



UTT12P10

Power MOSFET

100V, 12A P-CHANNEL POWER MOSFET

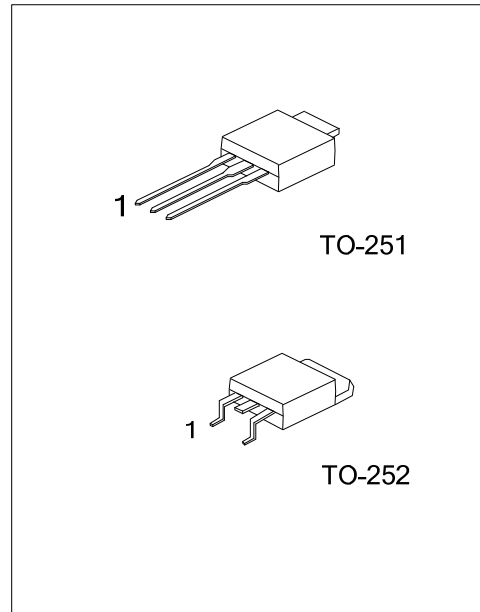
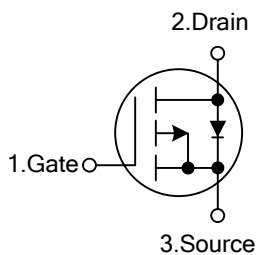
DESCRIPTION

The UTC **UTT12P10** 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

- * $R_{DS(ON)} < 0.2\Omega$ @ $V_{GS} = -10V$, $I_D = -12A$
- * High Switching Speed

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT12P10L-TM3-T	UTT12P10G-TM3-T	TO-251	G	D	S	Tube
UTT12P10L-TN3-T	UTT12P10G-TN3-T	TO-252	G	D	S	Tube
UTT12P10L-TN3-R	UTT12P10G-TN3-R	TO-252	G	D	S	Tape Reel

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

UTT12P10L-TM3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) TM3: TO-251, TN3: TO-252
	(3)Lead Free	(3) L: Lead Free, G: Halogen Free

■ 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, $V_{GSS}=-10\text{V}$	$T_C=25^{\circ}\text{C}$	I_D	-12	A
	Pulsed (Note 2)		I_{DM}	-48	A
	Single Pulsed (Note 2)		E_{AS}	60	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)			P_D	125	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 max. junction temperature.

3. $V_{DD}=-25\text{V}$, starting $T_J=25^{\circ}\text{C}$, $L=0.83\text{mH}$, $R_G=25\Omega$, $I_{AS}=12\text{A}$. (See Figure 2)

■ 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 =-250μA, V _{GS} =0V	-100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-100V, V _{GS} =0V			-1	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 =-12A (Note 2)			0.2	Ω
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							
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-50V, I _D =-12A, R _G =9.1Ω, R _D = 2.4Ω, See Fig. 1(Note 2)		40	50	ns
Rise Time		t _R			38	45	ns
Turn-OFF Delay Time		t _{D(OFF)}			314	330	ns
Fall-Time		t _F			66	75	ns
Total Gate Charge		Q _G	V _{DS} =-80V, V _{GS} =-10V, I _D =-12A, See Fig 3 (Note 2)		35	40	nC
Gate to Source Charge		Q _{GS}			8		nC
Gate to Drain ("Miller") Charge		Q _{GD}			6		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-12	A
Maximum Body-Diode Pulsed Current		I _{SM}	(Note 1)			-48	A
Drain-Source Diode Forward Voltage		V _{SD}	T _J =25°C, I _S =-12A,V _{GS} =0V(Note 2)			-5.0	V
Body Diode Reverse Recovery Time		t _{RR}	T _J =25°C, I _F =-12A,		130	260	ns
Body Diode Reverse Recovery Charge		Q _{RR}	di/dt=100A/μs (Note 2)		0.35	0.70	μC

