



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

#### CST30N20F Product Summary



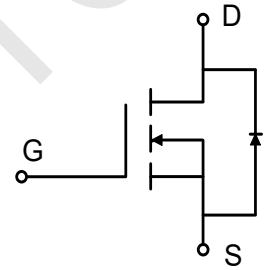
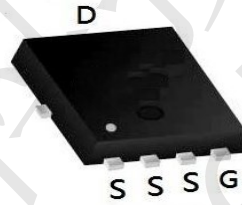
BVDSS	RDSON	ID
200V	57 mΩ	30A

#### CST30N20F Description

The CST30N20F 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 CST30N20F meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

#### CST30N20F PDFN5060-8L Pin Configuration



#### CST30N20F Absolute Maximum Ratings (T<sub>C</sub>= 25°C unless otherwise specified) :

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> (T <sub>C</sub> =25°C Unless Otherwise Noted)			
V <sub>DSS</sub>	Drain-Source Voltage	200	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
T <sub>J</sub>	Maximum Junction Temperature	-55 to 175	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 175	°C
I <sub>S</sub>	Source Current-Continuous(Body Diode)	T <sub>C</sub> =25°C 30	A
<b>Mounted on Large Heat Sink</b>			
I <sub>DM</sub>	Pulsed Drain Current *	T <sub>C</sub> =25°C 120	A
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> =25°C 30	A
		T <sub>C</sub> =100°C 20	A
P <sub>D</sub>	Maximum Power Dissipation	T <sub>C</sub> =25°C 125	W
		T <sub>C</sub> =100°C 62.5	W
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case	1.2	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient **	50	°C/W
E <sub>AS</sub>	Single Pulsed-Avalanche Energy ***	L=0.5mH 161.8	mJ



#### CST30N20F Electrical Characteristics (T<sub>c</sub> =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HY1920			Unit
			Min	Typ.	Max	
<b>Static Characteristics</b>						
BV <sub>DS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	200	-		V
I <sub>DSS</sub>	Drain-to-Source Leakage Current	V <sub>DS</sub> =200V, V <sub>GS</sub> =0V	-	-	1	μA
		T <sub>J</sub> =55°C	-	-	50	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	3.0	3.7	5.0	V
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
R <sub>DS(ON)*</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =45A		57	72	mΩ
<b>Diode Characteristics</b>						
V <sub>SD*</sub>	Diode Forward Voltage	I <sub>SD</sub> =45A, V <sub>GS</sub> =0V	-	0.84	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =45A, dI <sub>SD</sub> /dt=100A/μs	-	97.7	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	424.7	-	nC

#### CST30N20F Electrical Characteristics (Cont.) (T<sub>c</sub> =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HY1920			Unit
			Min	Typ.	Max	
<b>Dynamic Characteristics</b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	3.5	-	Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, Frequency=1.0MHz	-	2570	-	pF
C <sub>oss</sub>	Output Capacitance		-	199	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	97	-	
t <sub>d(ON)</sub>	Turn-on Delay Time		V <sub>DD</sub> =100V, R <sub>G</sub> =4Ω, I <sub>DS</sub> =45A, V <sub>GS</sub> =10V	-	15.18	-
T <sub>r</sub>	Turn-on Rise Time	-		39.7	-	
t <sub>d(OFF)</sub>	Turn-off Delay Time	-		33.4	-	
T <sub>f</sub>	Turn-off Fall Time	-		35.3	-	
<b>Gate Charge Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =100V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	53	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	15	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	19	-	

