



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

## CST100N85F Product Summary

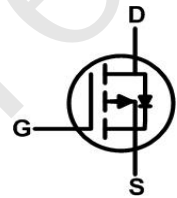


BVDSS	RDSON	ID
85V	4.3mΩ	100A

## CST100N85F Description

The CST100N85F 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 CST100N85F meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## CST100N85F PRPAK5X6 Pin Configuration



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	85	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	T <sub>C</sub> =25°C	100
		T <sub>C</sub> =100°C	63.3
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	400	A
Single Pulse Avalanche Energy <sup>2</sup>	EAS	273.8	mJ
Total Power Dissipation	P <sub>D</sub>	107.8	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

## Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient <sup>3</sup>	R <sub>θJA</sub>	60	°C/W
Thermal Resistance from Junction-to-Case	R <sub>θJC</sub>	1.16	°C/W



Electrical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	85	-	-	V
Gate-body Leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$T_J=25^\circ\text{C}$	$I_{DSS}$ $V_{DS} = 85V, V_{GS} = 0V$	-	-	1	$\mu A$
	$T_J=100^\circ\text{C}$		-	-	100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-Source on-Resistance <sup>4</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	4.3	5.6	m $\Omega$
Forward Transconductance <sup>4</sup>	$g_{fs}$	$V_{DS} = 5V, I_D = 20A$	-	57.8	-	S
<b>Dynamic Characteristics<sup>5</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 40V, V_{GS} = 0V,$ $f = 1\text{MHz}$	-	4645	-	$\mu F$
Output Capacitance	$C_{oss}$		-	673	-	
Reverse Transfer Capacitance	$C_{rss}$		-	41	-	
Gate Resistance	$R_g$	$f = 1\text{MHz}$	-	2.0	-	$\Omega$
<b>Switching Characteristics<sup>5</sup></b>						
Total Gate Charge	$Q_g$	$V_{GS} = 10V, V_{DS} = 40V,$ $I_D = 20A$	-	61.3	-	nC
Gate-Source Charge	$Q_{gs}$		-	21	-	
Gate-Drain Charge	$Q_{gd}$		-	11	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 40V,$ $R_G = 3\Omega, I_D = 20A$	-	16.5	-	ns
Rise Time	$t_r$		-	51.8	-	
Turn-off Delay Time	$t_{d(off)}$		-	37.1	-	
Fall Time	$t_f$		-	8.2	-	
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 20A, di/dt = 100A/\mu S$	-	69	-	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	141	-	nC
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	$I_S = 20A, V_{GS} = 0V$	-	-	1.2	V
Continuous Source Current	$T_C=25^\circ\text{C}$	$I_S$	-	-	100	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature  $T_J(\text{MAX})=150^\circ\text{C}$
2. The EAS data shows Max. rating . The test condition is  $V_{DD}=50V, V_{GS}=10V, L=0.4\text{mH}, I_{AS}=37A$
3. 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.
4. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
5. This value is guaranteed by design hence it is not included in the production test.



