



**CST20P80G P-Ch 18V Fast Switching MOSFETs**

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



**CST20P80G Product Summary**

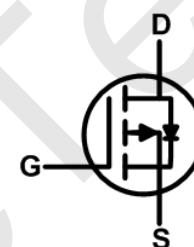
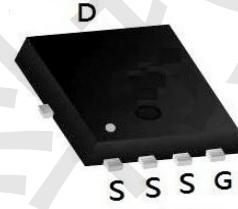
BVDSS	RDS(ON)	ID
-18V	2.4mΩ	-85A

**CST20P80G Description**

The CST20P80G is the high cell density trenched P-ch MOSFETs, which provides excellent RDS(ON) and efficiency for most of the small power switching and load switch applications.

The CST20P80G meet the RoHS and Green Product requirement with full function reliability approved.

**CST20P80G PDFN5060-8L Pin Configuration**



**CST20P80G Absolute Maximum Ratings  $T_c=25^\circ\text{C}$  unless otherwise noted**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-18	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ )	-85	A
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ )	-54	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	-360	A
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	41.67	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.33	W/ °C
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

**CST20P80G Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3	°C/W



**CST20P80G P-Ch 18V Fast Switching MOSFETs**

**CST20P80G Electrical Characteristics (TJ=25 °C, unless otherwise noted)**

**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	VGS=0V , ID=-250uA	-18	---	---	V
△BV <sub>DSS</sub> /△T <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, ID=-1mA	---	-0.008	---	V/°C
IDSS	Drain-Source Leakage Current	V <sub>DS</sub> =-20V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-16V , V <sub>GS</sub> =0V , T <sub>J</sub> =125°C	---	---	-30	uA
IGSS	Gate-Source Leakage Current	V <sub>GS</sub> =±12V , V <sub>DS</sub> =0V	---	---	±500	nA

**On Characteristics**

R <sub>DSON</sub>	Static Drain-Source On-Resistance					mΩ
		V <sub>GS</sub> =-4.5V , ID=-20A	---	2.4	3.2	
		V <sub>GS</sub> =-2.5V , ID=-20A	---	3.3	4.5	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , ID =-250uA	-0.4	-0.6	-1.0	V
			---	-3.44	---	mV/°C
gfs	Forward Transconductance	V <sub>DS</sub> =-10V , Is=-3A	---	30	---	S

**Dynamic and switching Characteristics**

Q <sub>g</sub>	Total Gate Charge <sup>2,3</sup>	V <sub>DS</sub> =-16V , V <sub>GS</sub> =-4.5V , ID=-5A	---	149	---	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2,3</sup>		---	14.4	---	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2,3</sup>		---	42.8	---	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2,3</sup>	V <sub>DD</sub> =-15V , V <sub>GS</sub> =-4.5V , R <sub>G</sub> =25Ω ID=-1A	---	21.2	---	nS
T <sub>r</sub>	Rise Time <sup>2,3</sup>		---	20.6	---	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2,3</sup>		---	26	---	
T <sub>f</sub>	Fall Time <sup>2,3</sup>		---	400	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V , V <sub>GS</sub> =0V , F=1MHz	---	10698	---	pF
C <sub>oss</sub>	Output Capacitance		---	2347	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	1267	---	
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	2.6	---	Ω

**Drain-Source Diode Characteristics and Maximum Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>s</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	-85	A
I <sub>SM</sub>	Pulsed Source Current		---	---	-190	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>s</sub> =-1A , T <sub>J</sub> =25°C	---	---	-1	V

Note :

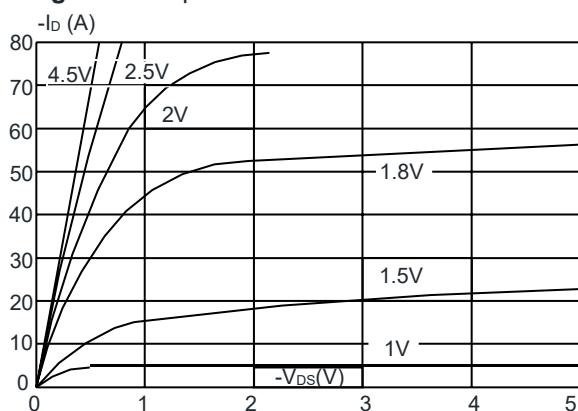
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



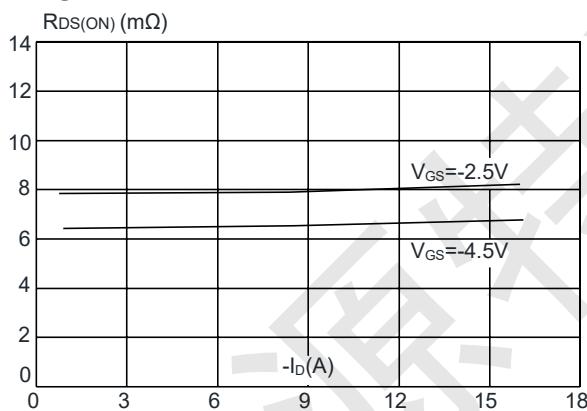
CST20P80G P-Ch 18V Fast Switching MOSFETs

