



CSTS150P06H P-Ch 60V Fast Switching MOSFETs

CSTS150P06H Features

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

CSTS150P06H Product Summary

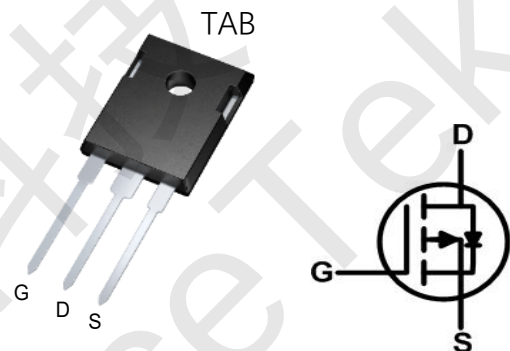


BVDSS	RDSON	ID
-60V	3.5 mΩ	-150A

CSTS150P06H Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

CSTS150P06H TO-247 Pin Configuration



CSTS150P06H Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$ unless otherwise specified):

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		-60	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	-150	A
	Continuous Drain Current	$T_C = 100^\circ\text{C}$	-91.7	A
I_{DM}^{a1}	Pulsed Drain Current		-580	A
V_{GS}	Gate-to-Source Voltage		± 20	V
E_{AS}^{a2}	Single pulse avalanche energy		2058	mJ
P_D	Power Dissipation		183	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering		260	$^\circ\text{C}$

CSTS150P06H Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.68	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	60	$^\circ\text{C/W}$



CSTS150P06H P-Ch 60V Fast Switching MOSFETs

CSTS150P06H Electrical Characteristics (T_J= 25°C unless otherwise specified):

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V _{DSS}	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-60	--	--	V
I _{DSS}	Drain to Source Leakage Current	V _{DS} = -60V, V _{GS} = 0V	--	--	1	μA
I _{GSS(F)}	Gate to Source Forward Leakage	V _{GS} =-20V	--	--	100	nA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{GS} =+20V	--	--	-100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-2	-2.4	-2.8	V
R _{DS(ON)}	Drain-to-Source On-Resistance	V _{GS} =-10V, I _D =-20A	--	3.5	4.2	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C _{iss}	Input Capacitance	V _{GS} =0V V _{DS} =-30V f=1.0MHz	--	9123	--	pF
C _{oss}	Output Capacitance		--	1583	--	
C _{rss}	Reverse Transfer Capacitance		--	85.6	--	

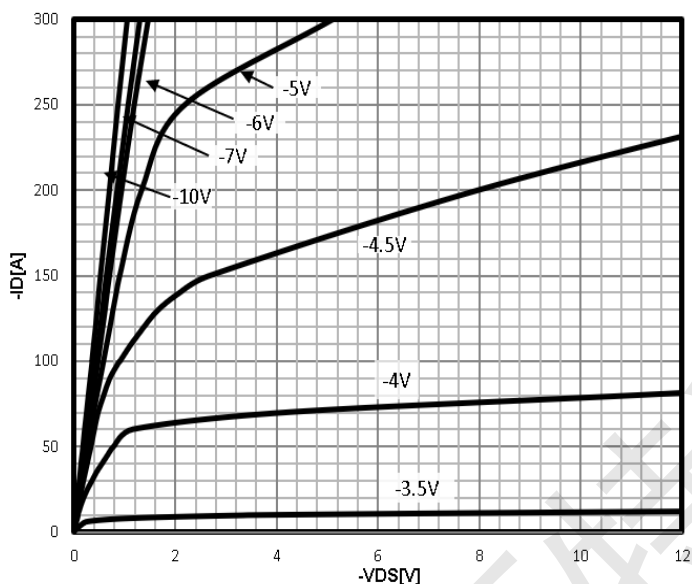
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	I _D =-10A, V _{DS} = -30V V _{GS} = -10V R _G = 3Ω	--	70	--	ns
t _r	Rise Time		--	45	--	
t _{d(OFF)}	Turn-Off Delay Time		--	165	--	
t _f	Fall Time		--	50	--	
Q _g	Total Gate Charge	V _{GS} =-10V	--	135	--	nC
Q _{gs}	Gate Source Charge	V _{DS} =-30V	--	28	--	
Q _{gd}	Gate Drain Charge	I _D =-10A	--	22.4	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I _S	Diode Forward Current	T _C =25 °C	--	--	-150	A
V _{SD}	Diode Forward Voltage	I _S =-20A, V _{GS} =0V	--	--	-1.2	V
t _{rr}	Reverse Recovery time	I _S =-10A, V _{DD} =-30V dI/dt=100A/μs	--	45	--	ns
Q _{rr}	Reverse Recovery Charge		--	100	--	nC

