



### CST4435B P-Ch 30V Fast Switching MOSFETs

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

#### CST4435B Product Summary



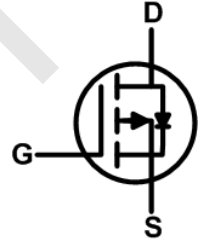
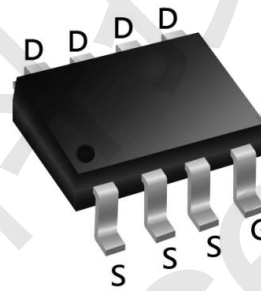
BVDSS	RDSON	ID
-30V	15mΩ	-10.0A

#### CST4435B Description

The CST4435B is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The CST4435B meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

#### CST4435B SOP8 Pin Configuration



#### CST4435B Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	-30	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> = 25°C	-10
		T <sub>A</sub> = 100°C	-7.0
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	-36	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	25	mJ
P <sub>D</sub>	Power Dissipation	3.5	W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	48	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C



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#### CST4435B Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

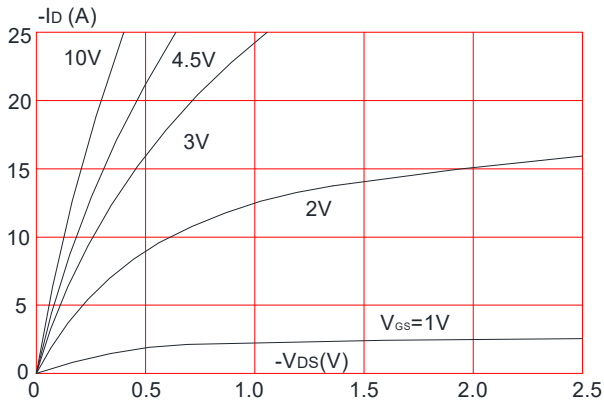
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -30V, V_{GS} = 0V,$	-	-	-1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.5	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance Note3	$V_{GS} = -10V, I_D = -9A$	-	15	20	m $\Omega$
		$V_{GS} = -4.5V, I_D = -5A$	-	20	30	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	900	-	pF
$C_{oss}$	Output Capacitance		-	125	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	109	-	pF
$Q_g$	Total Gate Charge	$V_{DS} = -15V, I_D = -8A,$ $V_{GS} = -10V$	-	42	-	nC
$Q_{gs}$	Gate-Source Charge		-	8.8	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	7.3	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -15V, I_D = -1A,$ $V_{GS} = -10V, R_{GEN} = 6\Omega$	-	13	-	ns
$t_r$	Turn-on Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	198	-	ns
$t_f$	Turn-off Fall Time		-	98	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	-10	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-36	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -9A$	-	-0.8	-1.2	V

- Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature  
 2. EAS condition:  $T_J=25^\circ\text{C}$ ,  $V_{DD}=-15V$ ,  $V_G=-10V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=-10A$   
 3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$