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

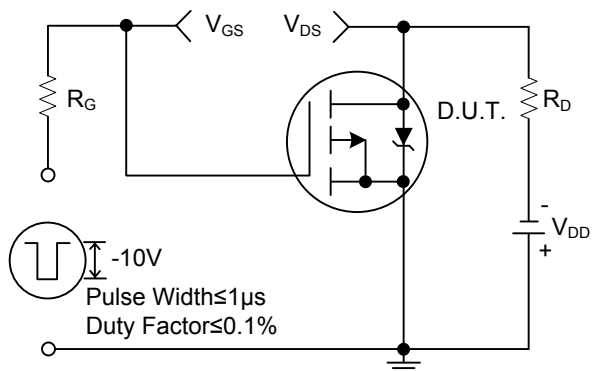


Fig. 1a Switching Time Test Circuit

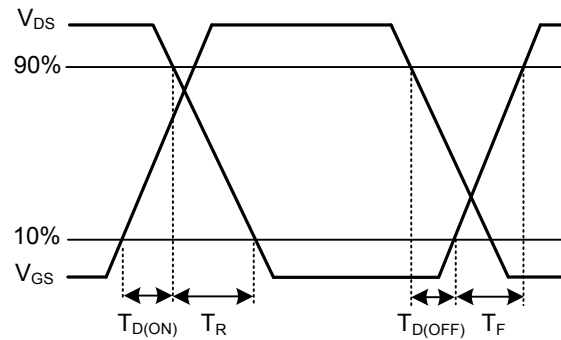


Fig. 1b Switching Time Waveforms

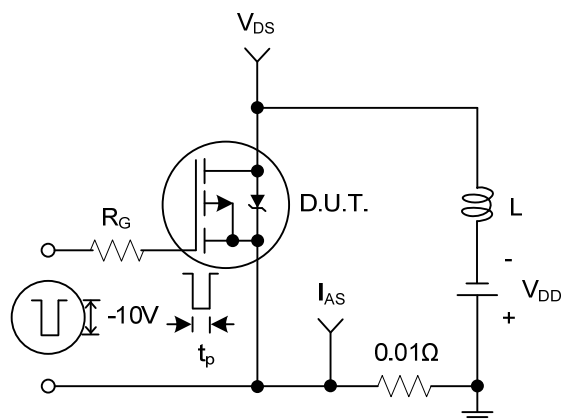


Fig. 2a Unclamped Inductive Test Circuit

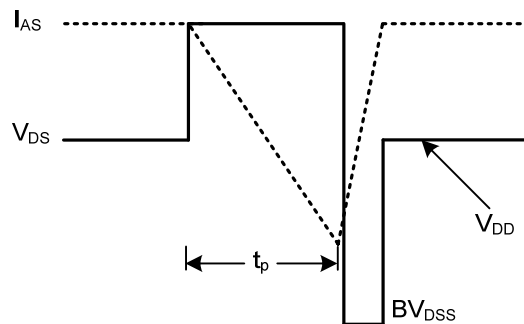