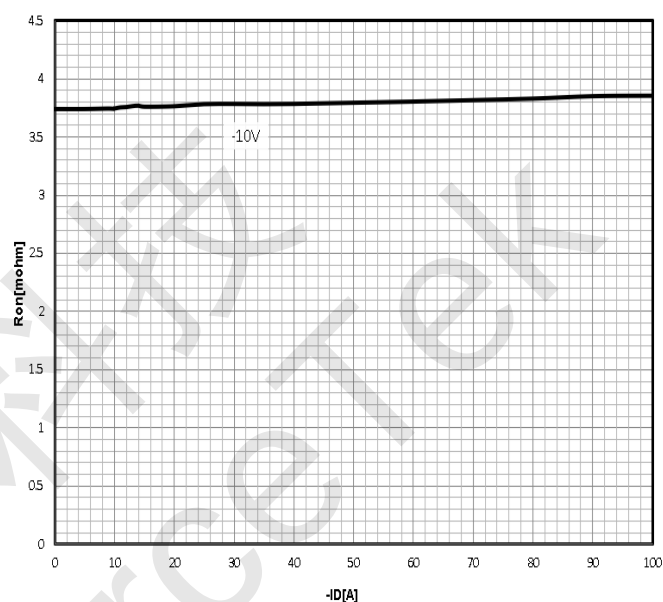


CSTS150P06H Characteristics Curve:

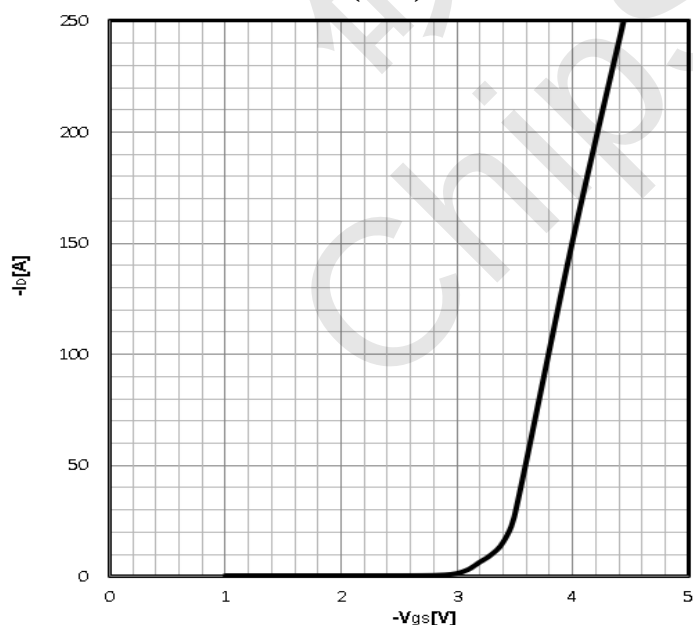
Typ. output characteristics
 $I_D = f(V_{DS})$