a1: Repetitive rating; pulse width limited by maximum junction temperature



#### CST30N20F Typical Operating Characteristic

Figure 1: Power Dissipation

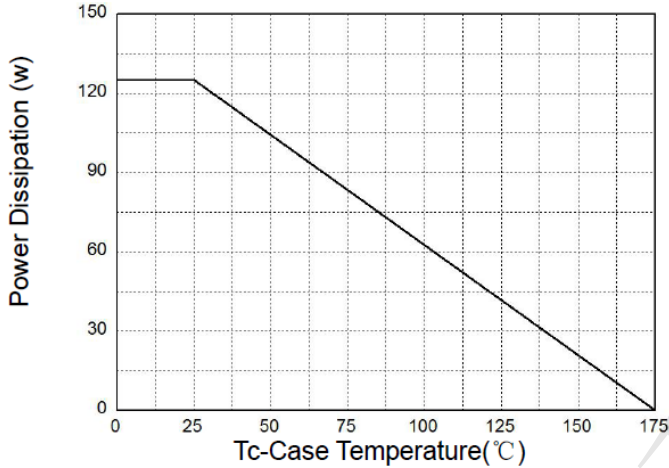


Figure 2: Drain Current

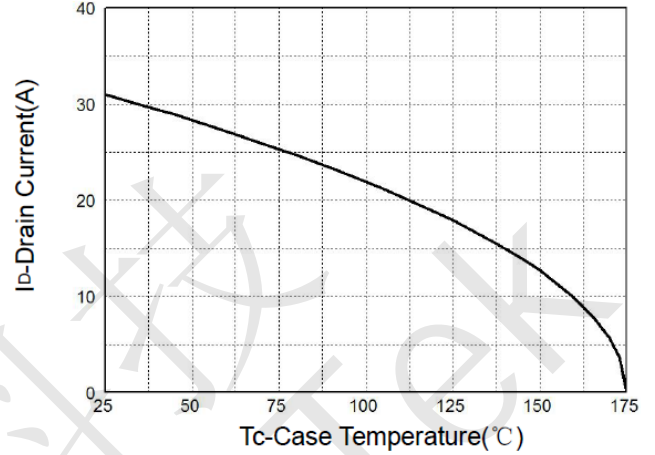


Figure 3: Safe Operation Area

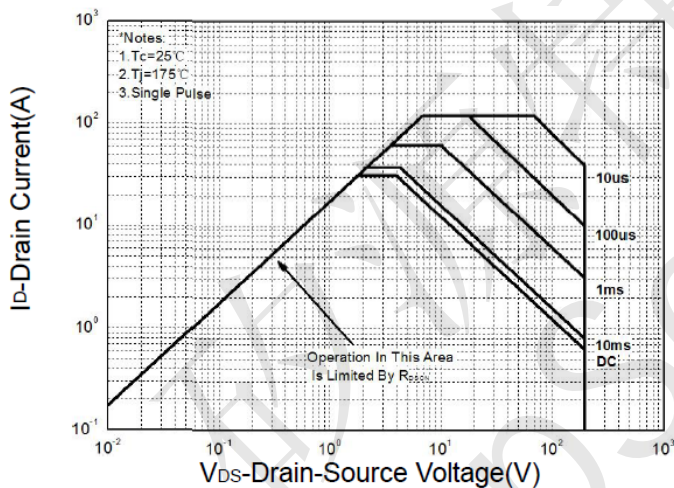


Figure 4: Thermal Transient Impedance

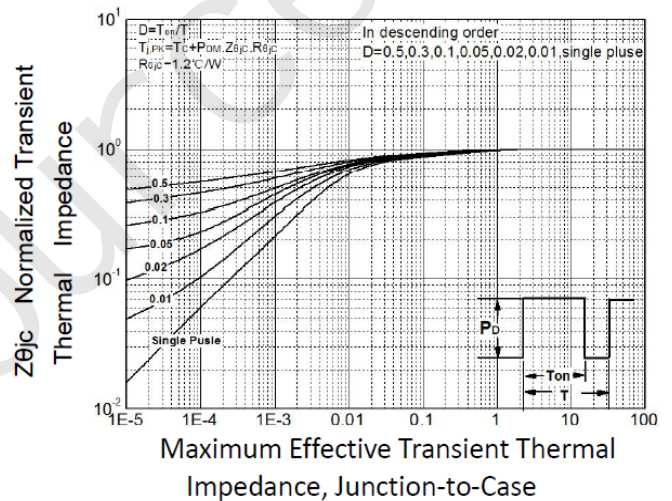


Figure 5: Output Characteristics

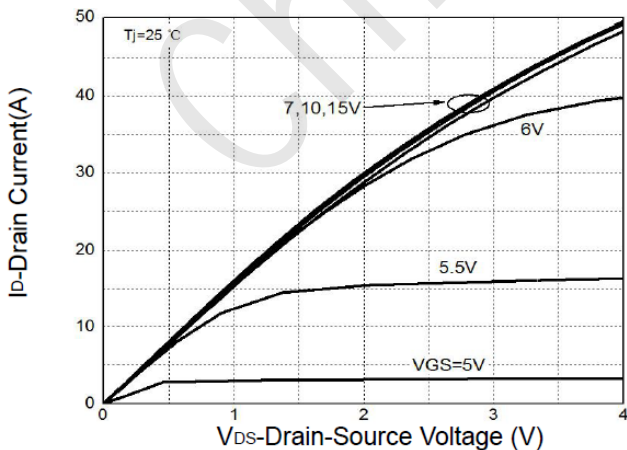
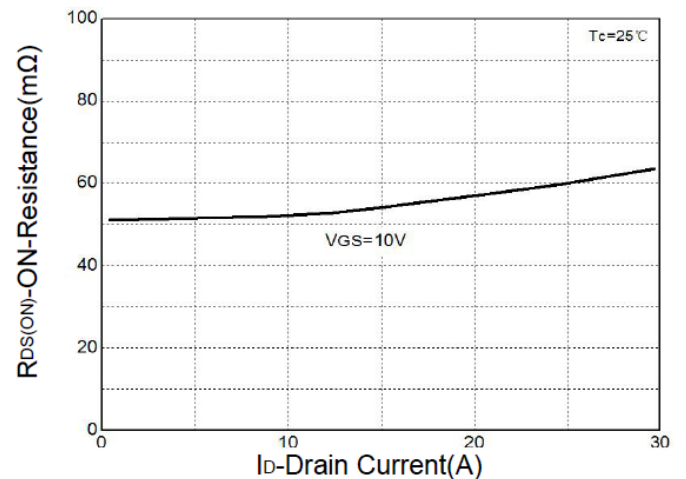


