



CSTS80P06F P-Ch 60V Fast Switching MOSFETs

CSTS80P06F Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

CSTS80P06F Product Summary

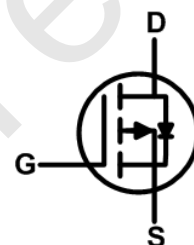
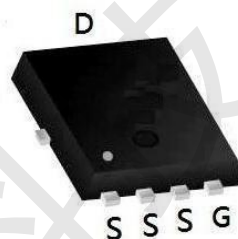


BVDSS	RDSON	ID
-60V	7.9mΩ	-80A

CSTS80P06F Applications

- Battery switching application
- Hard switched and high frequency circuits
- Power management

CSTS80P06F PDFN5060-8L Pin Configuration



CSTS80P06F Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ^{1,6}	-80	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ^{1,6}	-50	A
I_{DM}	Pulsed Drain Current ²	-320	A
EAS	Single Pulse Avalanche Energy ³	450	mJ
I_{AS}	Avalanche Current	---	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	110	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

CSTS80P06F Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	60	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.1	$^{\circ}C/W$



CSTS80P06F P-Ch 60V Fast Switching MOSFETs

CSTS80P06F Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-60	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	---	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-15A	---	7.9	9.8	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.6	-1.8	-2.3	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	---	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-60V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-60, V _{GS} =0V, T _J =100°C	---	---	-100	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-20A	50	---	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	2	---	Ω
Q _g	Total Gate Charge	V _{DS} =-30, V _{GS} =-10V, I _D =-20A	---	56	---	nC
Q _{gs}	Gate-Source Charge		---	11	---	
Q _{gd}	Gate-Drain Charge		---	9	---	
T _{d(on)}	Turn-On Delay Time	V _{GS} =-10V, V _{DD} =-30V, R _G =3Ω, I _D =-15A	---	4.5	---	ns
T _r	Rise Time		---	2.5	---	
T _{d(off)}	Turn-Off Delay Time		---	14.5	---	
T _f	Fall Time		---	3.5	---	
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	---	3060	---	pF
C _{oss}	Output Capacitance		---	620	---	
C _{rss}	Reverse Transfer Capacitance		---	20	---	

CSTS80P06F Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-80	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =-15A, T _J =25°C	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-15A, di/dt=100A/μs	---	60	---	nS
Q _{rr}	Reverse Recovery Charge	μs, T _J =25°C	---	105	---	nC

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%

3.The EAS data shows Max. rating. The test condition is T_J = C, V_{DD}=-30V, V_{GS}=-10V, L=0.5mH

4.The power dissipation is limited by 150°C junction temperature

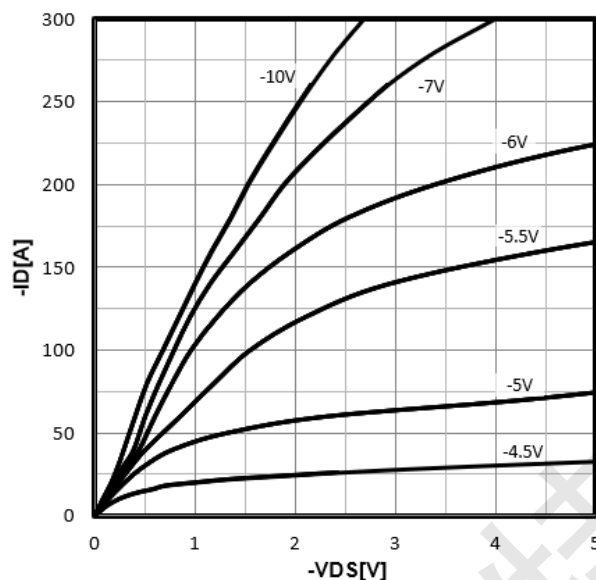
5.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.