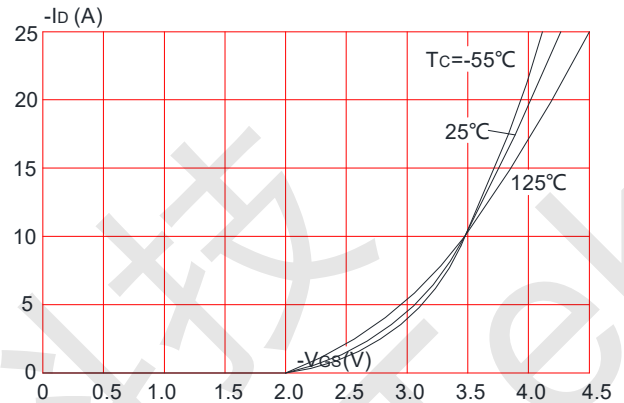


## CST4435B Typical Performance Characteristics

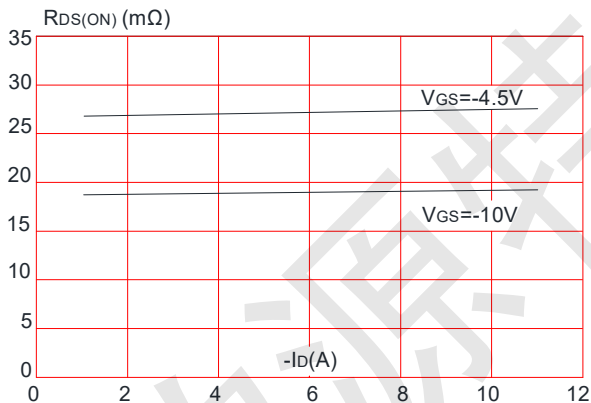
**Figure 1: Output Characteristics**



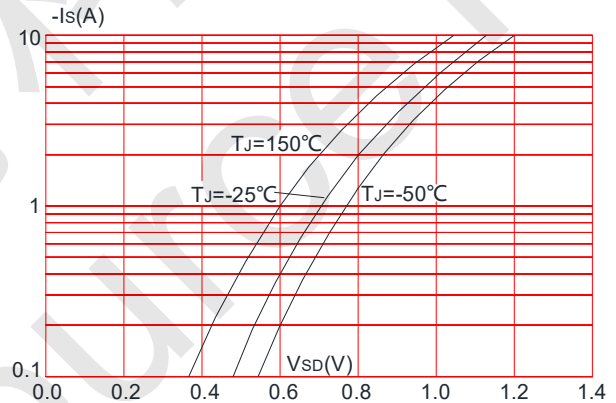
**Figure 2: Typical Transfer Characteristics**



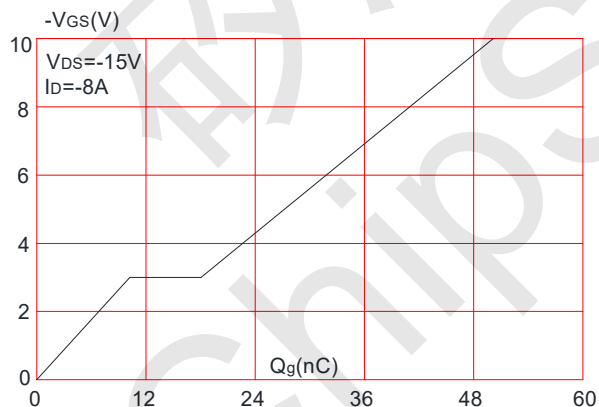
**Figure 3: On-resistance vs. Drain Current**



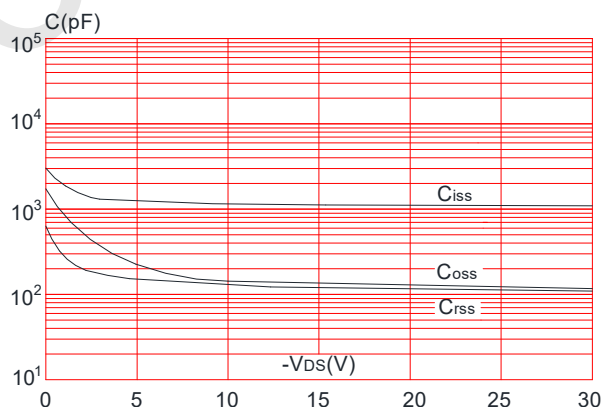
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



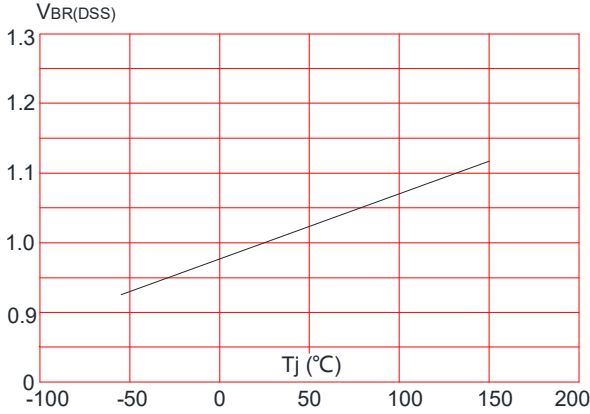
**Figure 6: Capacitance Characteristics**



