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

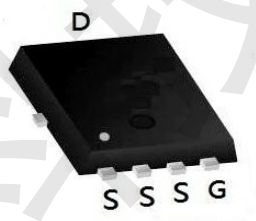
BVDSS	RDSON	ID
-18V	2.4mΩ	-85A

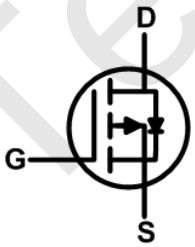
CST20P80G Description

The CST20P80G is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON 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 Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-18	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current – Continuous (T_C=25℃)	-85	A
	Drain Current – Continuous (T_C=100℃)	-54	A
I_{DM}	Drain Current – Pulsed[1]	-360	A
P_D	Power Dissipation (T_C=25℃)	41.67	W
	Power Dissipation – Derate a bove 25℃	0.33	W/ ℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

CST20P80G Thermal Characteristics

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

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CST20P80G Electrical Characteristics (TJ=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-18	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=-1mA	---	-0.008	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-16V , V_{GS}=0V , T_J=125℃	---	---	-30	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±500	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance					mΩ
		V_{GS}=-4.5V , I_D=-20A	---	2.4	3.2	
		V_{GS}=-2.5V , I_D=-20A	---	3.3	4.5	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.4	-0.6	-1.0	V
$\triangle V_{GS}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.44	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-10V , I_S=-3A	---	30	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=-16V , V_{GS}=-4.5V , I_D=-5A	---	149		nC
Q_{gs}	Gate-Source Charge[2,3]		---	14.4		
Q_{gd}	Gate-Drain Charge[2,3]		---	42.8		
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=-15V , V_{GS}=-4.5V , R_G=25Ω I_D=-1A	---	21.2		nS
T_r	Rise Time[2,3]		---	20.6		
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	26		
T_f	Fall Time[2,3]		---	400		
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , F=1MHz	---	10698		pF
C_{oss}	Output Capacitance		---	2347		
C_{rss}	Reverse Transfer Capacitance		---	1267		
Rg	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.6	---	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-85	A
I_{SM}	Pulsed Source Current		---	---	-190	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-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.

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CST20P80G Typical Performance Characteristics

