

**UT23P09**

Preliminary

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

■ DESCRIPTION

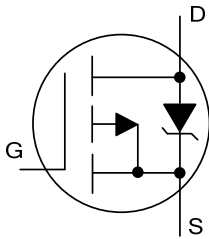
The UTC **UT23P09** is a P-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

The UTC **UT23P09** is suitable for all commercial-industrial applications, etc.

■ FEATURES

- * $R_{DS(ON)} < 0.117\Omega$ @ $V_{GS} = -10V$, $I_D = -11A$
- * High Switching Speed
- * Dynamic dv/dt Rating

■ SYMBOL

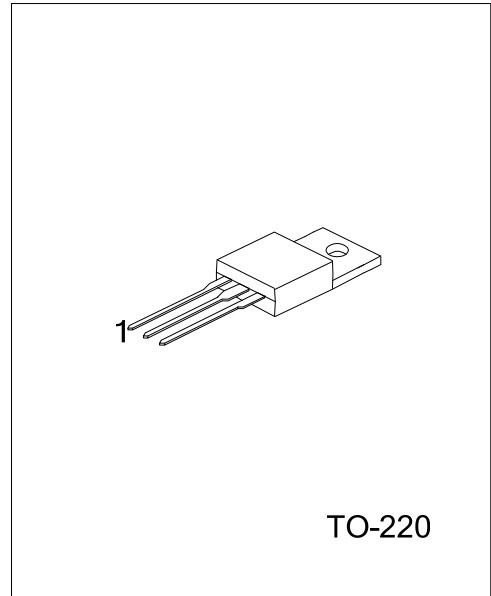


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT23P09L-TA3-T	UT23P09G-TA3-T	TO-220	G	D	S	Tube

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

UT23P09L-TA3-T (1)Packing Type (2)Package Type (3)Lead Free		(1) T: Tube (2) TA3: TO-220 (3) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATING

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	-100	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous	V _{GS} =-10V, T _C =25°C	I _D	-23	A
		V _{GS} =-10V, T _C =100°C		-16	A
	Pulsed (Note 2)		I _{DM}	-76	A
Avalanche Current (Note 2)			I _{AR}	-11	A
Avalanche Energy	Single Pulse (Note 3)		E _{AS}	430	mJ
	Repetitive (Note 2)		E _{AR}	14	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	-5.0	V/ns
Power Dissipation (T _C =25°C)			P _D	140	W
Linear Derating Factor				0.91	W/°C
Junction Temperature			T _J	-55~+150	°C
Storage Temperature Range			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 max. junction temperature.

3. Starting $T_J = 25^\circ C$, $L = 7.1mH$, $R_G = 25\Omega$, $I_{AS} = -11A$.

4. $I_{SD} \leq -11A$, $di/dt \leq 470A/\mu s$, $V_{DD} \leq BV_{DSS}$, $T_J \leq 150^\circ C$.