**CST20P80G Typical Performance Characteristics**

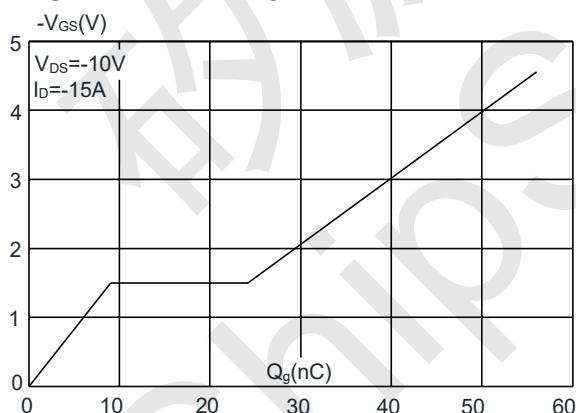
**Figure1:** Output Characteristics



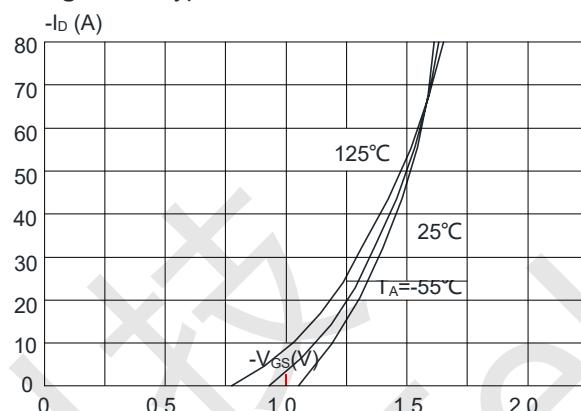
**Figure 3:** On-resistance vs. Drain Current



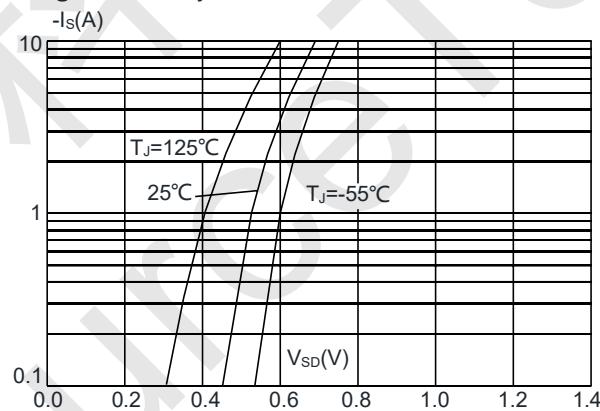
**Figure 5: Gate Charge Characteristics**



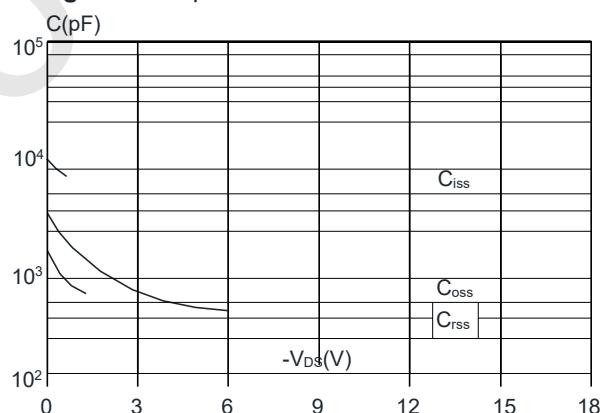
**Figure 2:** Typical Transfer Characteristics



**Figure 4:** Body Diode Characteristics



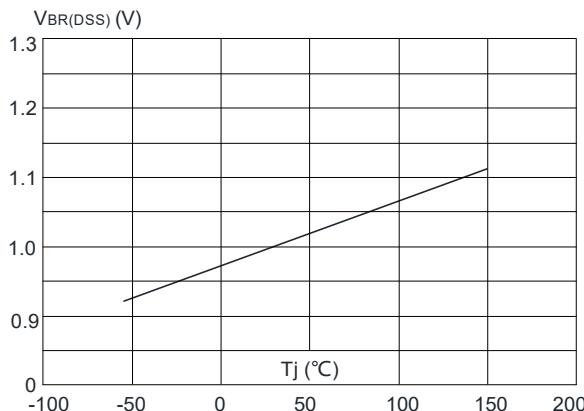
**Figure 6: Capacitance Characteristics**