CSTS80P06F Characteristics Curve:

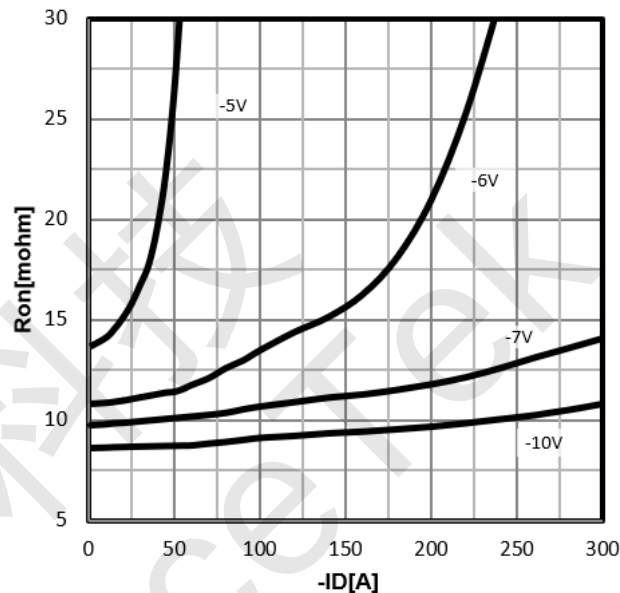
Typ. output characteristics

$$I_D = f(V_{DS})$$



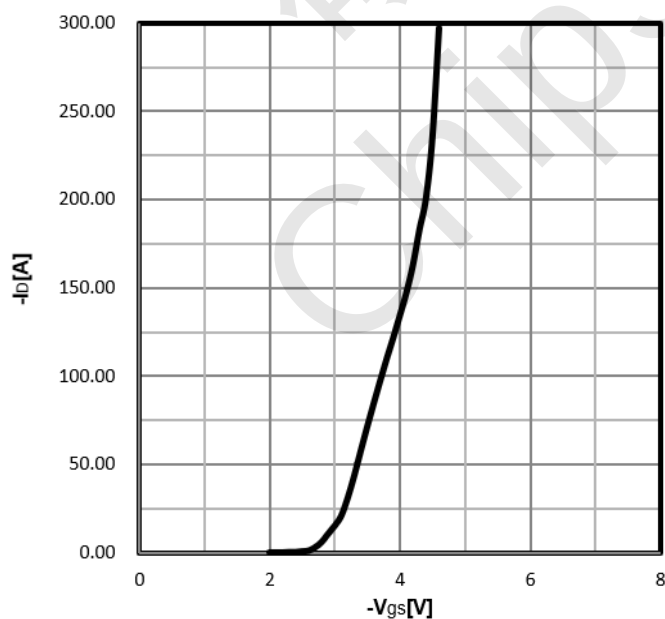
Typ. drain-source on resistance

$$R_{DS(on)} = f(I_D)$$



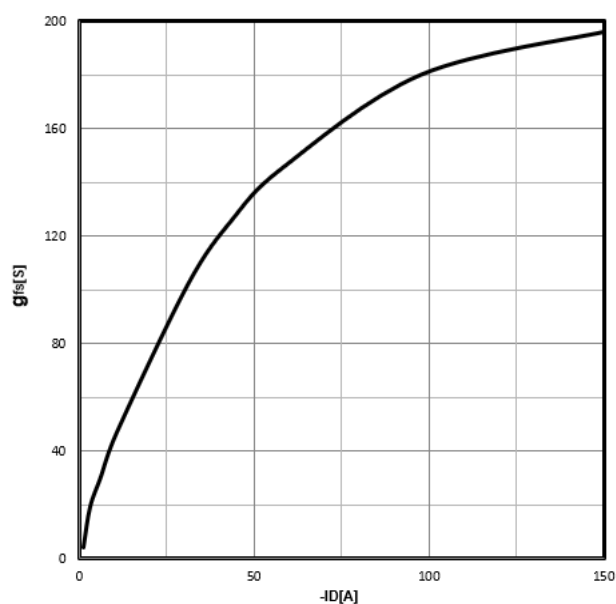
Typ. transfer characteristics

$$I_D = f(V_{GS})$$



