

BC2302R1

N-Channel Enhancement Mode MOSFET

The **BC2302R1** uses advanced trench technology to provide excellent $R_{DS(on)}$. It is widely used for load switches in power management.

Features and Benefits:

- Low On-Resistance
- High Dense Design
- Reliable and Rugged

Applications:

- E-Cigarettes
- Battery management
- Portable appliances
- Load Switch

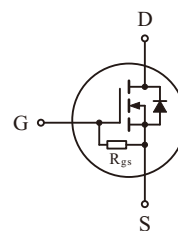
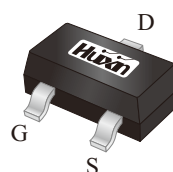
$$V_{DS} = 20V, I_D = 3.2A$$

$$R_{DS(on)} = 50m\Omega (V_{GS} = 4.5V, Typ)$$

$$R_{DS(on)} = 62m\Omega (V_{GS} = 2.5V, Typ)$$

$$V_{GS(th)} = 0.65V (Typ)$$

Package & Pin information



SOT-23

Package Information

Product Name	Package	Packing	Qty.
BC2302R1	SOT-23	Tape&Reel	3000PCS

Maximun Ratings ($T_J = 25^\circ C$ unless otherwise specified)

Parameter	Symbols	Value	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current, $V_{GS} = 4.5V$	I_D	3.2	A
Pulsed drain current (Note1)	I_{DM}	16	A
Single Pulsed Avalanche Energy (Note2)	E_{AS}	1.6	mJ
Power dissipation, $T_C = 25^\circ C$	P_D	1000	mW
Thermal Resistance from Junction to Ambient (Note3)	$R_{\theta JA}$	125	$^\circ C/W$
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 ~ +150	$^\circ C$

Note:

(1) Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

(2) EAS condition: $T_J = 25^\circ C$, $V_{DD} = 10V$, $V_G = 4.5V$, $R_G = 25\Omega$, $L = 0.1mH$

(3) Surface Mounted on FR4 Board.

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Symbols	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$V_{(BR)DSS}$	Drain-Source breakdown voltage	20	—	—	V	$V_{GS}=0, I_D=250\mu\text{A}$
$V_{GS(th)}$	Gate threshold voltage	0.45	0.65	0.90	V	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$
$R_{DS(on)}$	Drain-Source on-State resistance	—	50	60	$\text{m}\Omega$	$V_{GS}=4.5\text{V}, I_D=3\text{A}$
		—	62	80	$\text{m}\Omega$	$V_{GS}=2.5\text{V}, I_D=3\text{A}$
I_{DSS}	Zero gate voltage drain current	—	—	1	μA	$V_{DS}=20\text{V}, V_{GS}=0, T_J=25^{\circ}\text{C}$
I_{GSS}	Gate-Source leakage current	± 1	—	± 20	μA	$V_{DS}=0, V_{GS}=\pm 10\text{V}$
C_{iss}	Input capacitance	—	108	—	pF	$V_{GS}=0$ $V_{DS}=10\text{V}$ $f=1\text{MHz}$
C_{oss}	Output capacitance	—	21	—		
C_{rss}	Reverse transfer capacitance	—	16	—		
Q_g	Total gate charge	—	1.64	—	nC	$V_{DS}=10\text{V}$ $V_{GS}=4.5\text{V}$ $I_D=3\text{A}$
Q_{gs}	Gate to source charge	—	0.34	—		
Q_{gd}	Gate to drain (Miller) charge	—	0.39	—		
R_{gs}	Gate-Source pull-down resistor	—	2.0	—	$\text{M}\Omega$	

Body Diode Characteristics

Symbols	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$V_{GS}=0, I_S=3\text{A}$
I_{SD}	Body Diode Forward Current	—	—	3.0	A	