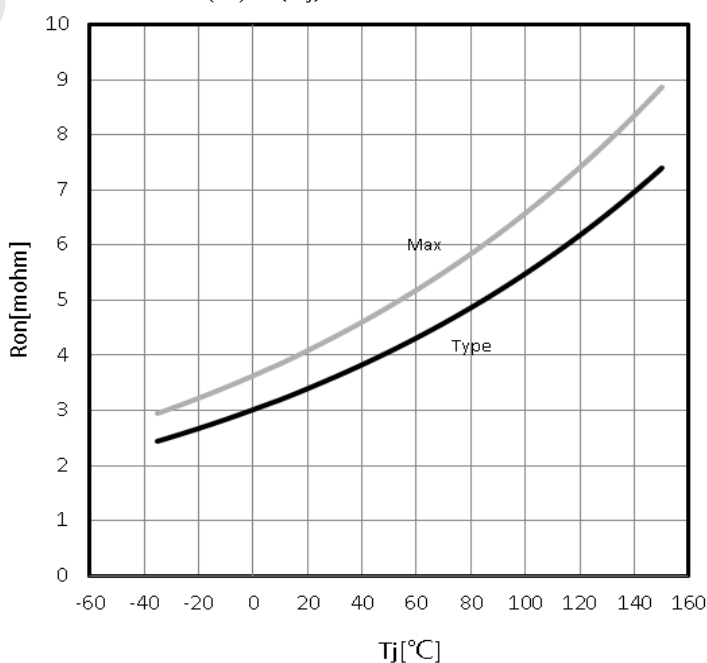
Typ. drain-source on resistance
 $R_{DS(on)} = f(I_D)$



Typ. transfer characteristics
 $I_D = f(V_{GS})$



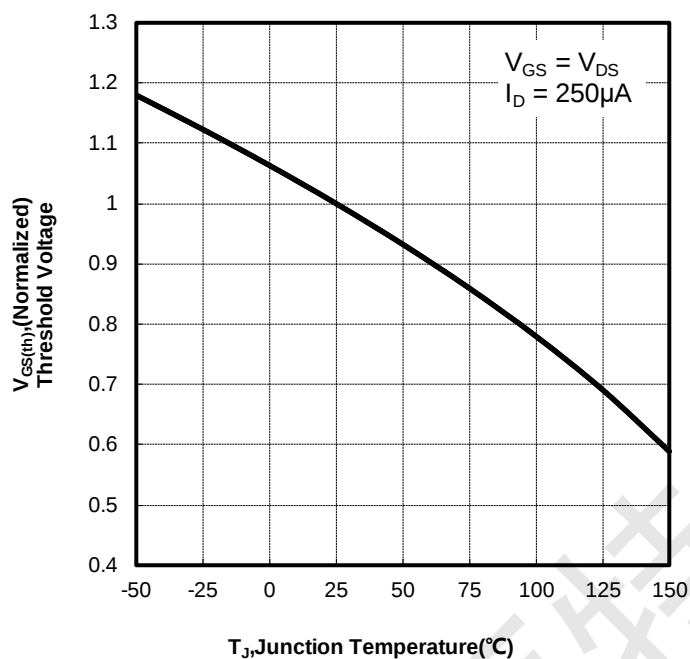
Drain-source on-state resistance
 $R_{DS(on)} = f(T_j); I_D = -20A; V_{GS} = -10V$





