



### CST306D Dual N-Ch 30V Fast Switching MOSFETs

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

#### CST306D Product Summary



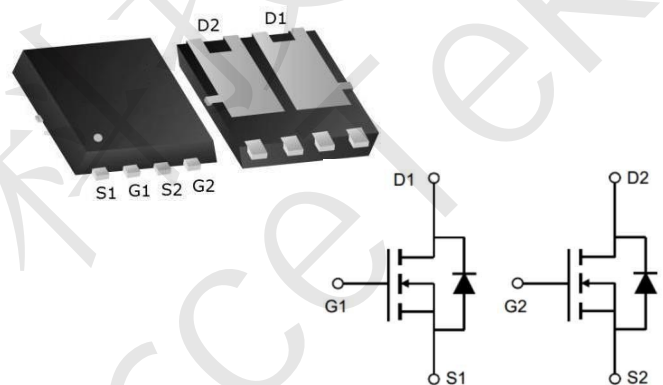
BVDSS	RDSON	ID
30V	5.0 mΩ	40A

#### CST306D Description

The CST306D is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The CST306D meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

#### CST306D PDFN3333-8L Pin Configuration



#### CST306D Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	40	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	28	A
$I_D@T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	17	A
$I_D@T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	14	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	135	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	39.8	mJ
$I_{AS}$	Avalanche Current	27	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	30	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

#### CST306D Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	---	50	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	4.6	$^\circ C/W$



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#### CST306D Electrical Characteristics ( $T_J=25$ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=20A$	---	5	6.3	m $\Omega$
		$V_{GS}=4.5V, I_D=15A$	---	6.9	9	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	---	2.5	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ C$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=20A$	---	67	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	1.7	---	$\Omega$
$Q_g$	Total Gate Charge (4.5V)	$V_{DS}=15V, V_{GS}=4.5V, I_D=15A$	---	8	---	nC
$Q_{gs}$	Gate-Source Charge		---	2.4	---	
$Q_{gd}$	Gate-Drain Charge		---	3.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, R_G=3.3\Omega, I_D=15A$	---	7.1	---	ns
$T_r$	Rise Time		---	40	---	
$T_{d(off)}$	Turn-Off Delay Time		---	15	---	
$T_f$	Fall Time		---	6	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	---	814	---	pF
$C_{oss}$	Output Capacitance		---	208	---	
$C_{rss}$	Reverse Transfer Capacitance		---	201	---	

#### CST306D Diode Characteristics

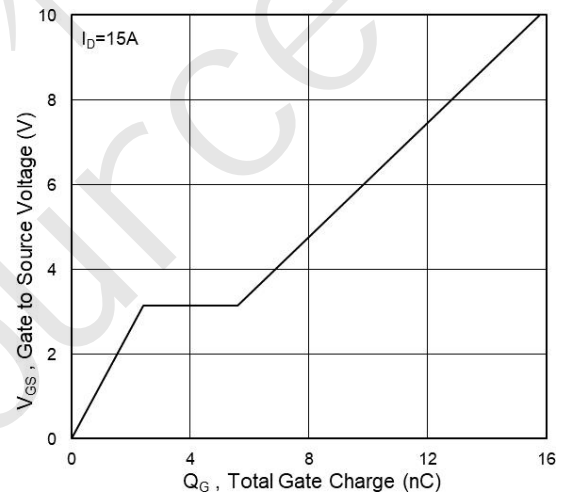
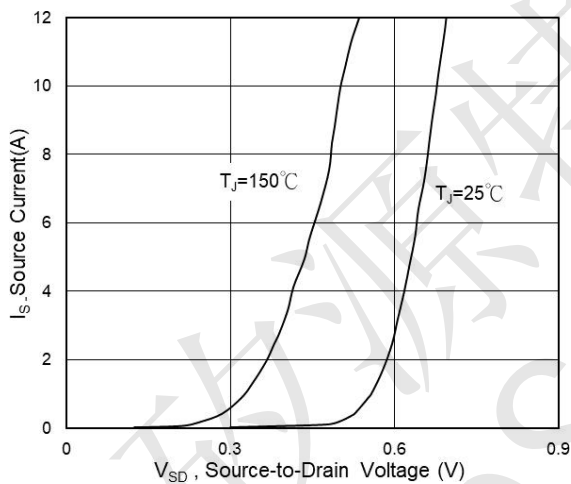
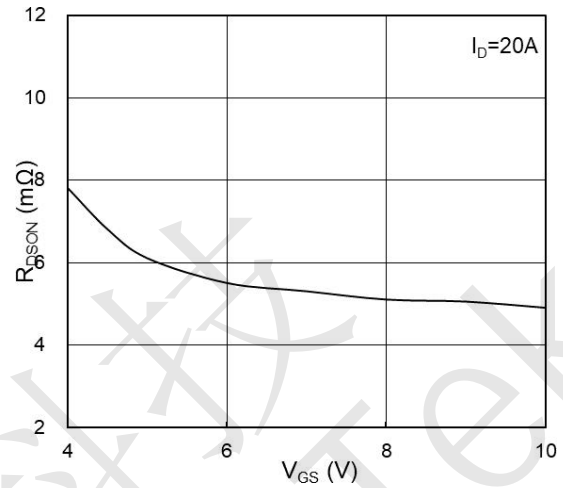
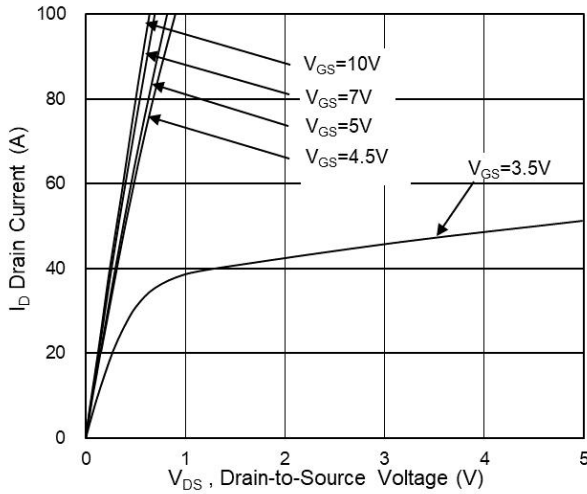
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,6</sup>	$V_G=V_D=0V$ , Force Current	---	---	40	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1	V
$t_{rr}$	Reverse Recovery Time	$I_F=20A, di/dt=100A/\mu s, T_J=25^\circ C$	---	15	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	25	---	nC