Typ. forward transconductance

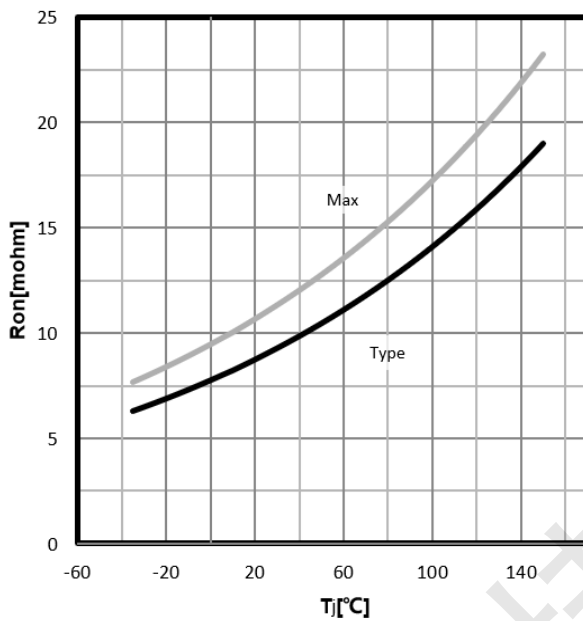
$$g_{fs} = f(I_D)$$



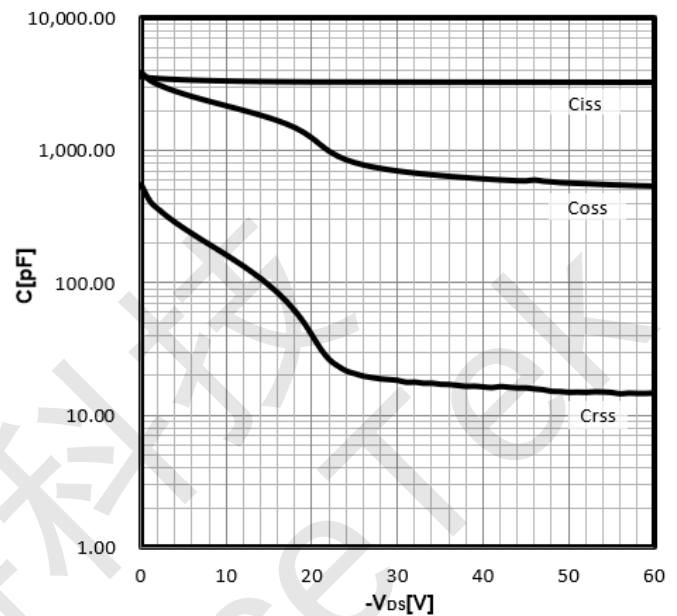


CSTS80P06F P-Ch 60V Fast Switching MOSFETs

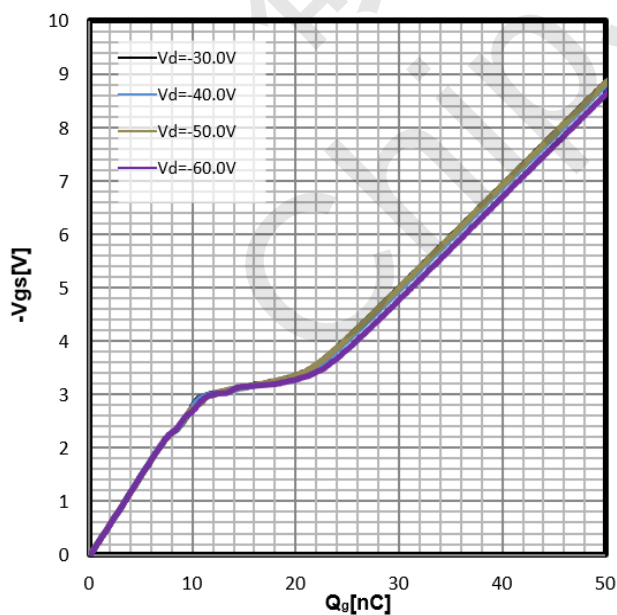
Drain-source on-state resistance
 $R_{DS(on)} = f(T_j)$; $I_D = -20A$; $V_{GS} = -10V$