Figure1: Output Characteristics

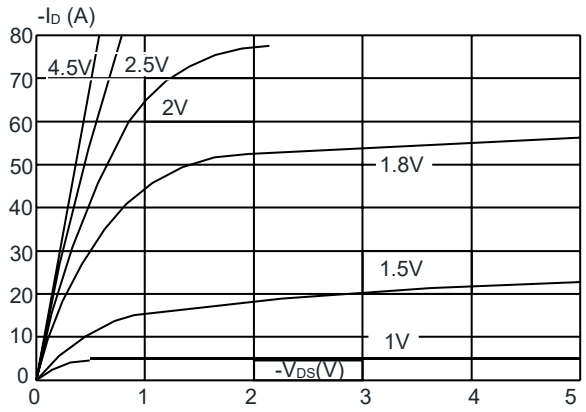

Figure 2: Typical Transfer Characteristics

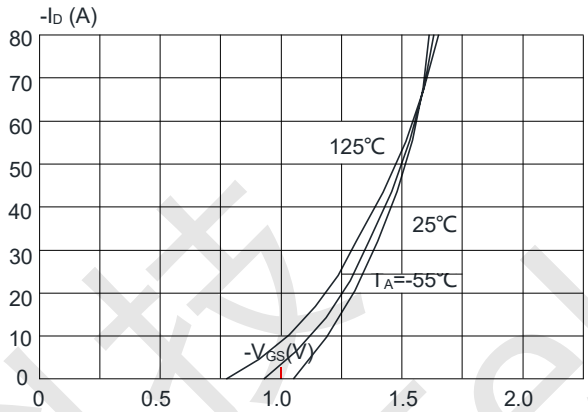

Figure 3: On-resistance vs. Drain Current

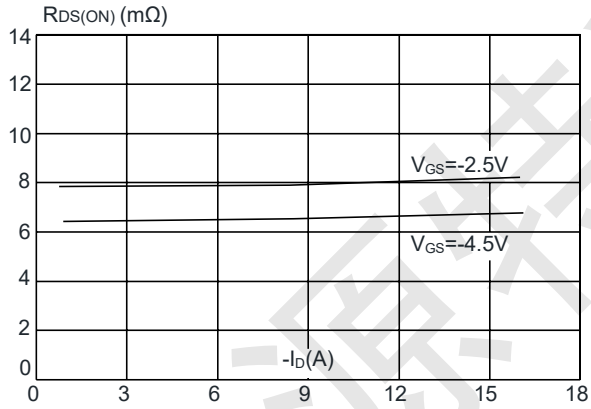

Figure 4: Body Diode Characteristics

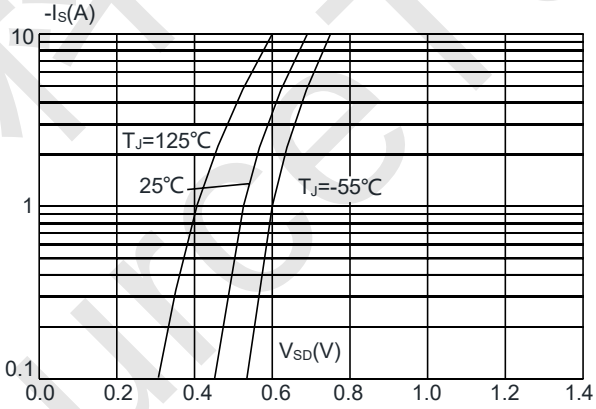

Figure 5: Gate Charge Characteristics

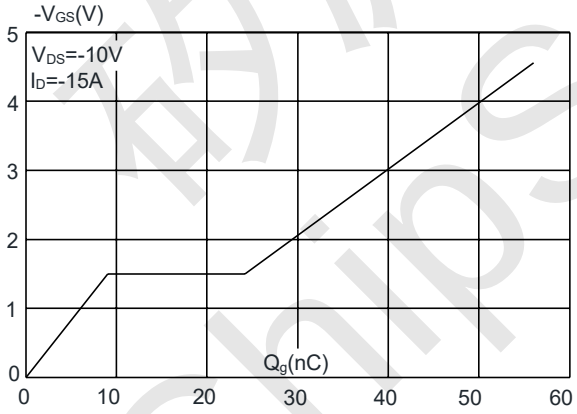

Figure 6: Capacitance Characteristics

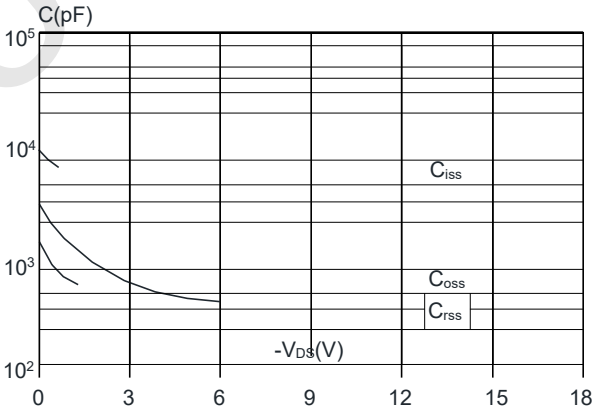

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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