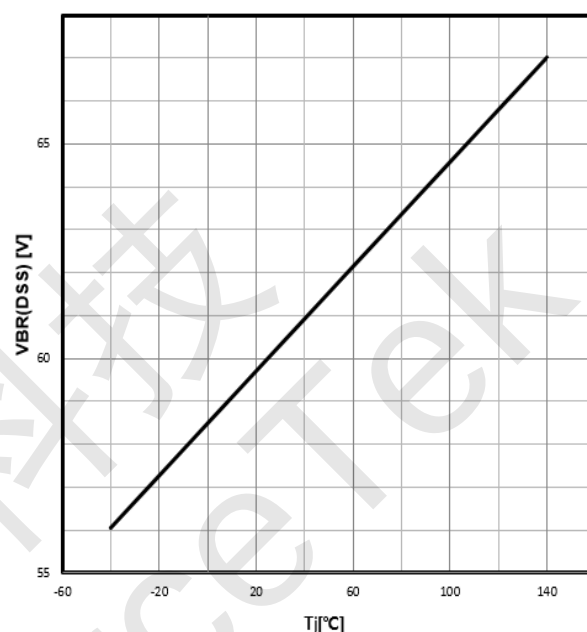
Gate Threshold Voltage

$$-V_{TH}=f(T_j); I_D=-250\mu A$$



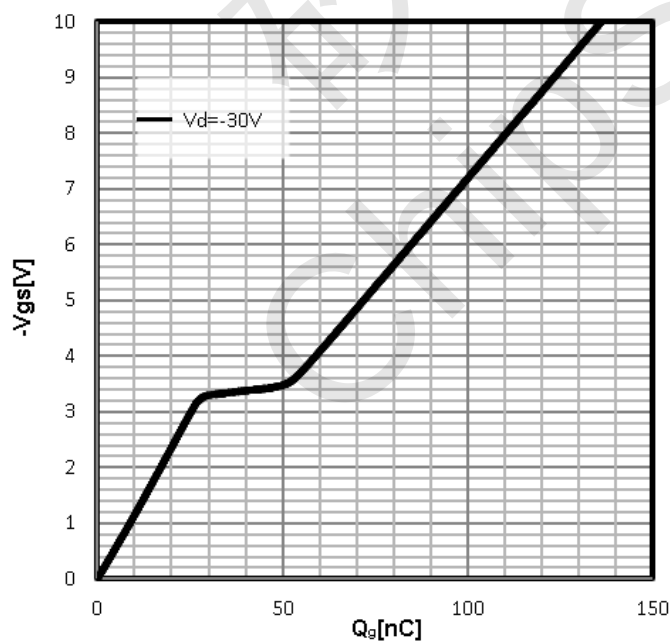
Drain-source breakdown voltage

$$V_{BR(DSS)}=f(T_j); I_D=-250\mu A$$



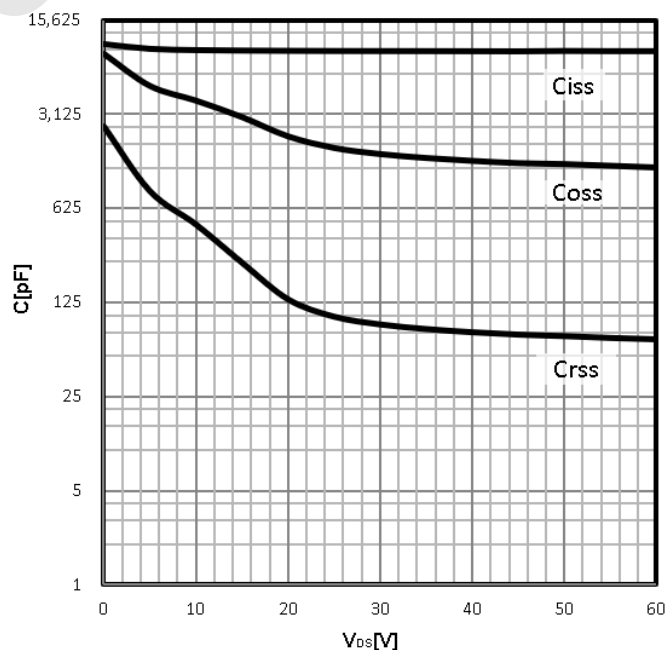