Figure 6: Drain-Source On Resistance





## CST30N20F Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature

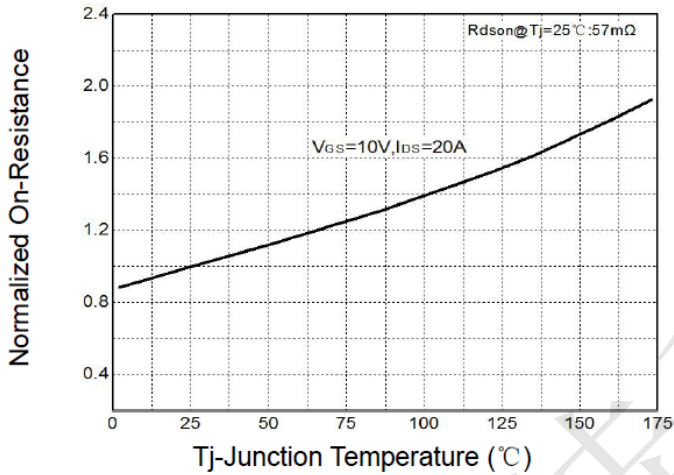


Figure 8: Source-Drain Diode Forward

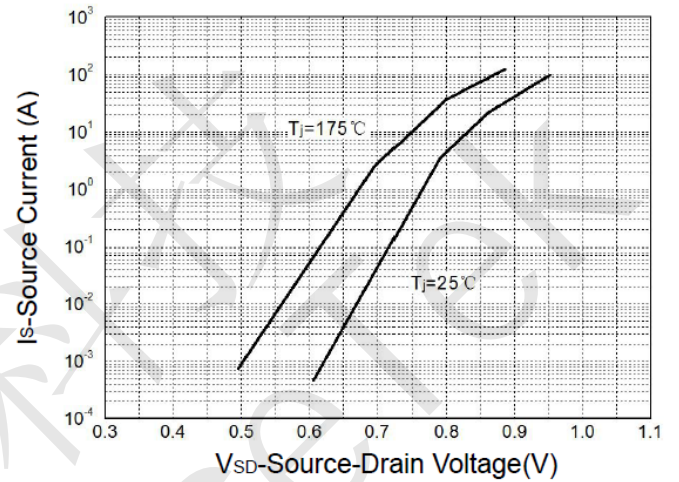


Figure 9: Capacitance Characteristics

