

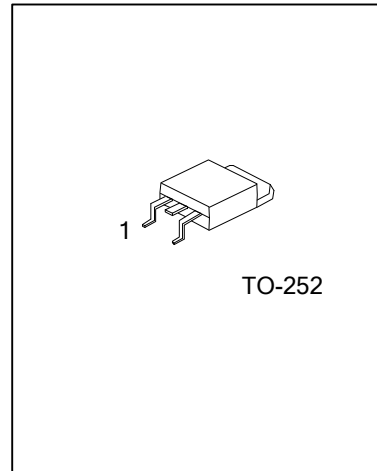


UTT16P10

Preliminary

Power MOSFET

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



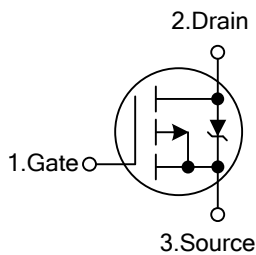
■ DESCRIPTION

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}	± 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	θ_{JC}	1.0	$^{\circ}\text{C/W}$

■ 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}	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-100			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°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	μA
		$V_{DS}=-80\text{V}$, $V_{GS}=0\text{V}$, $T_J=150^{\circ}\text{C}$			-100	μA
Gate- Source Leakage Current	Forward	$V_{GS}=+20\text{V}$			+100	nA
	Reverse	$V_{GS}=-20\text{V}$			-100	nA
ON CHARACTERISTICS						
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	Ω
DYNAMIC PARAMETERS						
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
SWITCHING PARAMETERS						
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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
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

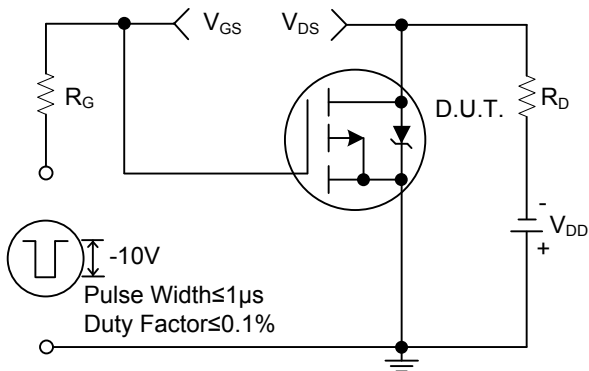


Fig. 1 Switching Time Test Circuit

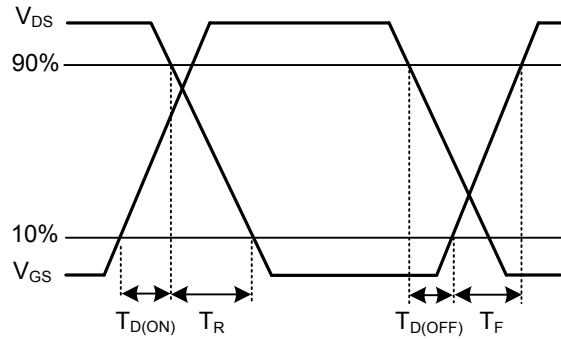


Fig. 2 Switching Time Waveforms

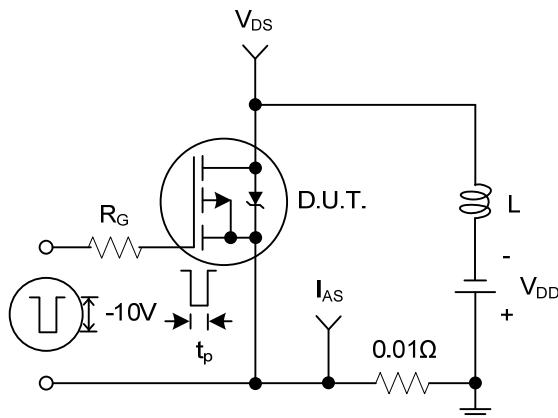


Fig. 3 Unclamped Inductive Test Circuit

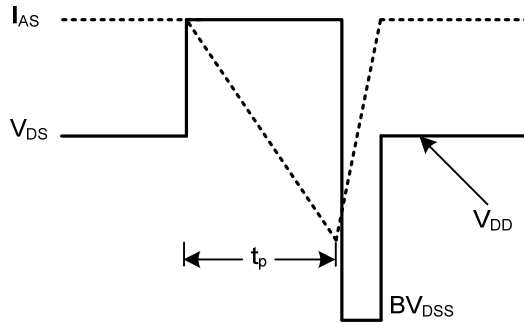


Fig. 4 Unclamped Inductive Waveforms

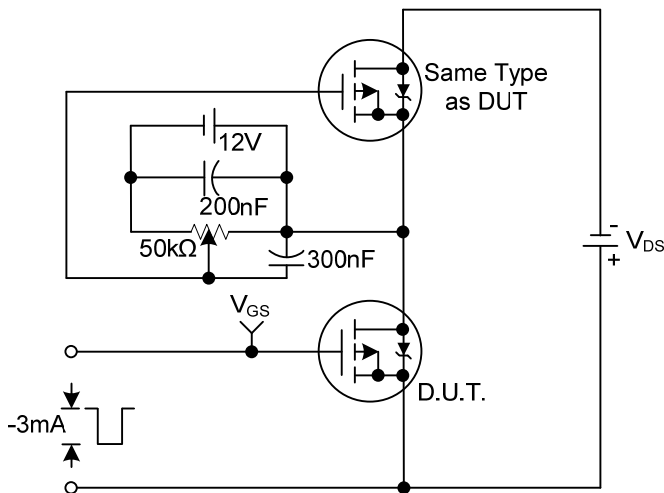


Fig.5 Gate Charge Test Circuit

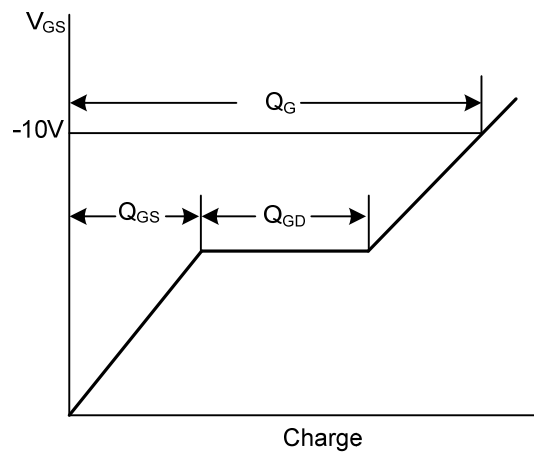


Fig. 6 Gate Charge Waveform

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