



### CST6005L N-Ch 60V Fast Switching MOSFETs

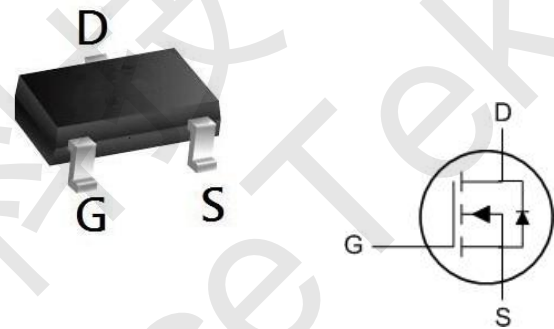
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

#### CST6005L Product Summary



BVDSS	RDSON	ID
60V	28mΩ	5 A

#### CST6005L SOT 23-3L Pin Configurations



#### CST6005L Description

The CST6005L is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The CST6005L meet the RoHS and Green Product requirement with full function reliability approved.

#### CST6005L Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	60	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	5
		T <sub>C</sub> = 100°C	3.8
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	30	A
P <sub>D</sub>	Power Dissipation	3	W
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	73	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +175	°C



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#### CST6005L 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	60	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, 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> =±20V	-	-	±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	1	1.6	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =15A	-	28	35	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	-	33	42	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	825	-	pF
C <sub>oss</sub>	Output Capacitance		-	49	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	41	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =4.5A, V <sub>GS</sub> =10V	-	14	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	2.9	-	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> =30V, I <sub>D</sub> =2A, R <sub>L</sub> =6.7Ω, R <sub>G</sub> =3Ω, V <sub>GS</sub> =10V	-	5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	2.6	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	16.1	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	2.3	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	30	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =15A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>F</sub> =15A, dI/dt=100A/μs	-	35	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	53	-	nC

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

2. EAS condition : T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, L=0.5mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=6.1A

