CST20P70F P-Ch 18V Fast Switching MOSFETs

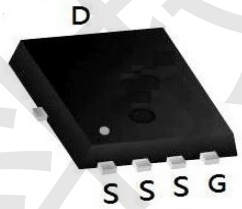
★ Super Low Gate Charge
★ Green Device Available
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

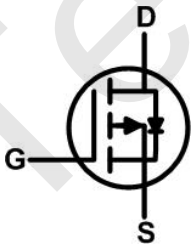
CST20P70F Product Summary

Green

BVDSS	RDSON	ID
-18V	3.6mΩ	-70A

CST20P70F PDFN5060-8L Pin Configuration





CST20P70F Description

The CST20P70F 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 CST20P70F meet the RoHS and Green Product requirement with full function reliability approved.

CST20P70F Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-18	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-70	A
I_D@T_C=70℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-53	A
I_{DM}	Pulsed Drain Current[2]	-280	A
P_D@T_C=25℃	Total Power Dissipation[3]	62	W
P_D@T_C=70℃	Total Power Dissipation[3]	35	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

CST20P70F Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	3	℃/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)		℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]		℃/W

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CST20P70F Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-15	18	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -15V, V_{GS} = 0V,	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250μA	-0.35	-0.65	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =-4.5V, I_D =-15A	-	3.6	5.5	mΩ
		V_{GS} =-2.5V, I_D =-12A	-	4.5	92	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =-10V, V_{GS} =0V, f = 1.0MHz	-	6600	-	pF
C_{oss}	Output Capacitance		-	460	-	pF
C_{rss}	Reverse Transfer Capacitance		-	659	-	pF
Q_g	Total Gate Charge	V_{DS} =-10V, I_D =-15A, V_{GS} =-4.5V	-	76	-	nC
Q_{gs}	Gate-Source Charge		-	10	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	20	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} =-10V, I_D =-13A, R_{GEN}=2.7Ω,V_{GS} =-10V	-	14	-	ns
t_r	Turn-on Rise Time		-	130	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	187	-	ns
t_f	Turn-off Fall Time		-	190	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-70	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-280	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =-30A	-	-	-1.2	V
trr	Reverse Recovery Time	T_J=25℃,I_{SD}=-15A, V_{GS}=0V di/dt=-100A/μs	-	23	-	ns
Qrr	Reverse Recovery Charge		-	14	-	Nc

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

2. EAS condition: T_J=25℃,V_{DD}=-10V,V_G=-10V, R_G=5.9Ω, L=0.5mh,I_{AS}=-16A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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CST20P70F Typical Performance Characteristics

