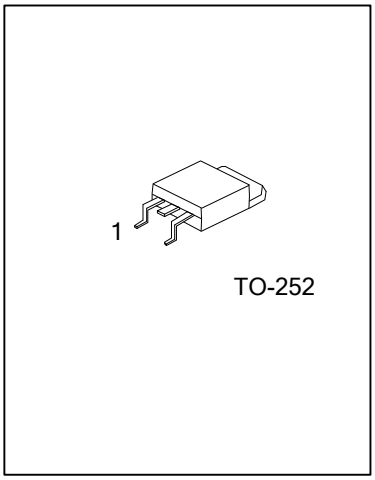
100V, 19A P-CHANNEL POWER MOSFET



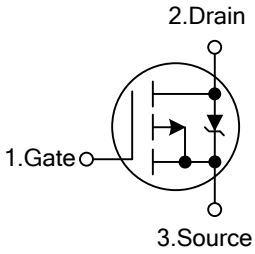
■ DESCRIPTION

The UTC **UTT18P10** 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

* $R_{DS(ON)}$<0.20Ω @ V_{GS}=-10V, I_D=-11A
* High Switching Speed

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT18P10L-TN3-R	UTT18P10G-TN3-R	TO-252	G	D	S	Tape Reel

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

UTT18P10L-TN3-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) TN3: TO-252 (3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS (T_J=25°C, unless otherwise specified)

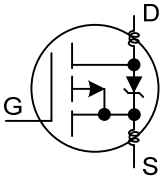
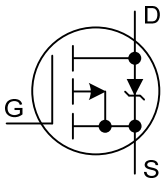
PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	-100	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous, V_{GSS}@-10V	T_C=25°C	I_D	-19	A
		T_C=100°C		-13	A
	Pulsed (Note 2)		I_{DM}	-72	A
Avalanche Current (Note 2)			I_{AR}	-19	A
Avalanche Energy	Repetitive (Note 3)		E_{AS}	640	mJ
	Single Pulsed (Note 2)		E_{AR}	15	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	-5.5	V/ns
Power Dissipation (T_C=25°C)			P_D	150	W
Junction Temperature			T_J	-55~+175	°C
Storage Temperature			T_{STG}	-55~+175	°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}=-25V, starting T_J=25°C, L=2.7mH, R_G=25Ω, I_{AS}=-19A. (See Figure 2)
4. I_{SD}≤-19A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, T_J≤175°C

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	θ_{JC}	1.0	°C/W

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=-250μA, V_{GS}=0V	-100			V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=-1mA		-0.087		V/°C
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-100V, V_{GS}=0V,			-100	μA
			V_{DS}=-80V, V_{GS}=0V, T_J=150°C			-500	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V			+100	nA
	Reverse		V_{GS}=-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-2.0		-4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-11A (Note 2)			0.20	Ω
Forward Transconductance		g_{FS}	V_{DS}=-50V, I_D=-11A (Note 2)	6.2			S
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=-25V, V_{GS}=0V, f=1.0MHz		1400		pF
Output Capacitance		C_{OSS}			590		pF
Reverse Transfer Capacitance		C_{RSS}			140		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=-80V, V_{GS}=-10V, I_D=-19A, See Fig 3 (Note 2)			61	nC
Gate to Source Charge		Q_{GS}				14	nC
Gate to Drain ("Miller") Charge		Q_{GD}				29	nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=-50V, I_D=-19A, R_G=9.1Ω, R_D = 2.4Ω, See Fig. 1(Note 2)		16		ns
Rise Time		t_R			73		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			34		ns
Fall-Time		t_F			57		ns
Internal Drain Inductance		L_D	Between lead, 6 mm (0.25.) from package and center of die contact 		4.5		nH
Internal Source Inductance		L_S			7.5		nH
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S	MOSFET symbol showing the integral reverse p-n junction diode. 			-19	A
Maximum Body-Diode Pulsed Current (Note 1)		I_{SM}				-72	A
Drain-Source Diode Forward Voltage		V_{SD}	T_J=25°C, I_S=-19A, V_{GS}=0V (Note 2)			-5.0	V
Body Diode Reverse Recovery Time		t_{RR}	T_J=25°C, I_F=-19A, di/dt=100A/μs (Note 2)		130	260	ns
Body Diode Reverse Recovery Charge		Q_{RR}			0.35	0.70	μC
Forward Turn-On Time		t_{ON}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:
1. Repetitive rating; pulse width limited by max. junction temperature.
2. Pulse width≤300μs; duty cycle≤2%.

