



### CST20P02D P-Ch 20V Fast Switching MOSFETs

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

#### CST20P02D Product Summary



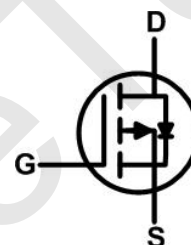
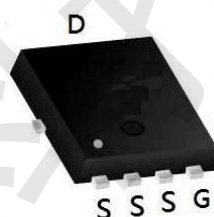
BVDSS	RDSON	ID
-20V	15mΩ	-20A

#### CST20P02D Description

The CST20P02D 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 CST20P02D meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

#### CST20P02D PDFN3333-8L Pin Configuration



#### CST20P02D Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	-20	V
V <sub>GSS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> = 25°C	-20
		T <sub>A</sub> = 100°C	-12
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	-28	A
P <sub>D</sub>	Power Dissipation	5	W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	62.5	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C



#### CST20P02D 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	-20	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = -20V, V <sub>GS</sub> =0V,	-	-	-1	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±12V	-	-	±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	-0.4	-0.7	-1.0	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance note2	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -7A	-	15	20	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -5A	-	21.	32	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = -10V, V <sub>GS</sub> =0V, f=1.0MHz	-	2000	-	pF
C <sub>oss</sub>	Output Capacitance		-	242	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	231	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = -10V, I <sub>D</sub> = -3A, V <sub>GS</sub> = -4.5V	-	15.3	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	2.2	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	4.4	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> = -10V, I <sub>D</sub> = -7A, V <sub>GS</sub> = -4.5V, R <sub>GEN</sub> =2.5Ω	-	10	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	31	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	28	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	8	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	-20	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-28	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> = -7A	-	-0.8	-1.2	V

