



### CST2312AL N-Ch 20V Fast Switching MOSFETs

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

#### CST2312AL Product Summary

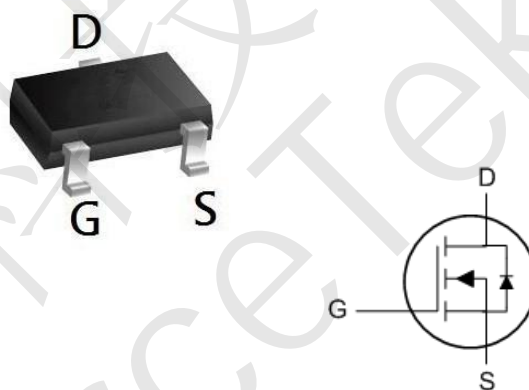


BVDSS	RDSON	ID
20V	22.8mΩ	7.5A

#### CST2312AL Description

The CST2312AL 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 CST2312AL meet the RoHS and Green Product requirement with full function reliability approved.

#### CST2312AL SOT23-3L Pin Configuration



#### CST2312AL Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 4.5\text{V}^1$	7.5	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 4.5\text{V}^1$	5.0	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	32	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	2	W
$P_D@T_A=70^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	0.66	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

#### CST2312AL Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	120	$^\circ\text{C/W}$



### CST2312AL N-Ch 20V Fast Switching MOSFETs

#### CST2312AL Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.75	1.2	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance note2	V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	-	22.8	30	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5A	-	31.1	39	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1.0MHz	-	700	-	pF
C <sub>oss</sub>	Output Capacitance		-	132	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	114	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =4A, V <sub>GS</sub> =4.5V	-	15	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	2	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	5.2	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =10V, I <sub>D</sub> =4A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =4.5V	-	9	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	25	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	37	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	14	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	7.5	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =8A	-	-	1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



