

**UT23P10H**

Preliminary

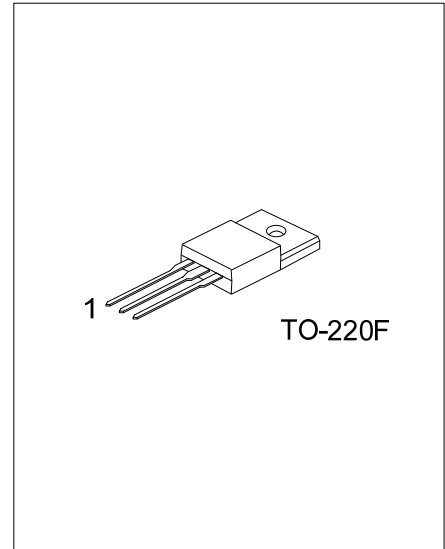
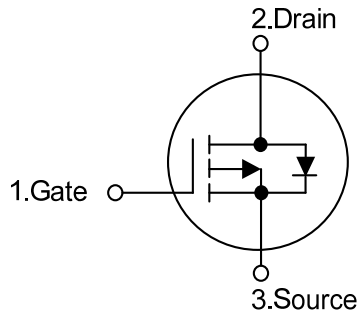
Power MOSFET

**-23A, -100V P-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UT23P10H** provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

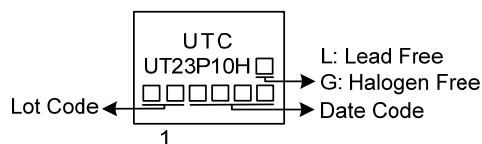
- * $R_{DS(ON)} \leq 70 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -11.5\text{A}$
- * High Switching Speed
- * 100% Avalanche Tested

**SYMBOL****ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT23P10HL-TF3-T	UT23P10HG-TF3-T	TO-220F	G	D	S	Tube

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

UT23P10HG-TF3-T (1)Packing Type (2)Package Type (3)Green Package		(1) T: Tube (2) TF3: TO-220F (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}	-100	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous, V _{GSS} @-10V	T _C =25°C	I _D	-23	A
		T _C =100°C		-15	A
	Pulsed (Note 2)		I _{DM}	-46	A
Avalanche Energy	Repetitive (Note 3)		E _{AS}	34	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	4.8	V/ns
Power Dissipation (T _C =25°C)			P _D	30	W
Junction Temperature			T _J	+150	°C
Storage Temperature			T _{STG}	-55 ~ +150	°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. $L = 0.1\text{mH}$, $I_{AS} = -26\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq -23\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	4.17	$^{\circ}\text{C}/\text{W}$

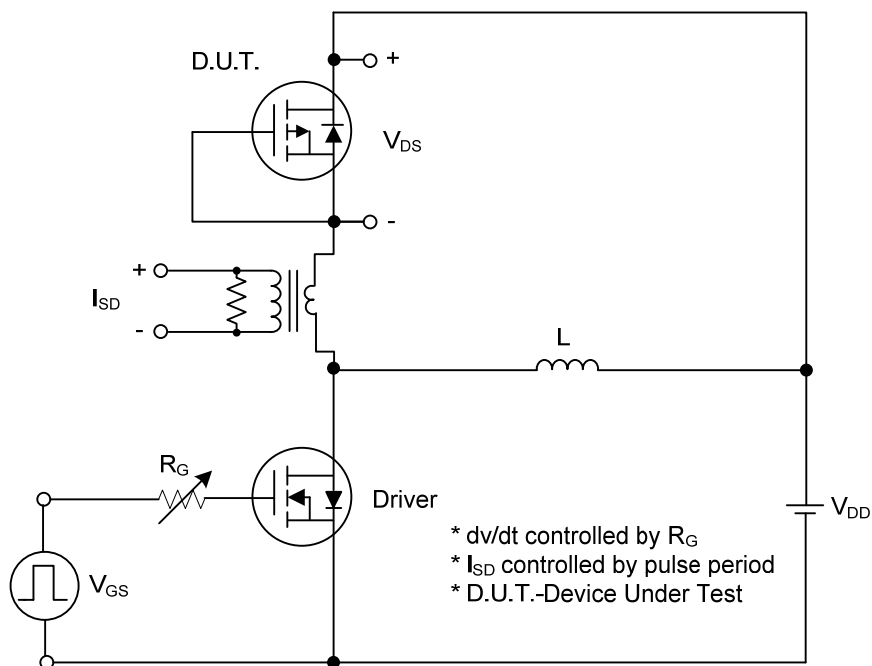
ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

