



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

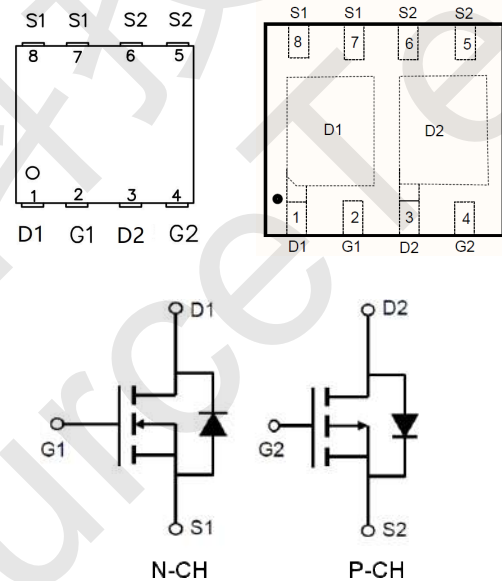
CST8G02M Product Summary

BVDSS	RDSON	ID
20V	12mΩ	8A
-20V	17mΩ	-8A

CST8G02M Description

The CST8G02M 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 CST8G02M meet the RoHS and Green Product requirement with full function reliability approved.

CST8G02M DFN2020-8L Pin Configuration



CST8G02M Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit		Unit
		N	P	
Drain-source voltage	V_{DS}	20	-20	V
Gate-source voltage	V_{GS}	±12	±12	V
Operating junction Temperature range	T_j	-55—150	-55—150	°C
Drain Current-Continuous (Silicon Limited)	$T_A=25^\circ\text{C}$	8	-8	A
	$T_A=75^\circ\text{C}$	6	-6	
Pulsed Drain Current (Package Limited)	I_{DM}	32	-28	A
Avalanche Current ^C	I_{AS}, I_{AR}	16	-27	A
Avalanche energy L=0.1mH ^C	E_{AS}, E_{AR}	20	36	mJ
Power Dissipation ^B	$T_A=25^\circ\text{C}$	15	20	W
	$T_A=75^\circ\text{C}$	4	8	
Junction and Storage Temperature Range	T_J, T_{STG}	-55—150		°C



CST8G02M N-Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1.5	V
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =5A	-	12	15	mΩ
		V _{GS} =2.5V, I _D =5A	-	16	23	
Forward transconductance	g _{fs}	V _{DS} =5V, I _D =5A	-	15	-	S
Dynamic Characteristics						
Input capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V f=1.0MHz	-	740	-	pF
Output capacitance	C _{OSS}		-	110	-	
Reverse transfer capacitance	C _{RSS}		-	82	-	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	-	1.1	-	Ω
Switching Characteristics						
Turn-on delay time	t _{D(ON)}	V _{DS} =15V V _{GS} =10V R _L =1.8Ω R _{GEN} =3Ω	-	5	-	ns
Rise time	t _r		-	3.5	-	
Turn-off delay time	t _{D(OFF)}		-	9	-	
Fall time	t _f		-	3.5	-	
Total gate charge	Q _g	V _{DS} =15V, I _D =5A V _{GS} =10V	-	15	-	nC
Gate-source charge	Q _{gs}		-	2.5	-	
Gate-drain charge	Q _{gd}		-	3	-	



CST8G02M P-Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-20	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	-	-	-1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.7	-1.5	V
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-5A	-	17	25	mΩ
		V _{GS} =-2.5V, I _D =-5A	-	24	30	
Forward transconductance	g _{fs}	V _{DS} =-5V, I _D =-5A	-	18	-	S
Dynamic Characteristics						
Input capacitance	C _{ISS}	V _{DS} =-15V, V _{GS} =0V f=1.0MHz	-	1040	-	pF
Output capacitance	C _{OSS}		-	180	-	
Reverse transfer capacitance	C _{RSS}		-	125	-	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	-	4	-	Ω
Switching Characteristics						
Turn-on delay time	t _{D(ON)}	V _{DS} =-15V V _{GS} =-10V R _L =2.3Ω R _{GEN} =3Ω	-	10	-	ns
Rise time	t _r		-	5.5	-	
Turn-off delay time	t _{D(OFF)}		-	3.6	-	
Fall time	t _f		-	4.6	-	
Total gate charge	Q _g	V _{DS} =-15V, I _D =-5A V _{GS} =-10V	-	19	-	nC
Gate-source charge	Q _{gs}		-	3.6	-	
Gate-drain charge	Q _{gd}		-	4.6	-	



