

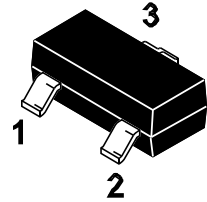
BC2302

N-Channel Enhancement Mode Power MOSFET

Features

- Fast switching
- Low gate charge and $R_{DS(on)}$
- High power and current handling capability
- $V_{DS} = 20V, I_D = 3.3A$
 $R_{DS(on)} < 45m\Omega @ V_{GS} = 4.5V$

SOT-23

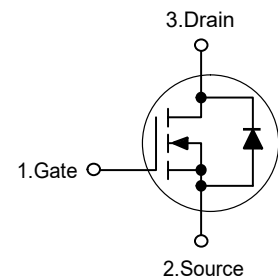


1. Gate 2. Source 3. Drain

Applications

- Battery protection
- Load switch
- Power management

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	3.3	A
Drain Current-Pulsed ^{Note1}	I_{DM}	16	A
Maximum Power Dissipation	P_D	0.9	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	139	°C/W
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Electrical Characteristics

(Ta=25°C unless otherwise specified)

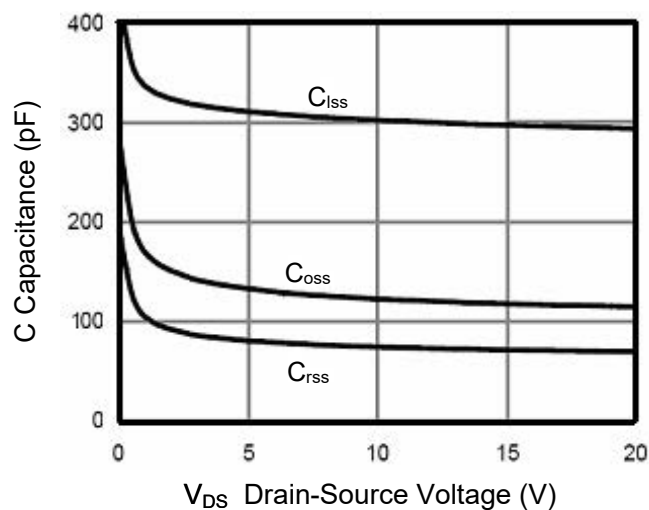
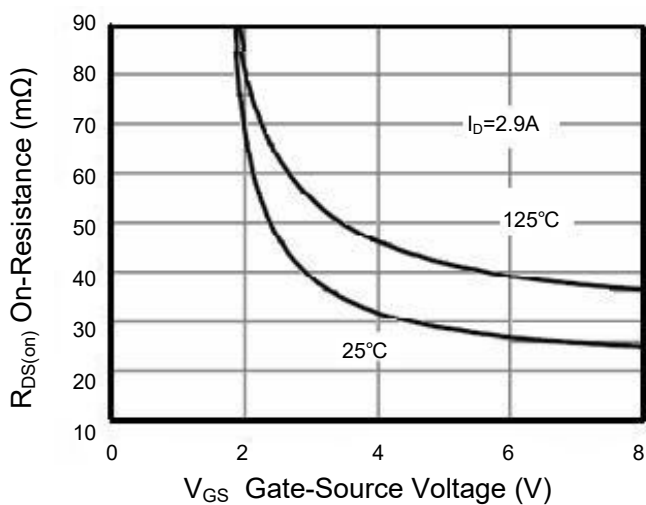
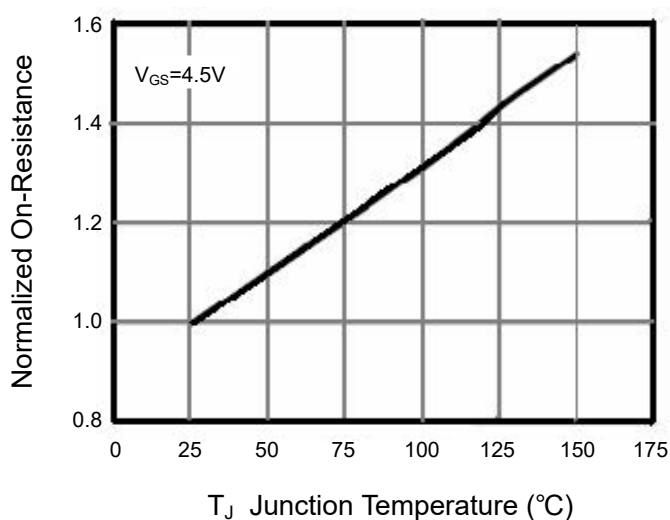
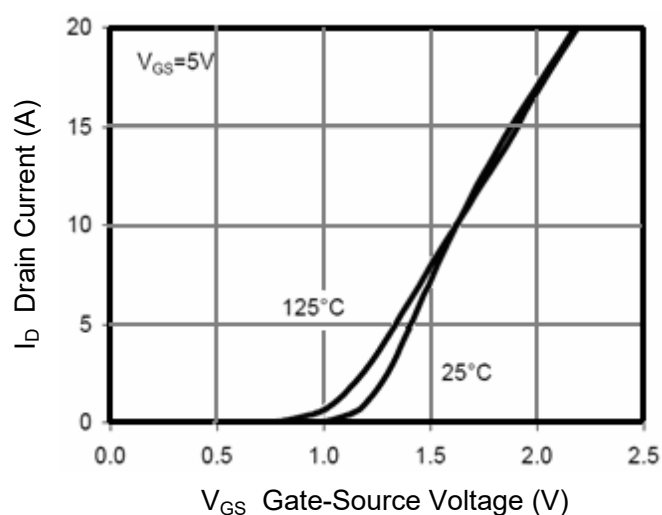
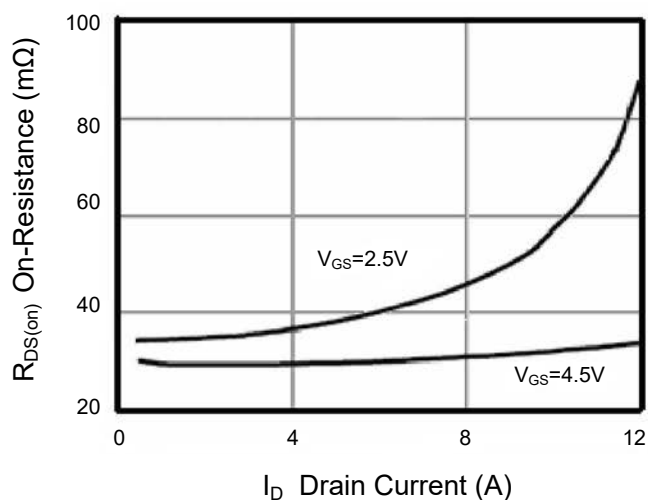
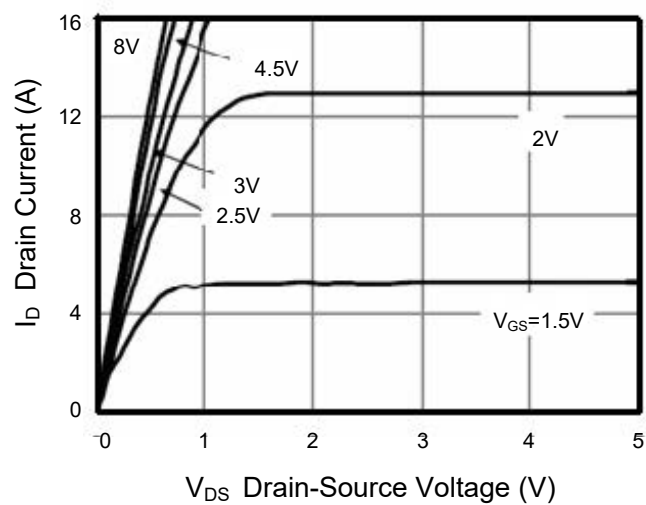
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage ^{Note3}	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.75	1.2	V
Drain-Source On-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=3A$	--	29	45	m Ω
		$V_{GS}=2.5V, I_D=2.8A$	--	35	60	m Ω
Forward Transconductance ^{Note3}	g_{FS}	$V_{DS}=5V, I_D=3A$	--	8	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz$	--	300	--	pF
Output Capacitance	C_{oss}		--	120	--	pF
Reverse Transfer Capacitance	C_{rss}		--	80	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=3A$ $V_{GS}=4.5V, R_{GEN}=6\Omega$	--	10	--	nS
Turn-on Rise Time	t_r		--	50	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	17	--	nS
Turn-off Fall Time	t_f		--	10	--	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=3A, V_{GS}=4.5V$	--	4	--	nC
Gate-Source Charge	Q_{gs}		--	0.7	--	nC
Gate-Drain Charge	Q_{gd}		--	1.5	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V_{SD}	$V_{GS}=0V, I_S=3.3A$	--	0.75	1.2	V
Diode Forward Current ^{Note2}	I_S		--	--	3.3	A

