



## CST1002B N-Ch 100V Fast Switching MOSFETs

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent Cdv/dt effect decline
- ★ Advanced high cell density Trench technology



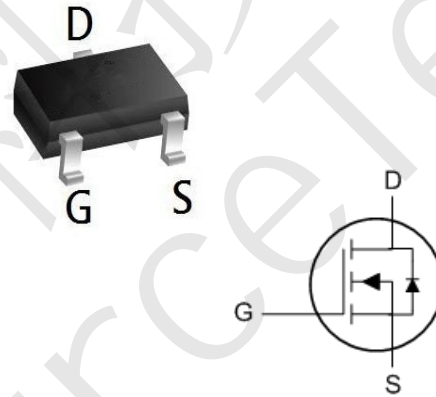
### CST1002B Product Summary

BVDSS	RDSON	ID
100V	200mΩ	2.3 A

### CST1002B Description

The CST1002B is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications. The CST1002B meet the RoHS and Green Product requirement with full function reliability approved.

### CST1002B SOT23 Pin Configuration



### CST1002B Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_{D@T_A=25^\circ C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	2.3	A
$I_{D@T_A=70^\circ C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	1.2	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	5	A
$P_{D@T_A=25^\circ C}$	Total Power Dissipation <sup>3</sup>	1	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### CST1002B Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	---	125	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	80	$^\circ C/W$



## CST1002B N-Ch 100V Fast Switching MOSFETs

### CST1002B Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250μA	100	-	-	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Drain Cut-off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250μA	1.1	1.5	2.5	V
Drain-Source on-state Resistance <sup>3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2A	-	200	280	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 1.5A	-	230	310	
<b>Dynamic Characteristics<sup>4</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 50V, f = 1MHz	-	440	-	pF
Output Capacitance	C <sub>oss</sub>		-	14	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	10	-	
<b>Switching Characteristics<sup>4</sup></b>						
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, I <sub>D</sub> = 2A	-	5.3	-	nC
Gate-source charge	Q <sub>gs</sub>		-	1.4	-	
Gate-drain charge	Q <sub>gd</sub>		-	1.8	-	
Turn-on Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 50V, R <sub>G</sub> = 1Ω, I <sub>D</sub> = 2A	-	14	-	ns
Rise time	t <sub>r</sub>		-	54	-	
Turn-off Time	t <sub>d(off)</sub>		-	18	-	
Fall time	t <sub>f</sub>		-	11	-	
<b>Source-Drain Diode characteristics</b>						
Body Diode Voltage <sup>3</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1A, V <sub>GS</sub> = 0V	-	-	1.2	V
Continuous Source Current	I <sub>S</sub>		-	-	2	A

**Notes:**

1. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C.
2. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper. The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.
4. This value is guaranteed by design hence it is not included in the production test.



