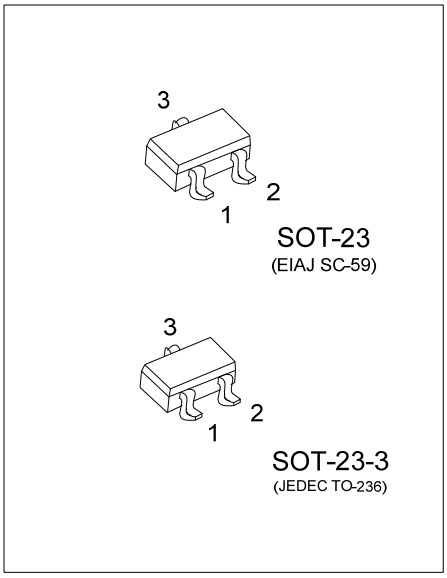
UT2309

Power MOSFET

P-CHANNEL ENHANCEMENT MODE

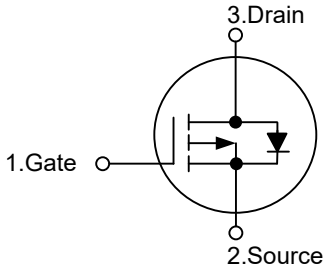


■ DESCRIPTION

The **UT2309** is P-channel power MOSFET, designed with high density cell with fast switching speed, ultra low on-resistance and excellent thermal and electrical capabilities.

Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

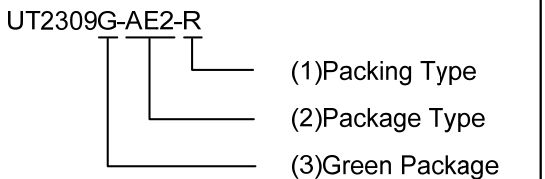
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2309L-AE2-R	UT2309G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT2309L-AE3-R	UT2309G-AE3-R	SOT-23	G	S	D	Tape Reel

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

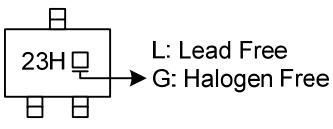


(1) R: Tape Reel

(2) AE2: SOT-23-3, AE3: SOT-23

(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS(T_A=25°C, unless otherwise specified)

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	SOT-23-3	P_D	1.1	W
	SOT-23		1.2	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

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	RATINGS	UNIT
Junction to Ambient (Note 3)	SOT-23-3	θ_{JA}	113	°C/W
	SOT-23		104	°C/W

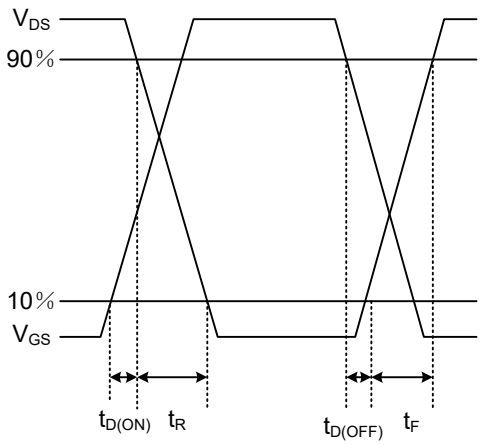
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0 V, I_D =-250 μA	-30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-0.5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250uA	-1.0		-3.0	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-3.0A			75	mΩ
		V_{GS}=-4.5V, I_D=-2.6A			120	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=-15V, f=1.0MHz		450		pF
Output Capacitance	C_{OSS}			91		pF
Reverse Transfer Capacitance	C_{RSS}			73		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 2)	Q_G	V_{DS}=-24V, V_{GS}=-4.5V, I_D=-3.0A		5.2		nC
Gate-Source Charge	Q_{GS}			2		nC
Gate-Drain Charge	Q_{GD}			3		nC
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	V_{DS}=-15V, V_{GS}=-10V, I_D=-3.0A, R_G=3.3Ω		5		ns
Turn-ON Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			24		ns
Turn-OFF Fall Time	t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward On Voltage	V_{SD}	I_S=-1.0A, V_{GS}=0V			-1.2	V

