

**N - CHANNEL ENHANCEMENT MODE POWER MOSFET****Description**

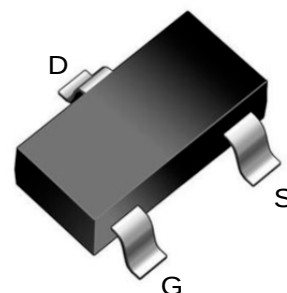
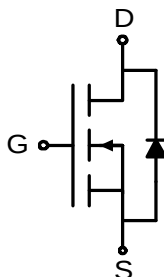
The CS5N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$$V_{DS} = 100V \quad I_D = 5A$$

$$R_{DS(ON \text{ typ})} = 92m\Omega @ V_{GS}=10V$$

$$R_{DS(ON \text{ typ})} = 120m\Omega @ V_{GS}=4.5V$$



SOT-23

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
CS5N10	SOT-23	510XX	3000

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	5	A
$I_D @ T_A=70^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	3.2	A
I_{DM}	Pulsed Drain Current ²	15	A
$P_D @ T_A=25^{\circ}C$	Total Power Dissipation ³	3.1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient(steady state) ¹	100	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance Junction-ambient($t < 10s$) ¹	40	$^{\circ}C/W$

**Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)**

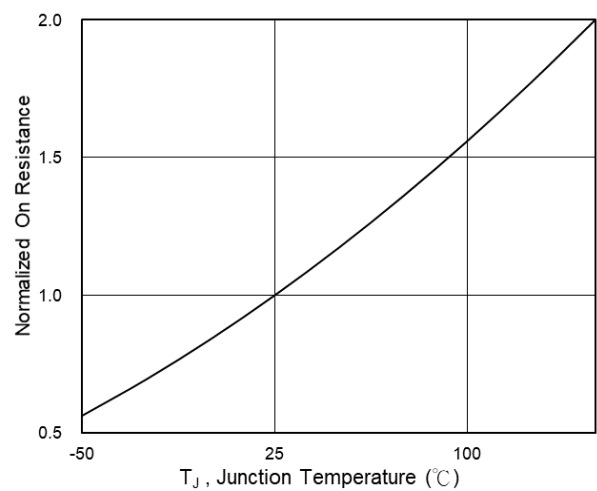
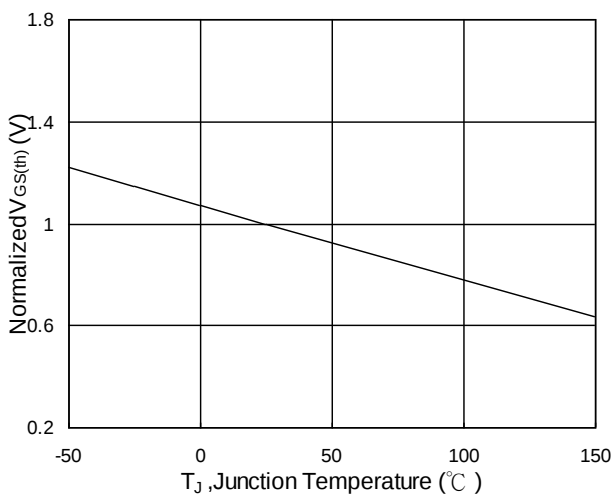
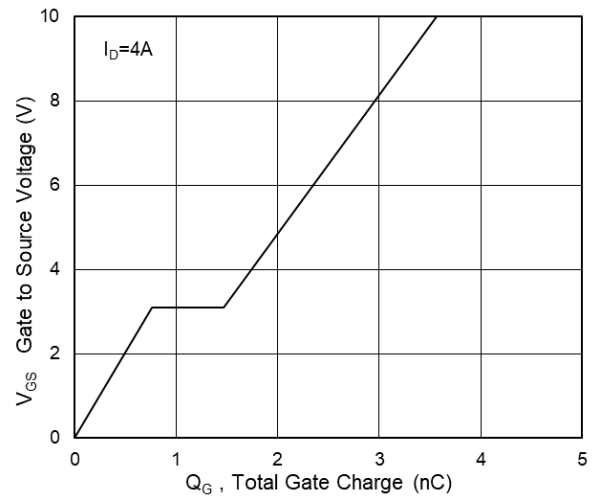
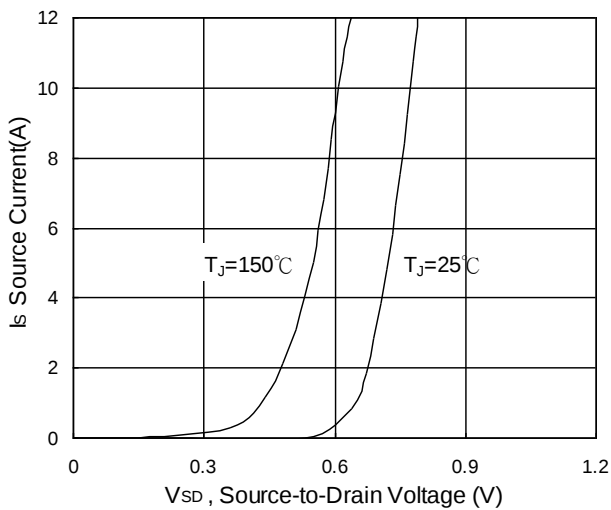
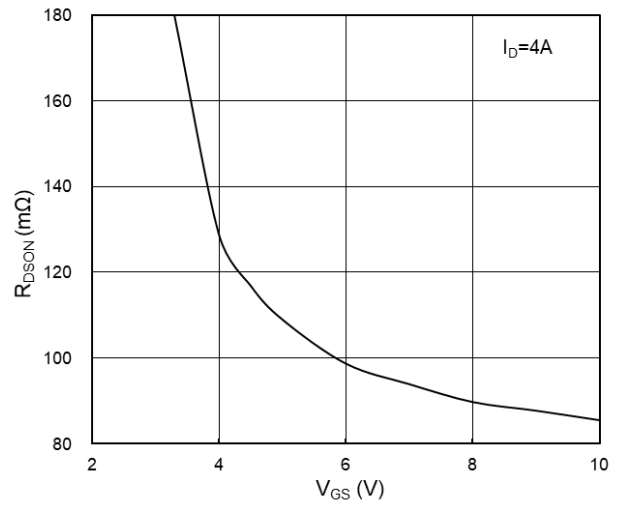
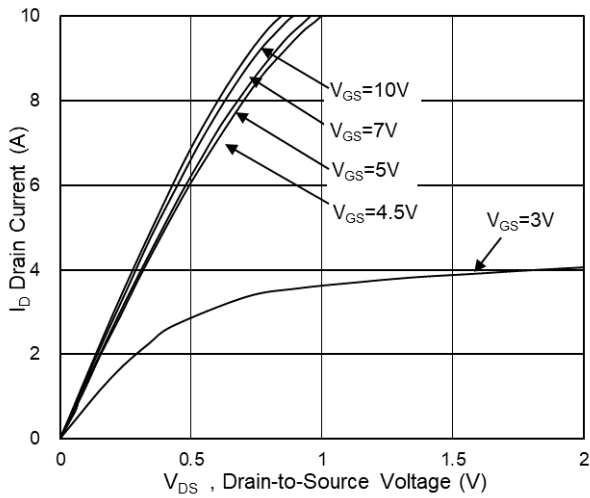
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	100	108	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=4A$	---	92	125	$m\Omega$
		$V_{GS}=4.5V$, $I_D=2A$	---	120	145	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	1.7	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=80V$, $V_{GS}=0V$, $T_J=85^{\circ}\text{C}$	---	---	50	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2.3	4.6	
Q_g	Total Gate Charge (10V)	$V_{DS}=30V$, $V_{GS}=10V$, $I_D=4A$	---	3.57	---	nC
Q_{gs}	Gate-Source Charge		---	0.76	---	
Q_{gd}	Gate-Drain Charge		---	0.71	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V$, $V_{GS}=10V$, $R_G=3.3$ $I_D=1A$	---	11	---	ns
T_r	Rise Time		---	6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	4	---	
C_{iss}	Input Capacitance	$V_{DS}=50V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	182	---	pF
C_{oss}	Output Capacitance		---	30	---	
C_{rss}	Reverse Transfer Capacitance		---	3.6	---	
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	2	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=1A$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$ 3.The power dissipation is limited by 150°C junction temperature4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



