



UT23P09

Preliminary

POWER MOSFET

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

■ DESCRIPTION

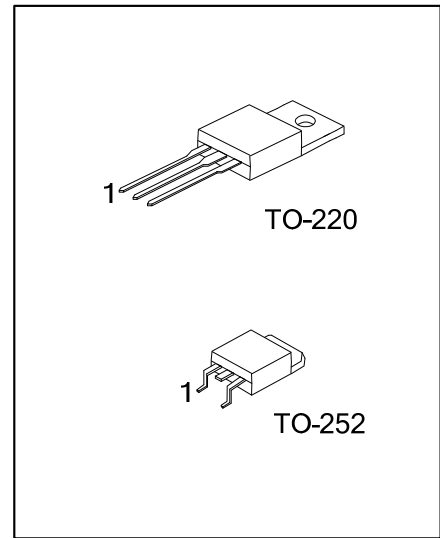
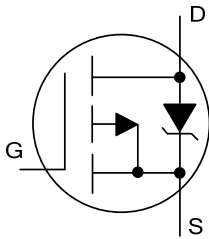
The UTC **UT23P09** is a P-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

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



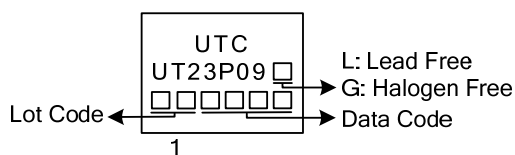
■ ORDERING INFORMATION

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
UT23P09L-TN3-R	UT23P09G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UT23P09L-TA3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V_{DSS}	-100	V	
Gate-Source Voltage		V_{GSS}	± 20	V	
Drain Current	Continuous	I_D	$V_{GS}=-10V, T_C=25^\circ C$	-23	A
			$V_{GS}=-10V, T_C=100^\circ C$	-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 ($T_C=25^\circ C$)	TO-220	P_D	140	W	
	TO-252		35	W	
Linear Derating Factor	TO-220		1.12	W/ $^\circ C$	
	TO-252		0.28	W/ $^\circ C$	
Junction Temperature		T_J	-55~+150	$^\circ C$	
Storage Temperature Range		T_{STG}	-55~+150	$^\circ C$	

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

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

■ THERMAL RESISTANCE

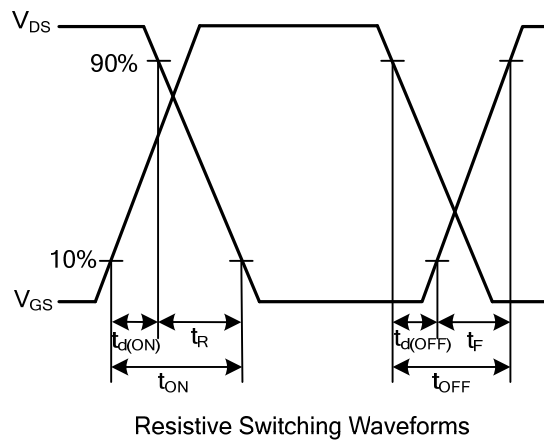
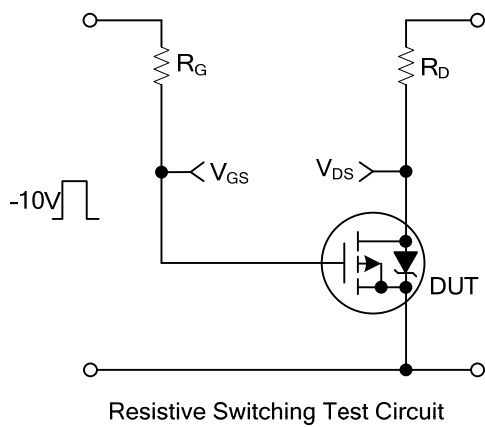
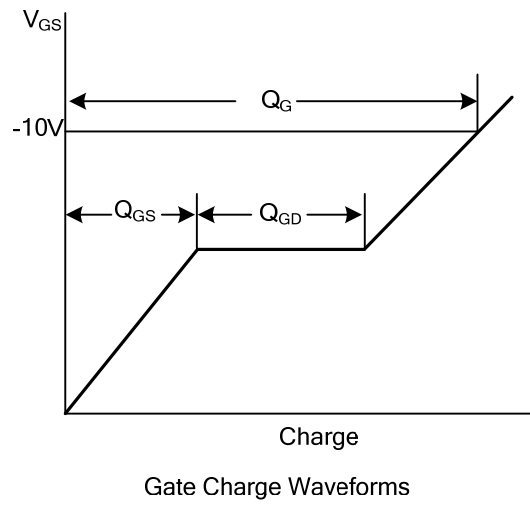
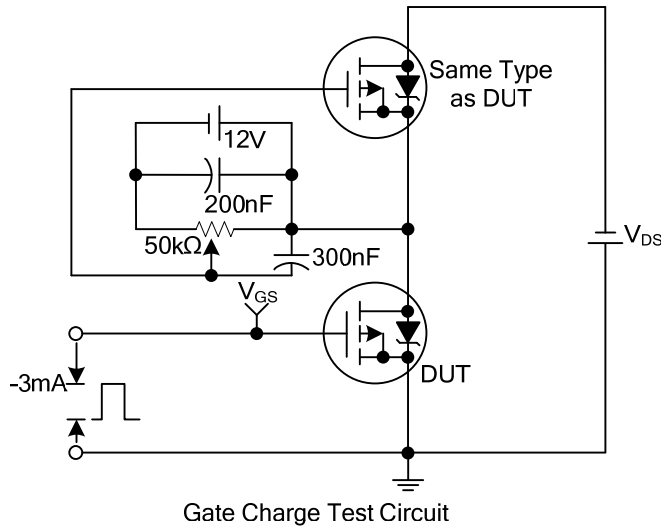
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62	$^\circ C/W$
	TO-252		110	$^\circ C/W$
Junction to Case	TO-220	θ_{JC}	0.89	$^\circ C/W$
	TO-252		3.57	$^\circ C/W$