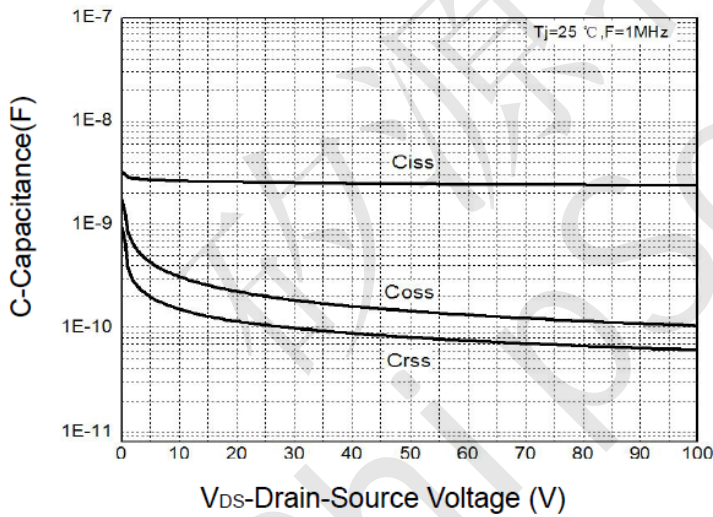
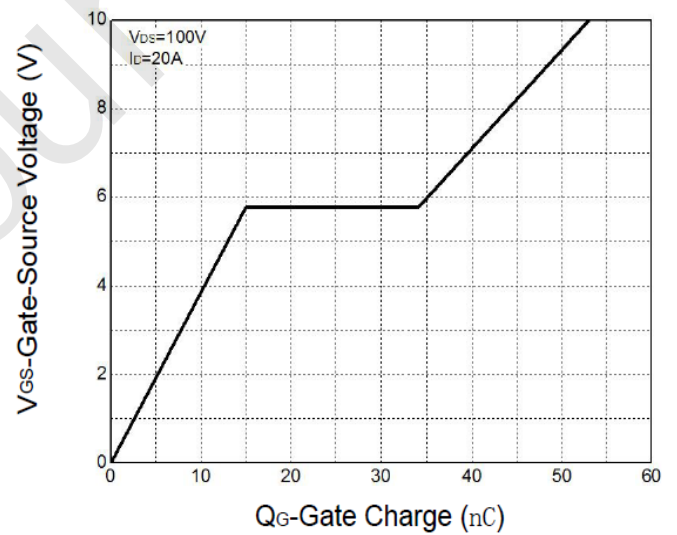
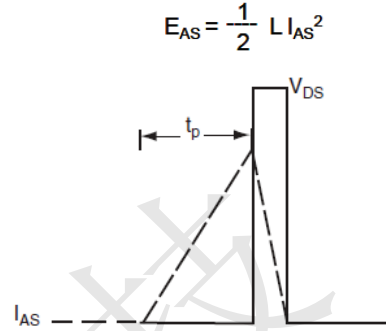
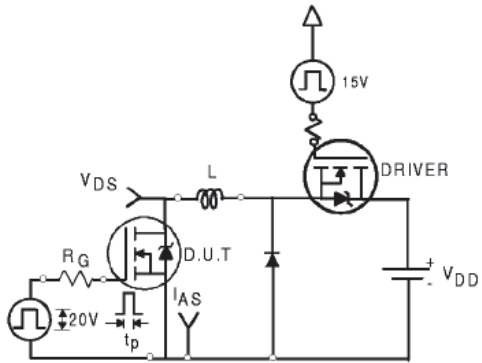


Figure 10: Gate Charge Characteristics

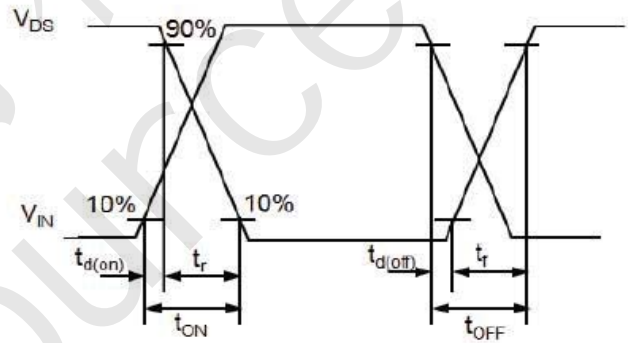
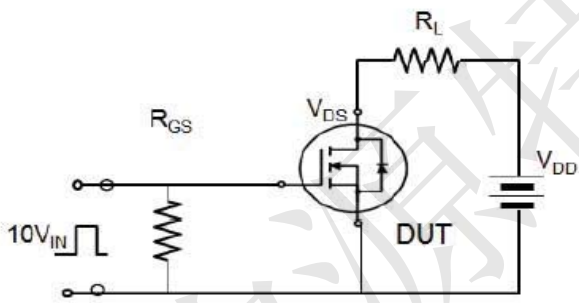