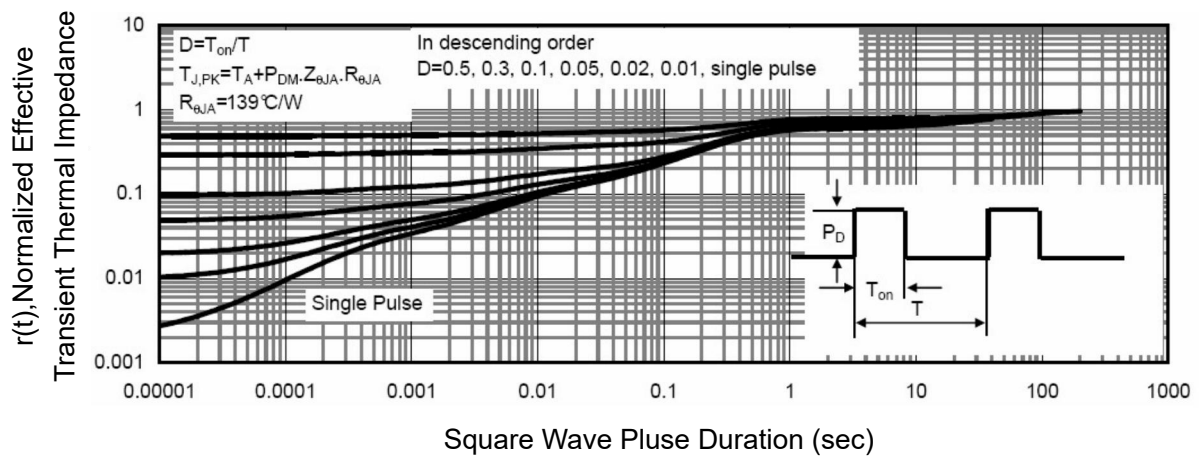
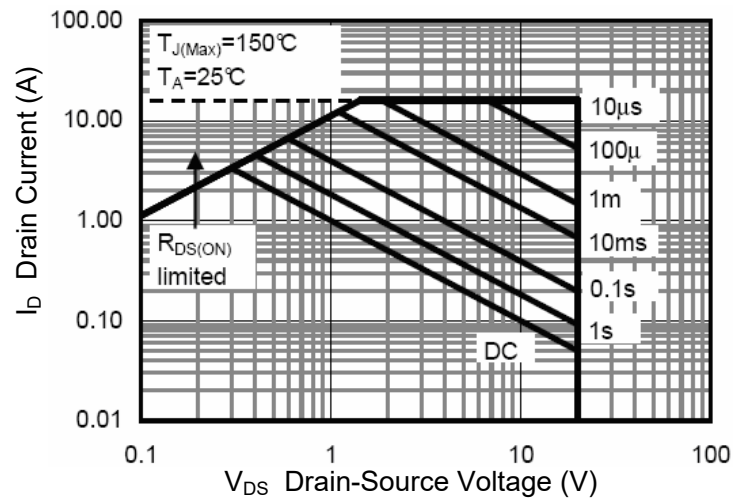
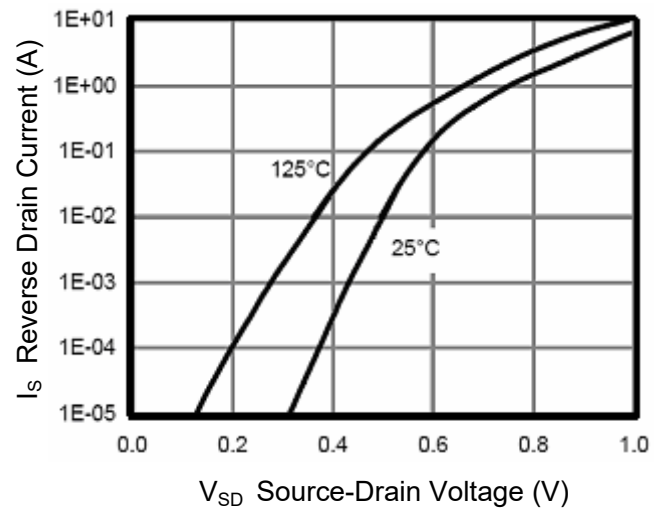
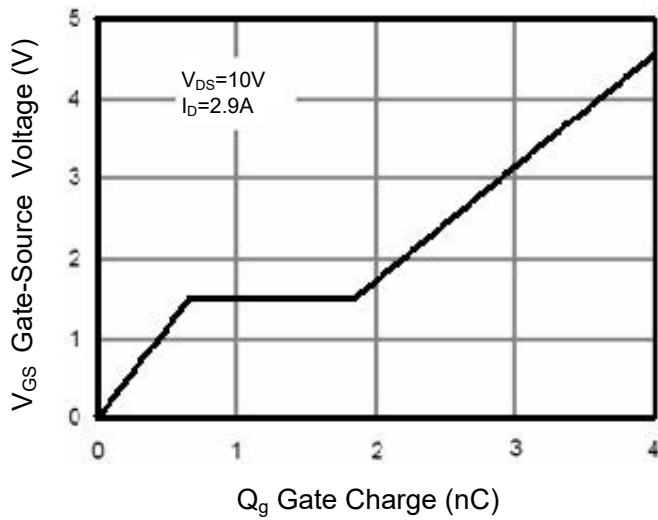
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, $t \leq 10$ sec.