#### Note :

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
- The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- The EAS data shows Max. rating . The test condition is  $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=24A$
- The power dissipation is limited by 150 $^\circ C$  junction temperature
- The data is theoretically the same as  $I_D$  and  $I_{DM}$ , in real applications , should be limited by total power dissipation.

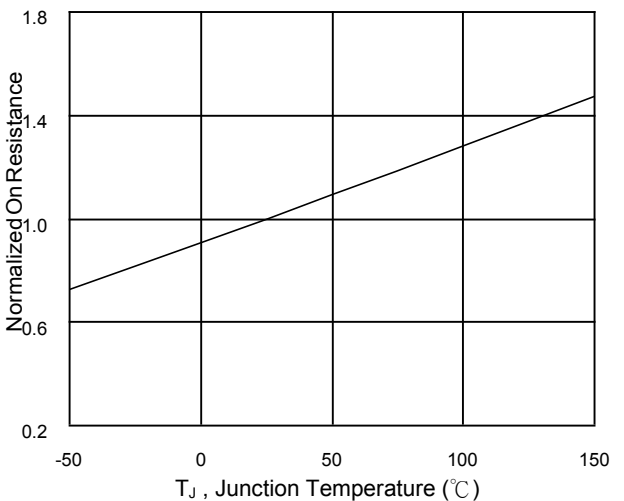
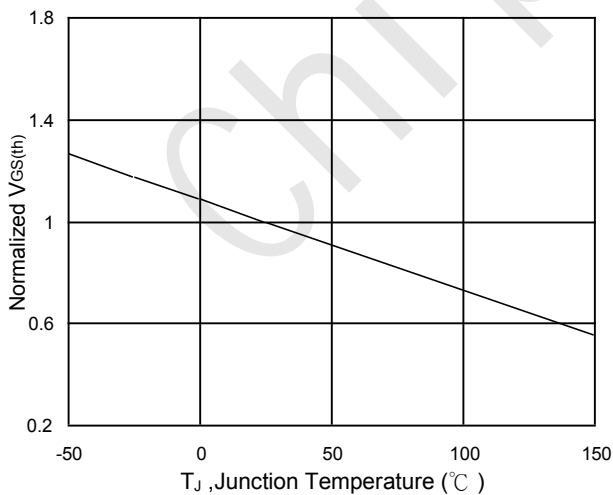