Typical Characteristics



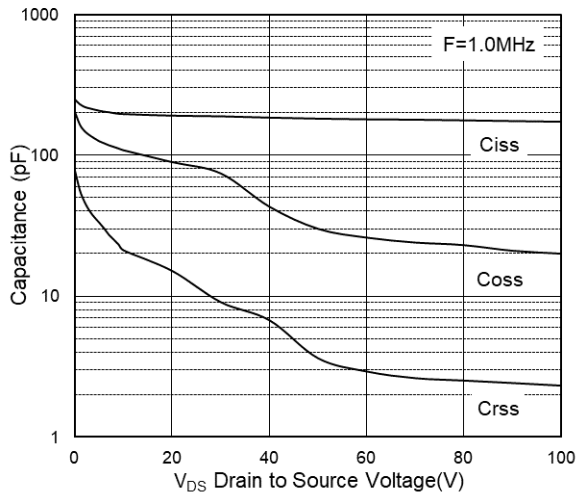


Fig.7 Capacitance

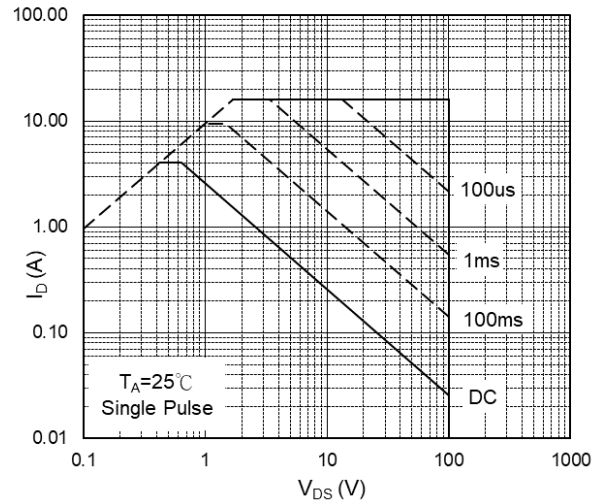


Fig.8 Safe Operating Area

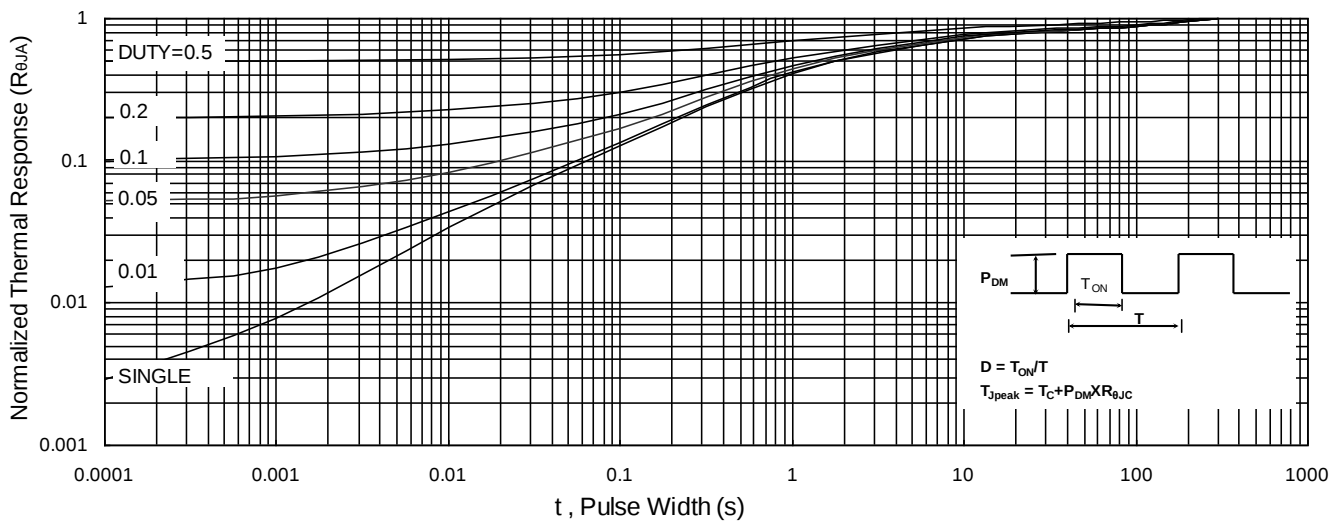


Fig.9 Normalized Maximum Transient Thermal Impedance