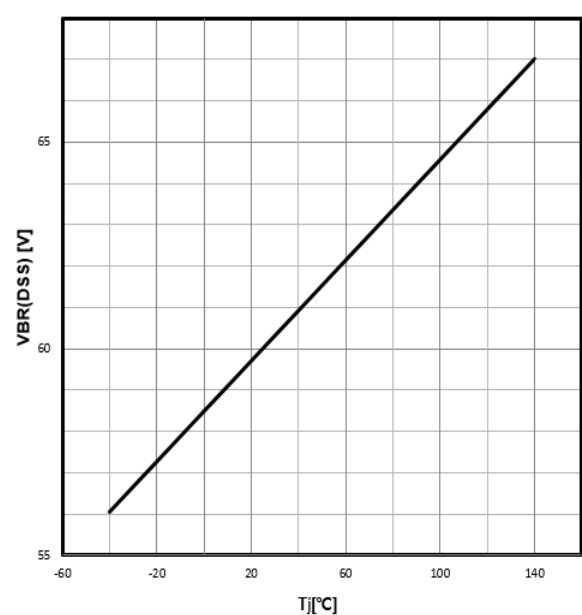
Typ. capacitances
 $C = f(V_{DS})$; $V_{GS} = 0V$; $f = 1MHz$



Typ. gate charge
 $V_{GS} = f(Q_{gate})$; $I_D = -20A$



Drain-source breakdown voltage
 $V_{BR(DSS)} = f(T_j)$; $I_D = -250uA$

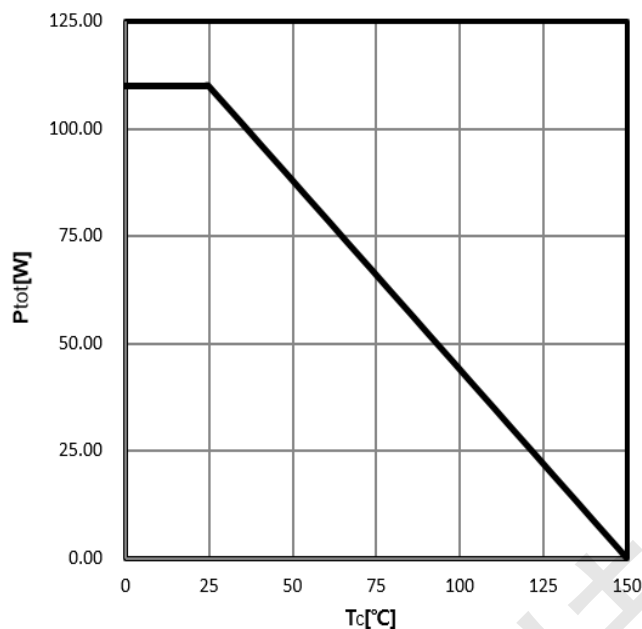




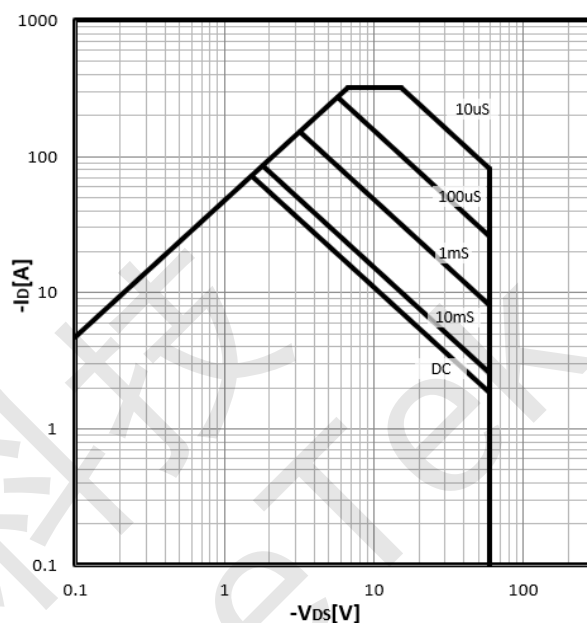
CSTS80P06F P-Ch 60V Fast Switching MOSFETs

