



UT2309A

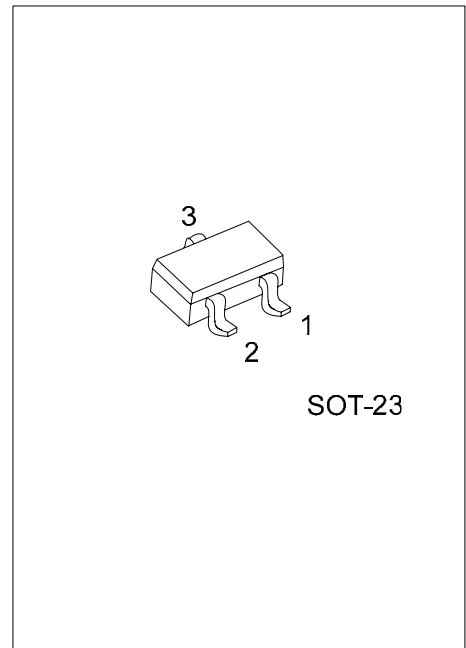
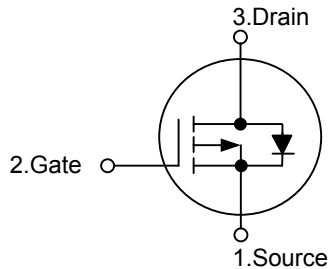
Power MOSFET

P-CHANNEL ENHANCEMENT MODE

DESCRIPTION

The **UT2309A** is P-channel Power MOSFET, designed with high density cell with fast switching speed, ultra low on-resistance, excellent thermal and electrical capabilities. Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

SYMBOL



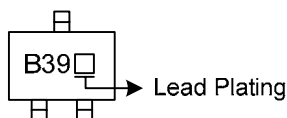
*Pb-free plating product number: UT2309AL

ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UT2309A-AE3-R	UT2309AL-AE3-R	SOT-23	S	G	D	Tape Reel

UT2309AL-AE3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel (2) AE3: SOT-23 (3) L: Lead Free Plating, Blank: Pb/Sn
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MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	-30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current (Note 3)	I_D	-3.7	A
Pulsed Drain Current (Note 1, 2)	I_{DM}	-12	A
Total Power Dissipation	P_D	1.38	W
Junction Temperature	T_J	+150	
Storage Temperature	T_{STG}	-55 ~ +150	

Note: 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.