### CST1002B N-Ch 100V Fast Switching MOSFETs

#### CST1002B Typical Characteristics

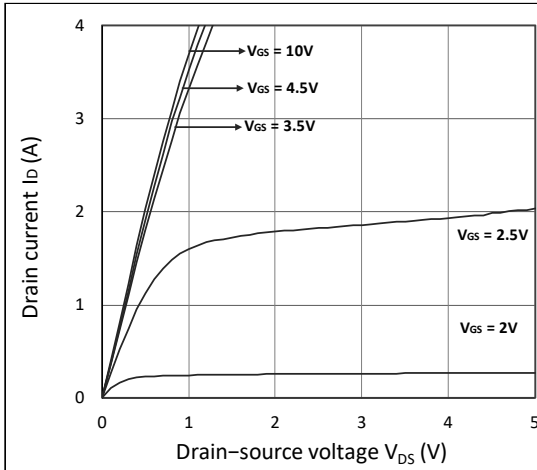


Figure 1. Output Characteristics

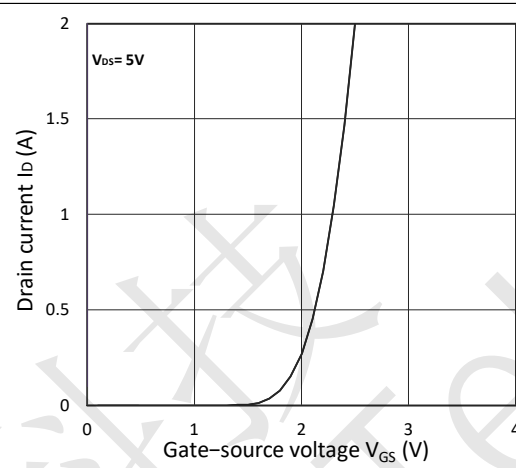


Figure 2. Transfer Characteristics

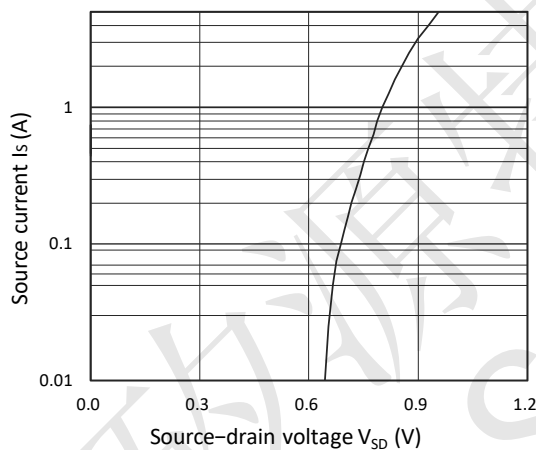


Figure 3. Forward Characteristics of Reverse

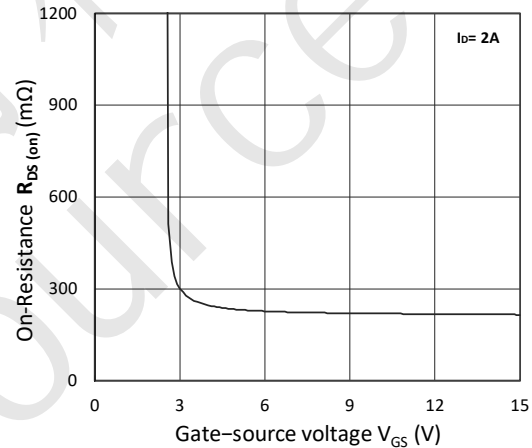


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

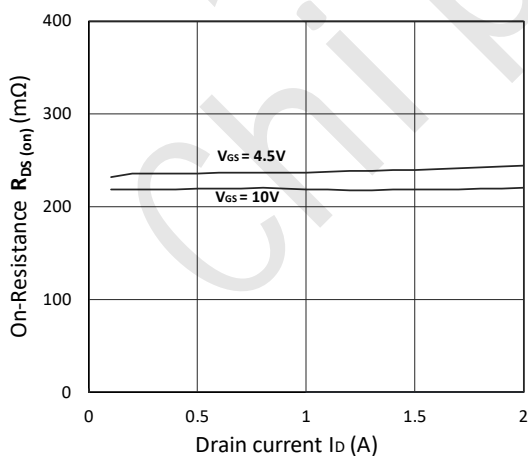


Figure 5.  $R_{DS(ON)}$  vs.  $I_D$

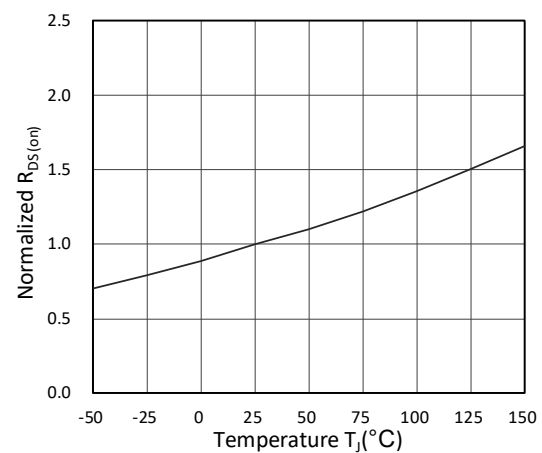


Figure 6. Normalized  $R_{DS(ON)}$  vs. Temperature



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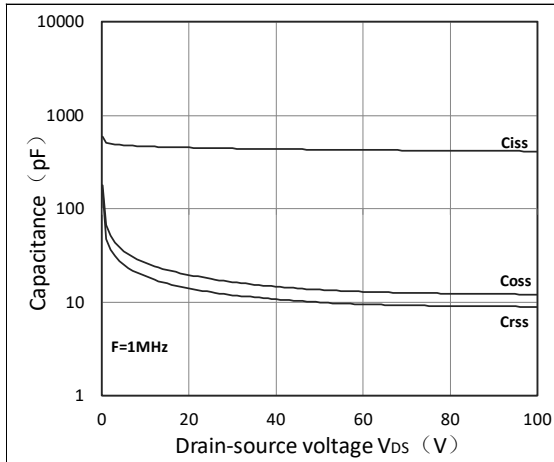