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

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%



### CST20P02D Typical Performance Characteristics

Figure 1: Output Characteristics

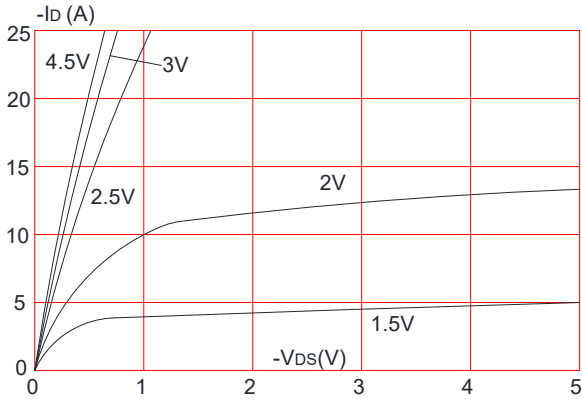


Figure 2: Typical Transfer Characteristics

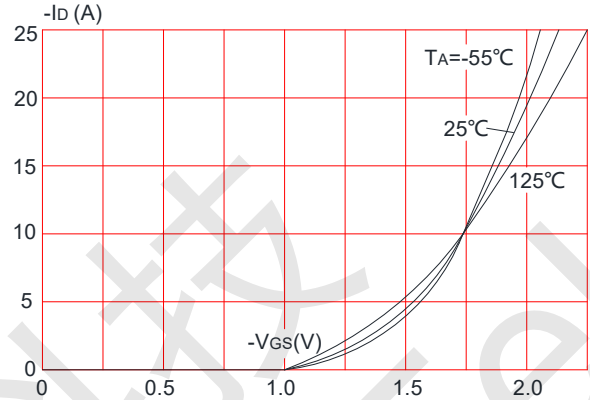


Figure 3: On-resistance vs. Drain Current

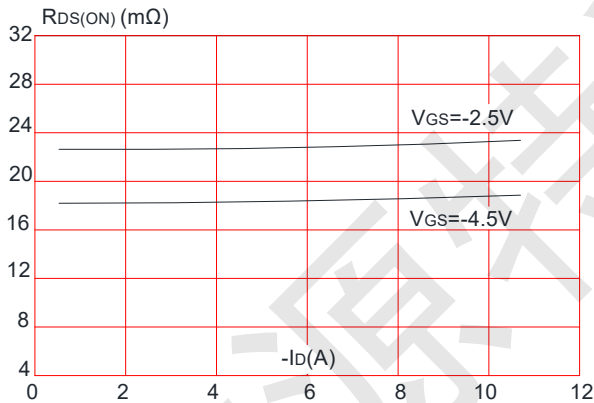


Figure 4: Body Diode Characteristics

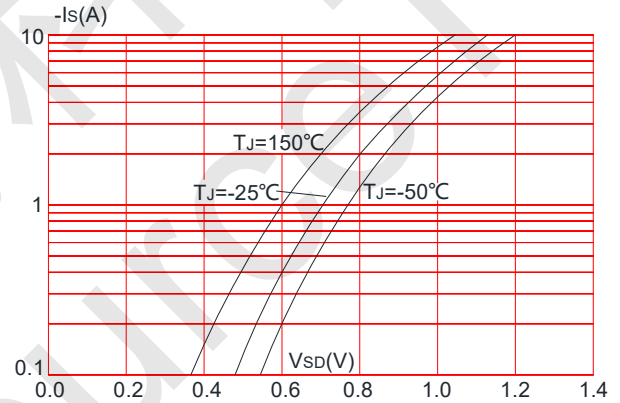


Figure 5: Gate Charge Characteristics

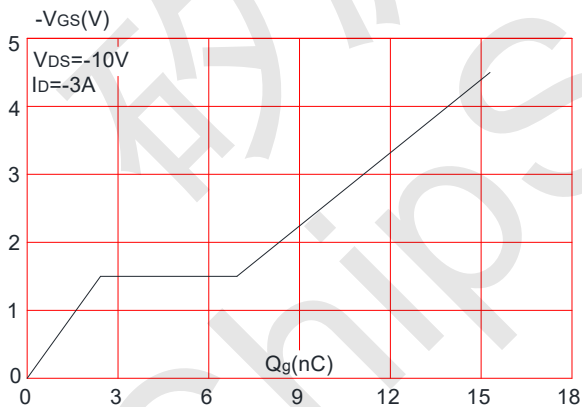
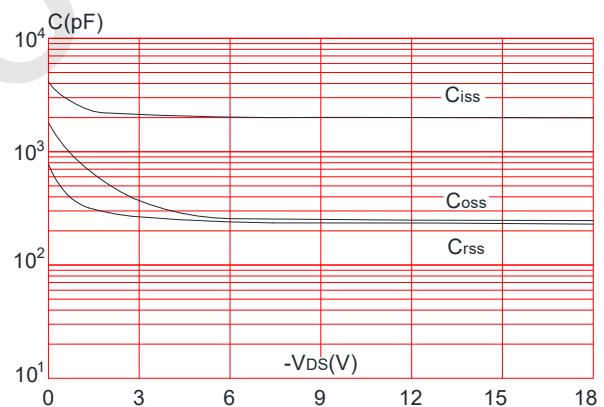


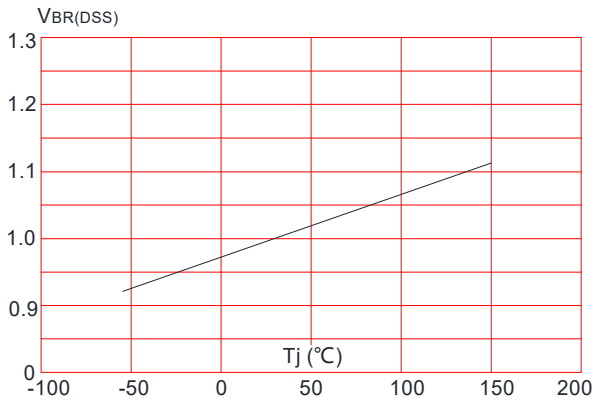
Figure 6: Capacitance Characteristics



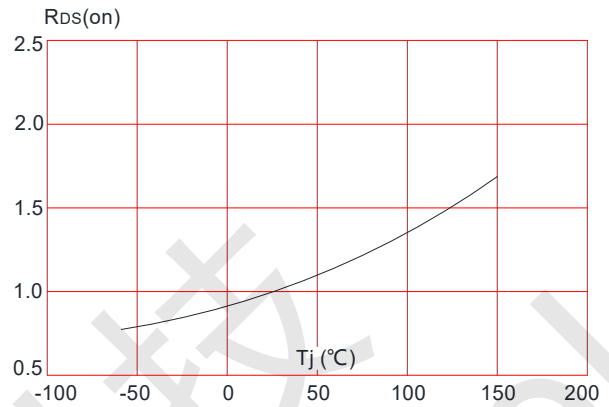


### CST20P02D P-Ch 20V Fast Switching MOSFETs

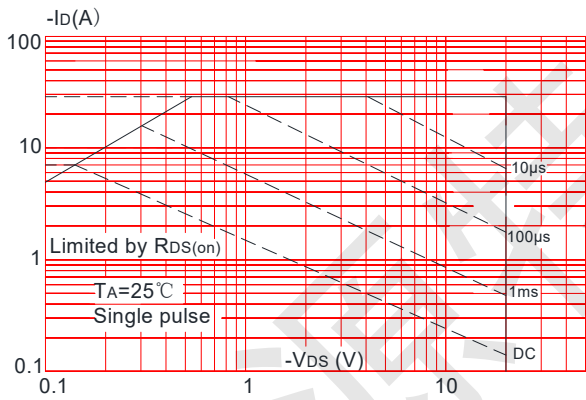
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