## CST2312AL Typical Performance Characteristics

Figure 1: Output Characteristics

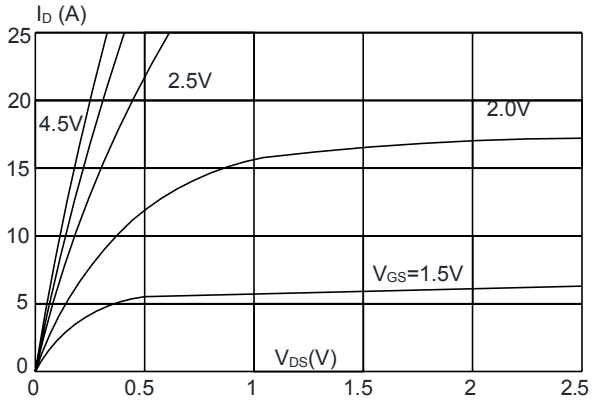


Figure 2: Typical Transfer Characteristics

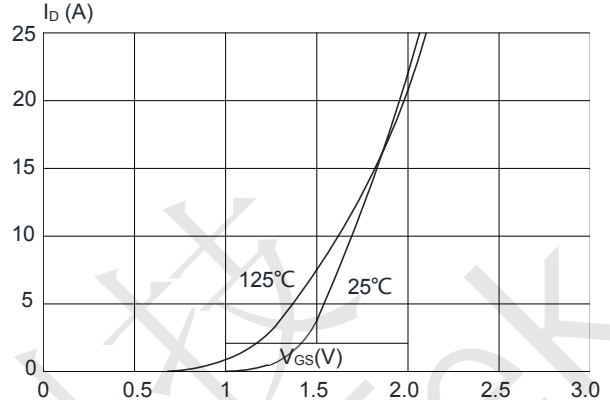


Figure 3: On-resistance vs. Drain Current

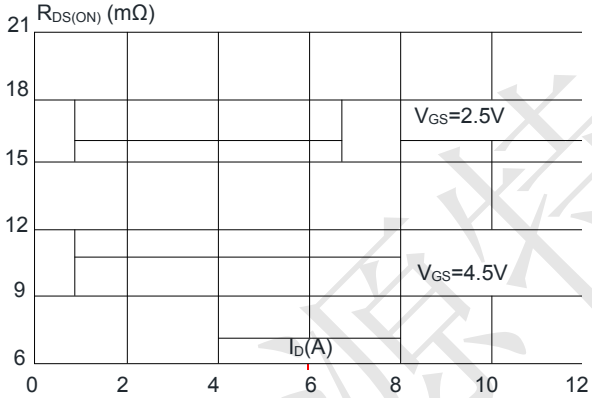


Figure 4: Body Diode Characteristics

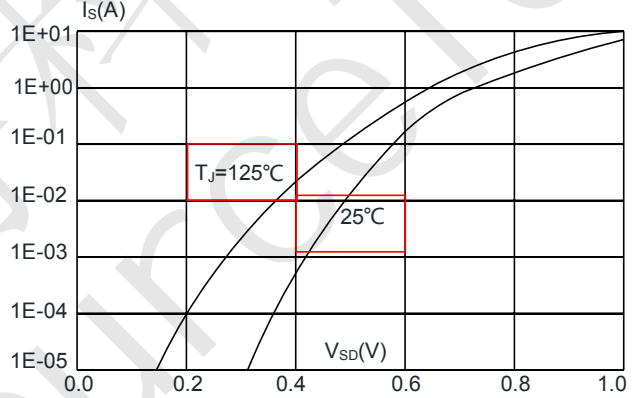


Figure 5: Gate Charge Characteristics

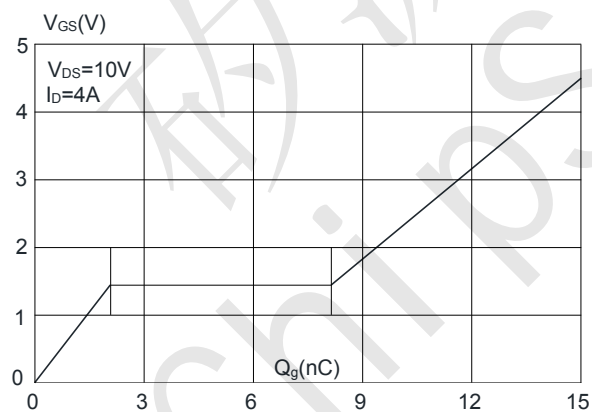
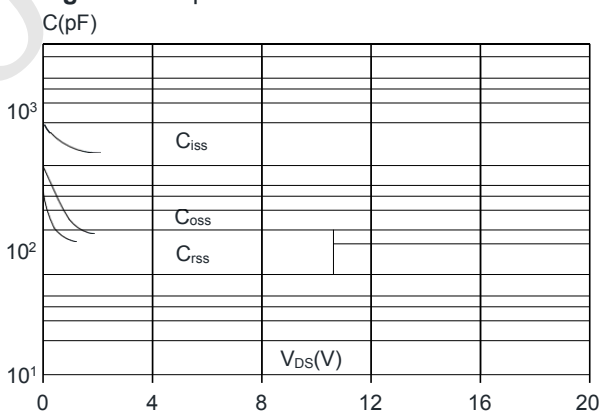


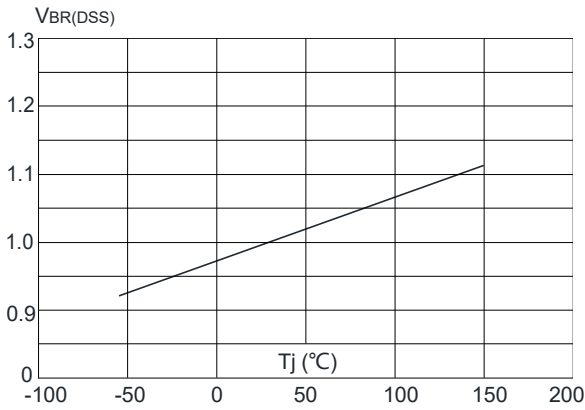
Figure 6: Capacitance Characteristics



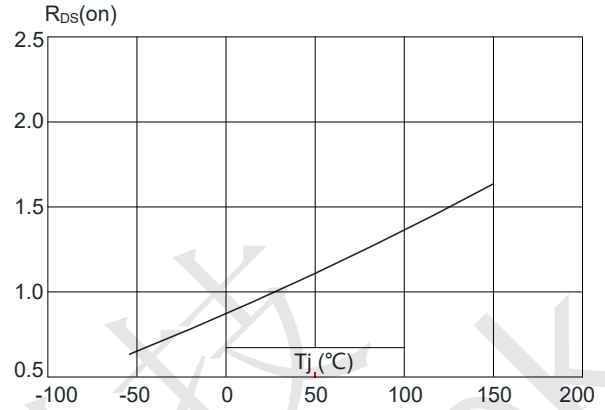


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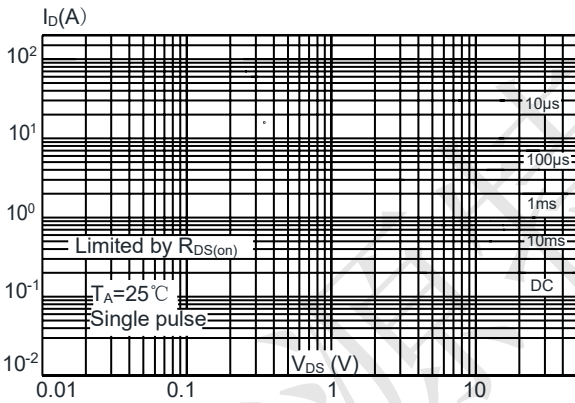
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



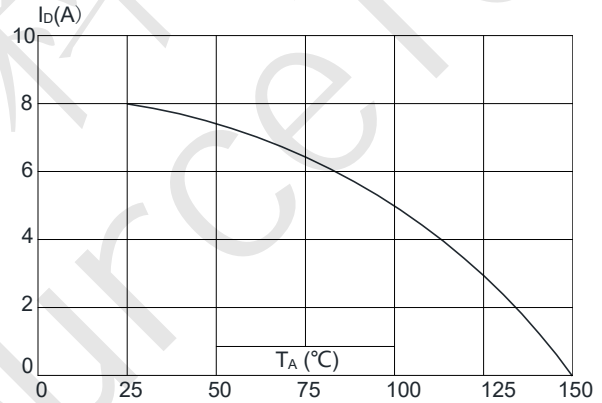
**Figure 8:** Normalized on Resistance vs. Junction Temperature