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, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V ,V _{DS} =0V			-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 =-11.5A			70	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =-25V, V _{GS} =0V, f=1MHz		2448		pF
Output Capacitance		C _{OSS}			138		pF
Reverse Transfer Capacitance		C _{RSS}			109		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-80V, V _{GS} =-10V, I _D =-23A		40		nC
Gate to Source Charge		Q _{GS}			8		nC
Gate to Drain ("Miller") Charge		Q _{GD}			6		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-50V, V _{GS} =-10V, I _D =-23A, R _G =3Ω (Note 1, 2)		11		ns
Rise Time		t _R			18		ns
Turn-OFF Delay Time		t _{D(OFF)}			32		ns
Fall-Time		t _F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-23	A
Maximum Body-Diode Pulsed Current (Note 1)		I _{SM}				-46	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =-23A, V _{GS} =0V (Note 2)			-1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =-23A, V _{GS} =0V,		110		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs		196		nC

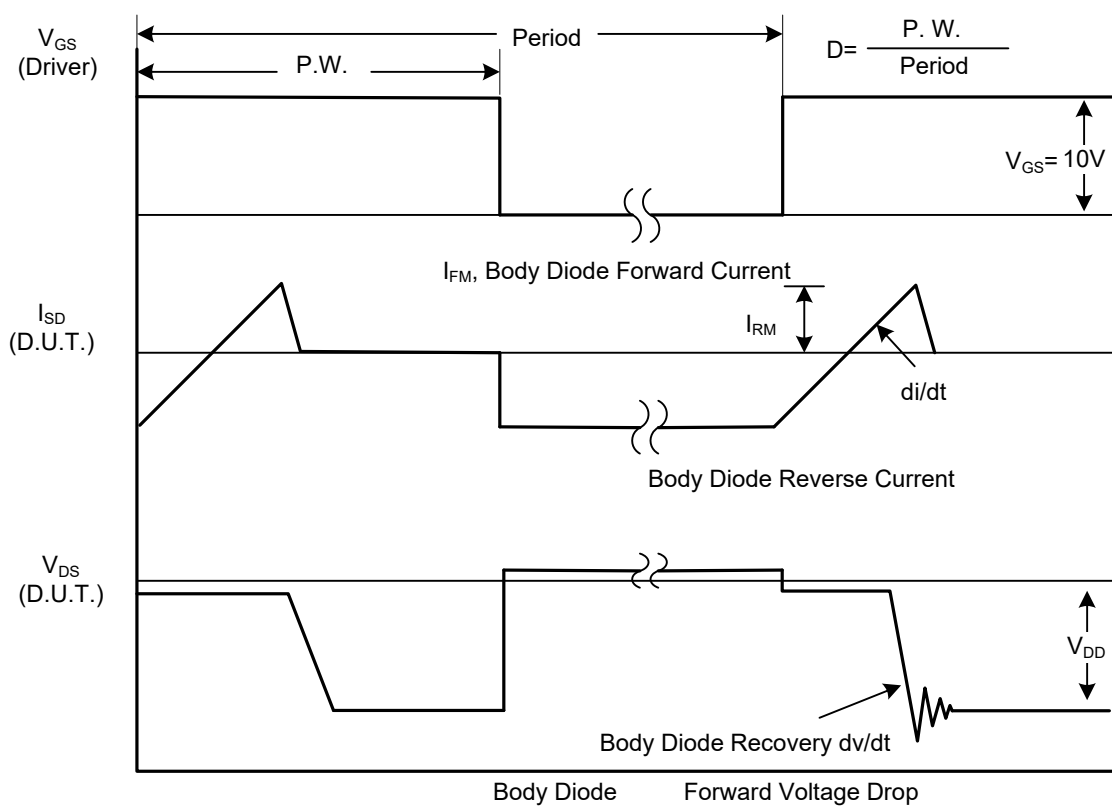
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