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

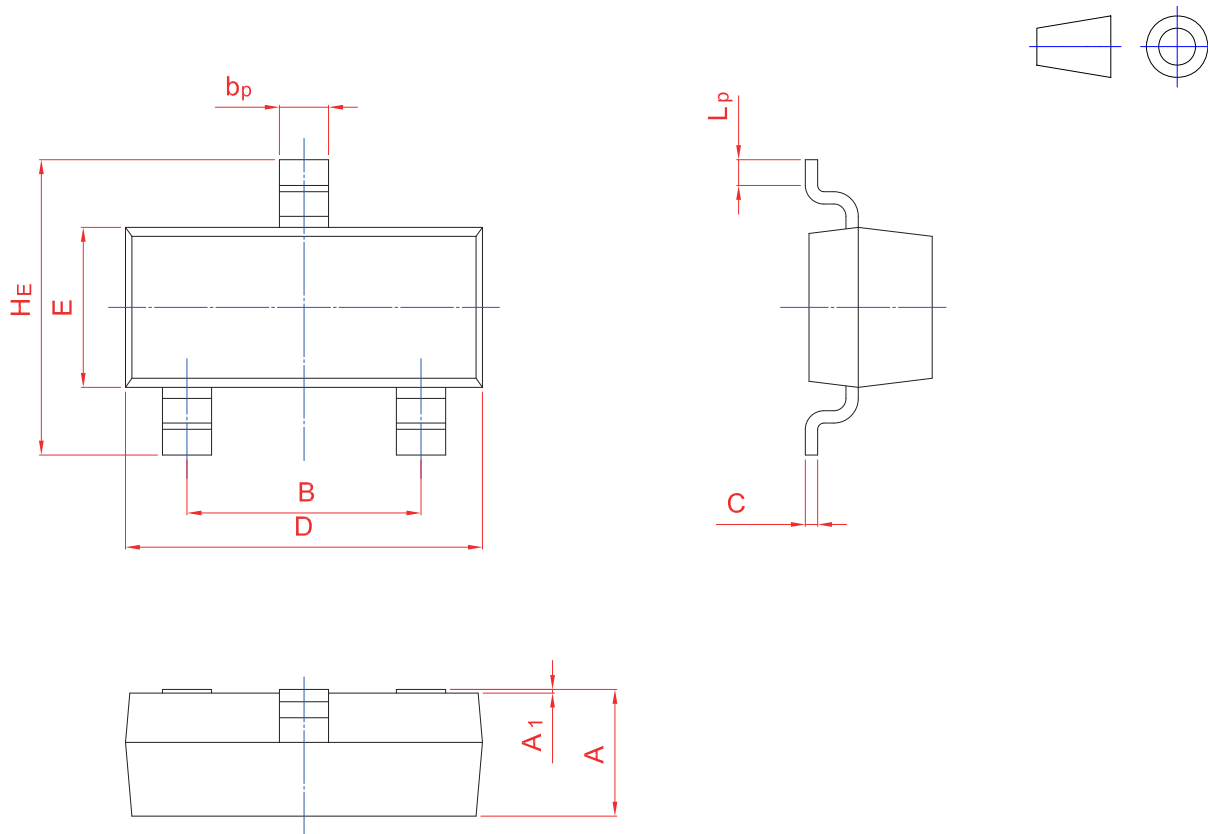
Typical Characteristic Curves





Package Outline

SOT-23



UNIT	A	B	b_p	C	D	E	H_E	A_1	L_p
mm	1.40 0.89	2.04 1.78	0.51 0.30	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20