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



## CST6005L Typical Performance Characteristics

Figure 1: Output Characteristics

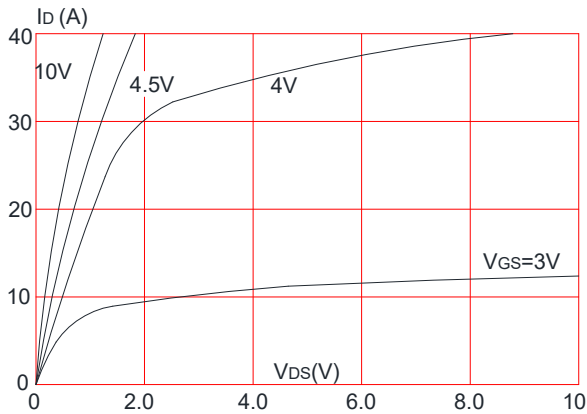


Figure 2: Typical Transfer Characteristics

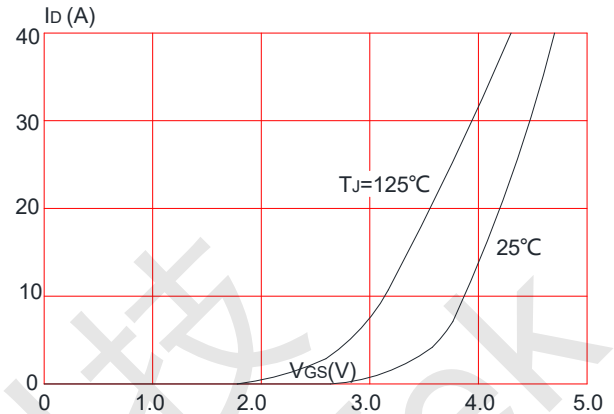


Figure 3: On-resistance vs. Drain Current

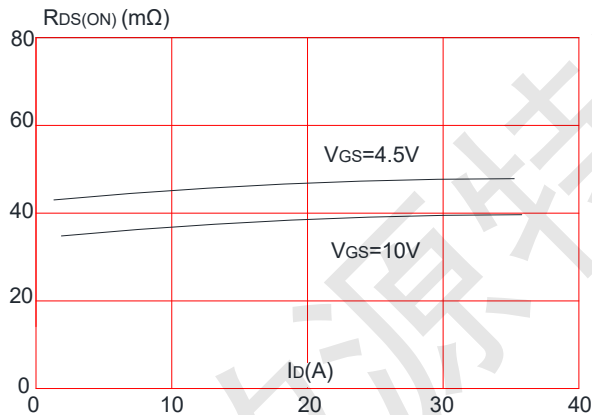


Figure 4: Body Diode Characteristics

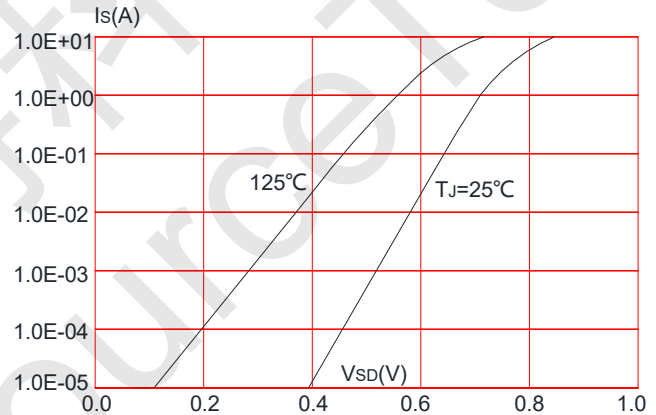


Figure 5: Gate Charge Characteristics

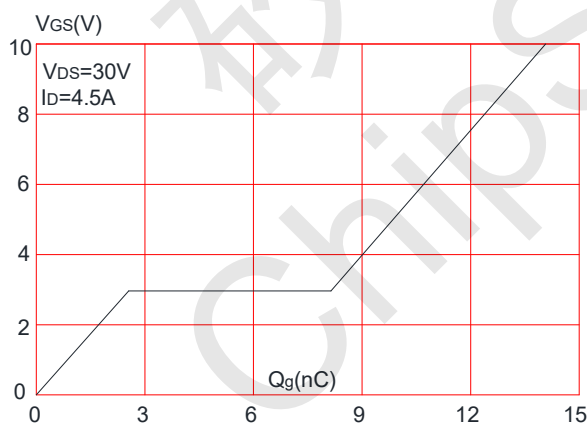
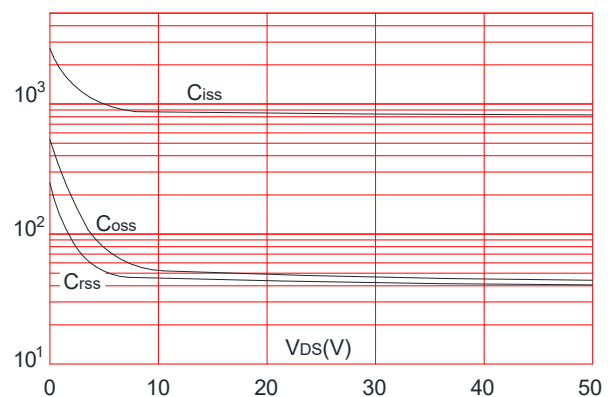


