

Description

The SX8205S uses advanced trench technology

to provide excellent $R_{DS(ON)}$, low gate charge

and operation with gate voltages as low as 2.5V.

This device is suitable for use as a Battery

protection or in other Switching application.

General Features

$V_{DS} = 20V, I_D = 6A$

$R_{DS(ON)} < 27\text{ m}\Omega @ V_{GS}=4.5V$

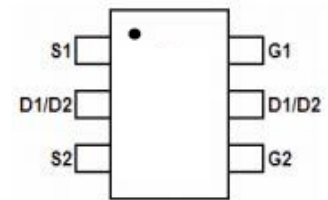
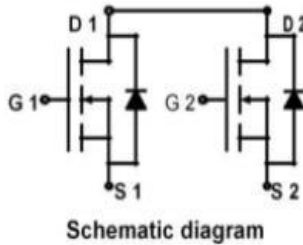
$R_{DS(ON)} < 37\text{ m}\Omega @ V_{GS}=2.5V$

Application

Battery protection

Load switch

Powermanagement



Absolute Maximum Ratings@ $T_J=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A=25^\circ\text{C}$	Drain Current, $V_{GS} @ 4.5V^3$	6	A
$I_D @ T_A=70^\circ\text{C}$	Drain Current, $V_{GS} @ 4.5V^3$	4.8	A
IDM	Pulsed Drain Current ¹	26	A
$P_D @ T_A=25^\circ\text{C}$	Total Power Dissipation	2	W
	Linear Derating Factor	0.016	W/ $^\circ\text{C}$
TSTG	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient ³	62.5	$^\circ\text{C}/\text{W}$

20V N+N Channel Enhancement Mode MOSFET
Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	-	-	V
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =6A	-	20.5	27	mΩ
		V _{GS} =2.5V, I _D =4A	-	27	37	mΩ
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	-	0.75	1.2	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =6A	-	6	-	S
IDSS	Drain-Source Leakage Current	V _{DS} =20V, V _{GS} =0V	-	-	25	uA
	Drain-Source Leakage Current (T _j =70°C)	V _{DS} =20V, V _{GS} =0V	-	-	250	uA
IGSS	Gate-Source Leakage	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =6A	-	11	17.6	nC
Q _{gs}	Gate-Source Charge	V _{DS} =16V	-	1.1	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	4.1	-	nC
td(on)	Turn-on Delay Time ²	V _{DS} =10V	-	4.2	-	ns
t _r	Rise Time	I _D =1A	-	9	-	ns
td(off)	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10	-	23	-	ns
t _f	Fall Time	V R _D =10Ω	-	3.5	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	570	910	pF
C _{oss}	Output Capacitance	V _{DS} =20V	-	90	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	85	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.6	2.4	Ω
V _{SD}	Forward On Voltage ²	I _S =1.7A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time ²	I _S =6A, V _{GS} =0V, dI/dt=100A/μs	-	21	-	ns
Q _{rr}	Reverse Recovery Charge		-	14	-	nC

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in² copper pad of FR4 board, t_≤10sec ; 135 °C/W when mounted on Min. copper pad.