CST8G02M N-Channel Typical Characteristics

Figure 1: Output Characteristics

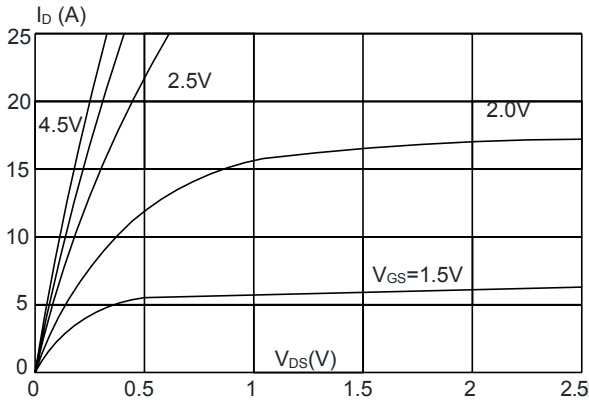


Figure 2: Typical Transfer Characteristics

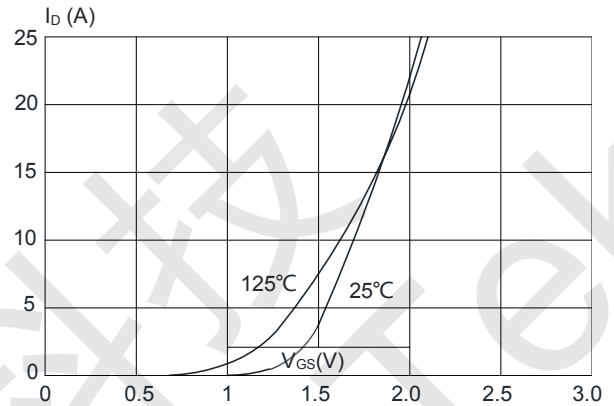


Figure 3: On-resistance vs. Drain Current

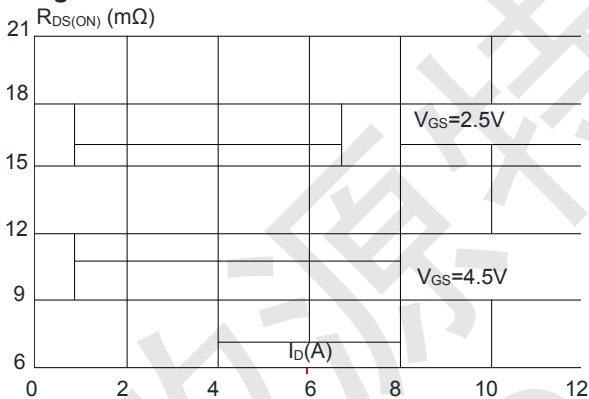


Figure 4: Body Diode Characteristics

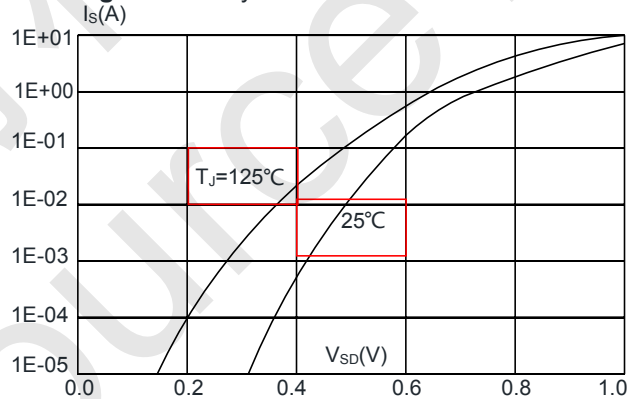


Figure 5: Gate Charge Characteristics

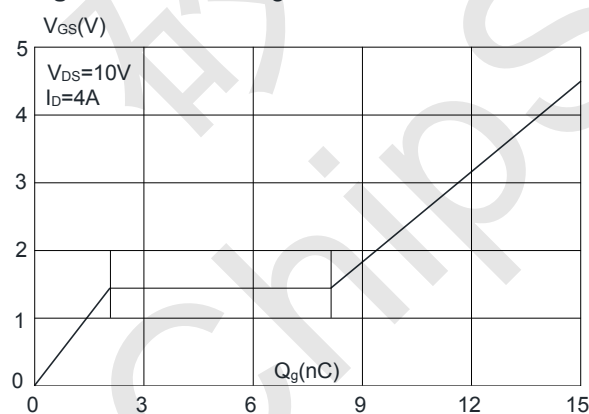
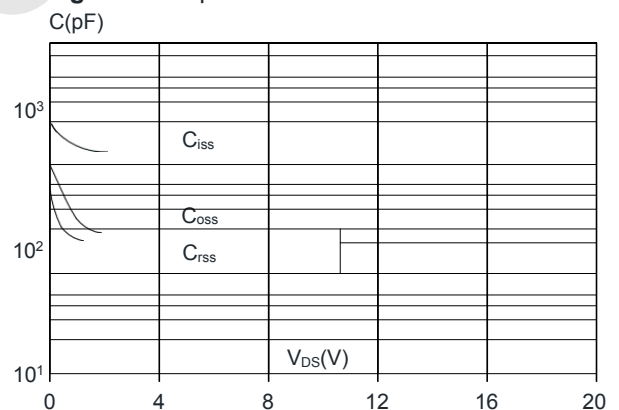