Figure1: Output Characteristics

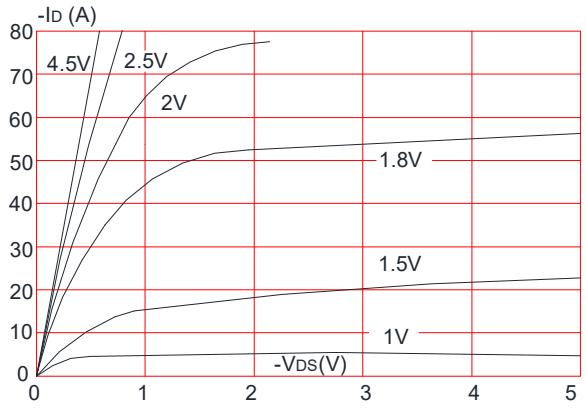

Figure 2: Typical Transfer Characteristics

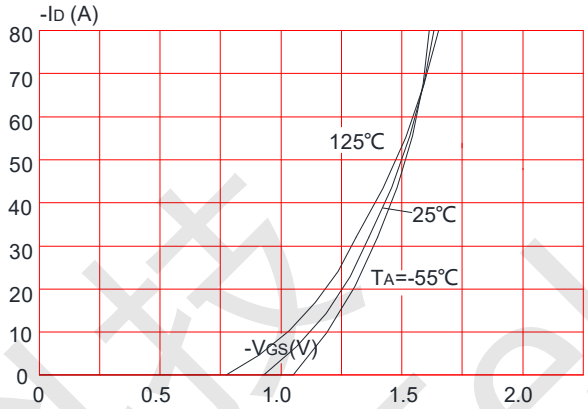

Figure 3: On-resistance vs. Drain Current

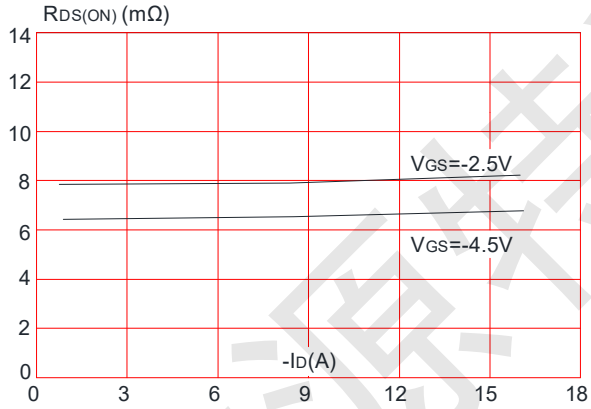

Figure 4: Body Diode Characteristics

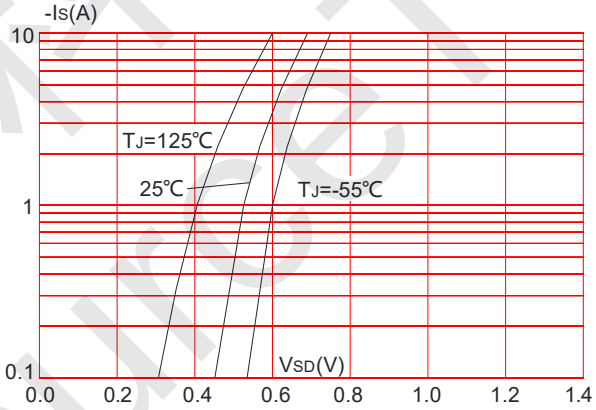

Figure 5: Gate Charge Characteristics

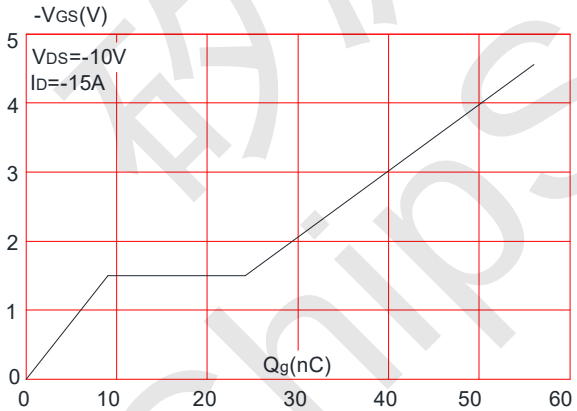

Figure 6: Capacitance Characteristics

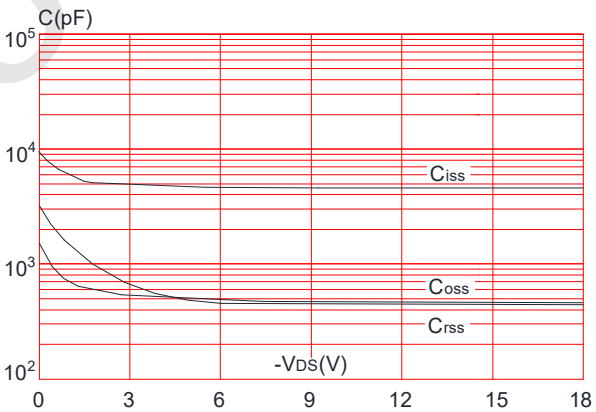

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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