■ THERMAL RESISTANCE

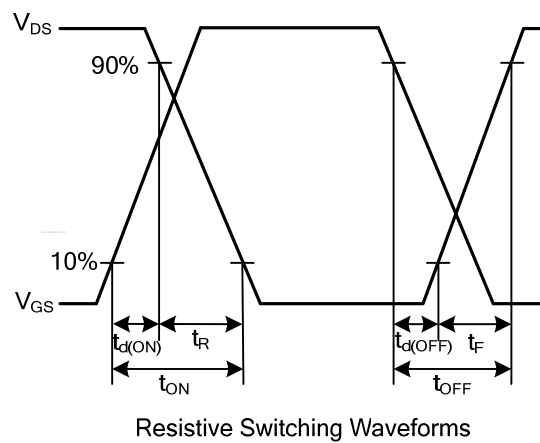
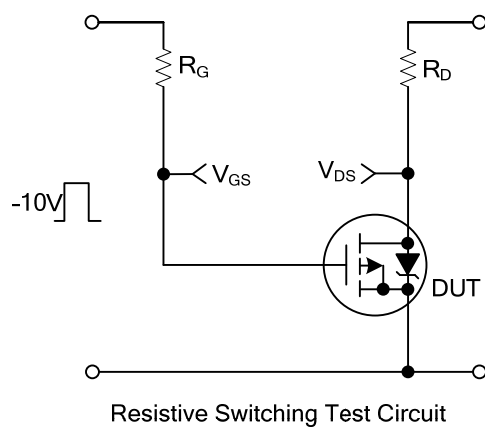
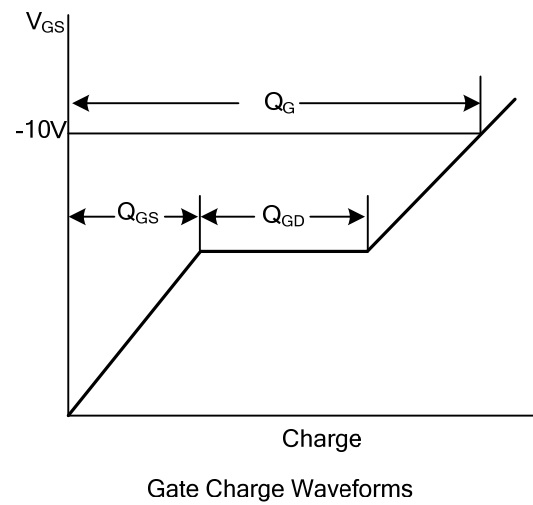
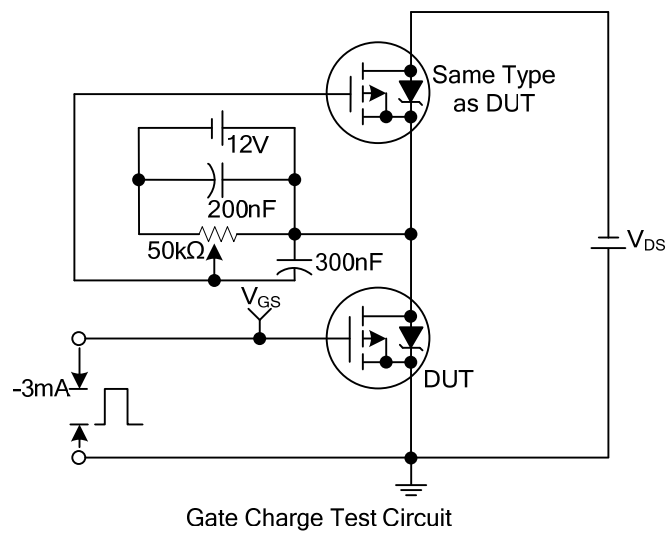
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	$^\circ C/W$
Junction to Case	θ_{JC}	1.1	$^\circ C/W$