Typical Characteristics

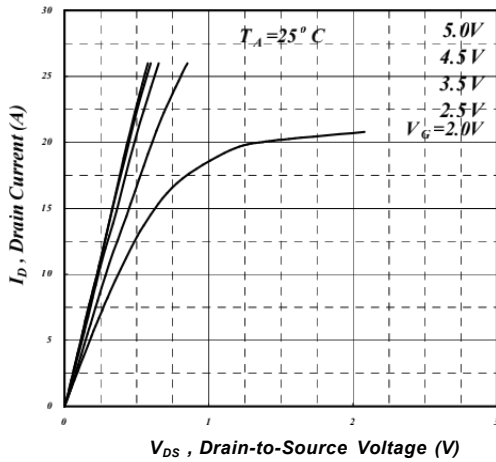


Fig 1. Typical Output Characteristics

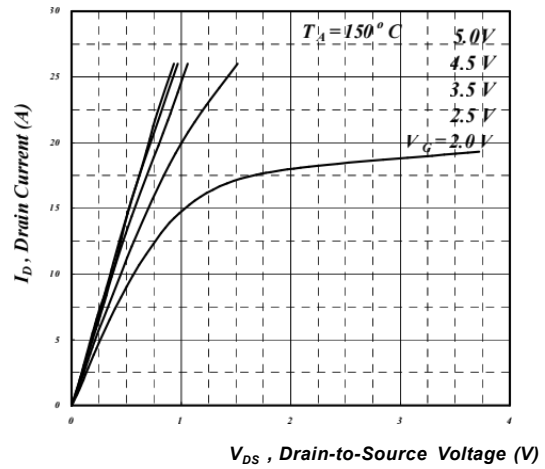


Fig 2. Typical Output Characteristics

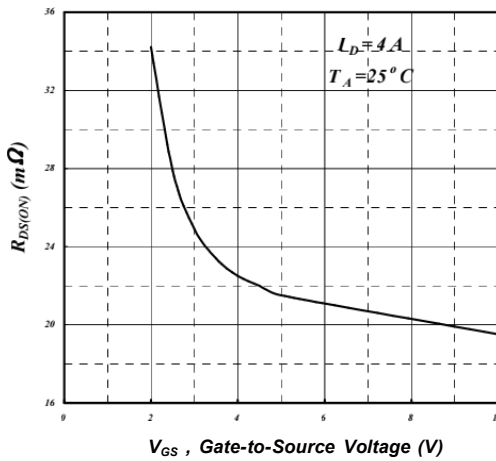


Fig 3. On-Resistance v.s. Gate Voltage

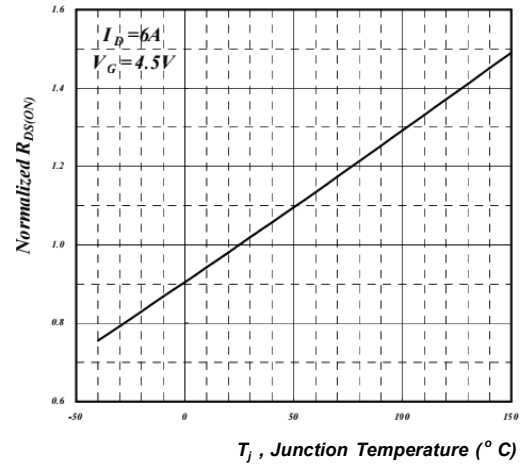


Fig 4. Normalized On-Resistance v.s. Temperature

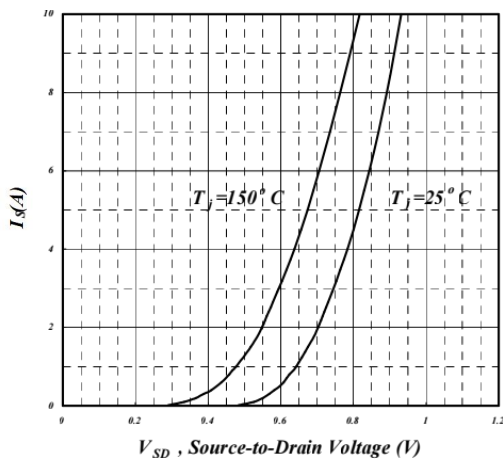


Fig 5. Forward Characteristic of Reverse Diode

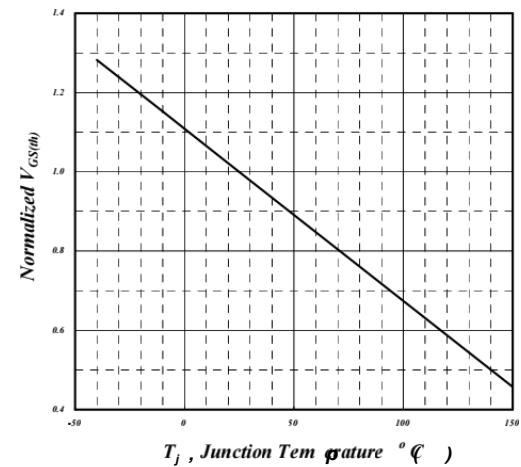


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Typical Characteristics

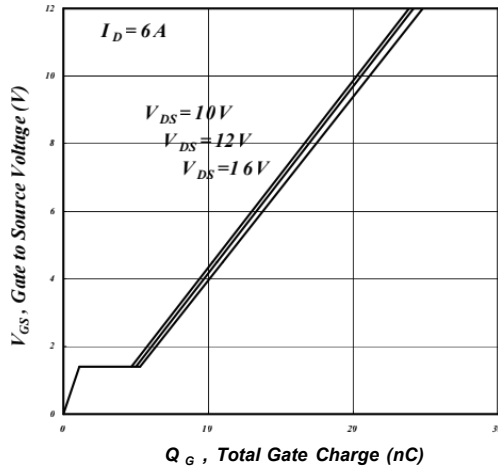