Typ. gate charge

$$V_{GS}=f(Q_{gate}); I_D=-10A$$



Typ. capacitances

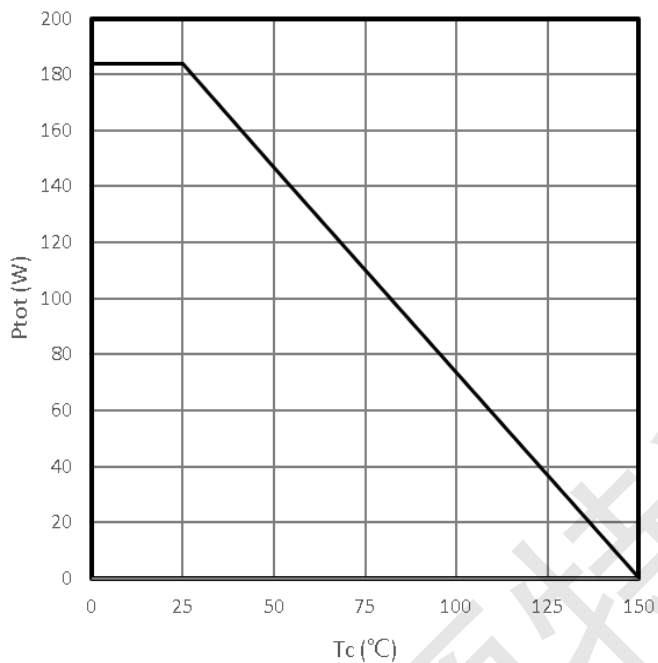
$$C=f(V_{DS}); V_{GS}=0V; f=1MHz$$





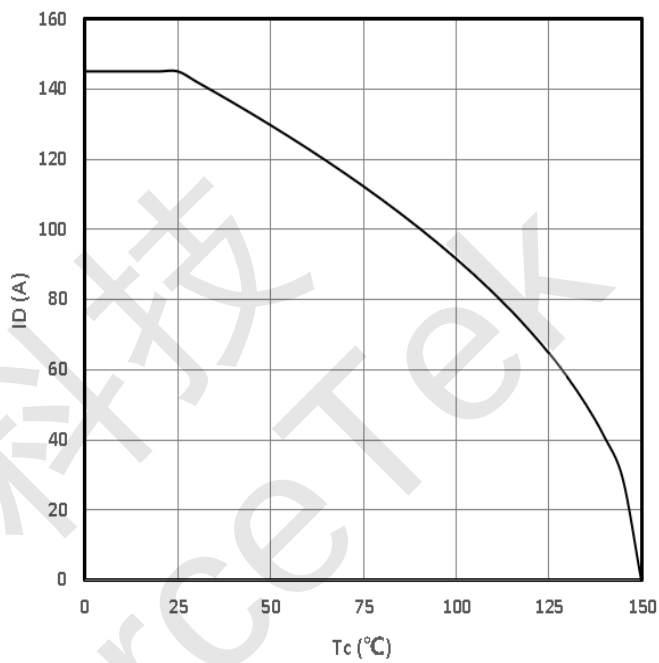
Power Dissipation

