C/W}$
Junction to Case	$\theta_{JC}$	17	$^\circ\text{C/W}$

Note: The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

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

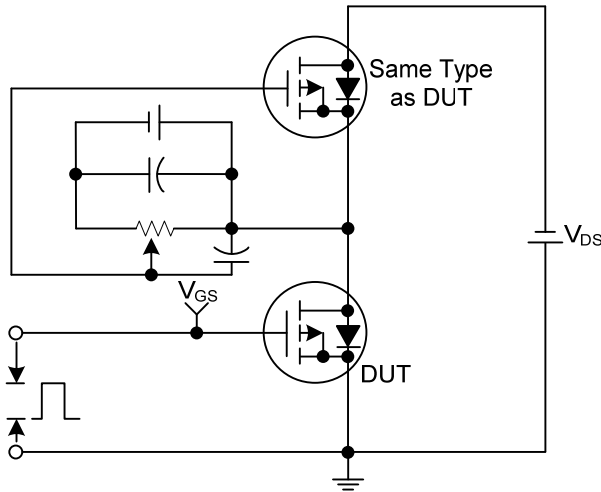
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=-250\ \mu\text{A}$ , $V_{GS}=0\text{V}$	-20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20\text{V}$ , $V_{GS}=0\text{V}$			-1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12\text{V}$ , $V_{DS}=0\text{V}$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=-250\ \mu\text{A}$	-0.3	-0.6	-1.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5\text{V}$ , $I_D=-8.0\text{A}$		6.5	8.5	m $\Omega$
		$V_{GS}=-2.5\text{V}$ , $I_D=-5.0\text{A}$		9.0	12	m $\Omega$
		$V_{GS}=-1.8\text{V}$ , $I_D=-3.0\text{A}$		12	17	m $\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=-15\text{V}$ , $f=1.0\text{MHz}$		4060		pF
Output Capacitance	$C_{OSS}$			520		pF
Reverse Transfer Capacitance	$C_{RSS}$			400		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{DS}=-10\text{V}$ , $V_{GS}=-4.5\text{V}$ , $I_D=-5\text{A}$		44.4		nC
Gate to Source Charge	$Q_{GS}$			7.2		nC
Gate to Drain Charge	$Q_{GD}$			10.2		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=-10\text{V}$ , $V_{GS}=-4.5\text{V}$ , $I_D=-1\text{A}$ , $R_G=25\ \Omega$		13.2		ns
Turn-ON Rise Time	$t_R$			68		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			160		ns
Turn-OFF Fall-Time	$t_F$			154		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				-14	A
Maximum Body-Diode Pulsed Current	$I_{SM}$				-28	A
Diode Forward Voltage	$V_{SD}$	$I_S=-1\text{A}$ , $V_{GS}=0\text{V}$			-1	V

■ TEST CIRCUITS AND WAVEFORMS

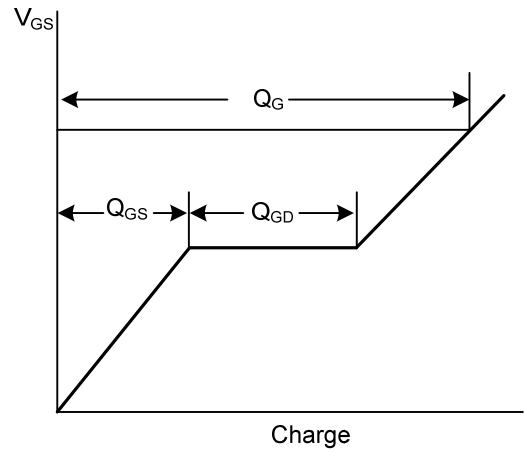


Peak Diode Recovery dv/dt Test Circuit and Waveforms

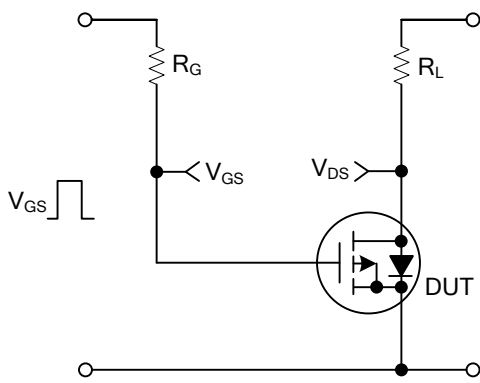
■ TEST CIRCUITS AND WAVEFORMS



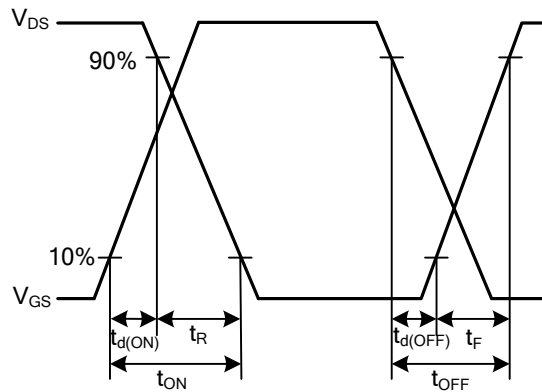
Gate Charge Test Circuit



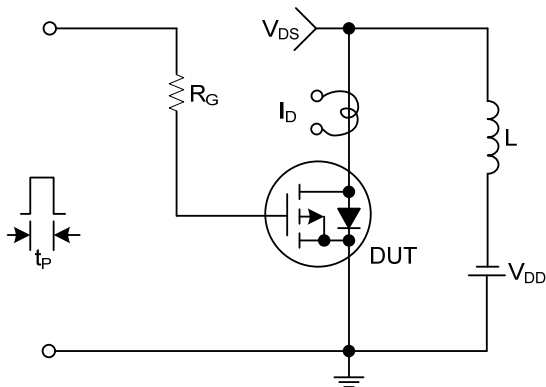
Gate Charge Waveforms



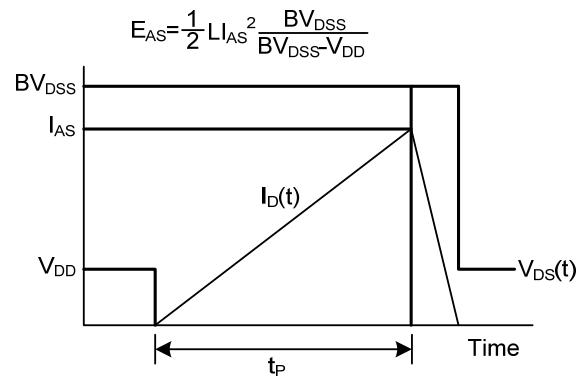
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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