■ TEST CIRCUITS AND WAVEFORMS

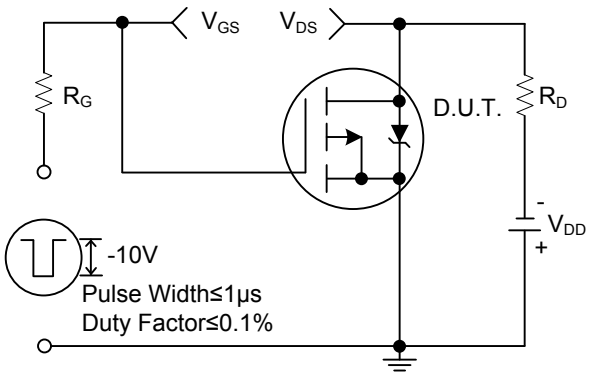


Fig. 1a Switching Time Test Circuit

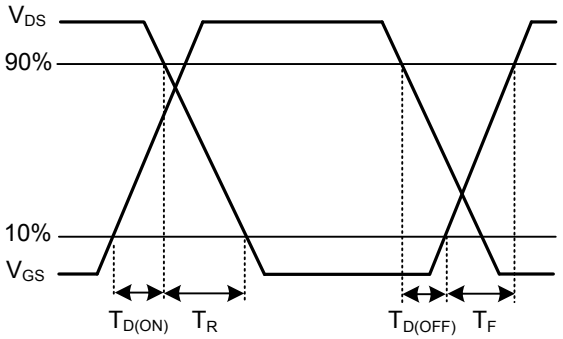


Fig. 1b Switching Time Waveforms

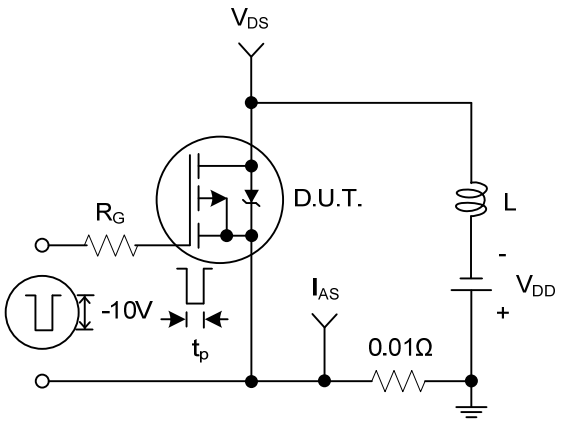


Fig. 2a Unclampled Inductive Test Circuit

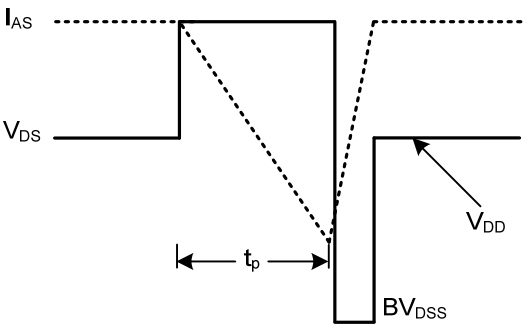


Fig. 2b Unclampled Inductive Waveforms

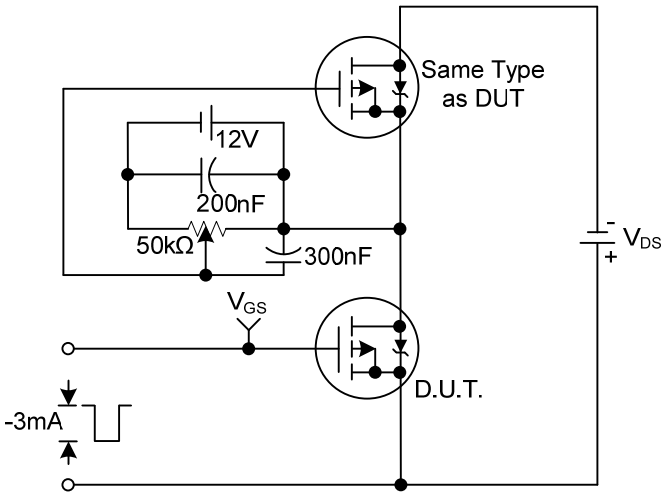


Fig.3a Gate Charge Test Circuit

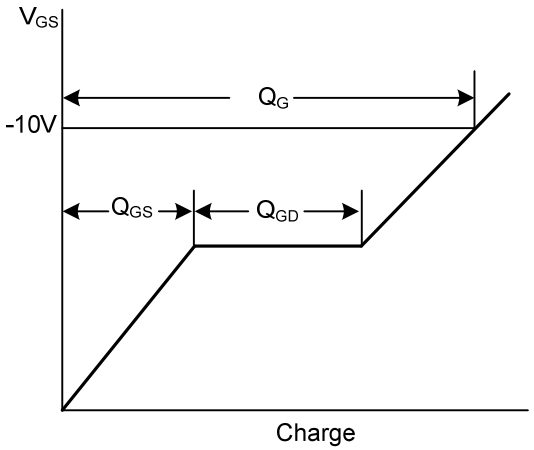
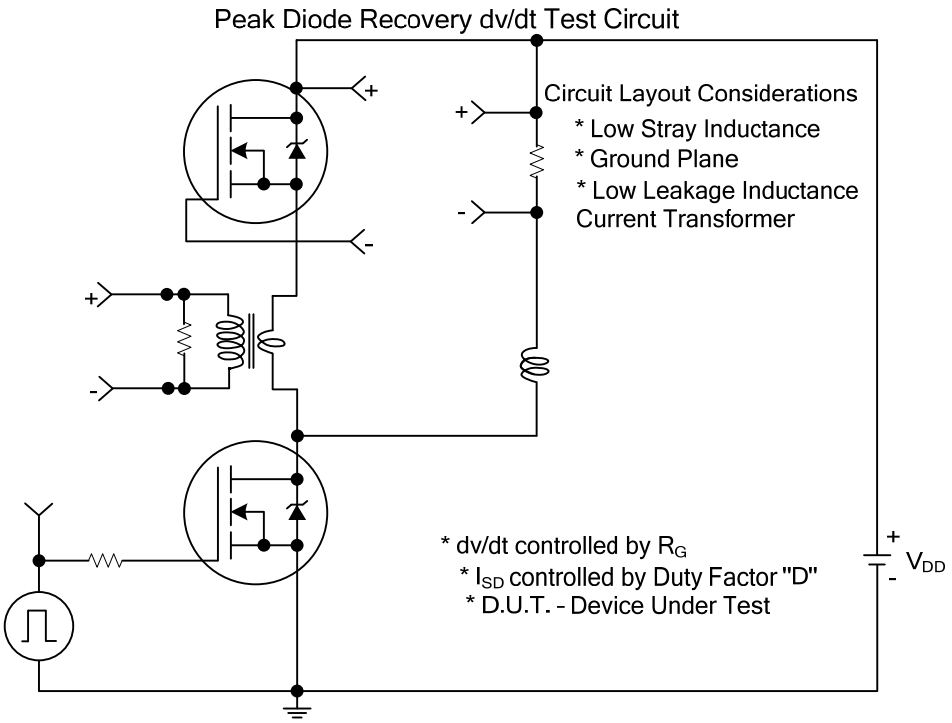