CST100N85F Typical Characteristics

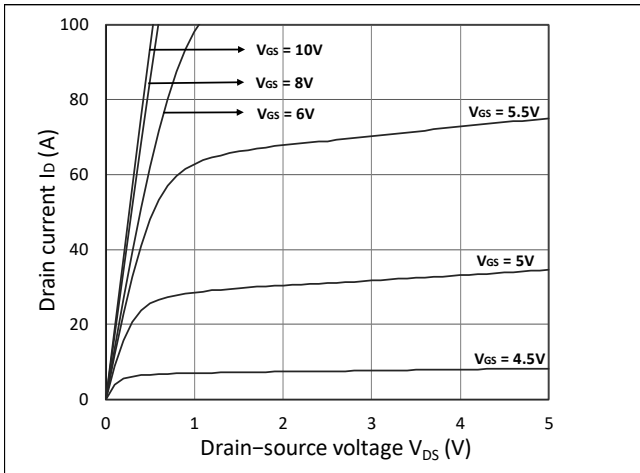


Figure 1. Output Characteristics

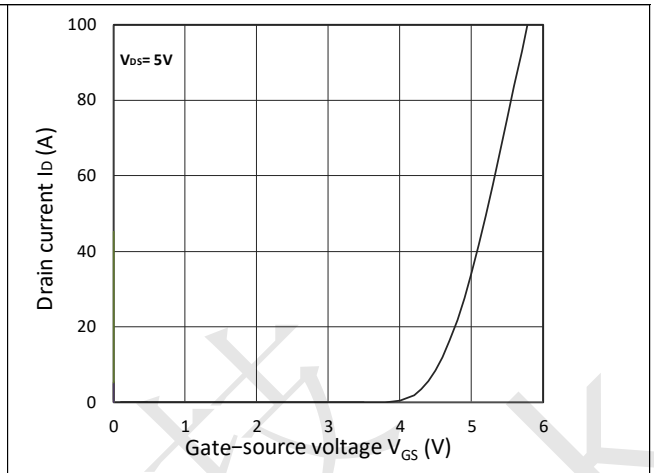


Figure 2. Transfer Characteristics

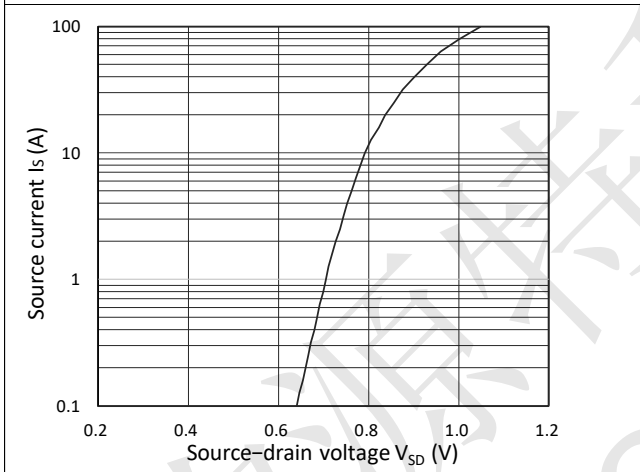


Figure 3. Forward Characteristics of Reverse

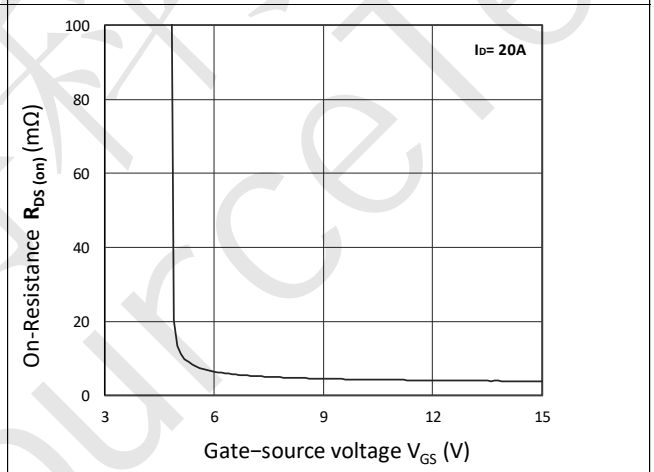


