

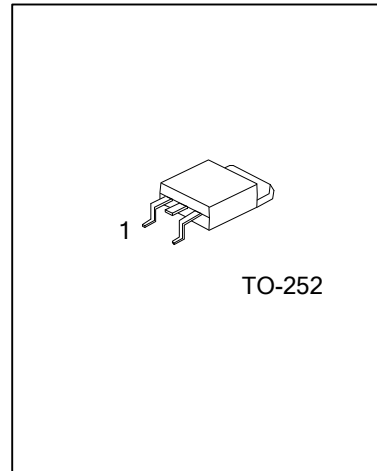


**UTT16P10**

Preliminary

*Power MOSFET*

**100V, 16A P-CHANNEL  
POWER MOSFET**



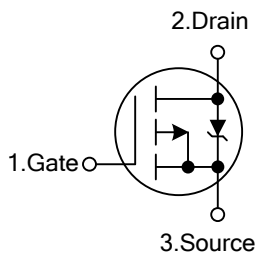
■ DESCRIPTION

The UTC **UTT16P10** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and a minimum on-state resistance. It can also withstand high energy in the avalanche.

■ FEATURES

- \*  $R_{DS(ON)} < 0.21\Omega$  @  $V_{GS} = -10V, I_D = -16A$
- \* High Switching Speed

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT16P10L-TN3-R	UTT16P10G-TN3-R	TO-252	G	D	S	Tape Reel
UTT16P10L-TN3-T	UTT16P10G-TN3-T	TO-252	G	D	S	Tube

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

<p>UTT16P10L-TN3-R</p>	<p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) TN3: TO-252</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ( $T_J=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			$V_{DSS}$	-100	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous,	$T_C=25^{\circ}\text{C}$	$I_D$	-16	A
	$V_{GSS}@-10\text{V}$	$T_C=100^{\circ}\text{C}$		-9.8	A
	Pulsed (Note 2)		$I_{DM}$	-64	A
Avalanche Current (Note 2)			$I_{AR}$	-16	A
Avalanche Energy	Repetitive (Note 3)		$E_{AS}$	345	mJ
	Single Pulsed (Note 2)		$E_{AR}$	15	mJ
Peak Diode Recovery dv/dt			dv/dt	-5.5	V/ns
Power Dissipation ( $T_C=25^{\circ}\text{C}$ )			$P_D$	150	W
Junction Temperature			$T_J$	-55~+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 max. junction temperature.

3.  $V_{DD}=-25\text{V}$ , starting  $T_J=25^{\circ}\text{C}$ ,  $L=2.7\text{mH}$ ,  $R_G=25\Omega$ ,  $I_{AS}=-16\text{A}$ .

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	$\theta_{JC}$	1.0	$^{\circ}\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=-250\mu\text{A}$ , $V_{GS}=0\text{V}$	-100			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}$ , $I_D=-1\text{mA}$		-0.1		$\text{V}/^{\circ}\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-100\text{V}$ , $V_{GS}=0\text{V}$ ,			-25	$\mu\text{A}$
		$V_{DS}=-80\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=150^{\circ}\text{C}$			-100	$\mu\text{A}$
Gate- Source Leakage Current	Forward	$V_{GS}=+20\text{V}$			+100	nA
	Reverse	$V_{GS}=-20\text{V}$			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=-250\mu\text{A}$	-1.0		-3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$ , $I_D=-16\text{A}$ (Note 2)			0.21	$\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=-25\text{V}$ , $V_{GS}=0\text{V}$ , $f=1.0\text{MHz}$		1180	1900	pF
Output Capacitance	$C_{OSS}$			250		pF
Reverse Transfer Capacitance	$C_{RSS}$			75		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{DS}=-80\text{V}$ , $V_{GS}=-10\text{V}$ , $I_D=-16\text{A}$ ,		37	60	nC
Gate to Source Charge	$Q_{GS}$			5		nC
Gate to Drain ("Miller") Charge	$Q_{GD}$			15		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=-50\text{V}$ , $I_D=-16\text{A}$ , $R_G=9.1\Omega$ , $R_D = 2.4\Omega$		11		ns
Rise Time	$t_R$			25		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			56		ns
Fall-Time	$t_F$			36		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$				-16	A
Maximum Body-Diode Pulsed Current	$I_{SM}$	(Note 1)			-64	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=-16\text{A}$ , $V_{GS}=0\text{V}$ (Note 2)			-1.3	V

Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

■ TEST CIRCUITS AND WAVEFORMS

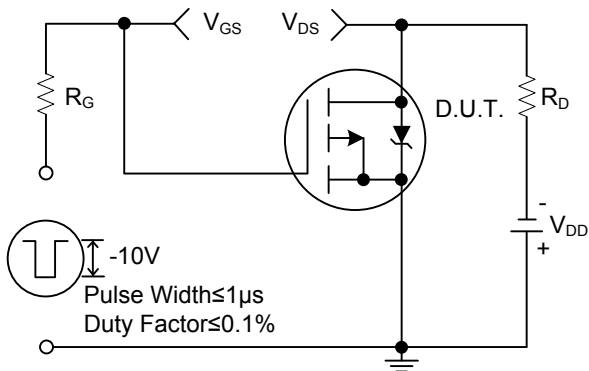


Fig. 1 Switching Time Test Circuit

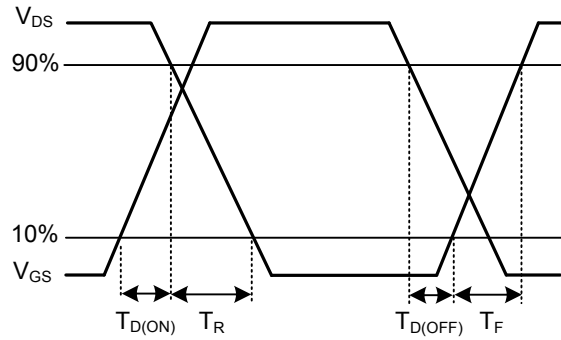


Fig. 2 Switching Time Waveforms

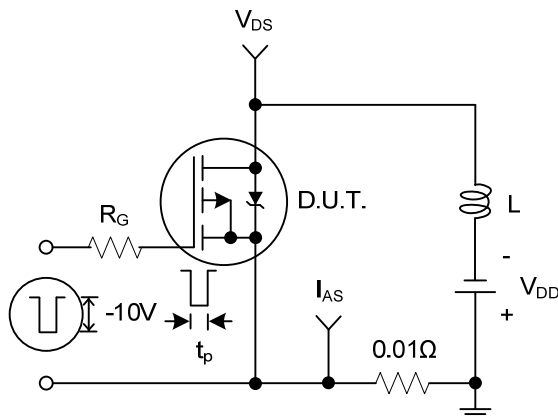


Fig. 3 Unclamped Inductive Test Circuit

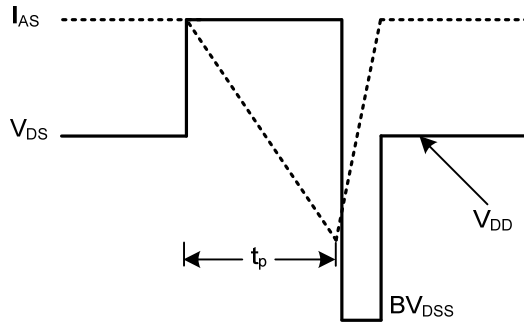


Fig. 4 Unclamped Inductive Waveforms

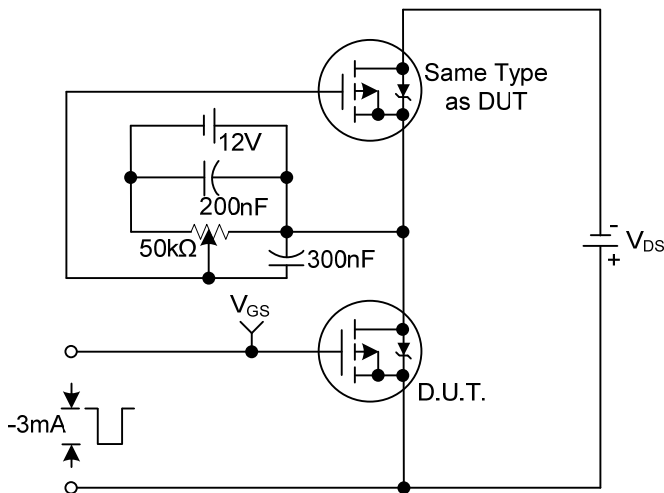


Fig.5 Gate Charge Test Circuit

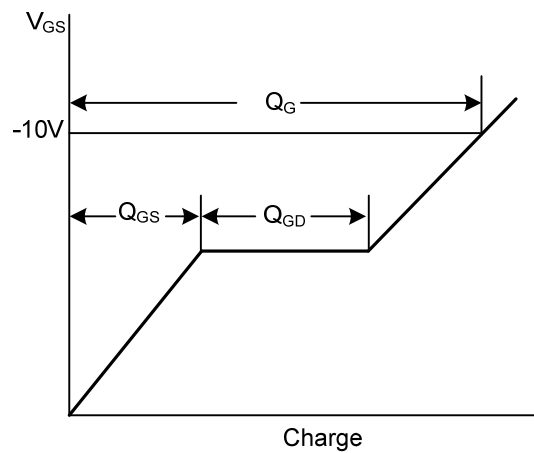


Fig. 6 Gate Charge Waveform

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