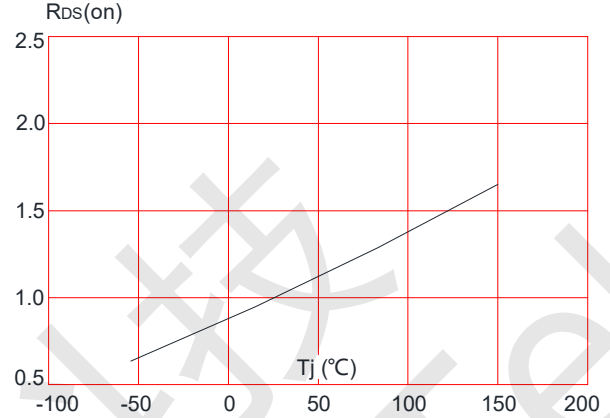


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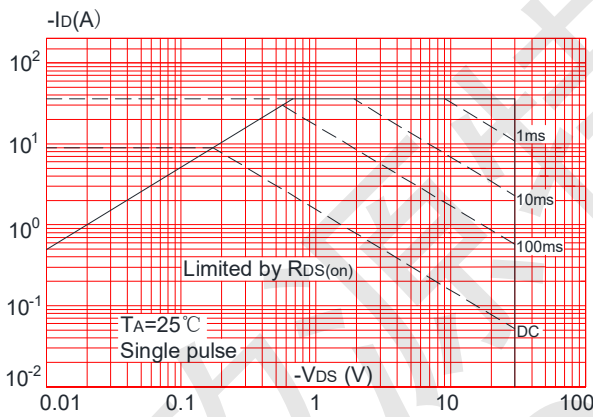
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



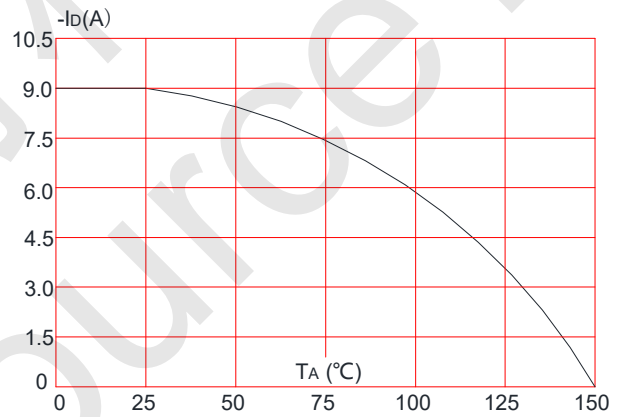
**Figure 8:** Normalized on Resistance vs. Junction Temperature



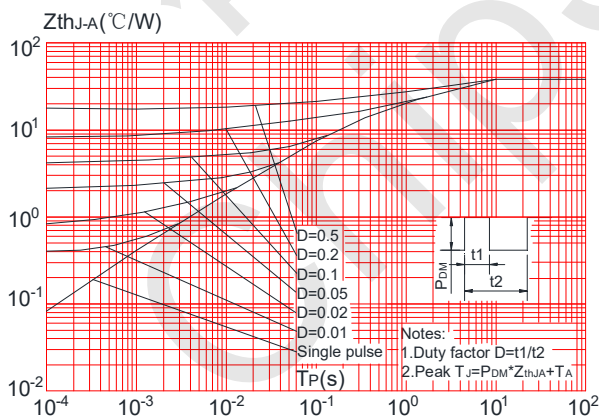
**Figure 9:** Maximum Safe Operating Area