■ 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}				
	Reverse					
		V _{GS} =20V, V _{DS} =0V			100	nA
		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

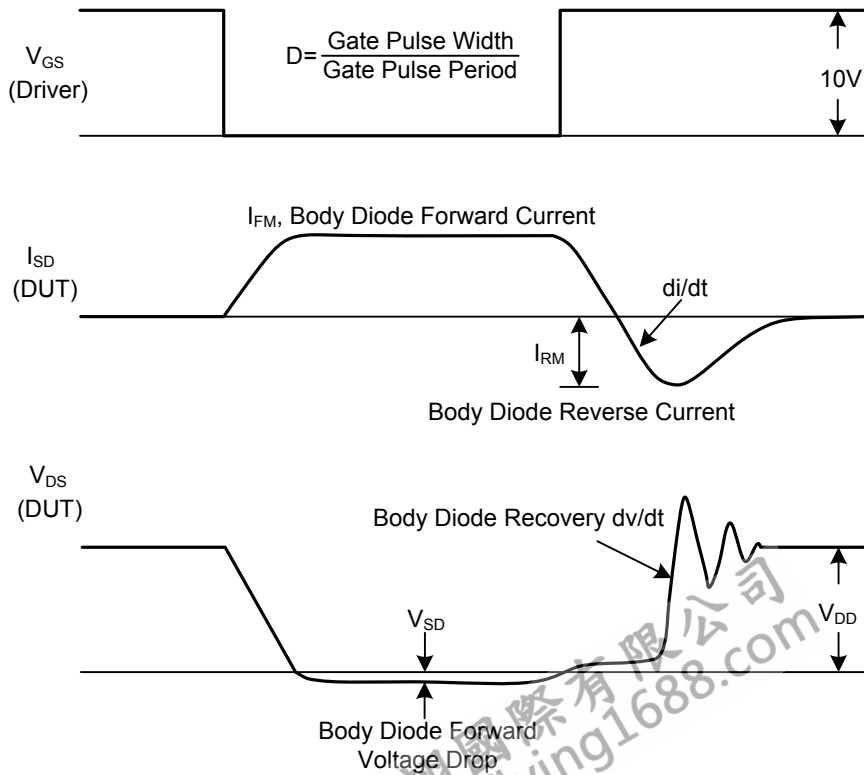
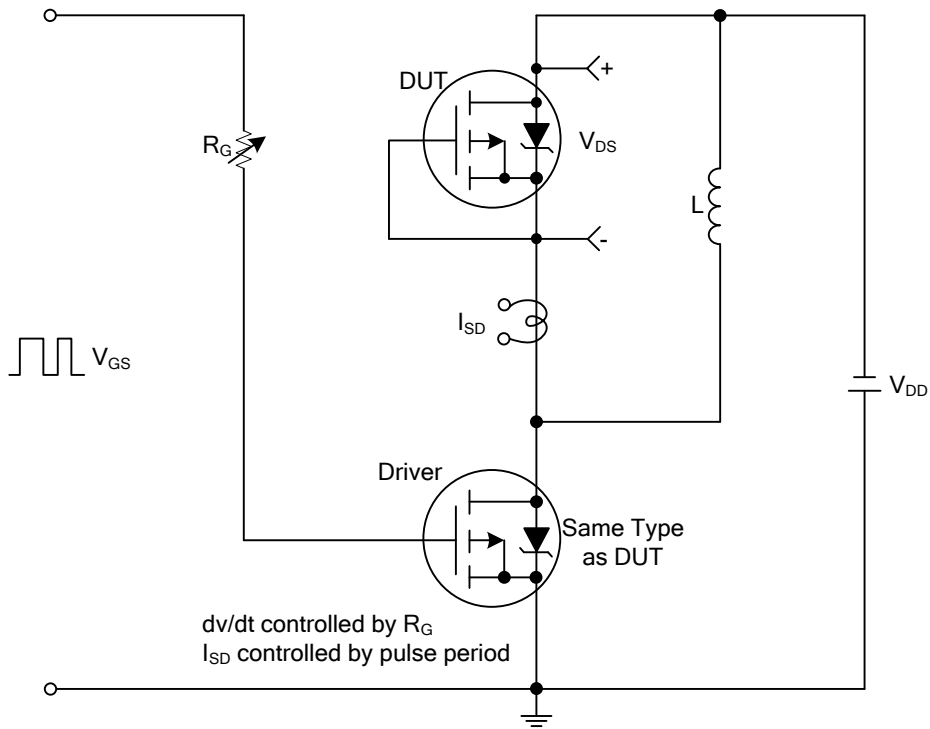
Note: 5. Pulse width≤300μs; duty cycle≤2%.

■ TEST CIRCUITS AND WAVEFORMS



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■ TEST CIRCUITS AND WAVEFORMS(Cont.)



Peak Diode Recovery dv/dt Test Circuit and Waveforms

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