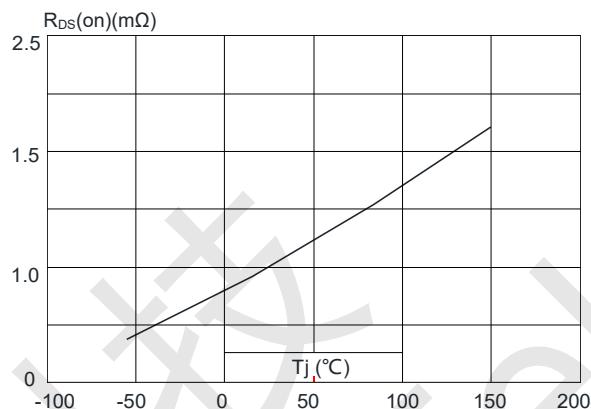


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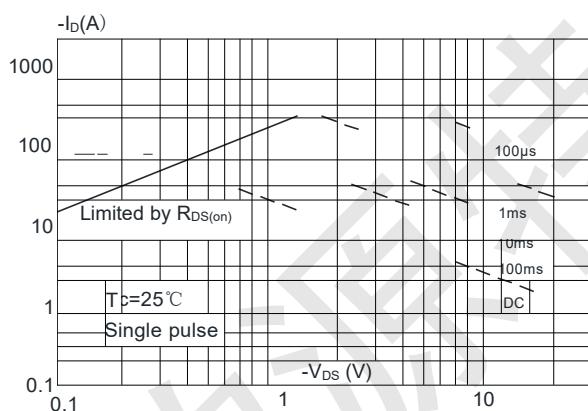
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



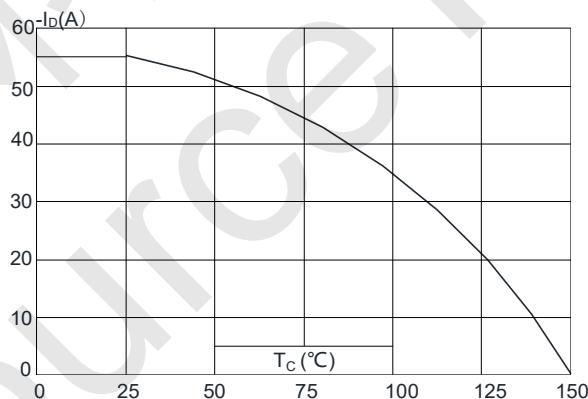
**Figure 8:** Normalized on Resistance vs. Junction Temperature



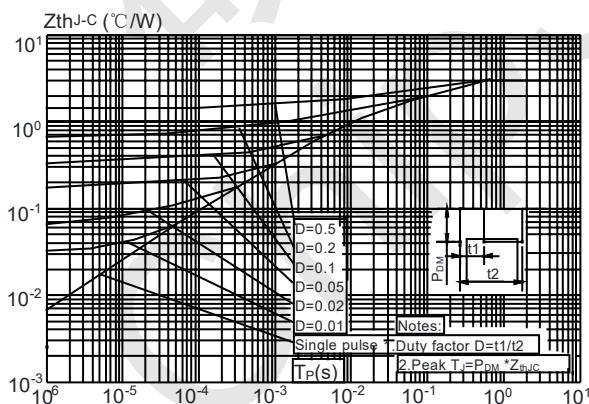
**Figure 9:** Maximum Safe Operating Area



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



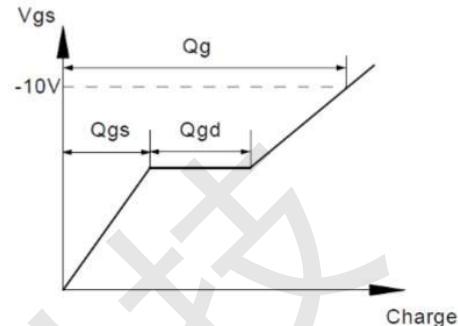
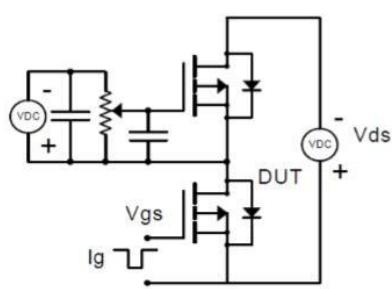
**Figure 11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