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



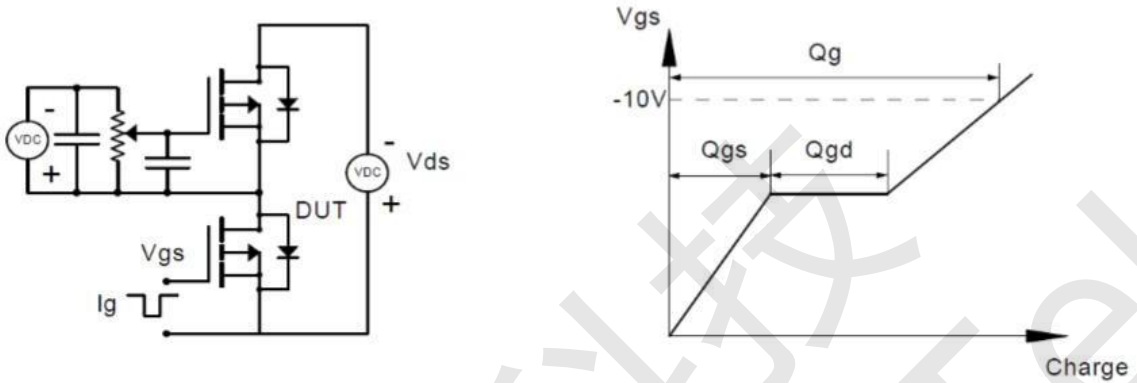
**Figure 11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