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

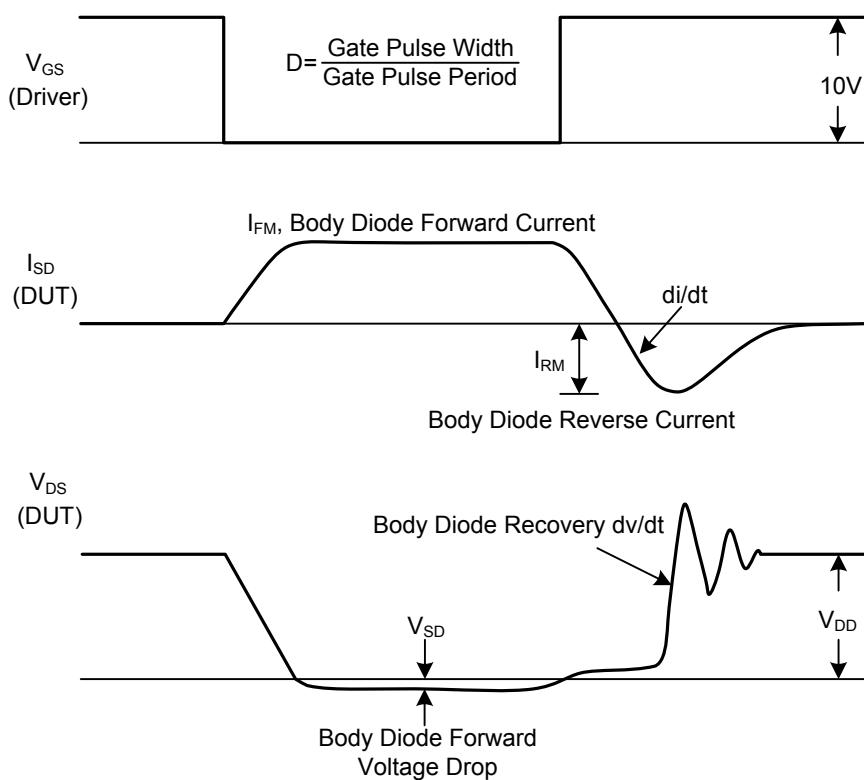
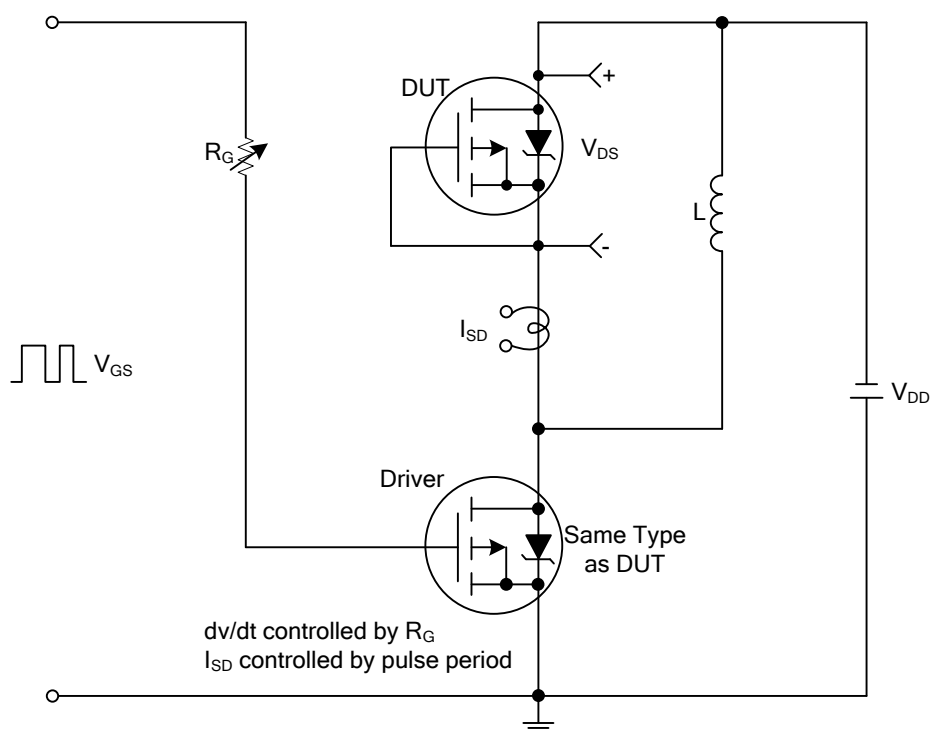
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-100			V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =-1mA		-0.11		V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-100V, V _{GS} =0V			-25	μA
			V _{DS} =-80V, V _{GS} =0V, T _J =150°C			-250	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							
Static Drain-Source On-Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-11A (Note 5)			0.117	Ω
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-2.0		-4.0	V
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		1300		pF
Output Capacitance		C _{OSS}			400		pF
Reverse Transfer Capacitance		C _{RSS}			240		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	I _D =-11A, V _{DS} =-80V, V _{GS} =-10V, (Note 5)			97	nC
Gate-to-Source Charge		Q _{GS}				15	nC
Gate-to-Drain ("Miller") Charge		Q _{GD}				51	nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-50V, I _D =-11A, R _G =5.1Ω R _D =4.2Ω, (Note 5)		15		ns
Rise Time		t _R			67		ns
Turn-OFF Delay Time		t _{D(OFF)}			51		ns
Fall Time		t _F			51		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body Diode Continuous Source Current		I _S	—			-23	A
Maximum Body-Diode Pulsed Current (Note 2)		I _{SM}				-76	A
Drain-Source Diode Forward Voltage		V _{SD}	T _J =25°C, I _S =-11A, V _{GS} =0V (Note 5)			-1.6	V
Body Diode Reverse Recovery Time		t _{RR}	T _J =25°C, I _F =-11A, di/dt=-100A/μs (Note 5)		150	220	ns
Body Diode Reverse Recovery Charge		Q _{RR}			830	1200	nC

Note: 5. Pulse width≤300μs; duty cycle≤2%.

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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