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



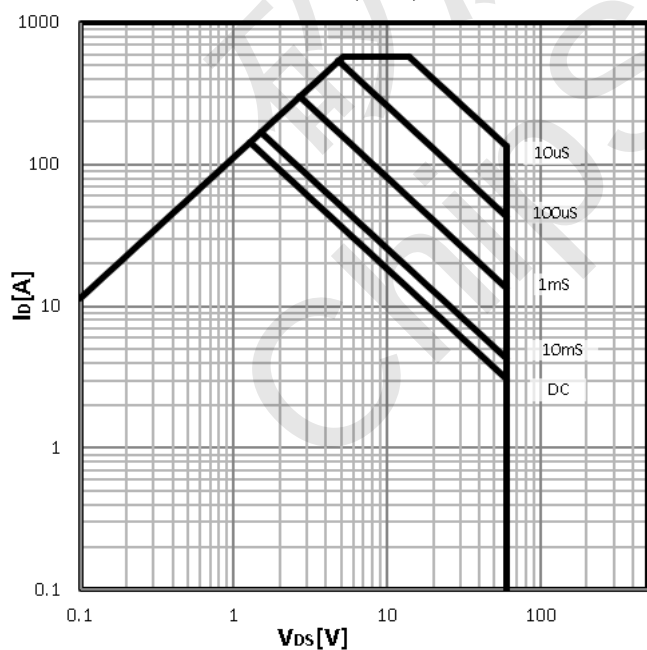
Maximum Drain Current

$$-I_D=f(T_c)$$



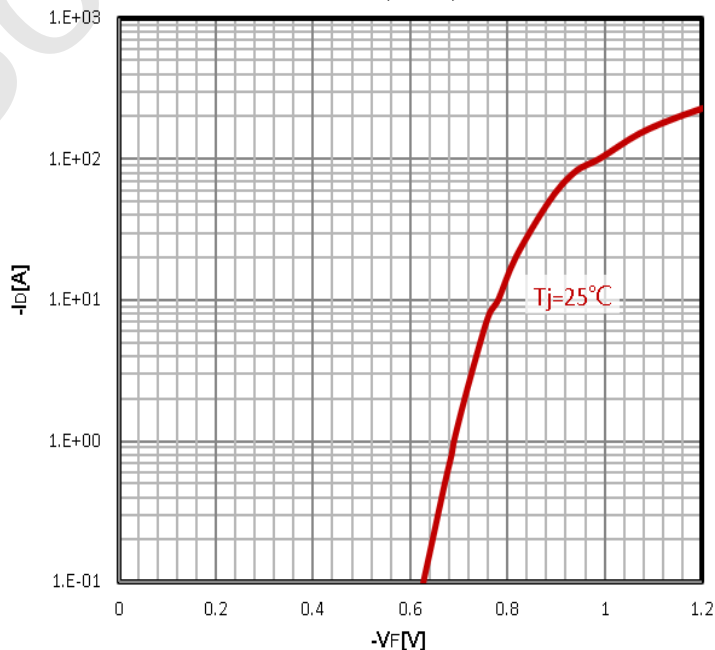
Safe operating area

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



