

# SOT-23 Plastic-Encapsulate MOSFETS

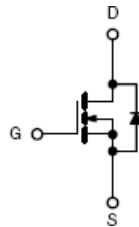
## BC2304 N-Channel 30-V(D-S) MOSFET

### FEATURE

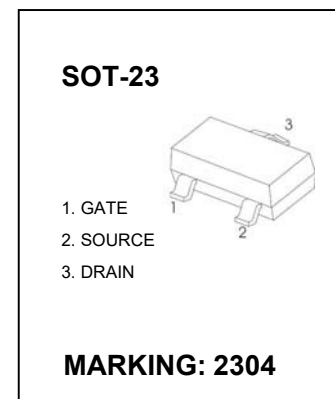
TrenchFET Power MOSFET

### APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter



Equivalent Circuit



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	3.3	A
Pulsed Drain Current	$I_{DM}$	15	
Continuous Source-Drain Diode Current	$I_S$	0.9	
Maximum Power Dissipation	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient ( $t \leq 5s$ )	$R_{\theta JA}$	357	$^{\circ}\text{C/W}$
Storage Temperature	$T_J$	150	$^{\circ}\text{C}$
Junction Temperature	$T_{STG}$	-55 ~ +150	

**Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)**

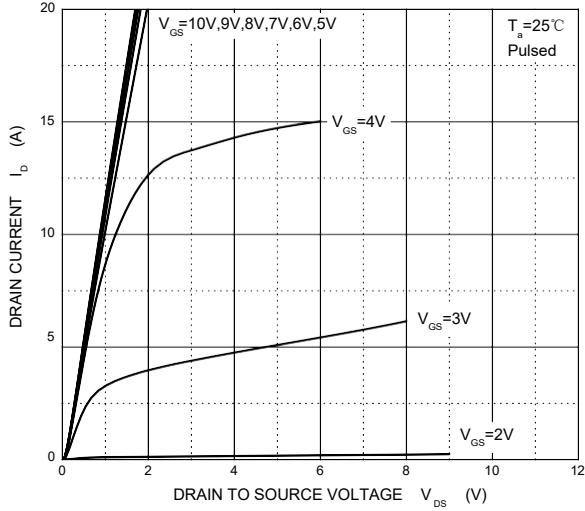
Parameter	Symbol	Test condition	Min	Typ	Max	Units
<b>Static</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	30			V
Gate-source threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2		2.2	
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
Drain-source on-state resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.2A		0.049	0.060	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.8A		0.061	0.075	
Forward transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> =4.5V, I <sub>D</sub> =2.5A	2.5			S
<b>Dynamic<sup>b</sup></b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =3.4A		4.5	6.7	nC
					2.1	
Gate-source charge	Q <sub>gs</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.4A		0.85		
Gate-drain charge	Q <sub>gd</sub>			0.65		
Gate resistance	R <sub>g</sub>	f =1.0MHz	0.8	4.4	8.8	Ω
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f =1MHz		235		pF
Output capacitance	C <sub>oss</sub>			45		
Reverse transfer capacitance	C <sub>riss</sub>			17		
Turn-on delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, R <sub>L</sub> =5.6Ω, I <sub>D</sub> ≈2.7A, V <sub>GEN</sub> =4.5V, R <sub>g</sub> =1Ω		12	20	ns
Rise time	t <sub>r</sub>			50	75	
Turn-off delay time	t <sub>d(off)</sub>			12	20	
Fall time	t <sub>f</sub>			22	35	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, R <sub>L</sub> =5.6Ω, I <sub>D</sub> ≈2.7A, V <sub>GEN</sub> =10V, R <sub>g</sub> =1Ω		5	10	
Rise time	t <sub>r</sub>			12	20	
Turn-off delay time	t <sub>d(off)</sub>			10	15	
Fall time	t <sub>f</sub>			5	10	
<b>Drain-source body diode characteristics</b>						
Continuous source-drain diode current	I <sub>S</sub>	T <sub>C</sub> =25°C			1.4	A
Pulse diode forward current	I <sub>SM</sub>				15	A
Body diode voltage	V <sub>SD</sub>	I <sub>S</sub> =-2.7A, V <sub>GS</sub> =0V		0.8	1.2	V