Electrical Characteristics Diagrams

Fig1. Typ. output characteristics

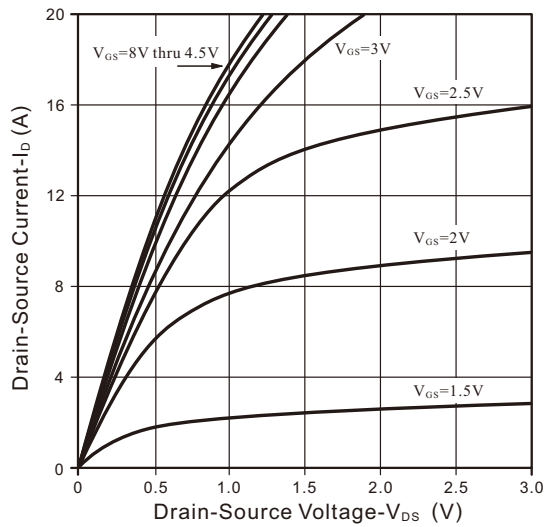


Fig2. Transfer Characteristic

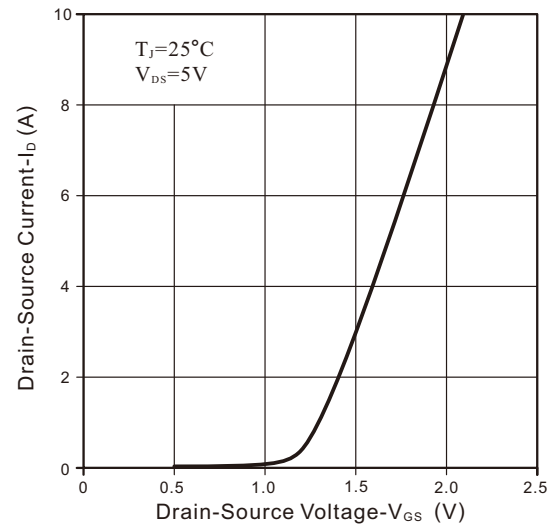


Fig3. On-Resistance vs. Drain Current

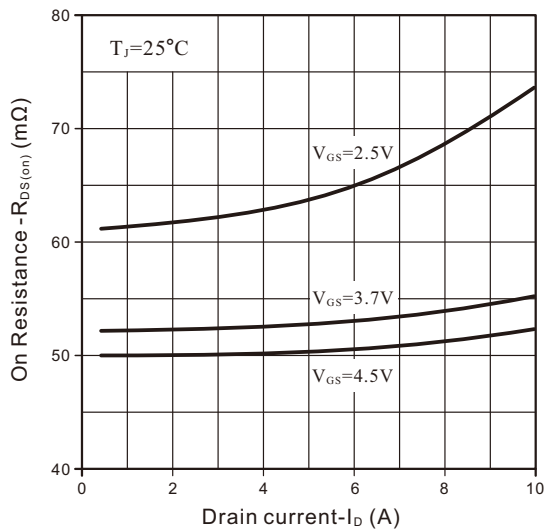


Fig4. On-Resistance vs. Gate-to-Source Voltage

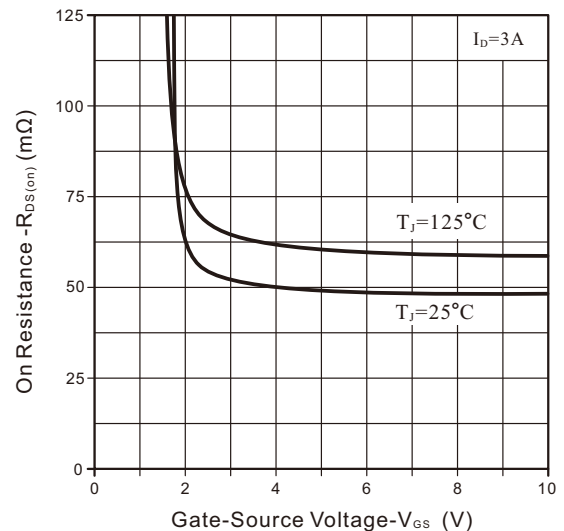


Fig5. Typical Capacitance vs. D-S Voltage

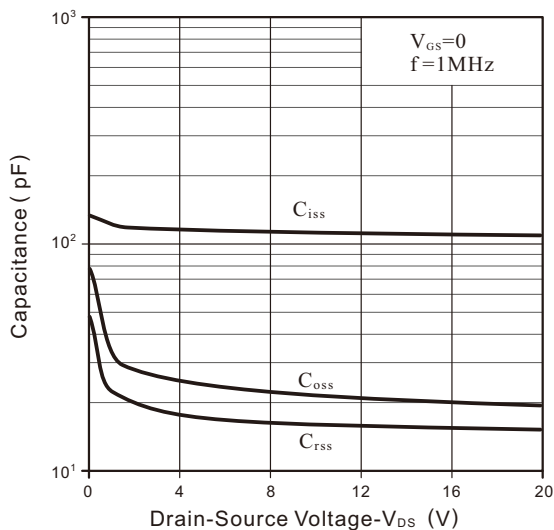
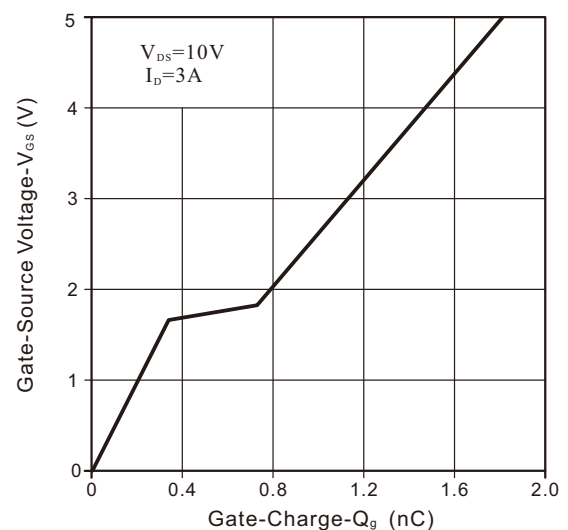