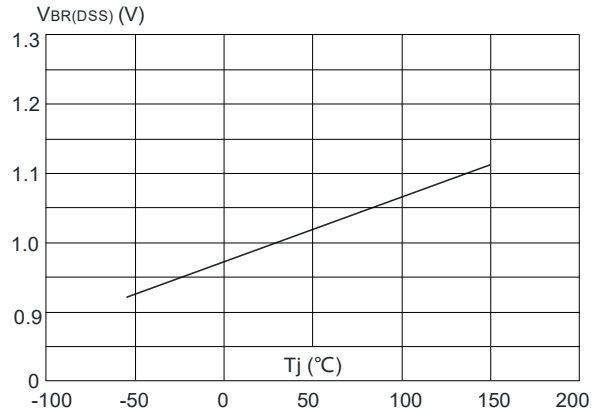


Figure 8: Normalized on Resistance vs. Junction Temperature

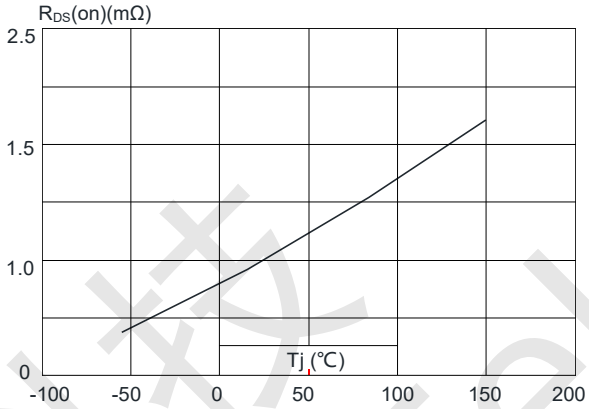


Figure 9: Maximum Safe Operating Area

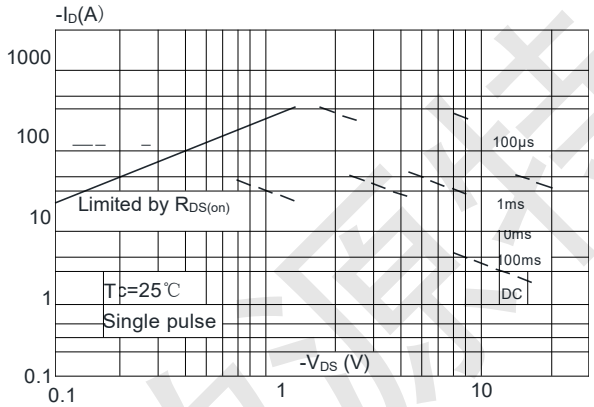


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

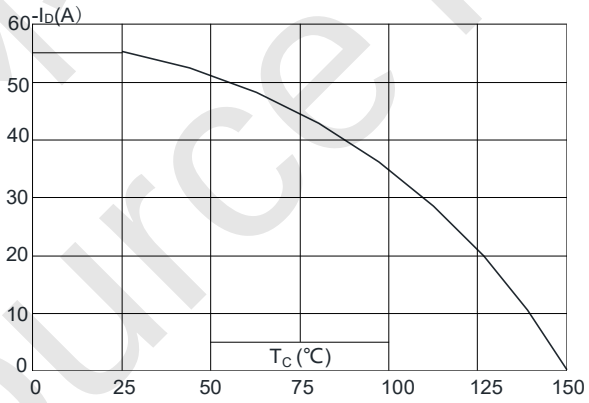
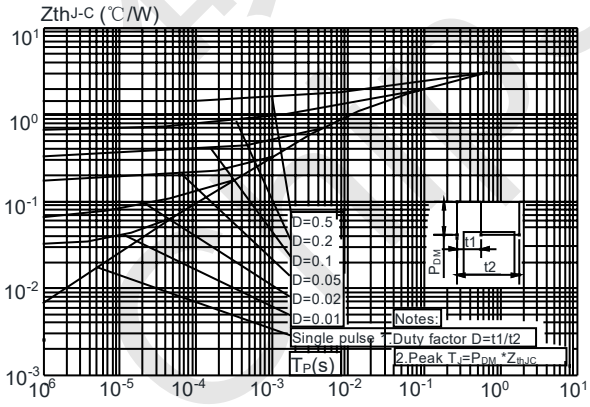
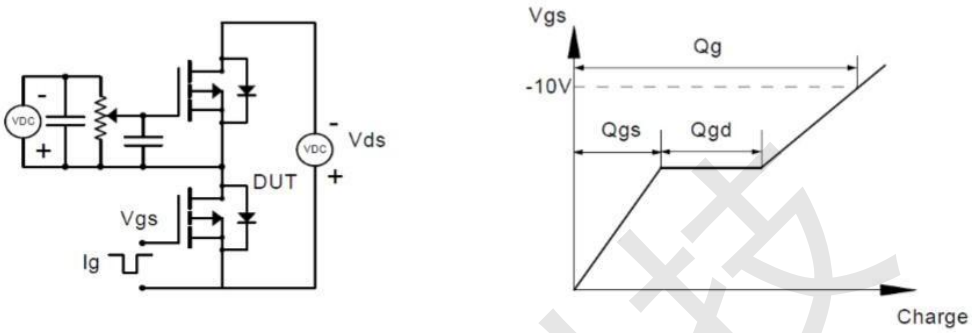