#### CST306D Typical Characteristics



#### Fig.3 Source Drain Forward Characteristics

#### Fig.4 Gate-Charge Characteristics





### CST306D Dual N-Ch 30V Fast Switching MOSFETs

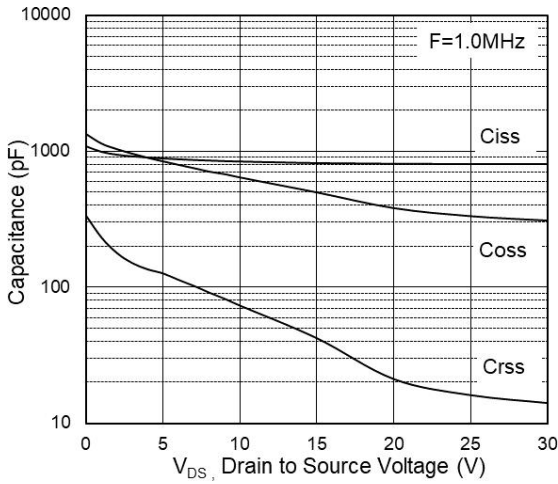


Fig.7 Capacitance

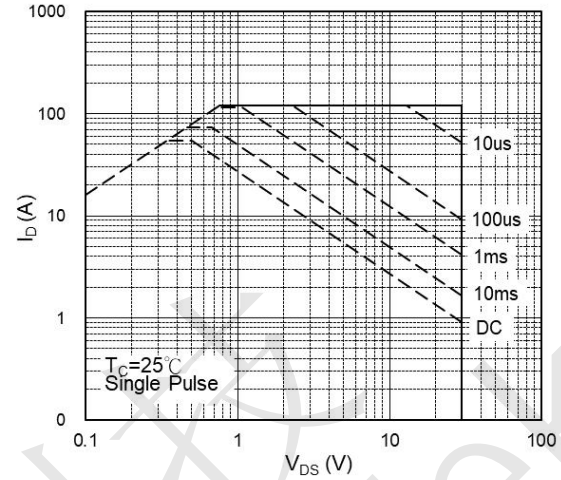


Fig.8 Safe Operating Area

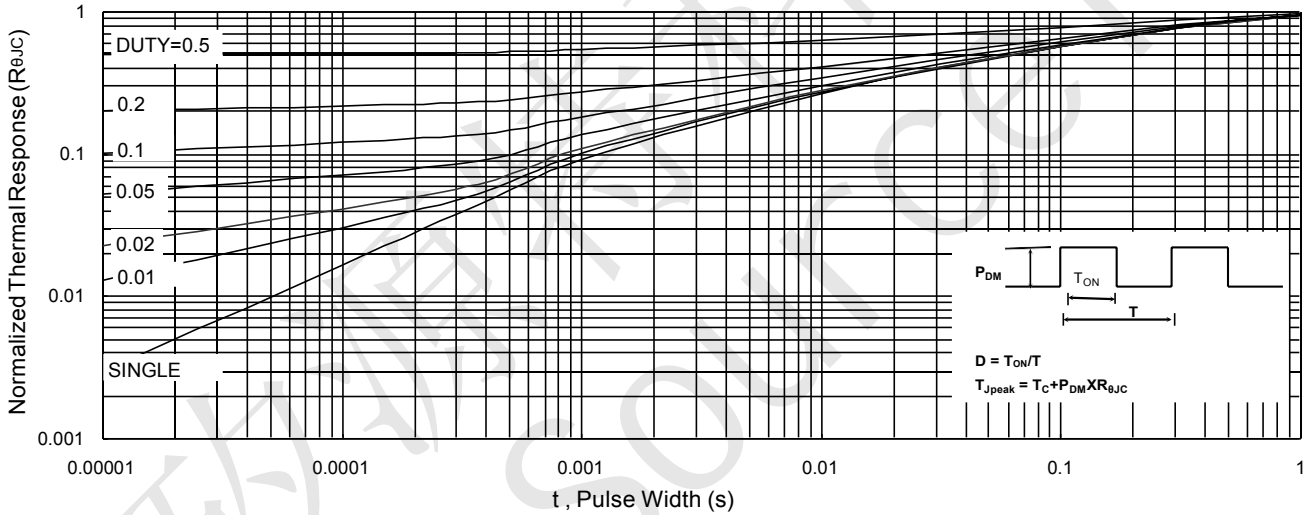


Fig.9 Normalized Maximum Transient Thermal Impedance

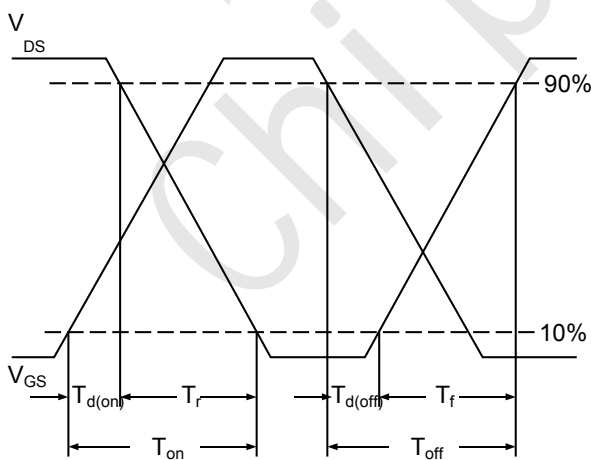


Fig.10 Switching Time Waveform

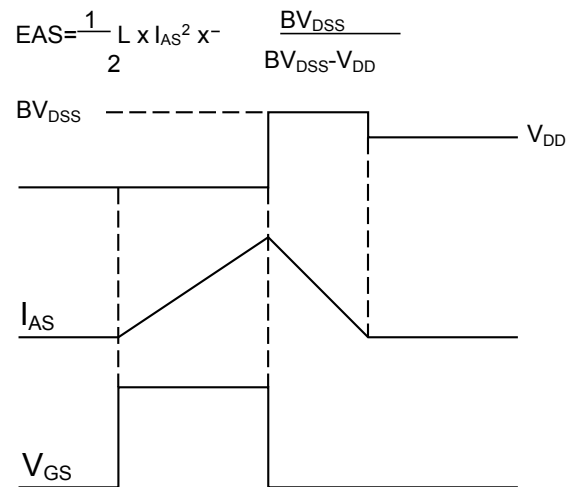