Figure 6: Capacitance Characteristics





CST8G02M N+P-Ch 20V Fast Switching MOSFETs

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

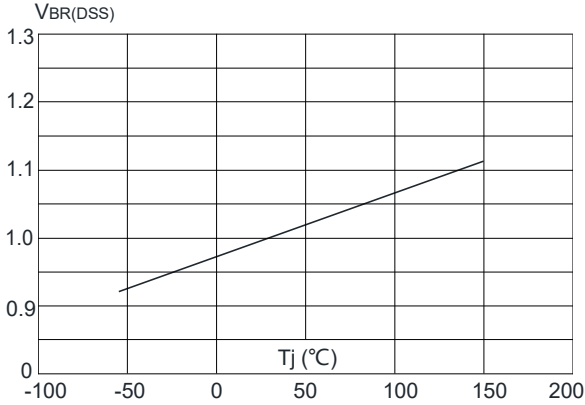


Figure 8: Normalized on Resistance vs. Junction Temperature

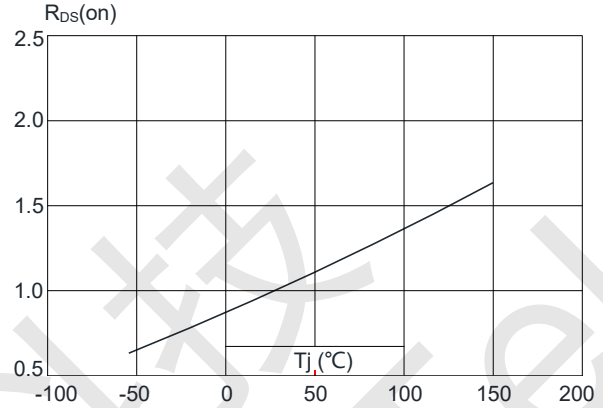


Figure 9: Maximum Safe Operating Area

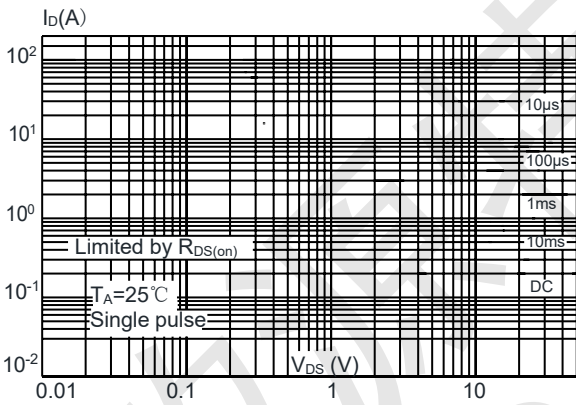


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

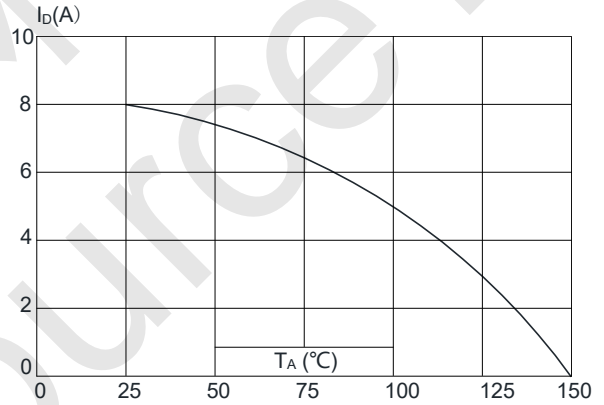
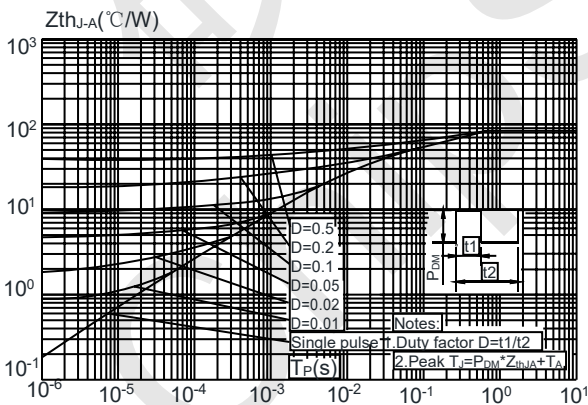