Power Dissipation

$$P_{tot}=f(T_c)$$

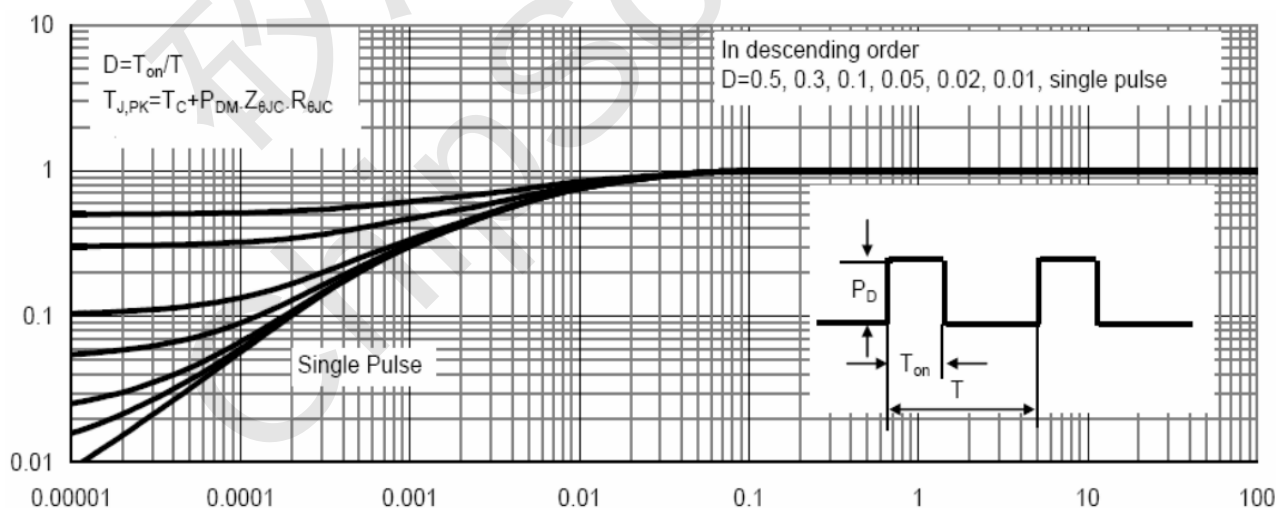


$$I_D=f(V_{DS})$$



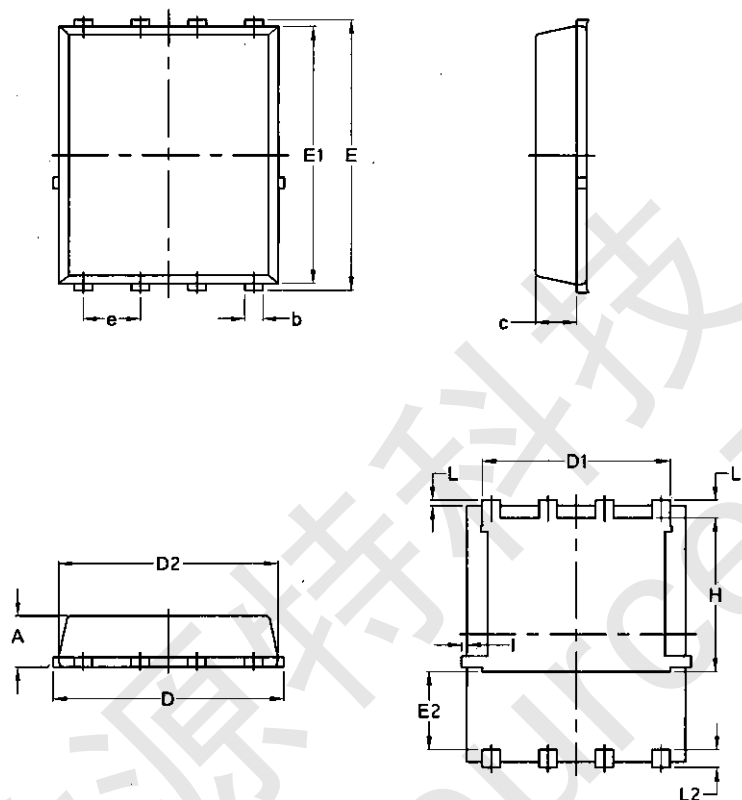
Max. transient thermal impedance

$$Z_{thJC}=f(t_p)$$





CSTS80P06F Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Min	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