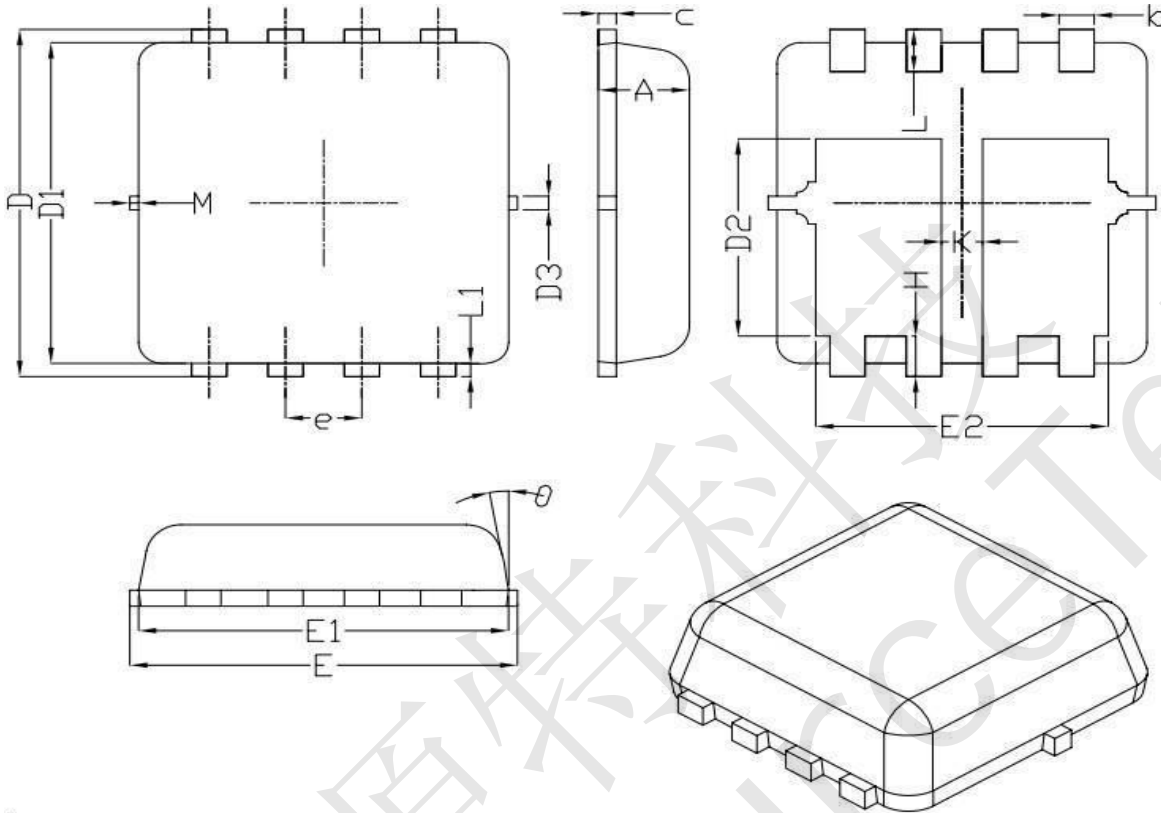


Fig.11 Unclamped Inductive Switching Waveform



### CST306D Dual N-Ch 30V Fast Switching MOSFETs

#### CST306D Dual PDFN3333-8L Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	--	0.13	--
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	--	0.13	--
K	0.30	--	--
$\theta$	--	10°	12°
M	*	*	0.15
* Not Specified			

Notes:

1. Refer to JEDEC MO-240 variation CA.
2. Dimensions "D1" and "E1" do NOT include mold flash protrusions or gate burrs.
3. Dimensions "D1" and "E1" include interterminal flash or protrusion.