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

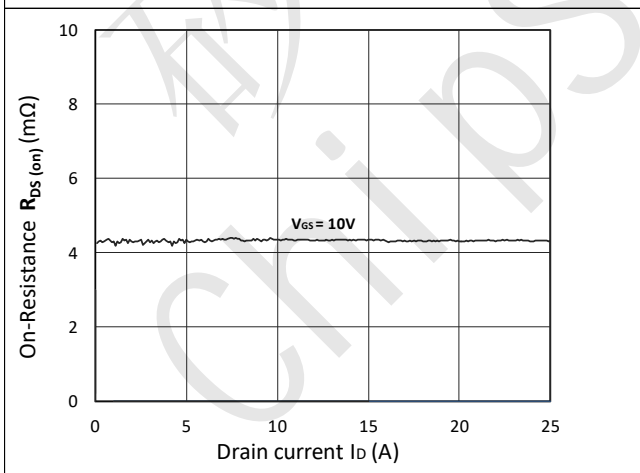


Figure 5.  $R_{DS(ON)}$  vs.  $I_D$

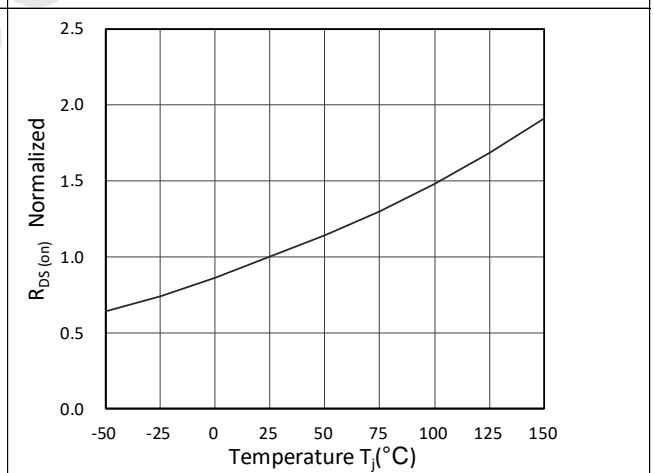


Figure 6. Normalized  $R_{DS(on)}$  vs. Temperature



N-Ch 85V Fast Switchin MOSFETs

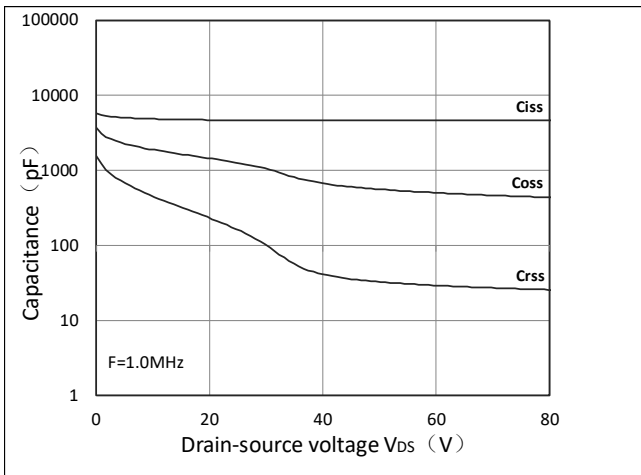


Figure 7. Capacitance Characteristics