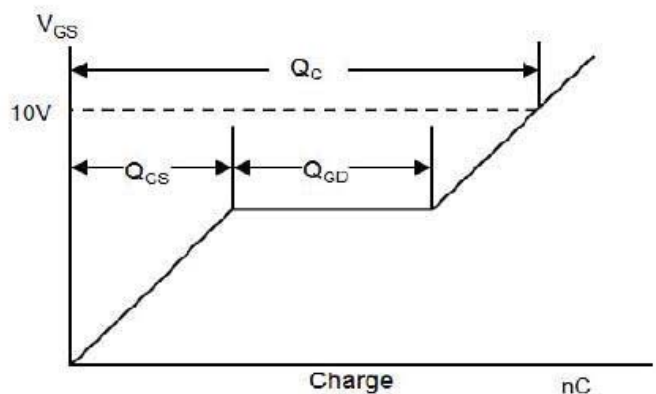
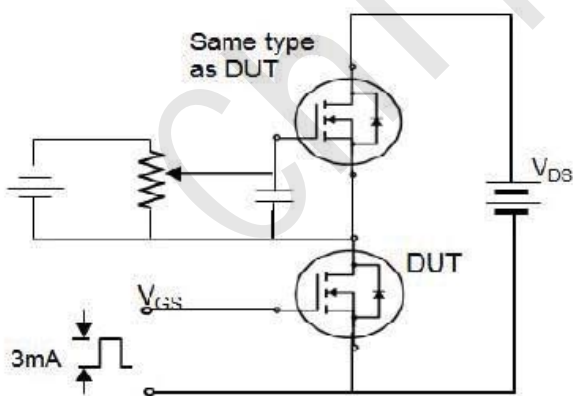
### Avalanche Test Circuit



### Switching Time Test Circuit

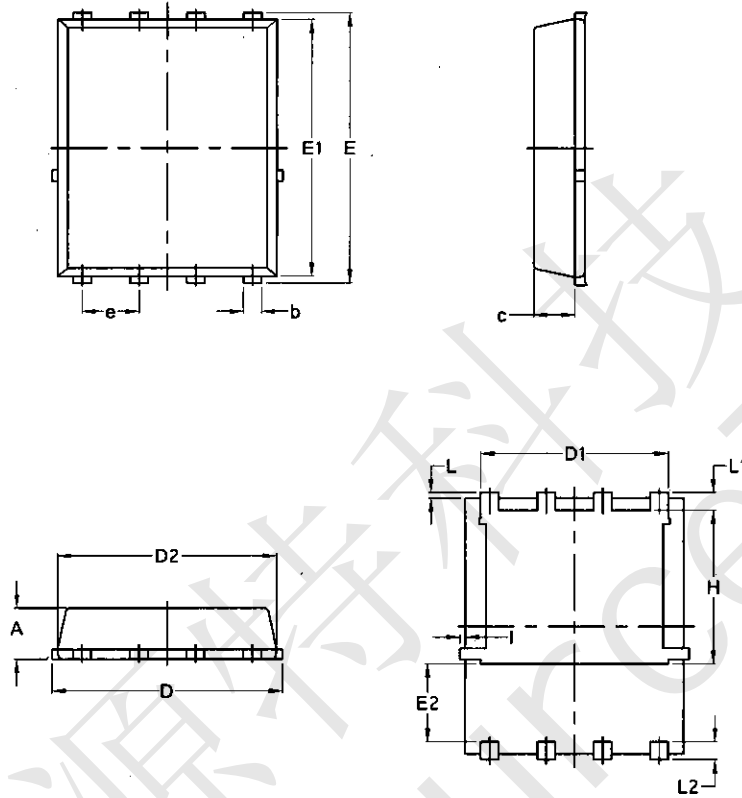


### Gate Charge Test Circuit





CST30N20F Package Mechanical Data-PDFN5060-8L-JQ 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