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient





CST8G02M P-Channel Typical Characteristics

Figure 1: Output Characteristics

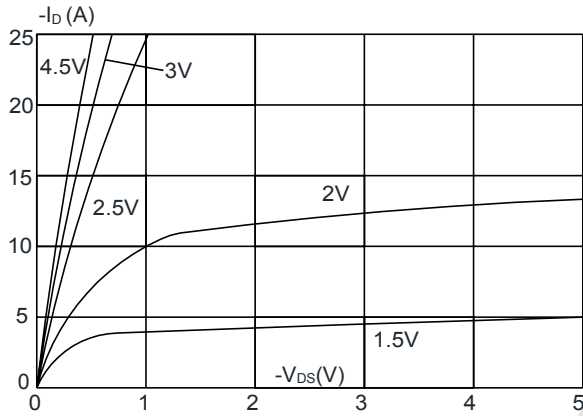


Figure 2: Typical Transfer Characteristics

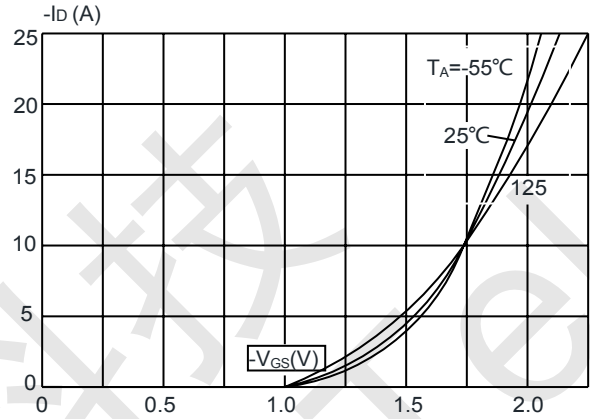


Figure 3: On-resistance vs. Drain Current

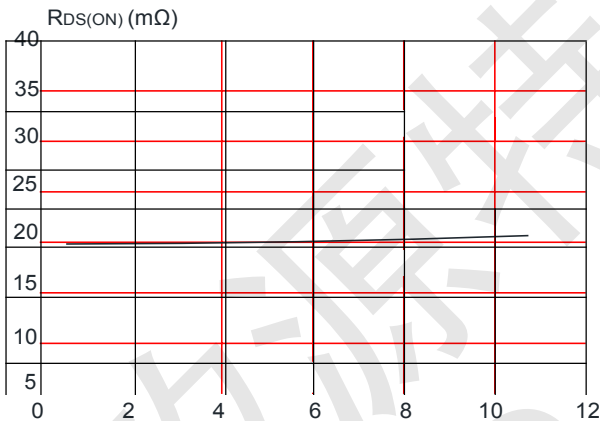


Figure 4: Body Diode Characteristics

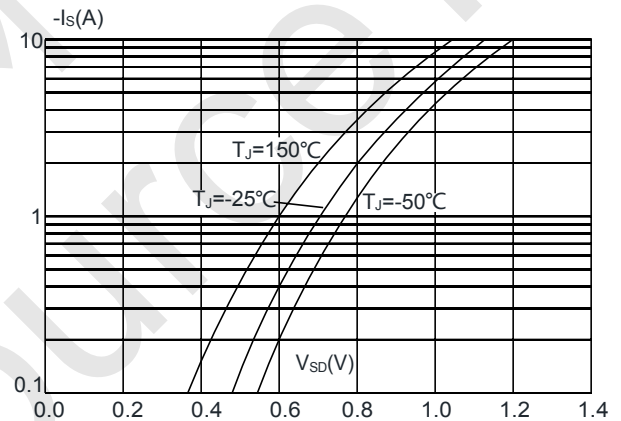


Figure 5: Gate Charge Characteristics

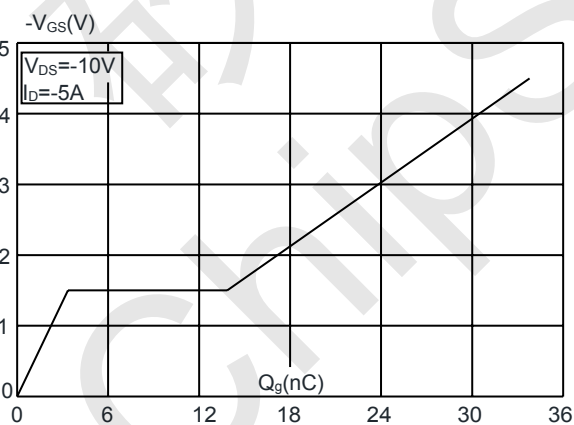
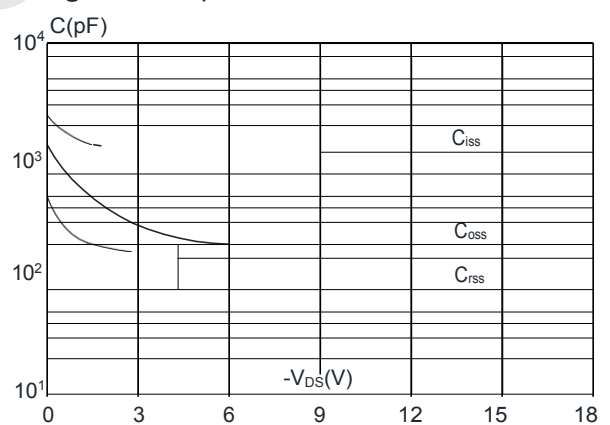