**Notes :**

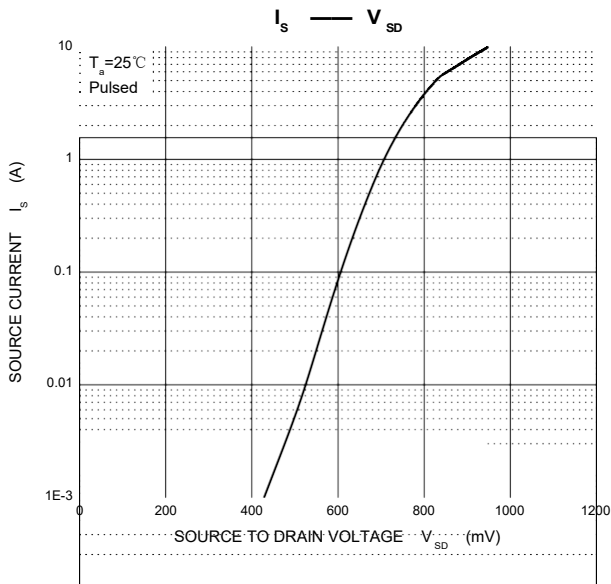
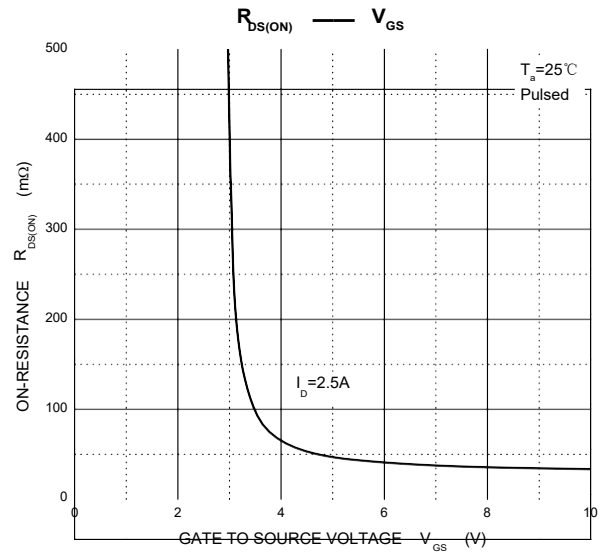
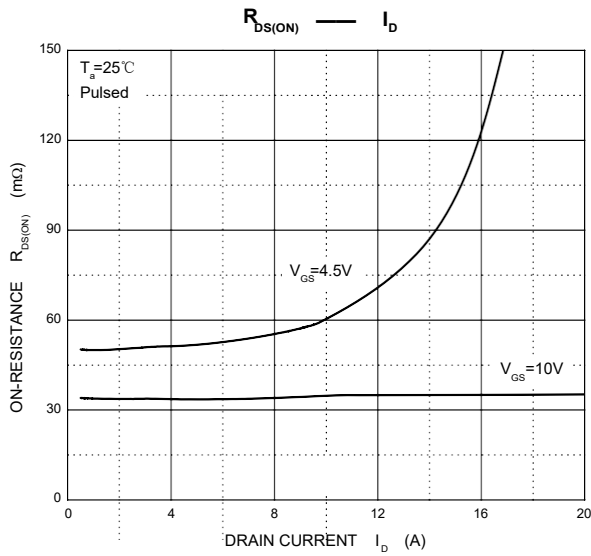
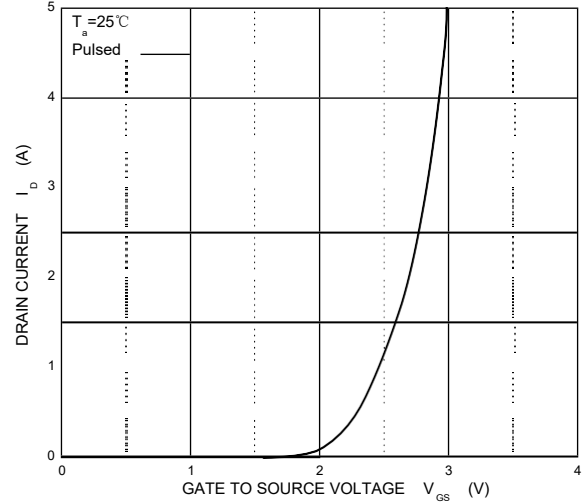
- Pulse Test : Pulse width≤300μs, duty cycle ≤2%.
- Guaranteed by design, not subject to production testing.

## Typical Characteristics

Output Characteristics



Transfer Characteristics



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23