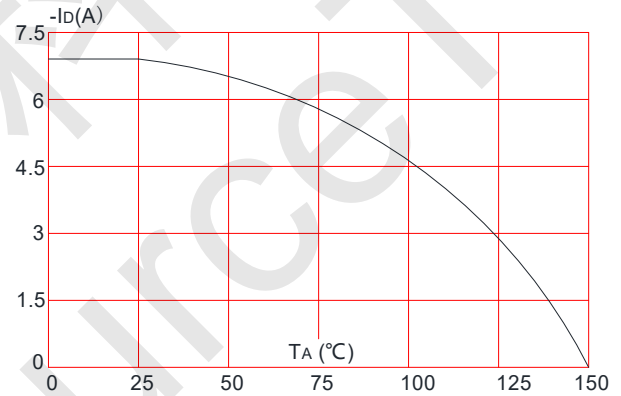
**Figure 8:** Normalized on Resistance vs. Junction Temperature



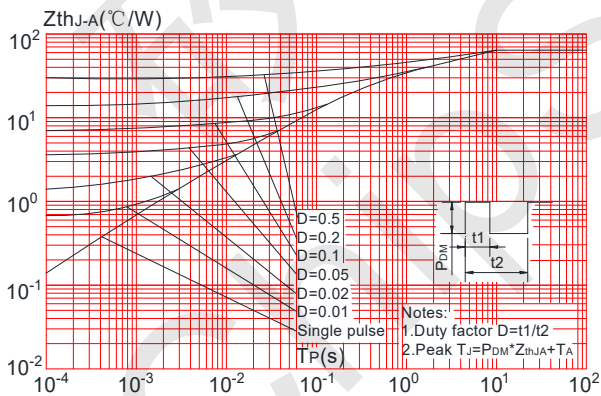
**Figure 9:** Maximum Safe Operating Area



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

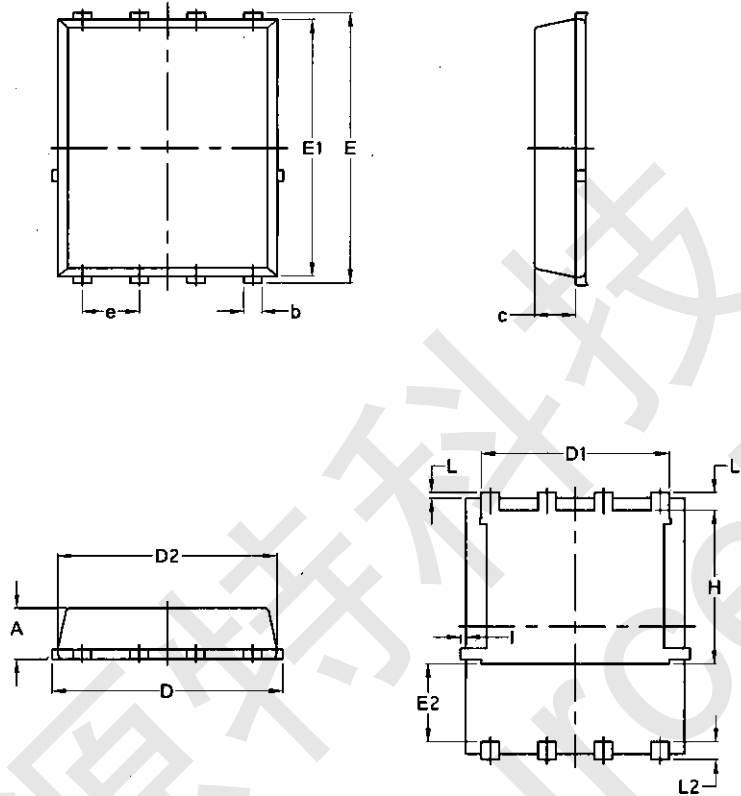


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient





CST20P02D Package Mechanical Data-PDFN3333-8L-Single



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.00	0.03	0.05
b	0.24	0.30	0.35
c	0.10	0.15	0.20
D	3.25	3.32	3.40
D1	3.05	3.15	3.25
D2	2.40	2.50	2.60
E	3.00	3.10	3.20
E1	1.35	1.45	1.55
e	0.65 BSC.		
H	3.20	3.30	3.40
L	0.30	0.40	0.50
L1	0.10	0.15	0.20
L2	1.13 REF.		