■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 3)	θ_{JA}			90	/W

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

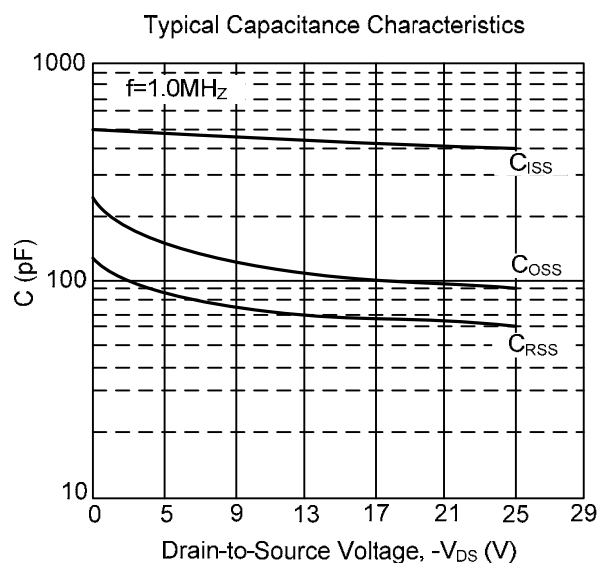
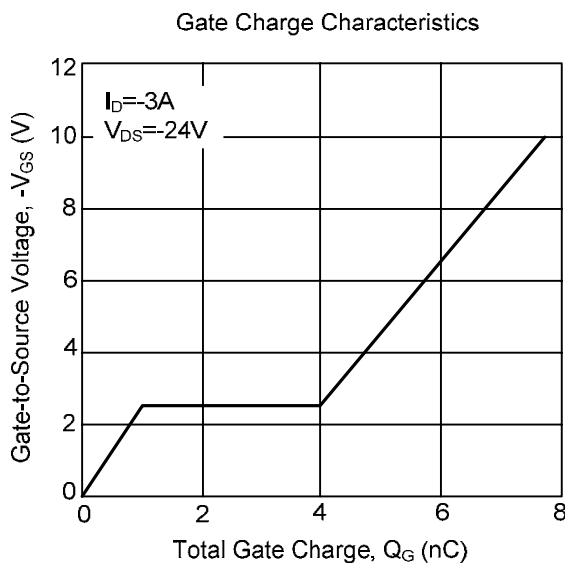
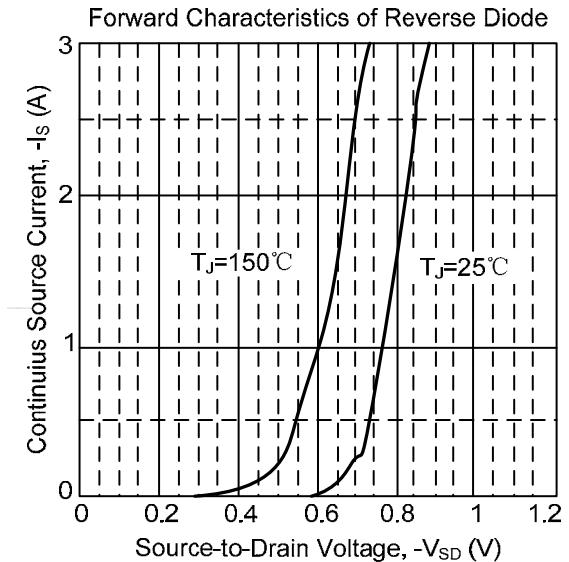
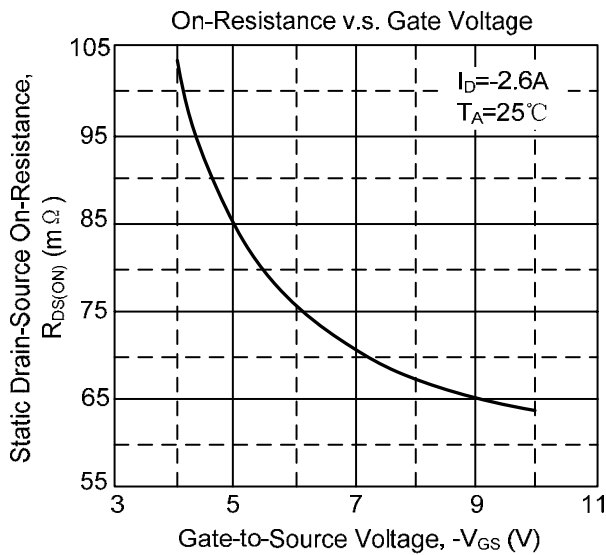
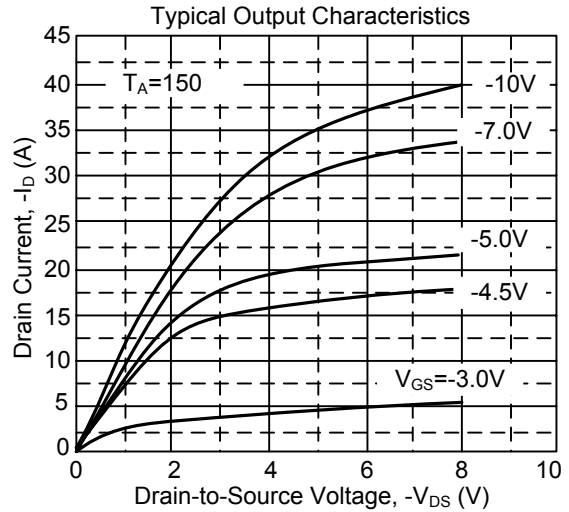
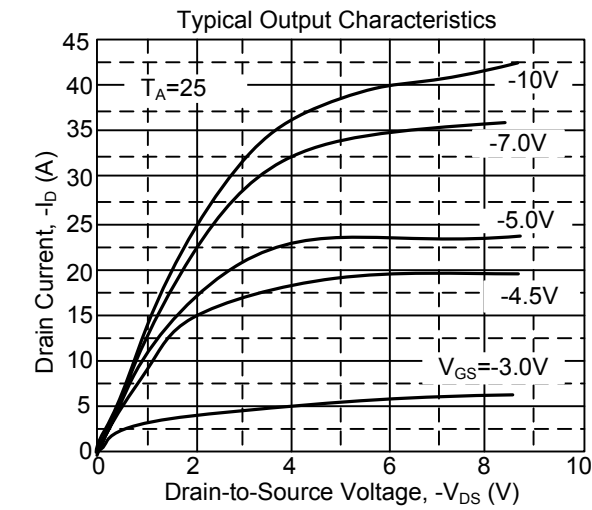
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{V}, I_D = -250\ \mu\text{A}$	-30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$			-0.5	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$			5	nA
Breakdown Voltage Temperature Coefficient	$BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D = -1\text{mA}$		-0.02		V/
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1		-3	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS} = -10\text{V}, I_D = -5\text{A}$			65	$\text{m}\Omega$
		$V_{GS} = -4.5\text{V}, I_D = -5\text{A}$			85	$\text{m}\Omega$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{V}, V_{DS} = -25\text{V}, f = 1.0\text{MHz}$		412	660	pF
Output Capacitance	C_{OSS}			91		
Reverse Transfer Capacitance	C_{RSS}			62		
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	$V_{DS} = -15\text{V}, I_D = -1\text{A}, R_G = 3.3\Omega, V_{GS} = -10\text{V}, R_D = 15\Omega$		8		ns
Turn-ON Rise Time	t_R			5		
Turn-OFF Delay Time	$t_{D(OFF)}$			20		
Turn-OFF Fall Time	t_F			7		
Total Gate Charge (Note 2)	Q_G	$V_{DS} = -24\text{V}, V_{GS} = -4.5\text{V}, I_D = -3\text{A}$		5	8	nC
Gate-Source Charge	Q_{GS}			1		
Gate-Drain Charge	Q_{GD}			3		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward On Voltage	V_{SD}	$I_S = -1\text{A}, V_{GS} = 0\text{V}$		-0.76	-1.2	V
Reverse Recovery Time	t_{RR}	$I_S = -3\text{A}, V_{GS} = 0\text{V},$		20		ns
Reverse Recovery Charge	Q_{RR}	$di/dt = -100\text{A}/\mu\text{s}$		15		nC