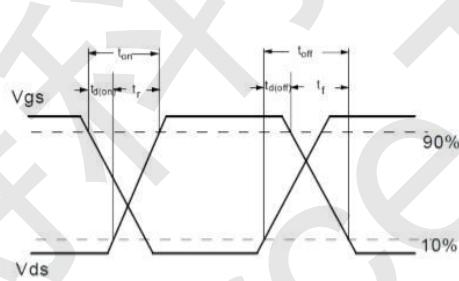
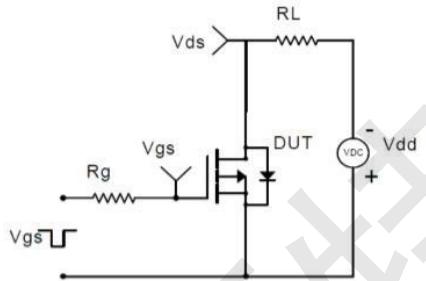


## CST20P80G Test Circuit

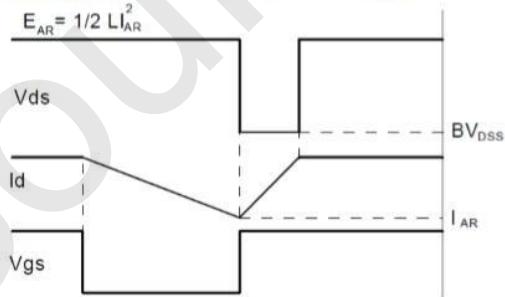
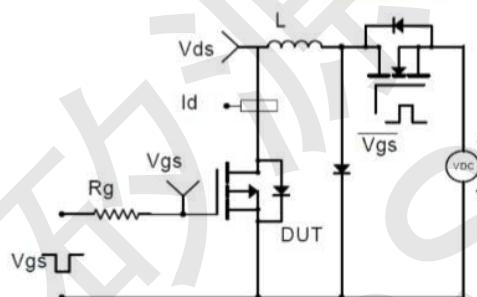
Gate Charge Test Circuit & Waveform



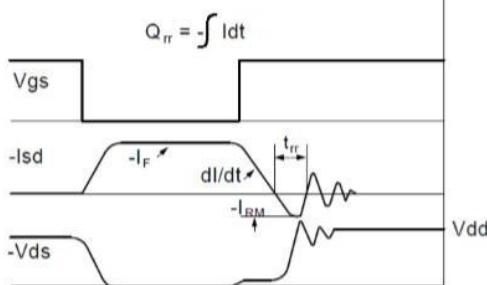
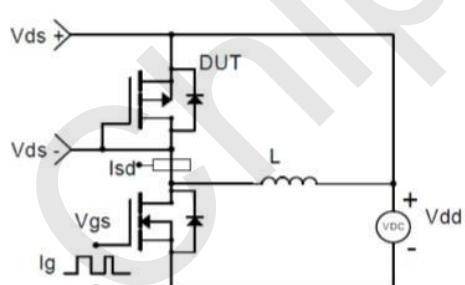
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



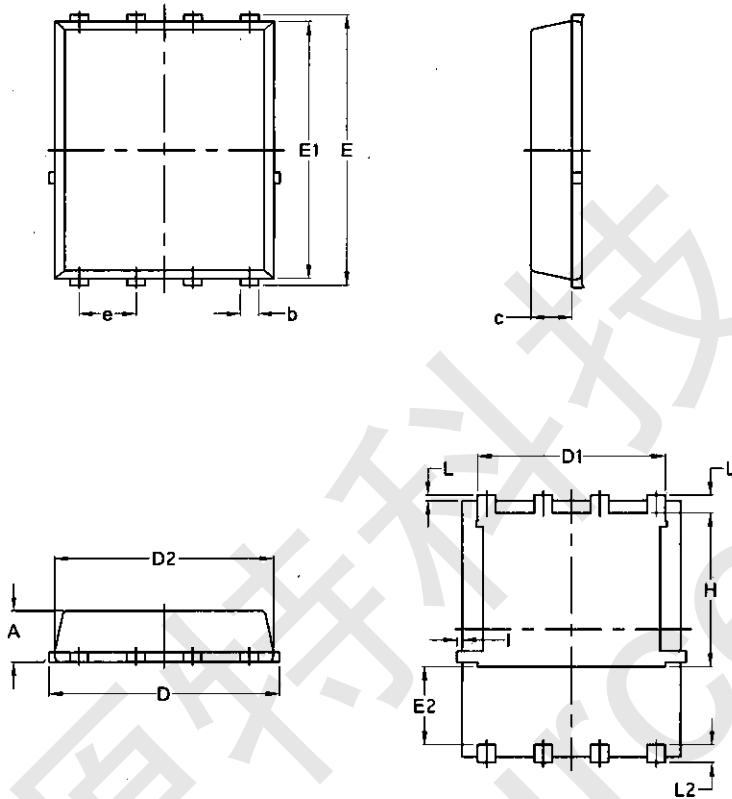
Diode Recovery Test Circuit & Waveforms





CST20P80G P-Ch 18V Fast Switching MOSFETs

CST20P80G Package Mechanical Data-PDFN5060-8L- Single



Symbol	Common			
	mm		Inch	
	Mim	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