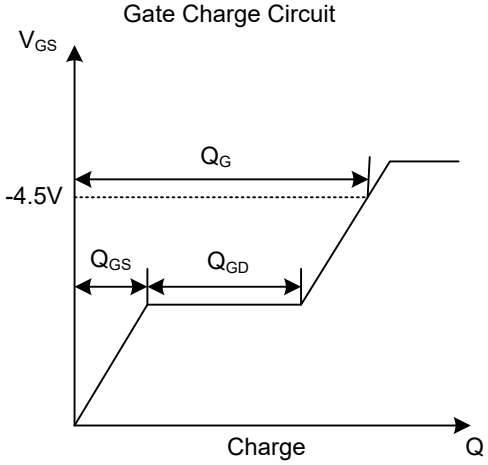
Notes: 1. Repetitive rating, pulse width limited by junction temperature.
2. Pulse width ≤ 300μs, duty cycle ≤ 2%.
3. Device mounted on FR-4 substrate PC board, 2oz copper, with 1in^2 square copper plate.

■ TEST CIRCUITS AND WAVEFORMS

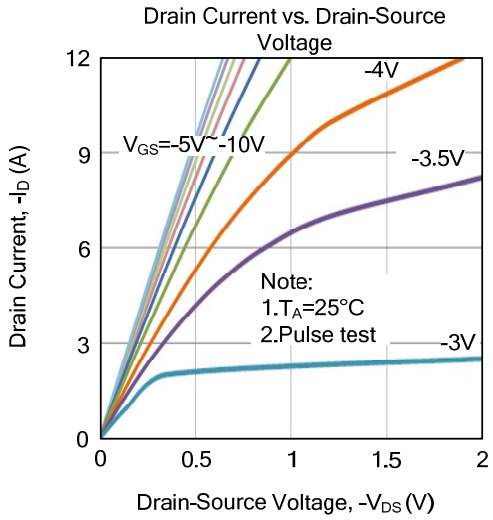
Switching Time Circuit