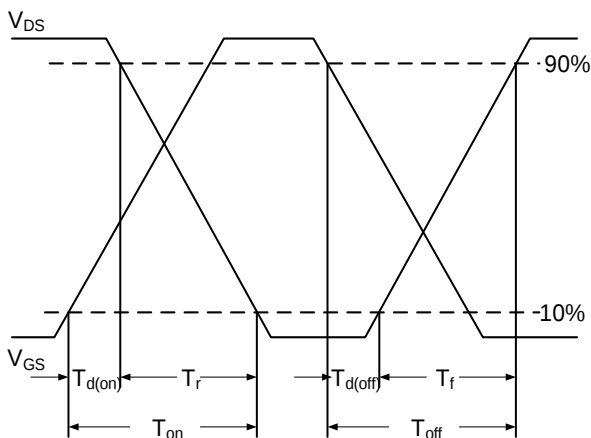


Fig.10 Switching Time Waveform

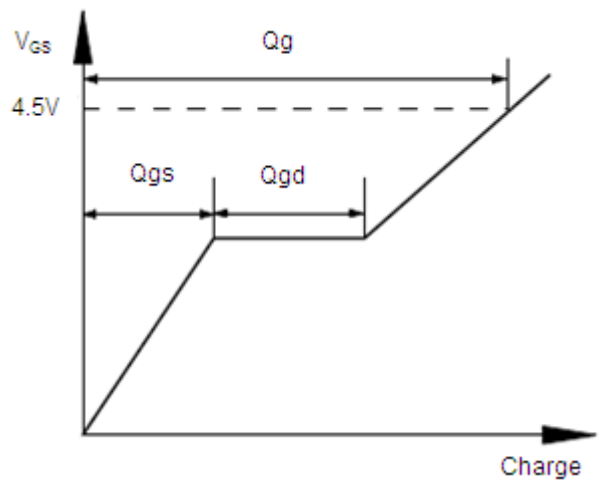
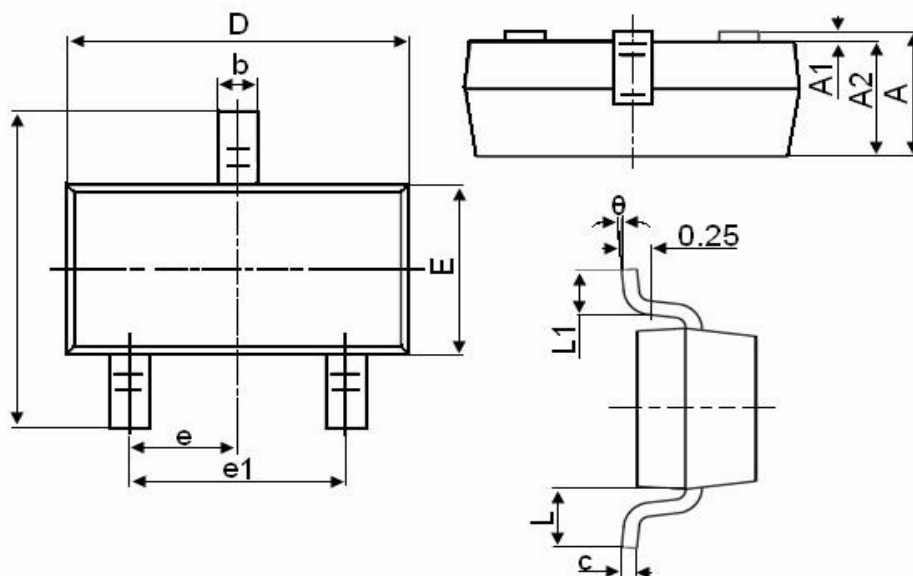


Fig.11 Gate Charge Waveform



Package Mechanical Data-SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°