Fig6. Typical Gate-Charge



Electrical Characteristics Diagrams

Fig7. On-Resistance vs. T_J

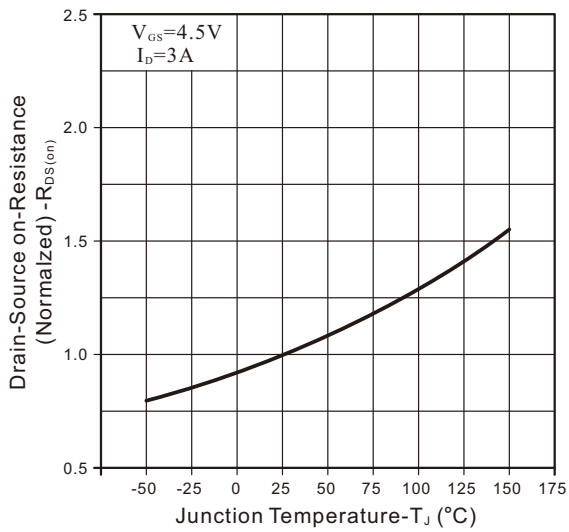
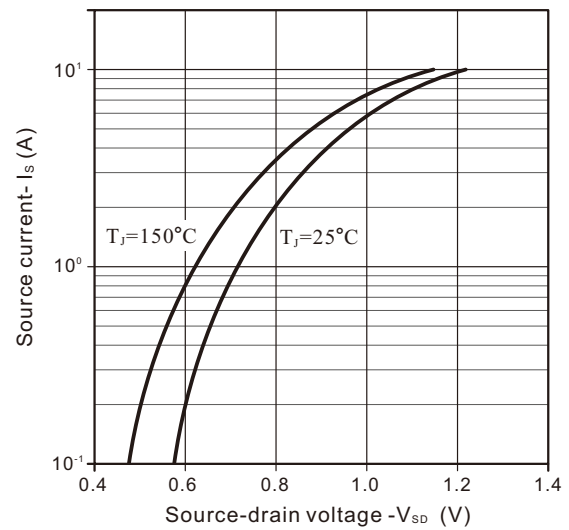
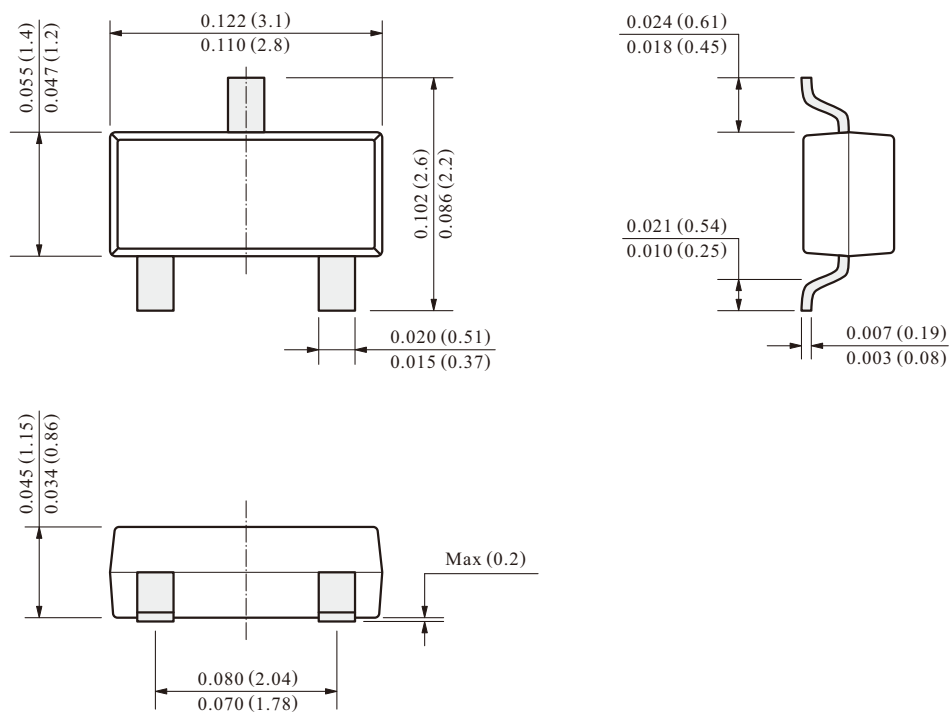


Fig8. Forward characteristic of body diode



Package Information

SOT-23-Package Outline Dimension



Dimensions in inches and (millimeters)