Body Diode Forward Voltage Variation

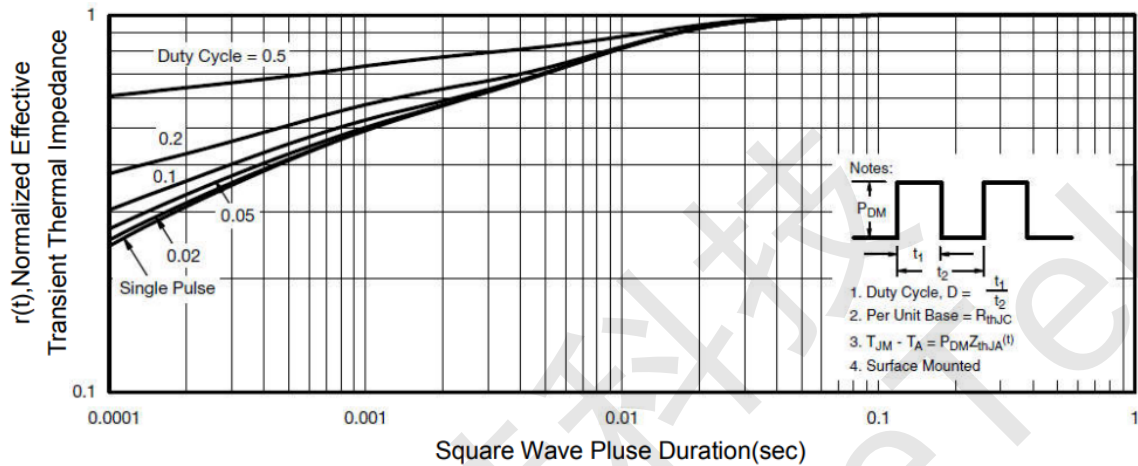
$$-I_F=f(-V_{DS})$$





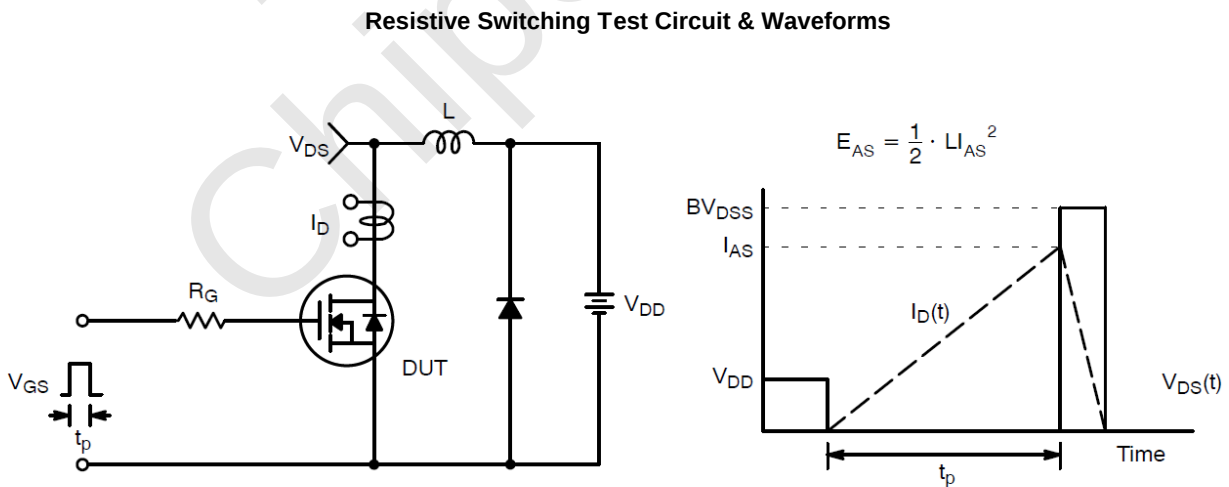
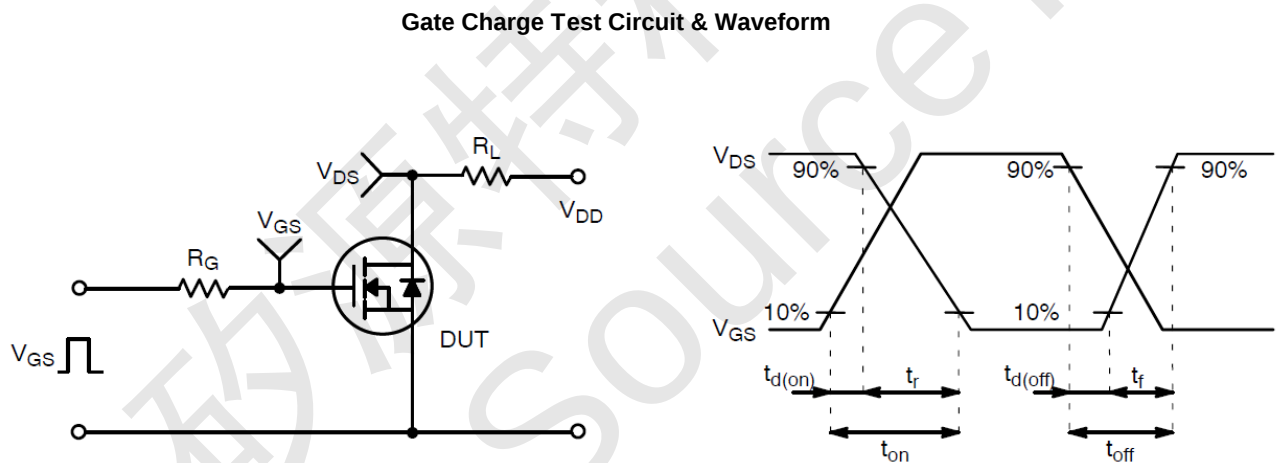
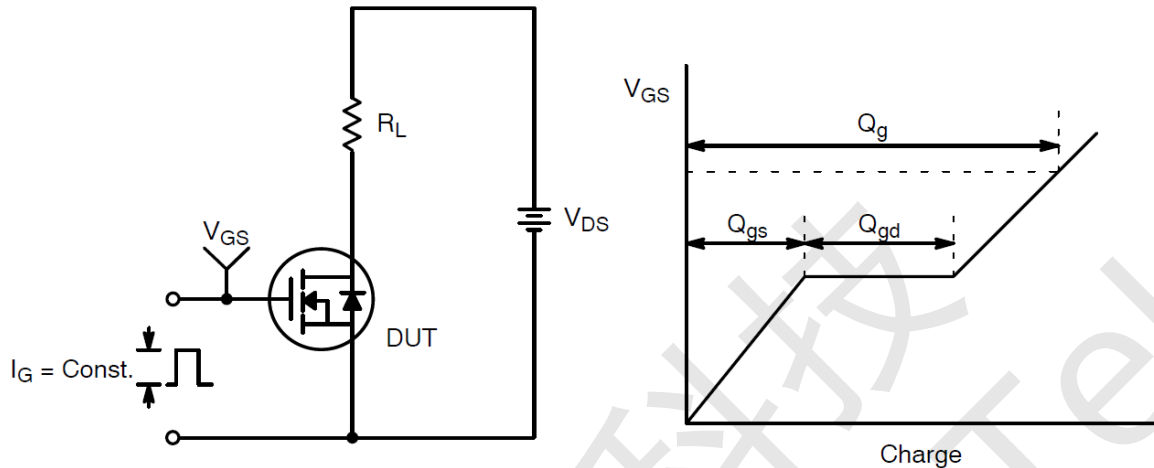
Max. transient thermal impedance