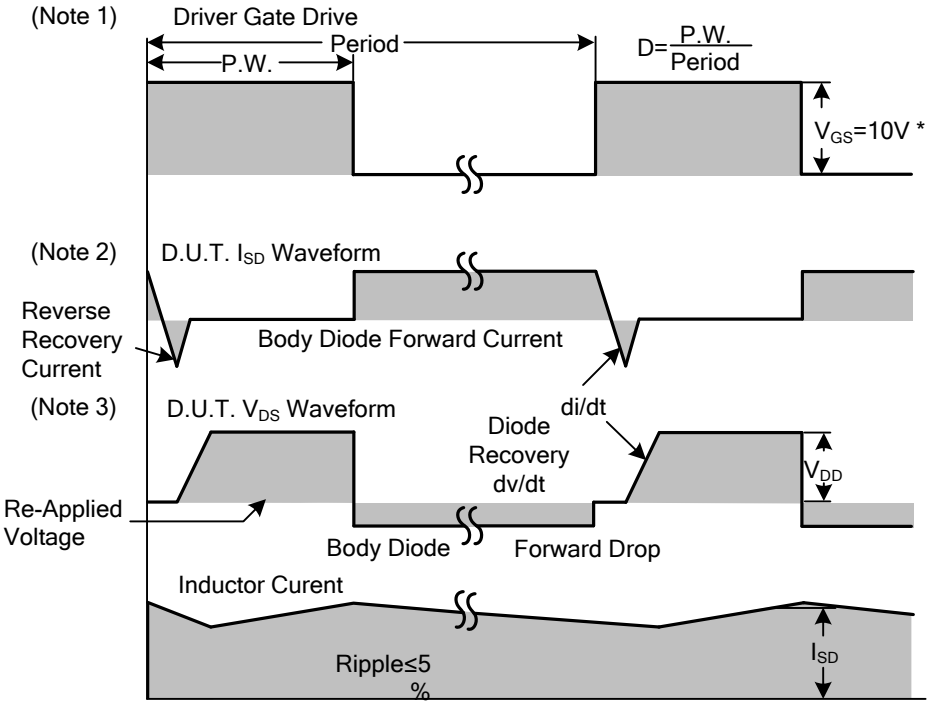


Fig. 3b Gate Charge Waveform

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



* Reverse Polarity for P-Channel
** Use P-Channel Driver for P-Channel Measurements



*** V_{GS}=5V for Logic Level and 3V Drive Devices

For N and P Channel Power MOSFET

Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.
2. V_{DD}=-25V, starting T_J=25°C, L=2.7mH, R_G=25Ω, I_{AS}=-19A. (See Figure 2)
3. I_{SD}≤-19A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, T_J≤175°C