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

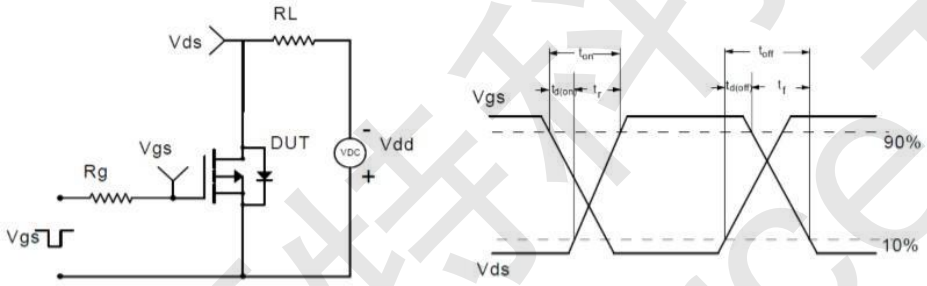


CST20P80G Test Circuit

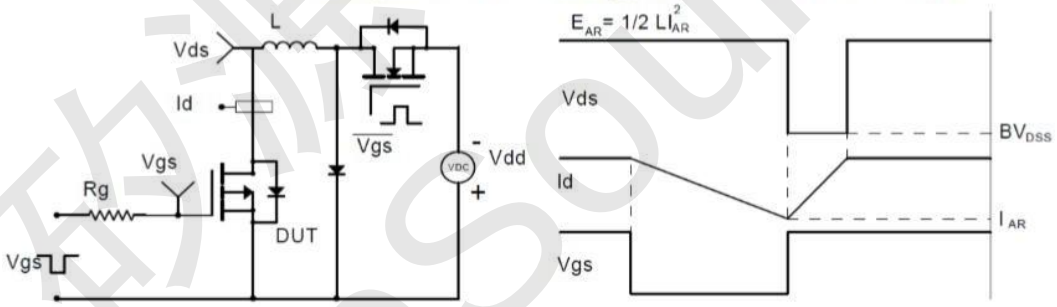
Gate Charge Test Circuit & Waveform



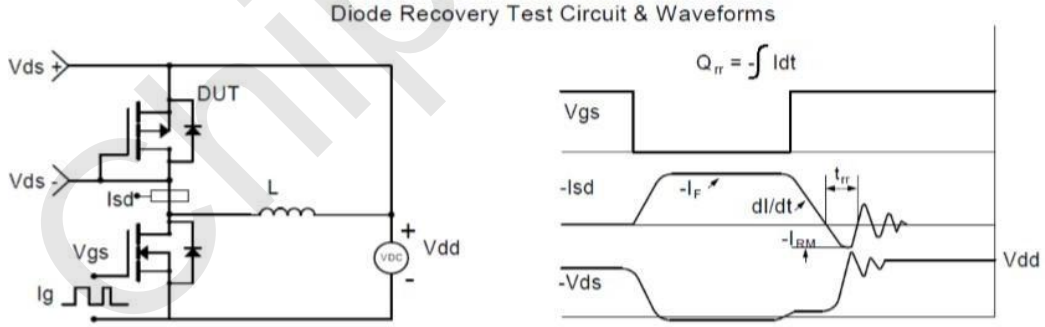
Resistive Switching Test Circuit & Waveforms



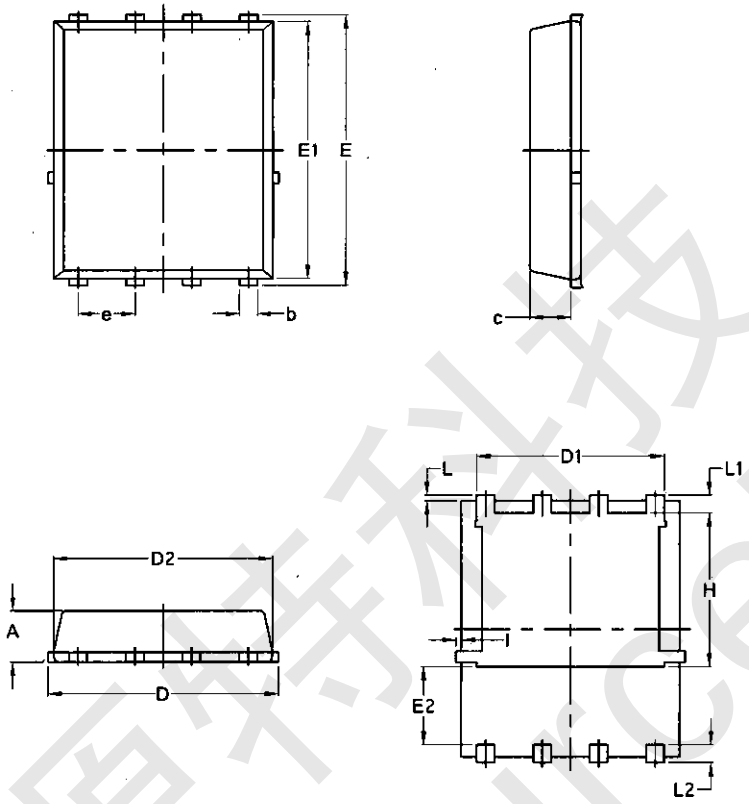
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



CST20P80G 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