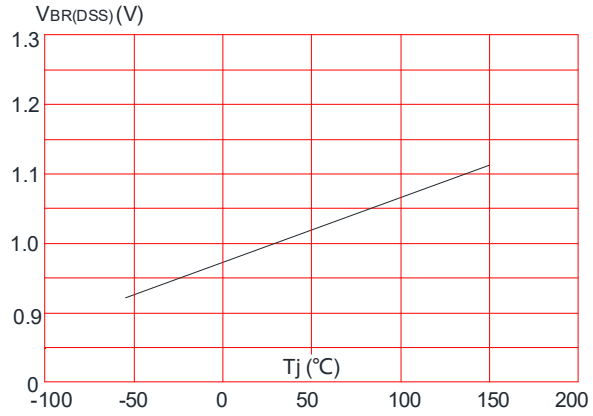


Figure 8: Normalized on Resistance vs. Junction Temperature

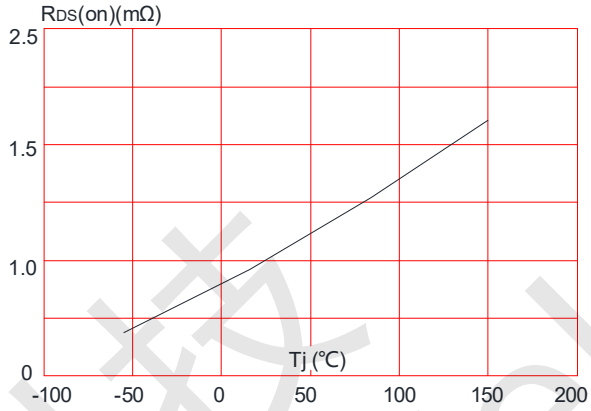


Figure 9: Maximum Safe Operating Area

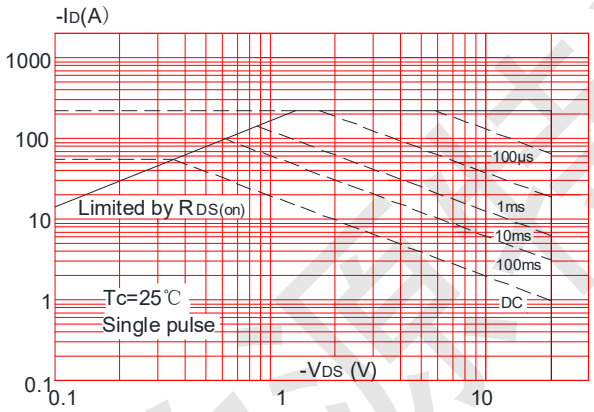


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

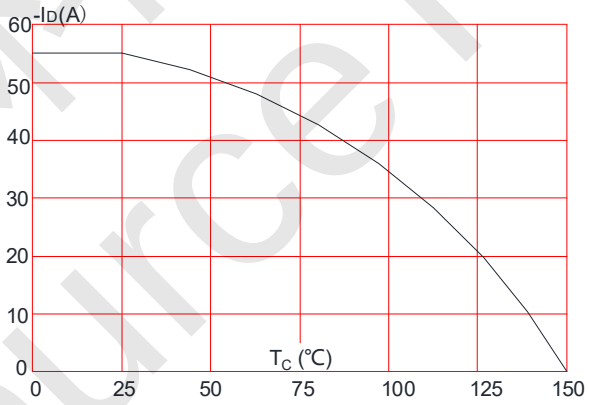
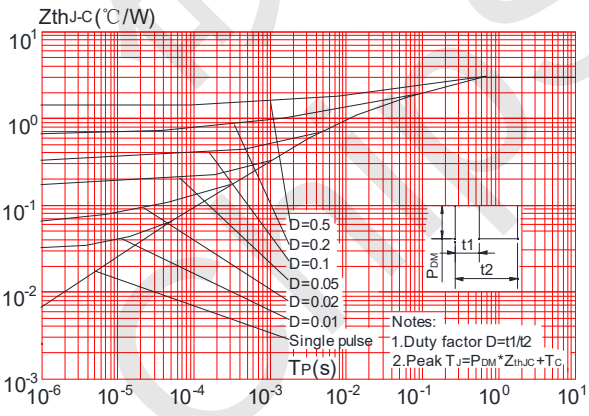
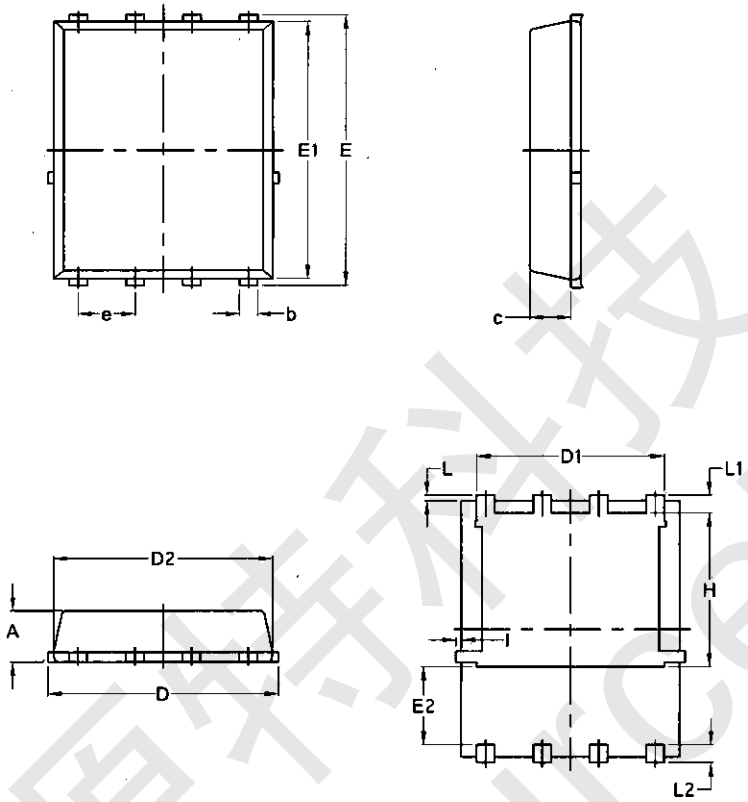


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



CST20P70F 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