Figure 7. Capacitance Characteristics

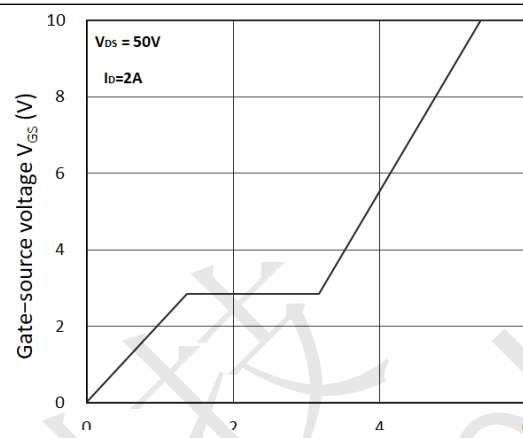
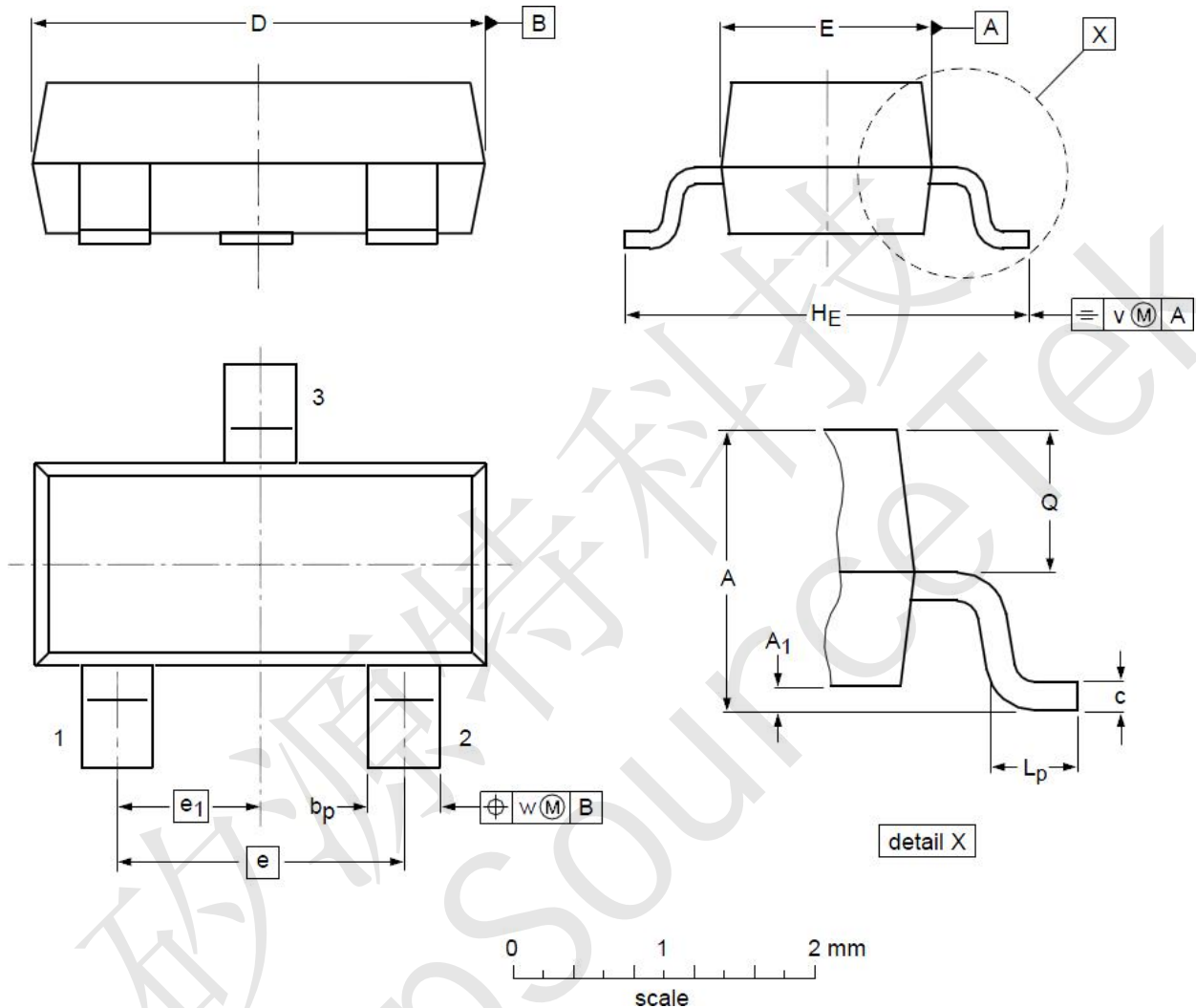


Figure 8. Gate Charge Characteristics



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CST1002B SOT23 Mechanical Data



DIMENSIONS ( unit : mm )

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A <sub>1</sub>	0.01	0.05	0.10
b <sub>p</sub>	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e <sub>1</sub>	--	0.95	--
H <sub>E</sub>	2.25	2.40	2.55	L <sub>p</sub>	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				