Notes: 1. Pulse width limited by $T_{J(MAX)}$

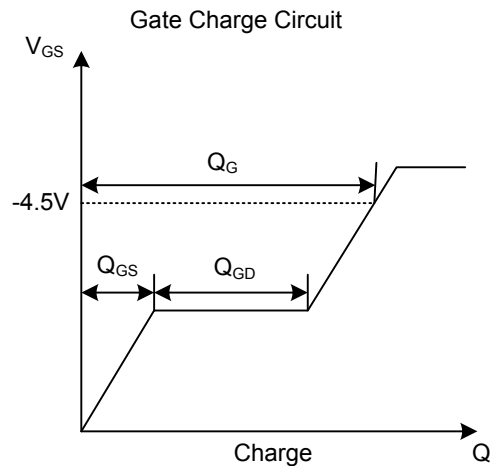
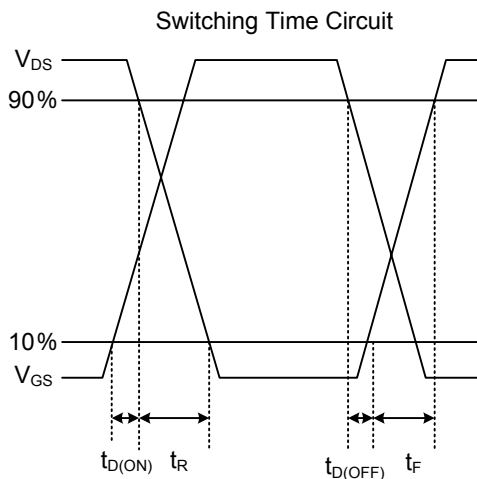
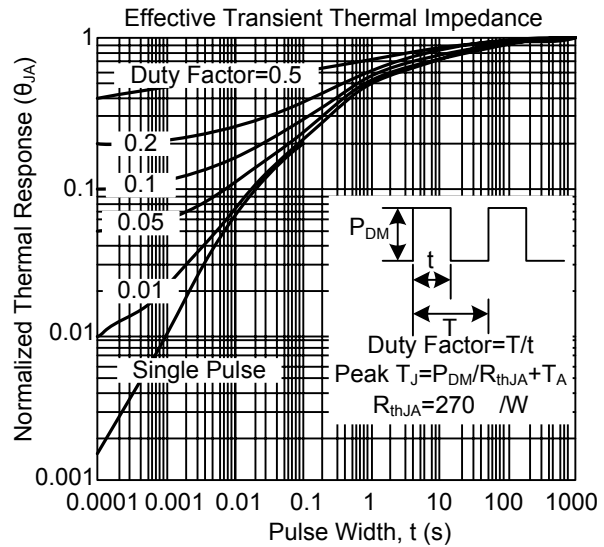
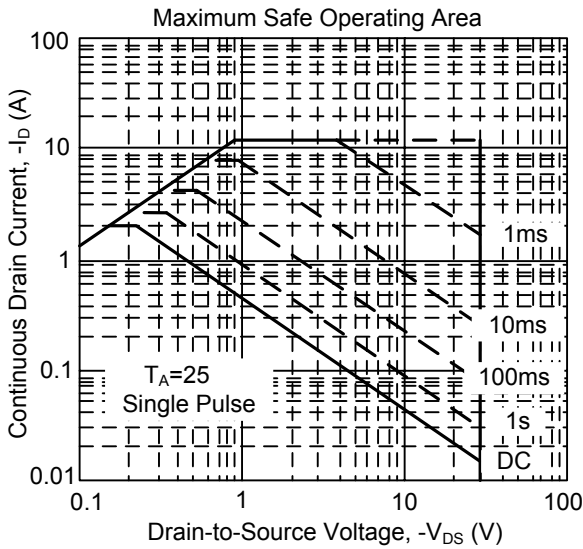
2. Pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

3. Surface mounted on $1\ \text{in}^2$ copper pad of FR4 board.

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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