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





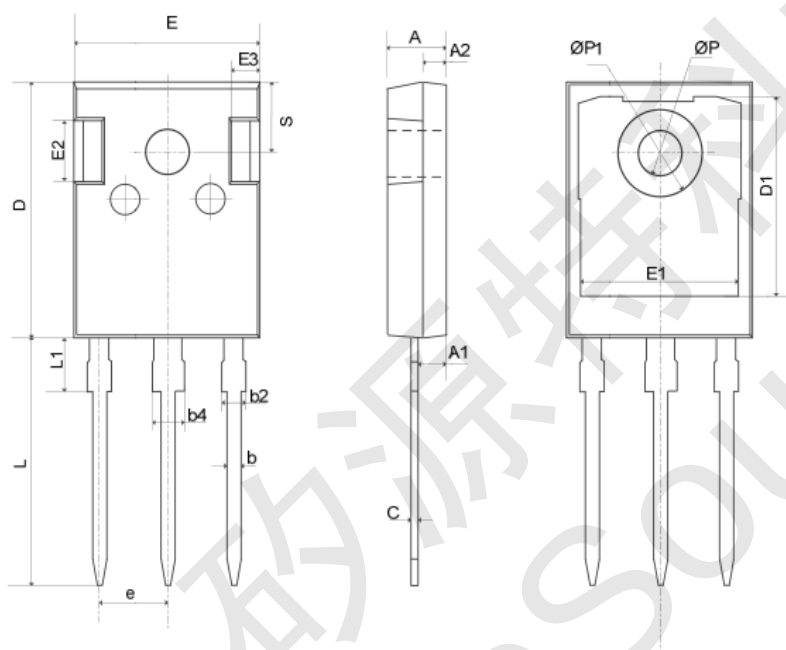
CSTS150P06H Test Circuit and Waveform:





CSTS150P06H Mechanical Dimensions for TO-247

COMMON DIMENSIONS



SYMBOL	MM	
	MIN	MAX
A	4.80	5.20
A1	2.21	2.61
A2	1.85	2.15
b	1.11	1.36
b2	1.91	2.21
b4	2.91	3.21
c	0.51	0.75
D	20.70	21.30
D1	16.25	16.85
E	15.50	16.10
E1	13.00	13.60
E2	4.80	5.20
E3	2.30	2.70
e	5.44BSC	
L	19.62	20.22
L1	—	4.30
ØP	3.40	3.80
ØP1	—	7.30
S	6.15BSC	