Figure 6: Capacitance Characteristics





CST8G02M N+P-Ch 20V Fast Switching MOSFETs

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

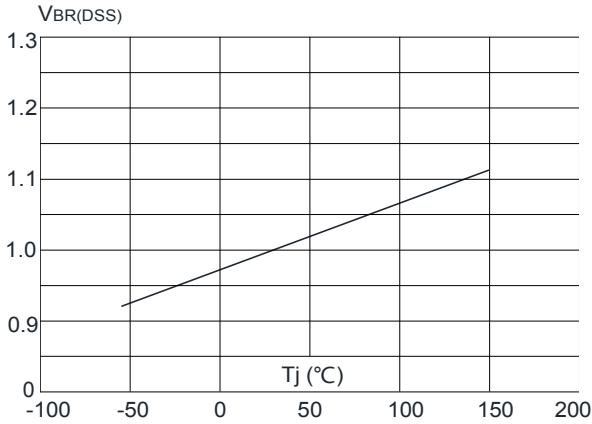


Figure 8: Normalized on Resistance vs. Junction Temperature

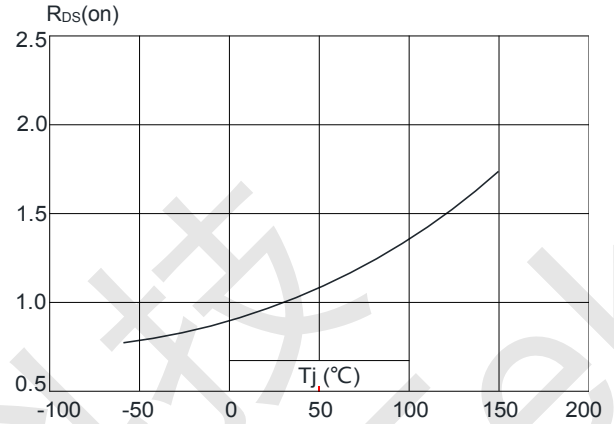


Figure 9: Maximum Safe Operating Area

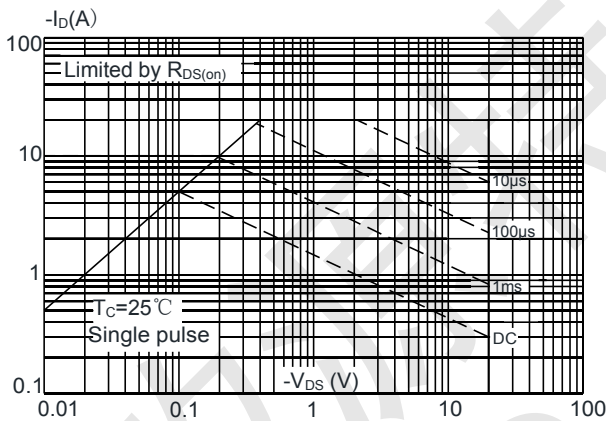


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

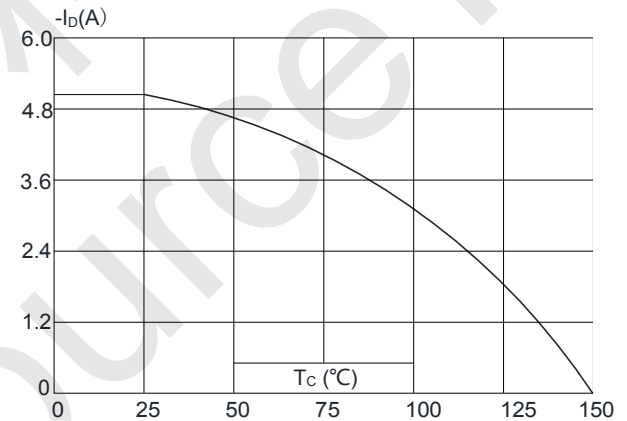