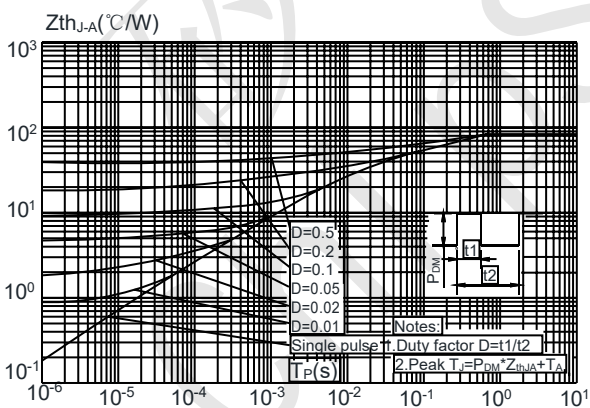
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature

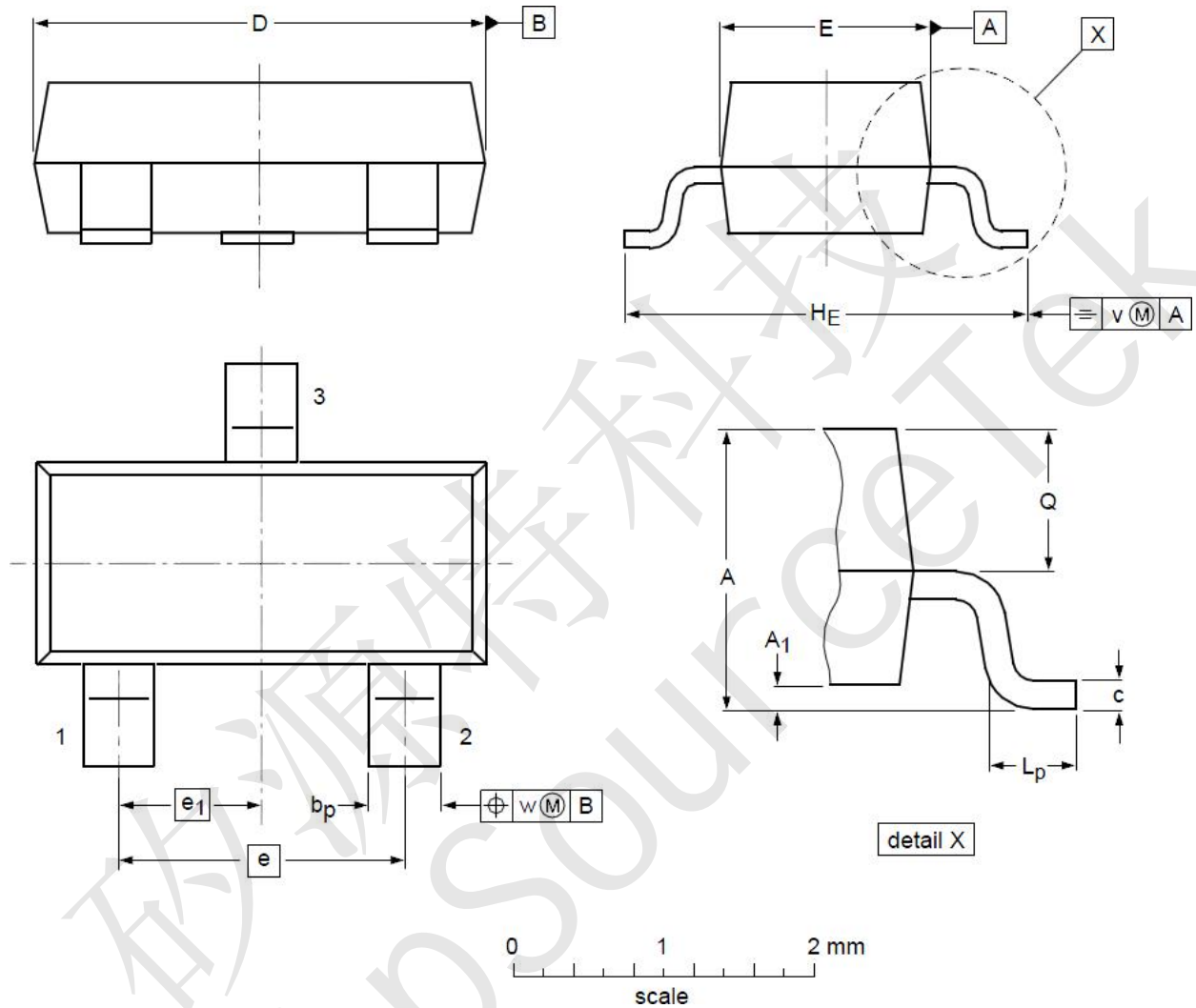


**Figure 11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient





CST2312AL Package Mechanical Data-SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°