

## SOT-23 Plastic-Encapsulate MOSFETS

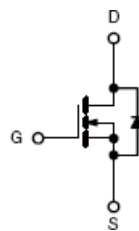
### BC2302B N-Channel 20-V(D-S) MOSFET

#### FEATURE

TrenchFET Power MOSFET

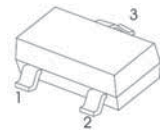
#### APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter



Equivalent Circuit

#### SOT-23



1. GATE
2. SOURCE
3. DRAIN

MARKING CODE: "2302" OR "S2B"

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current	$I_D$	3.0	A
Continuous Source-Drain Current(Diode Conduction)	$I_S$	0.6	
Power Dissipation	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient ( $t \leq 5s$ )	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Operating Junction	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	

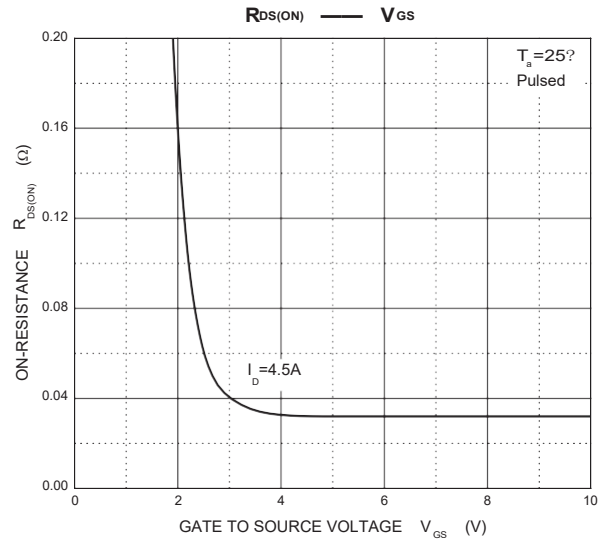
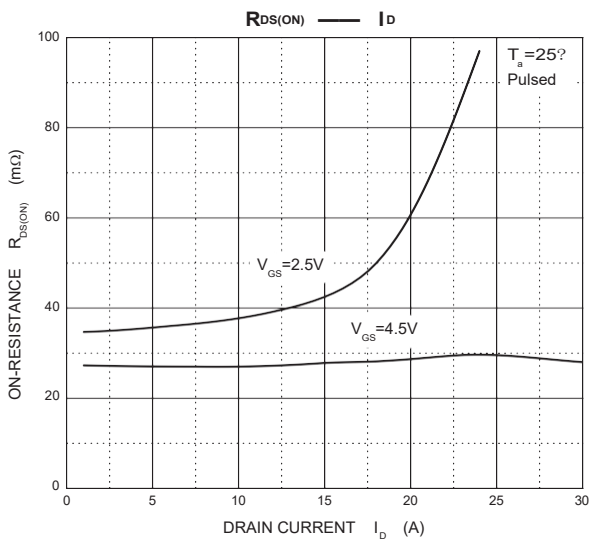
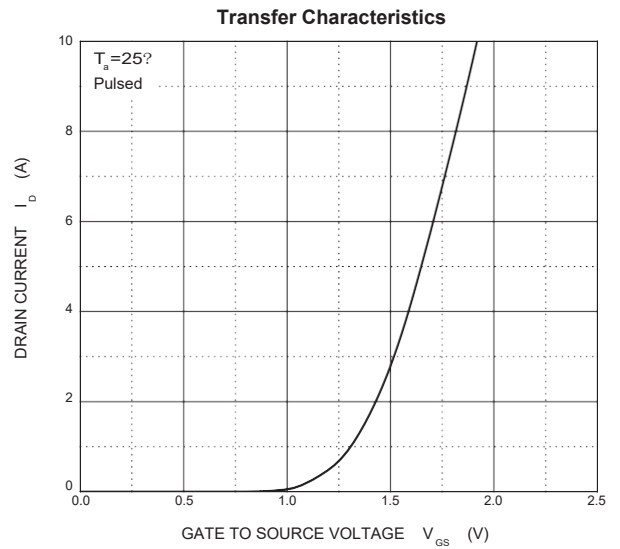
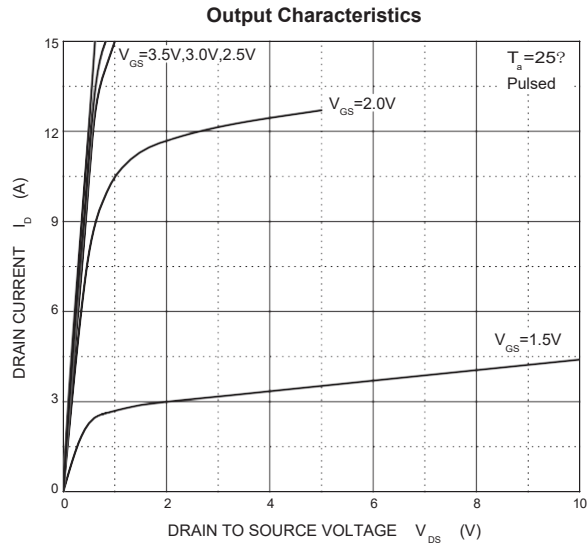
**Electrical characteristics ( $T_a=25^\circ\text{C}$  unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Static</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 10\mu A$	20			V
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 50\mu A$	0.5	0.95	1.25	
Gate-body leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 8V$			$\pm 100$	nA
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$			1	$\mu A$
Drain-source on-resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 4.5V, I_D = 3.0A$		0.045	0.055	$\Omega$
		$V_{GS} = 2.5V, I_D = 2.0A$		0.060	0.080	
Forward transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 5V, I_D = 3.6A$		8		S
Diode forward voltage	$V_{SD}$	$I_S = 0.94A, V_{GS} = 0V$		0.76	1.2	V
<b>Dynamic</b>						
Total gate charge	$Q_g$	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 3.6A$		4.0		nC
Gate-source charge	$Q_{gs}$			0.65		
Gate-drain charge	$Q_{gd}$			1.5		
Input capacitance <sup>b</sup>	$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		300		pF
Output capacitance <sup>b</sup>	$C_{oss}$			120		
Reverse transfer capacitance <sup>b</sup>	$C_{rss}$			80		
<b>Switching<sup>b</sup></b>						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 10V,$ $R_L = 5.5\Omega, I_D \approx 3.6A,$ $V_{GEN} = 4.5V, R_g = 6\Omega$		7		ns
Rise time	$t_r$			55		
Turn-off delay time	$t_{d(off)}$			16		
Fall time	$t_f$			10		