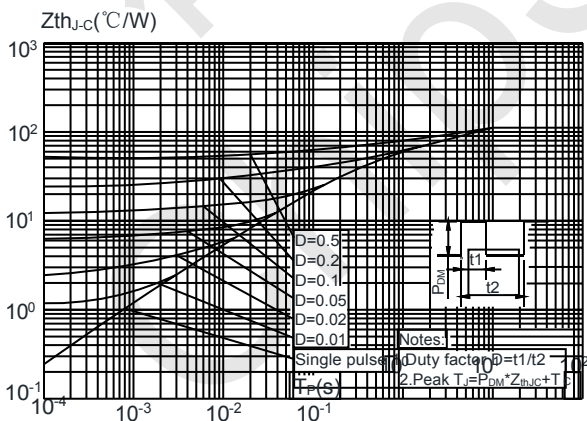
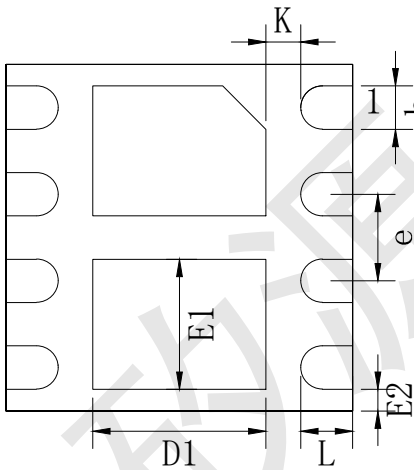
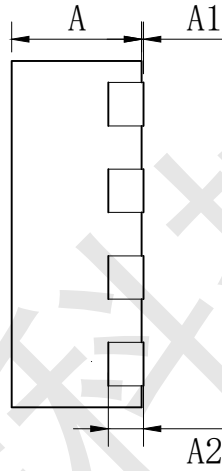
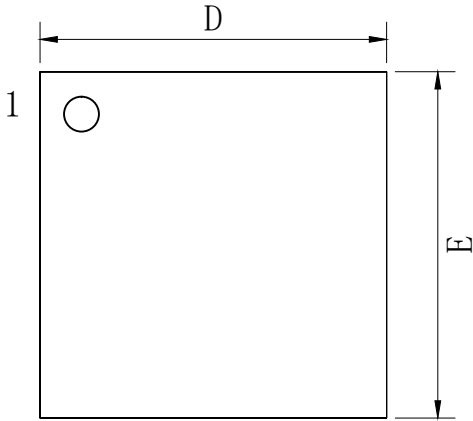


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case





CST8G02M Package Mechanical Data-DFN2020-8L



SYMBOL	MILLMETER		
	MIN	NOM	MAX
A	—	—	0.80
A1	0.00	—	0.05
A2	0.203 TIY		
b	0.20	0.25	0.30
D	1.95	2.00	2.05
D1	0.95	1.00	1.05
E	1.95	2.00	2.05
E1	0.70	0.75	0.80
E2	0.125 TIY		
e	0.50 BSC		
K	0.20 BSC		
L	0.25	0.30	0.35