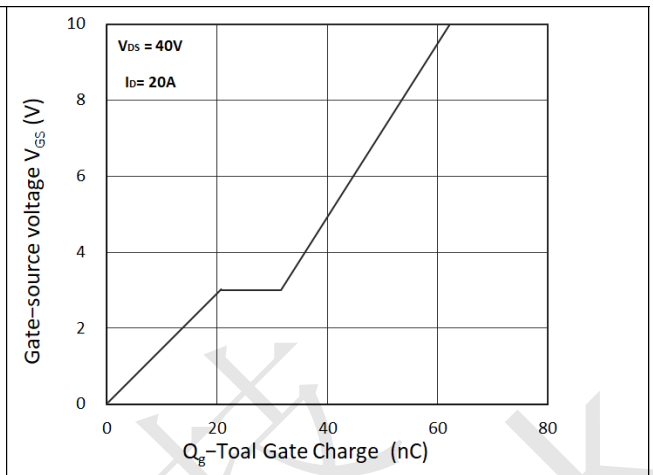


Figure 8. Gate Charge Characteristics

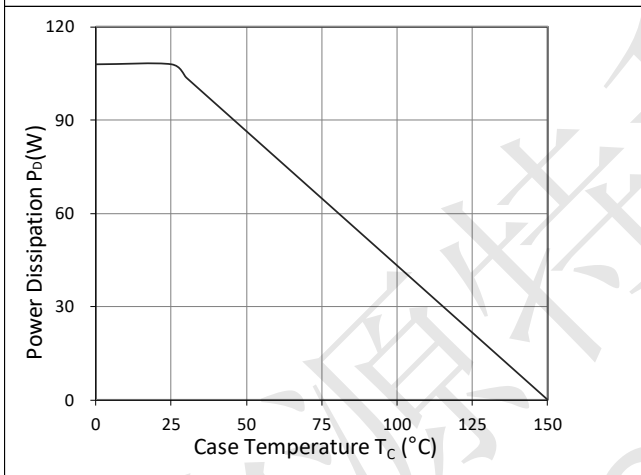


Figure 9. Power Dissipation

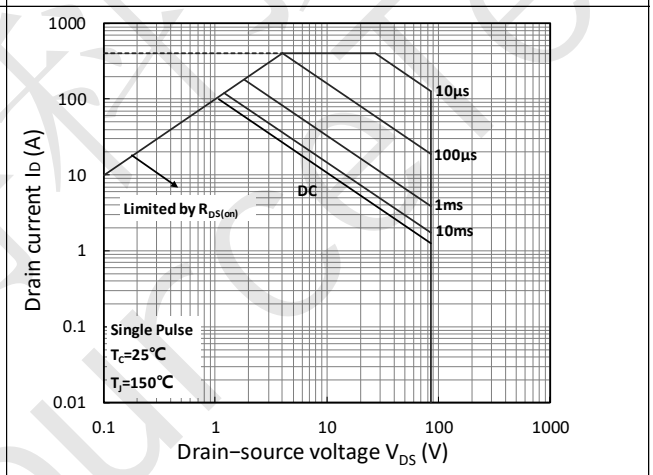


Figure 10. Safe Operating Area

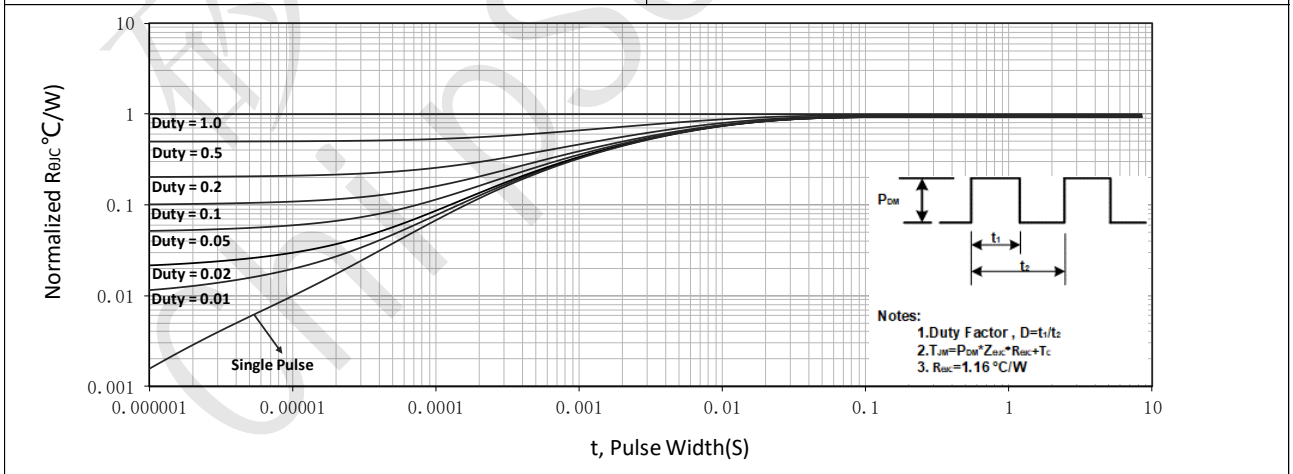
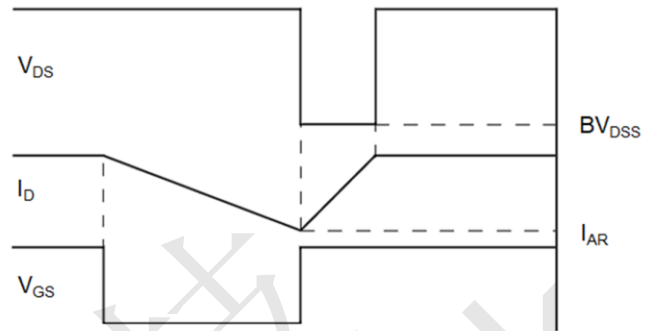
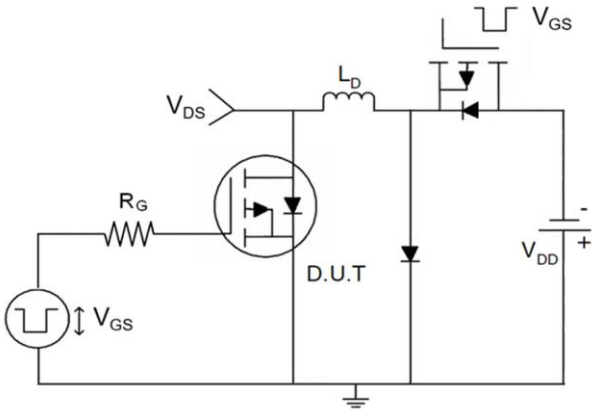