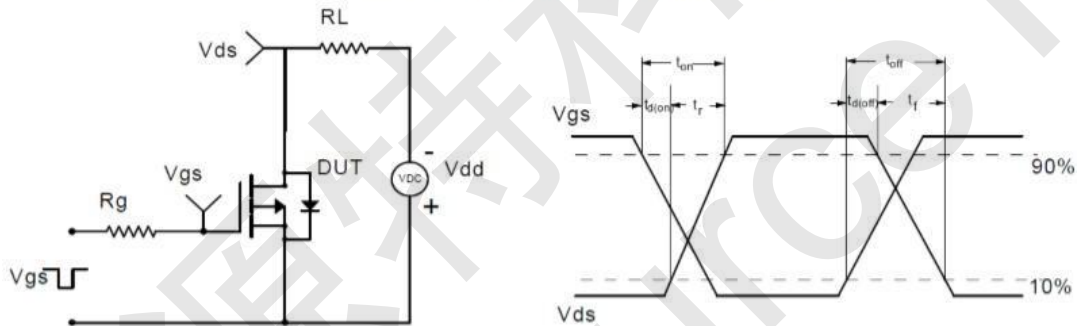


#### CST4435B Test Circuit

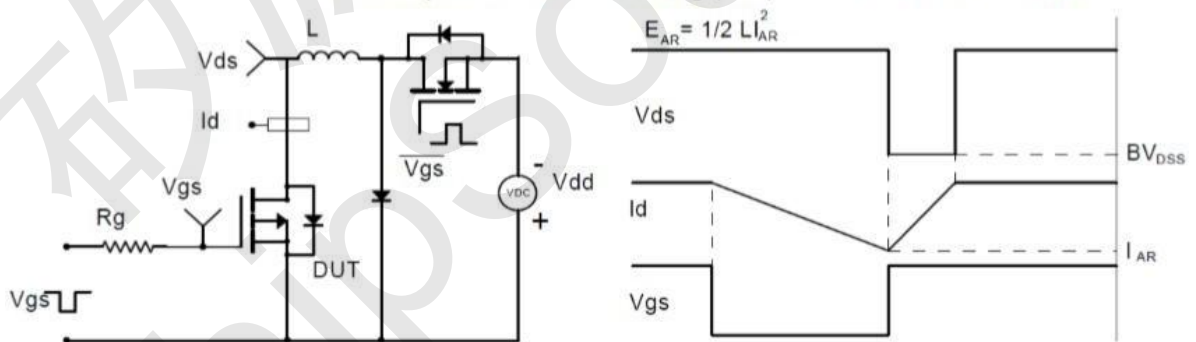
Gate Charge Test Circuit & Waveform



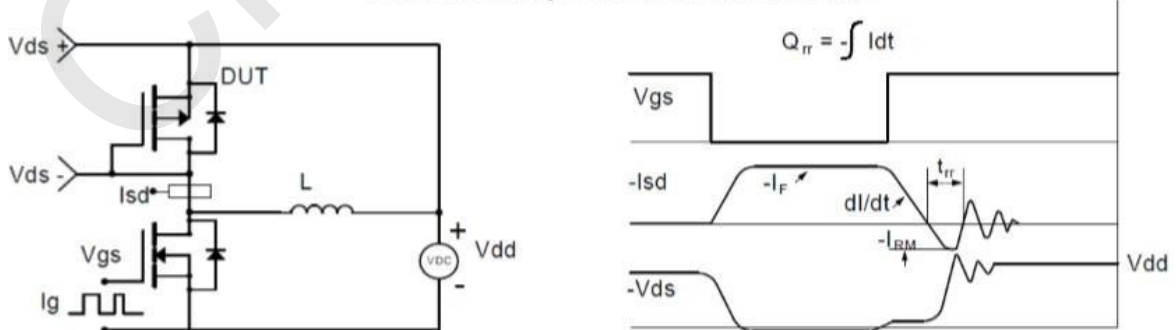
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

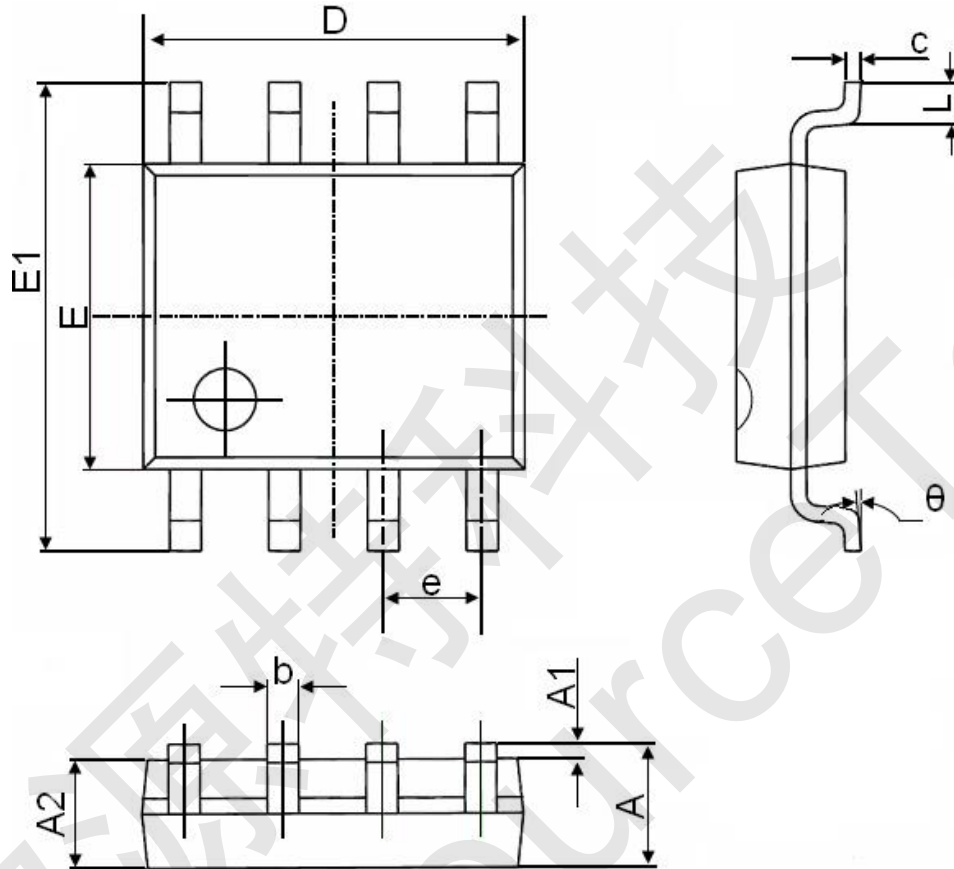


Diode Recovery Test Circuit & Waveforms





CST4435B SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°