Fig 7. Gate Charge Characteristics

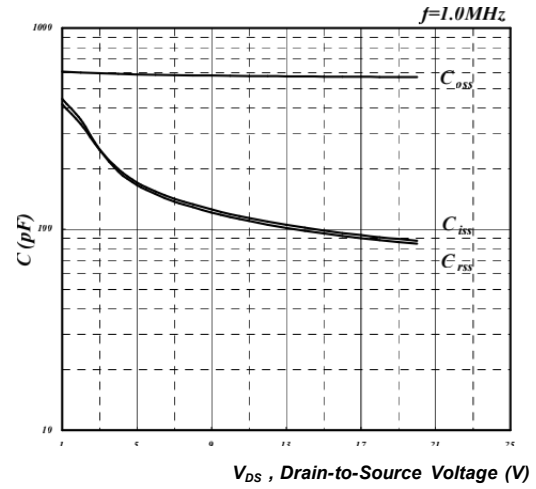


Fig 8. Typical Capacitance Characteristics

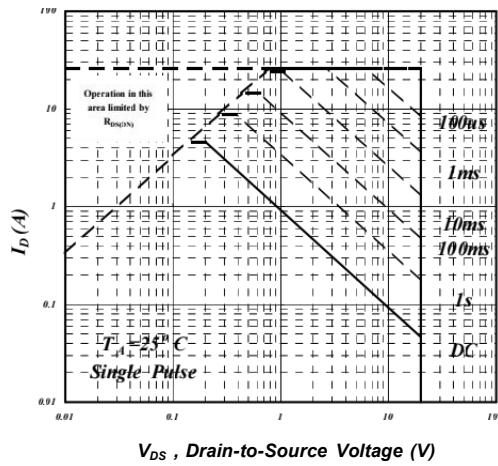


Fig 9. Maximum Safe Operating Area

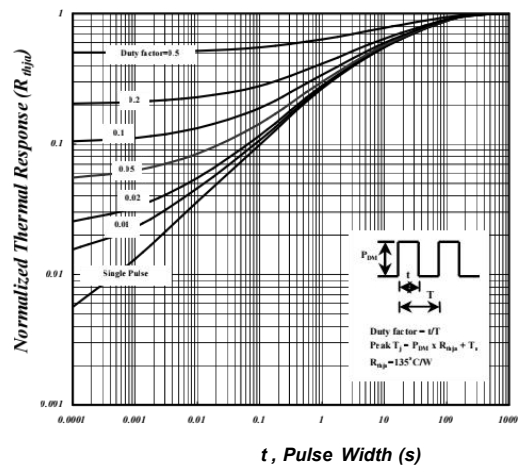


Fig 10. Effective Transient Thermal Impedance

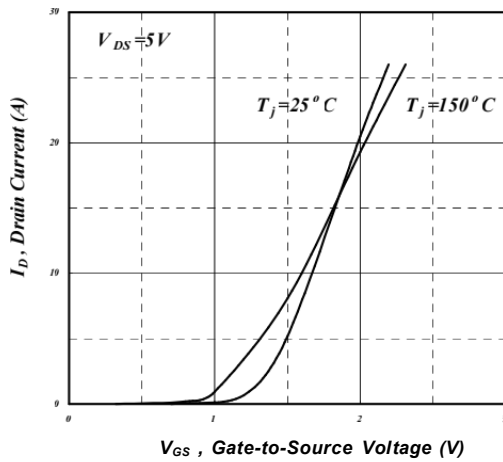


Fig 11. Transfer Characteristics

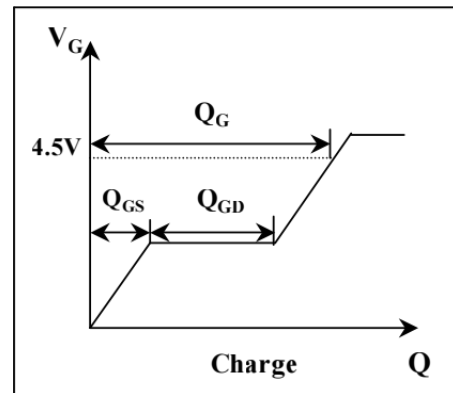
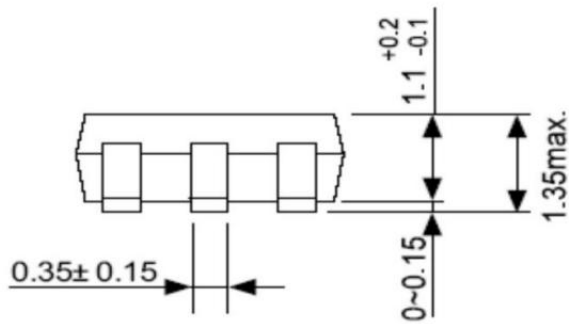
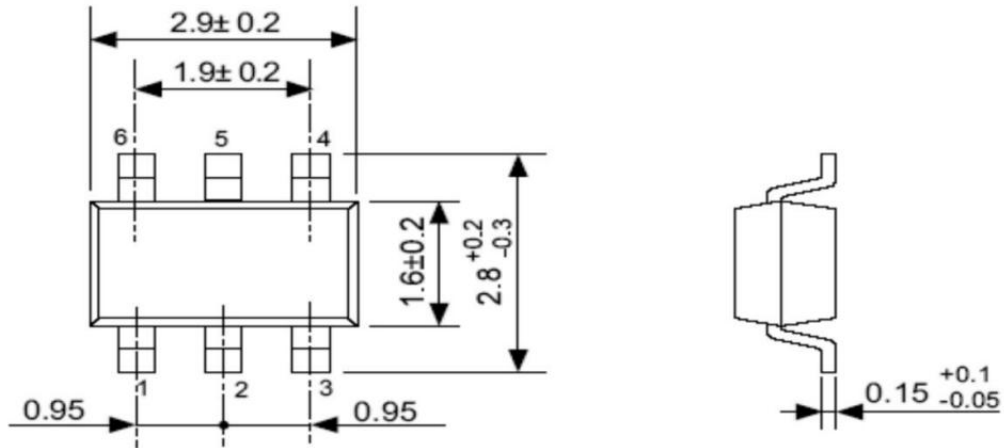


Fig 12. Gate Charge Waveform

SOT23-6 PACKAGE INFORMATION



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT-23-6L		3000