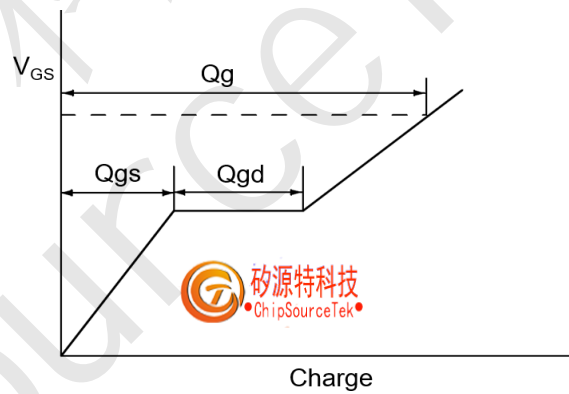
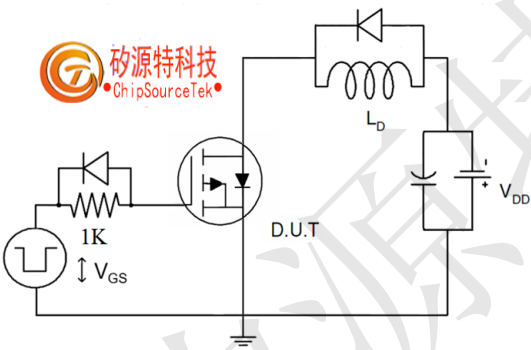
Figure 11. Normalized Maximum Transient Thermal Impedance



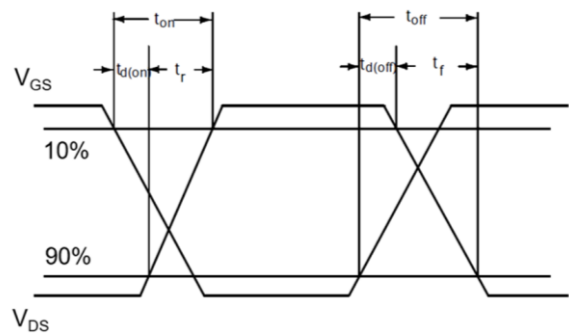
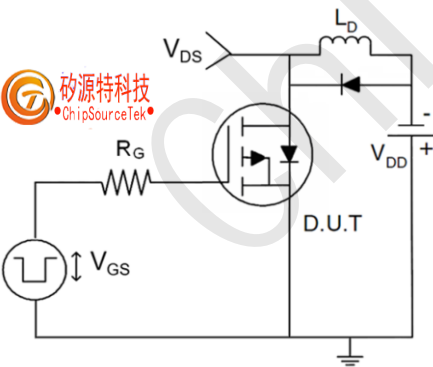
1)  $E_{AS}$  Test Circuits



2) Gate Charge Test Circuit

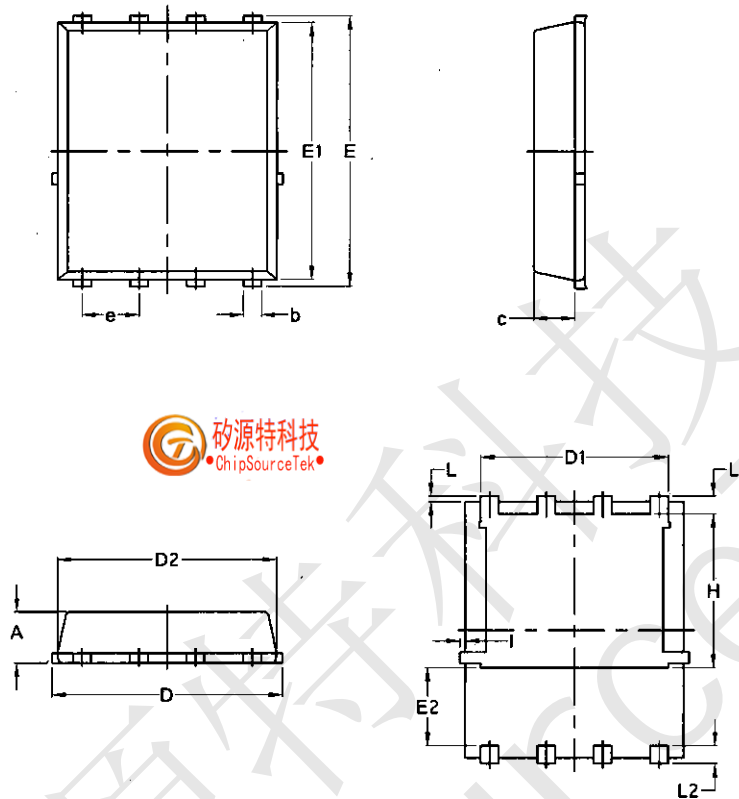


3) Switch Time Test Circuit





CST100N85F Package Mechanical Data-DFN5\*6-8L -Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070