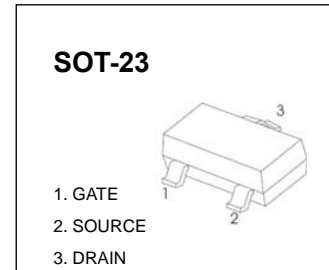


Plastic-Encapsulate MOSFETS

P-Channel Enhancement Mode Field Effect Transistor

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	190mΩ@-10V	-2A
	240mΩ@-4.5V	



DESCRIPTION

The CB2309 uses advanced trench technology to provide excellent $R_{DS(on)}$. This device is suitable for use as a uni-directional or bi-directional load switch.

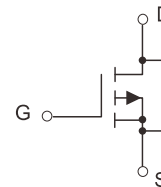
MARKING



S9 = Device code

Solid dot = Green molding compound device, if none, the normal device

Equivalent Circuit



Maximum ratings ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	-2	A
Pulsed Drain Current	I_{DM}	-8	
Power Dissipation	$P_D^{(4)}$	1.56	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}^{(4)}$	80	$^\circ\text{C}/\text{W}$
Operation Junction and Storage Temperature Range	T_J, T_{stg}	-55 ~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -60V, V_{GS} = 0V, T_J = 25\text{ }^\circ\text{C}$			-1	μA
		$V_{DS} = -60V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$			-1	mA
Gate-source leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On characteristics						
Drain-source on-resistance ^②	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -2A$		145	190	m Ω
		$V_{GS} = -4.5V, I_D = -1.5A$		172	240	m Ω
Forward transconductance	g_{FS}	$V_{DS} = -10V, I_D = -2A$		3.5		S
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.2	-1.5	-2.5	V
Dynamic Characteristics ^③						
Input capacitance	C_{iss}	$V_{DS} = -30V, V_{GS} = 0V, f = 1MHz$		425	615	pF
Output capacitance	C_{oss}			35	50	pF
Reverse transfer capacitance	C_{rss}			20	30	pF
Gate resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		17		Ω
Switching Characteristics ^③						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = -10V, V_{DD} = -30V,$ $I_D = -1A, R_G = 6\Omega$		5.2	10	ns
Turn-on rise time	t_r			19	36	ns
Turn-off delay time	$t_{d(off)}$			35	67	ns
Turn-off fall time	t_f			10.6	20	ns
Total Gate Charge	Q_g	$V_{DS} = -30V, I_D = -2A,$ $V_{GS} = -10V$		8.2	12	nC
Gate-Source Charge	Q_{gs}			1.8	3.6	nC
Gate-Drain Charge	Q_{gd}			1.5	3	nC
Drain-source diode characteristics and maximum ratings						
Diode forward voltage ^②	V_{SD}	$I_S = -1A, V_{GS} = 0V$		-0.83	-1	V
Continuous drain-source diode forward current	I_S				-2	A
Pulsed drain-source diode forward current ^①	I_{SM}				-8	A

Notes:

- 1.Repetitive Rating : Pulse width limited by maximum junction temperature.
- 2.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 3.Guaranteed by design, not subject to production testing.
- 4.The value of R θ JA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25\text{ }^\circ\text{C}$.



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Typical Characteristics