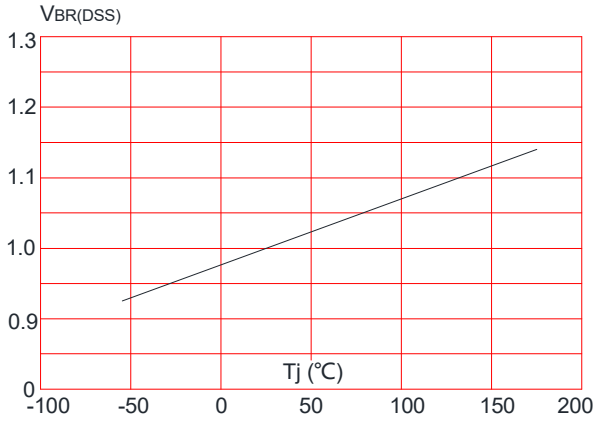
Figure 6: Capacitance Characteristics



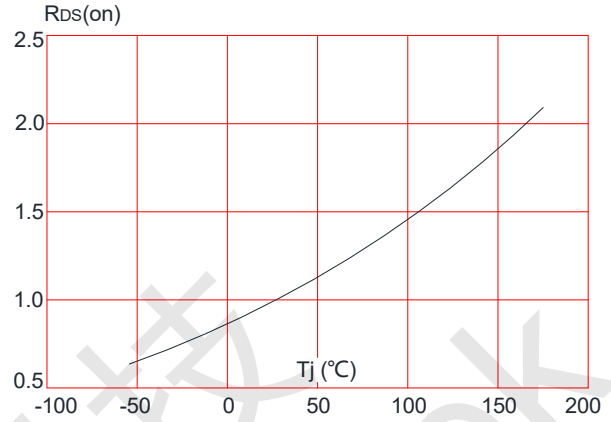


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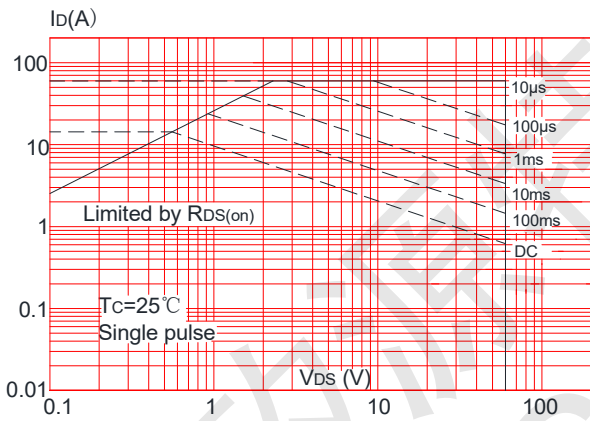
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



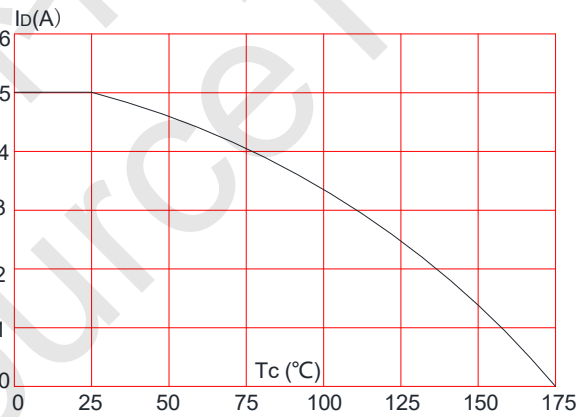
**Figure 8:** Normalized on Resistance vs. Junction Temperature



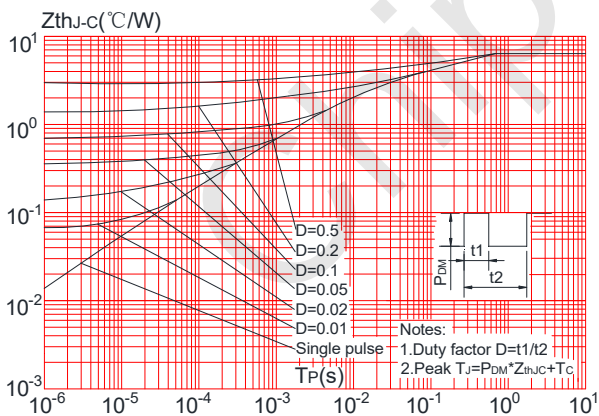
**Figure 9:** Maximum Safe Operating Area



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

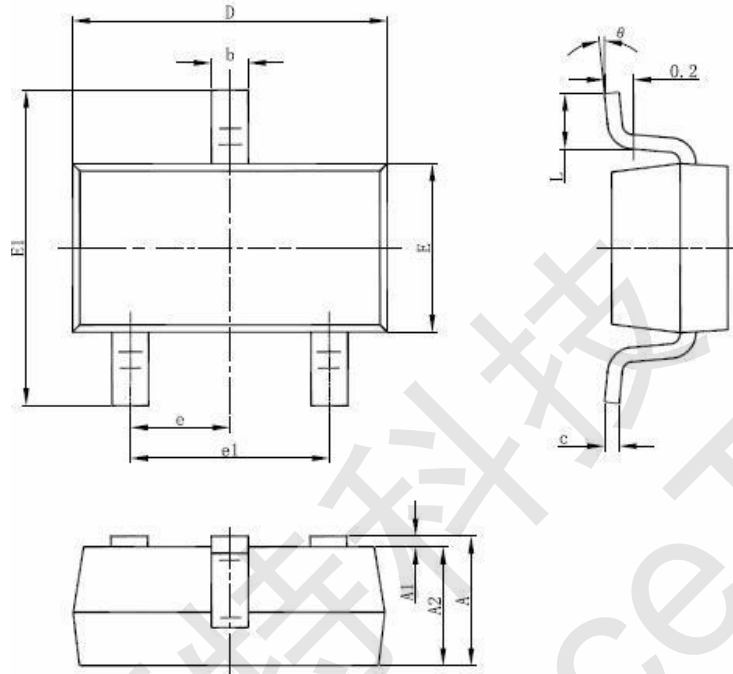


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case





CST6005L SOT-23-3L Package Information



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°