**Notes :**

- Pulse Test : Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- These parameters have no way to verify.

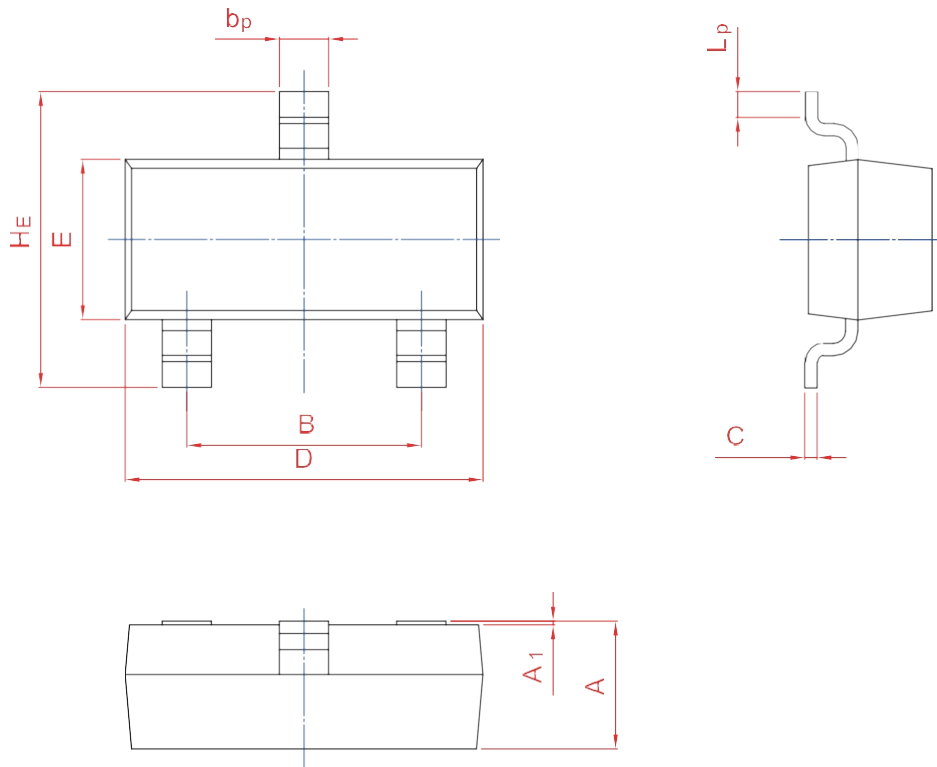
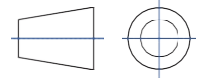
## Typical Characteristics



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	b <sub>p</sub>	C	D	E	HE	A <sub>1</sub>	L <sub>p</sub>
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20