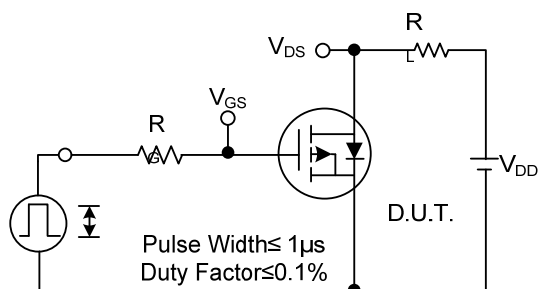


Peak Diode Recovery dv/dt Test Circuit

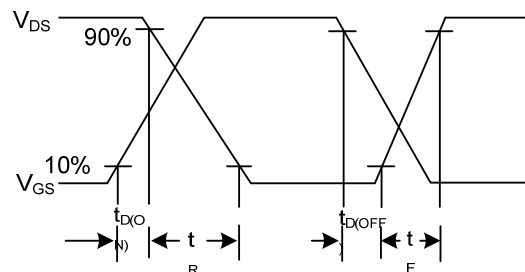


Peak Diode Recovery dv/dt Waveforms

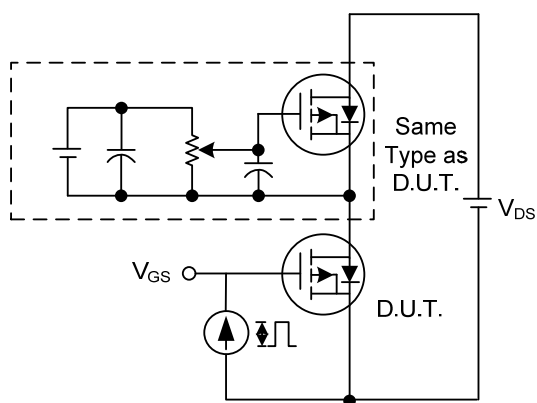
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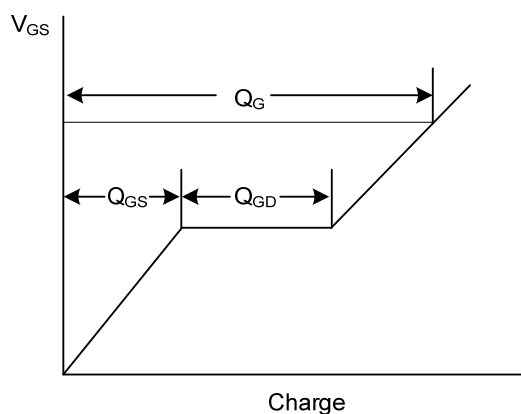
Switching Test Circuit



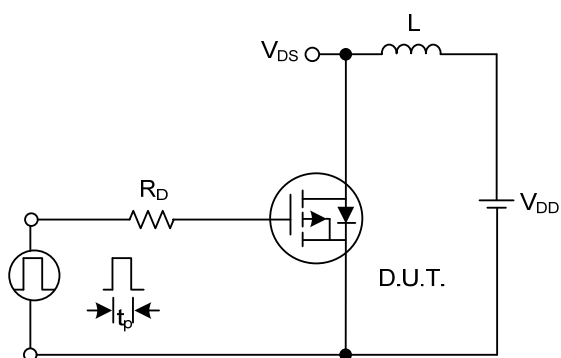
Switching Waveforms



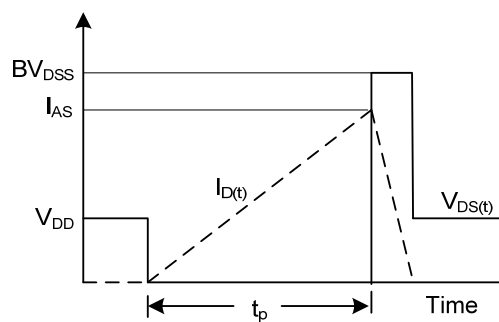
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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