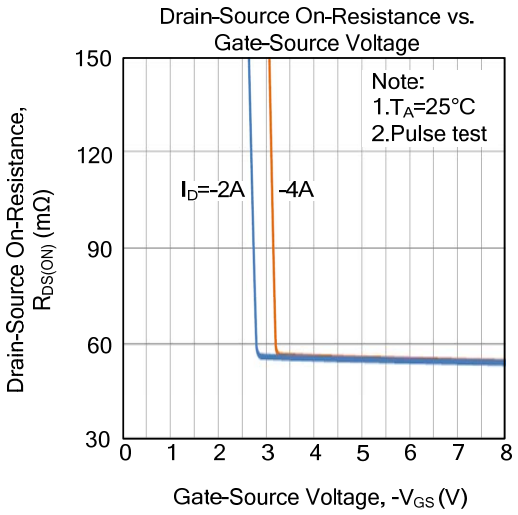


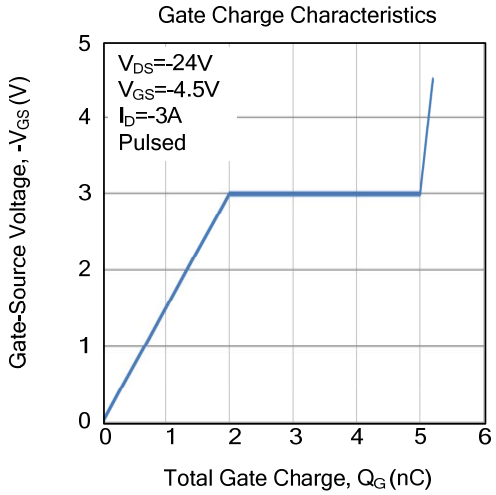
Gate Charge Circuit

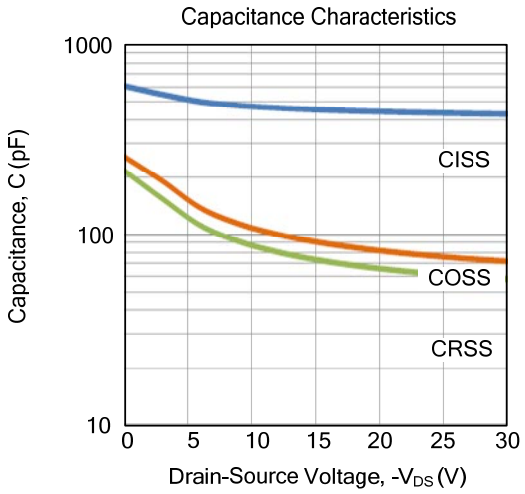


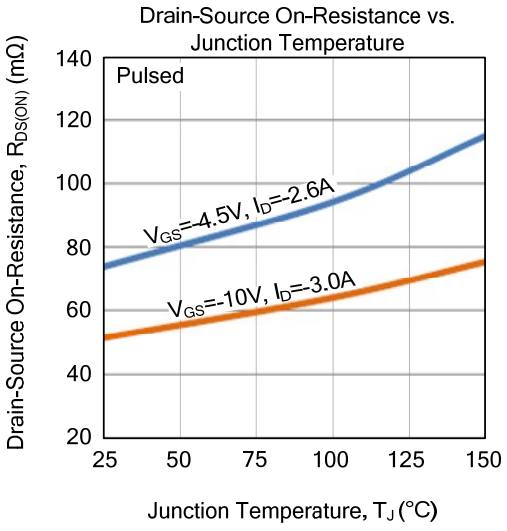
■ TYPICAL CHARACTERISTICS

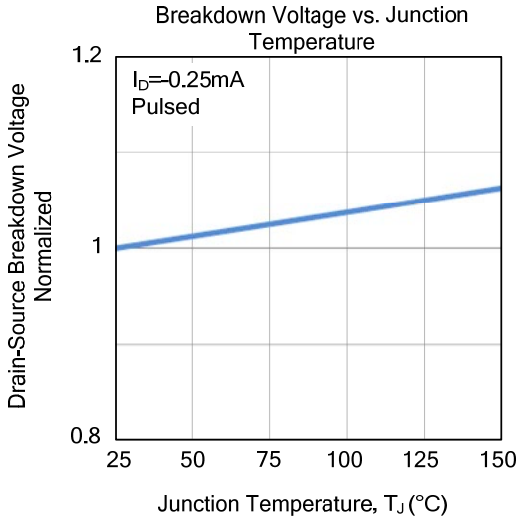






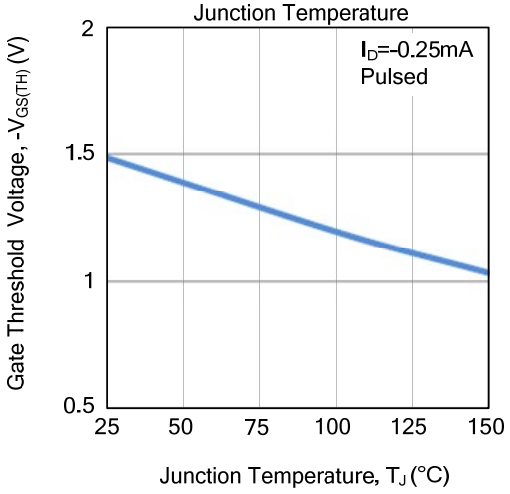




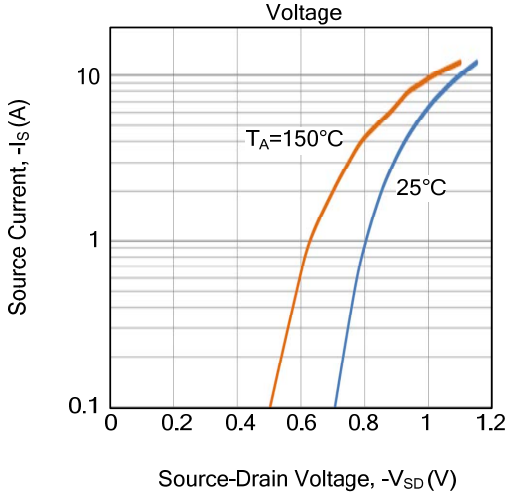


■ TYPICAL CHARACTERISTICS (Cont.)