Fig. 2b Unclamped Inductive Waveforms

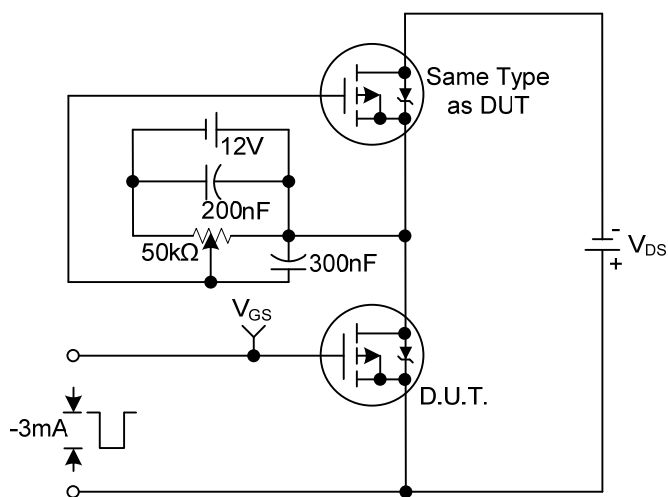


Fig. 3a Gate Charge Test Circuit

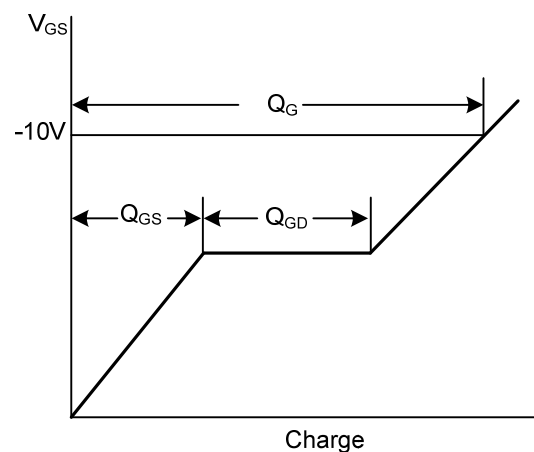
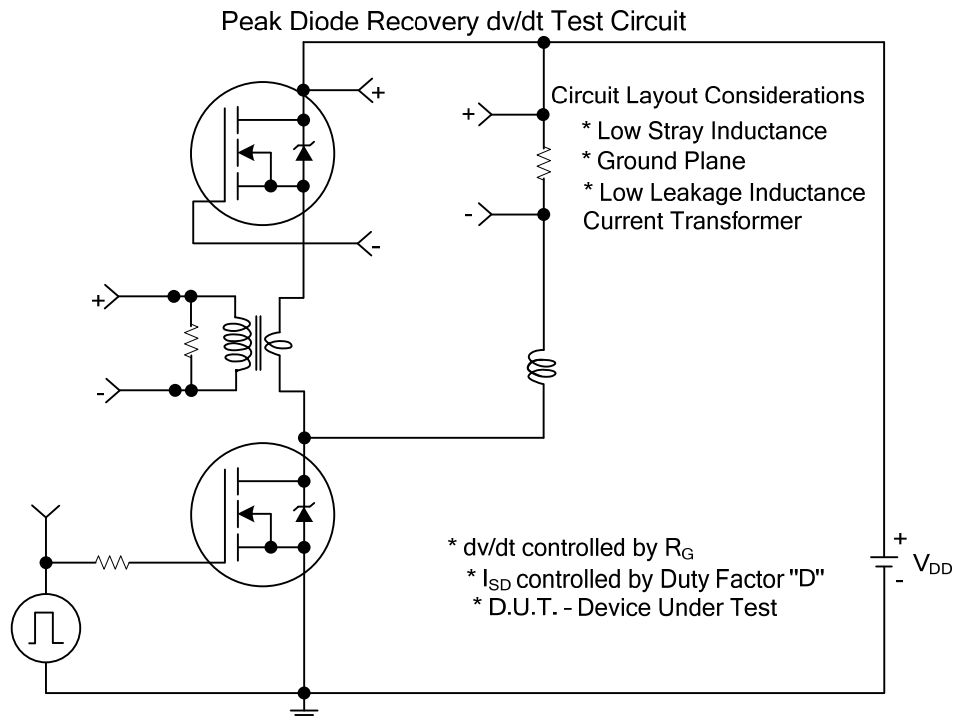


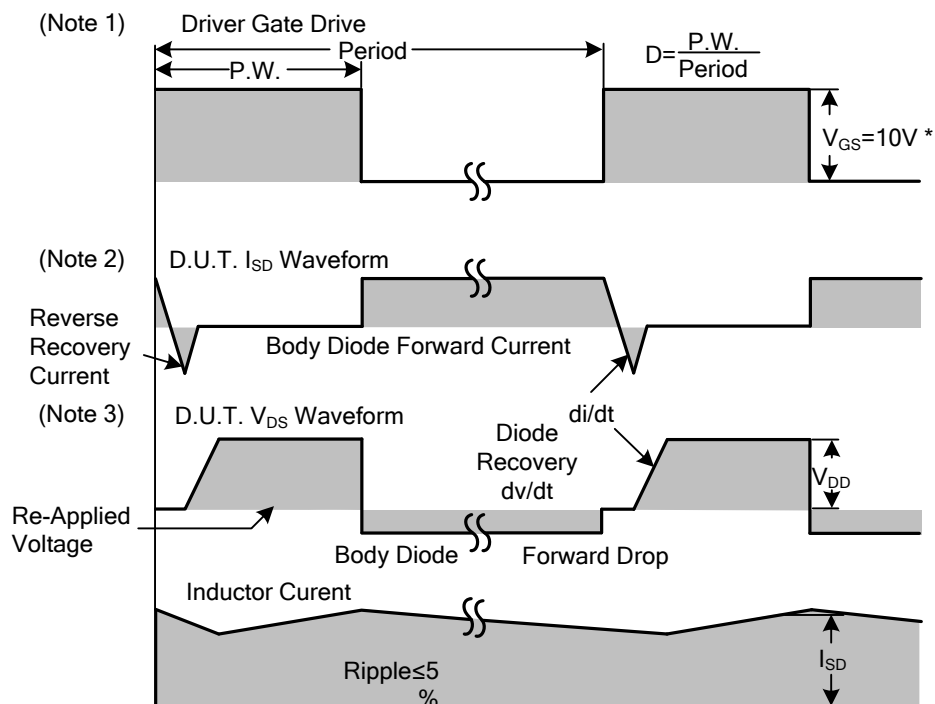
Fig. 3b Gate Charge Waveform

■ TEST CIRCUITS AND WAVEFORMS(Cont.)