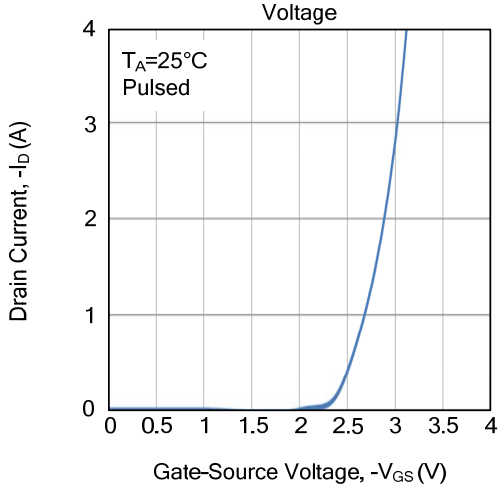
Gate Threshold Voltage vs. Junction Temperature



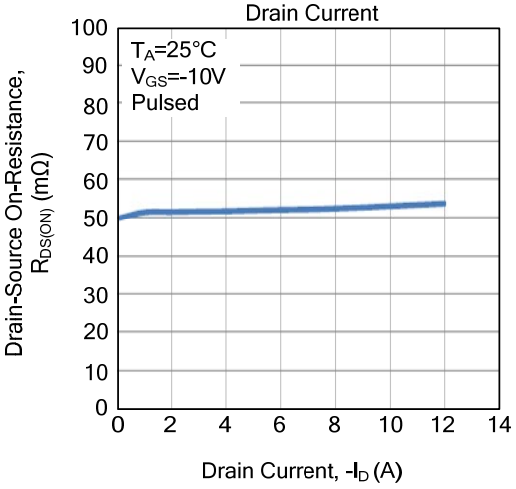
Source Current vs. Source-Drain Voltage



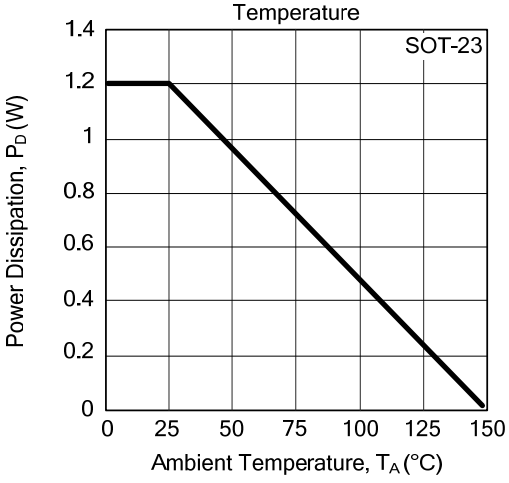
Drain Current vs. Gate-Source Voltage



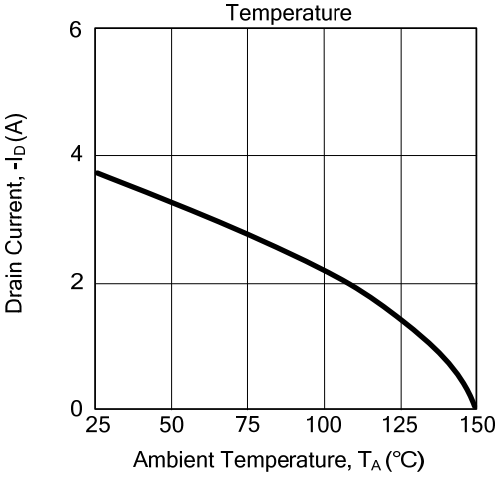
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Ambient Temperature



Drain Current vs. Ambient Temperature



■ TYPICAL CHARACTERISTICS (Cont.)