* Reverse Polarity for P-Channel

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

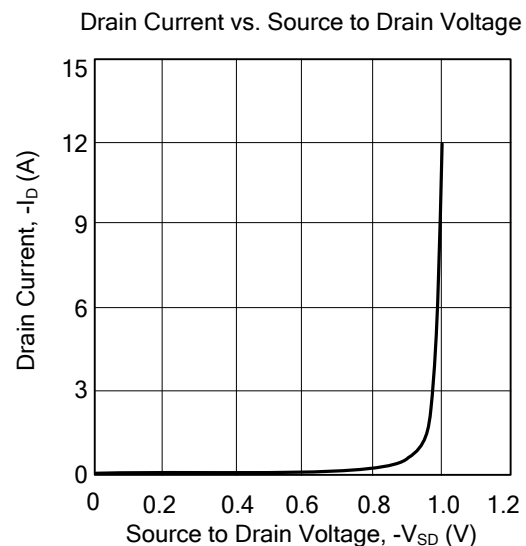
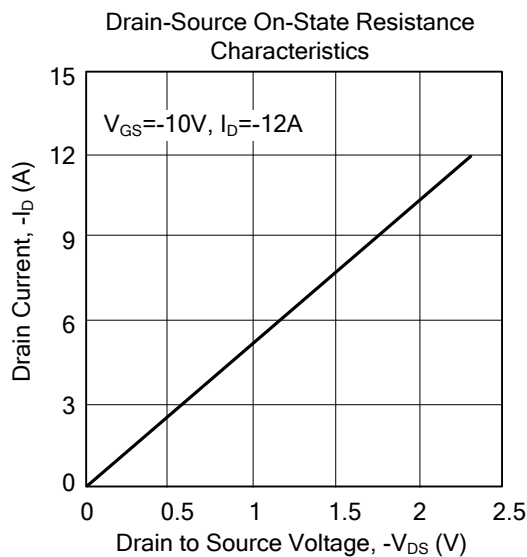
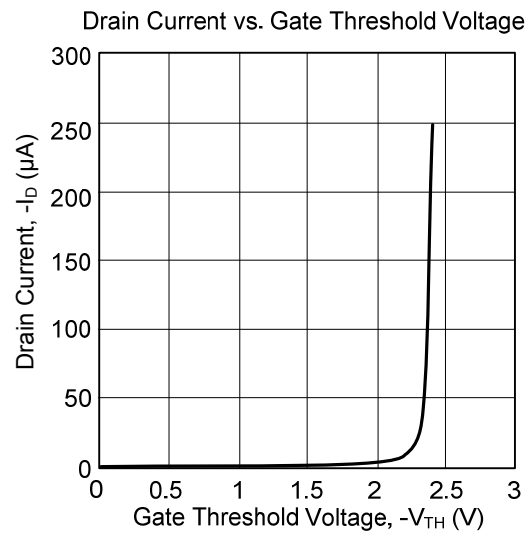
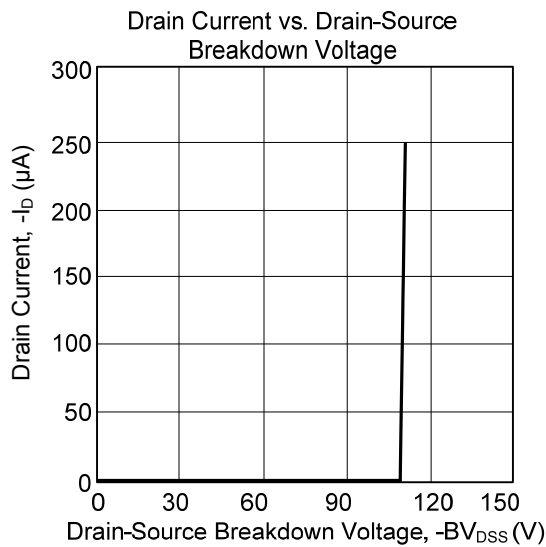


*** $V_{GS}=5V$ for Logic Level and 3V Drive Devices

For N and P Channel Power MOSFET

- Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.
 2. $V_{DD}=-25V$, starting $T_J=25^\circ C$, $L=2.7mH$, $R_G=25\Omega$, $I_{AS}=-12A$. (See Figure 2)
 3. $I_{SD}\leq -12A$, $di/dt\leq 200A/\mu s$, $V_{DD}\leq BV_{DSS}$, $T_J\leq 175^\circ C$

■ TYPICAL CHARACTERISTICS



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