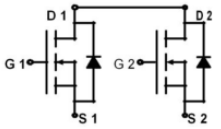
AP8205S

20V N+N Channel Enhancement Mode MOSFET

Description

The AP8205S 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.



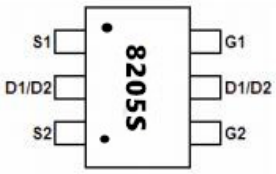
Schematic diagram

General Features

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

$R_{DS(ON)}$ < 20.5.mΩ @ V_{GS}=4.5V

$R_{DS(ON)}$ < 27.mΩ @ V_{GS}=2.5V



Application

Battery protection

Load switch

Powermanagement

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP8205S	SOT-23-6L	8205S	3000

Absolute Maximum Ratings@T_j=25°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℃	Drain Current, V_{GS} @ 4.5V[3]	6	A
I_D@T_A=70℃	Drain Current, V_{GS} @ 4.5V[3]	4.8	A
IDM	Pulsed Drain Current[1]	26	A
P_D@T_A=25℃	Total Power Dissipation	2	W
	Linear Derating Factor	0.016	W/℃
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	62.5	℃/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}=10V	-	23	-	ns
t_f	Fall Time	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
trr	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 ℃/W when mounted on Min. copper pad.

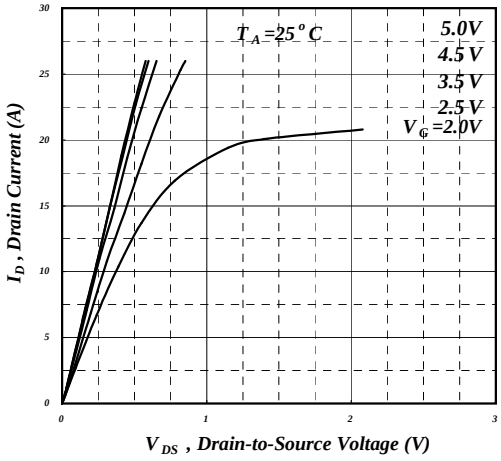


Fig 1. Typical Output Characteristics

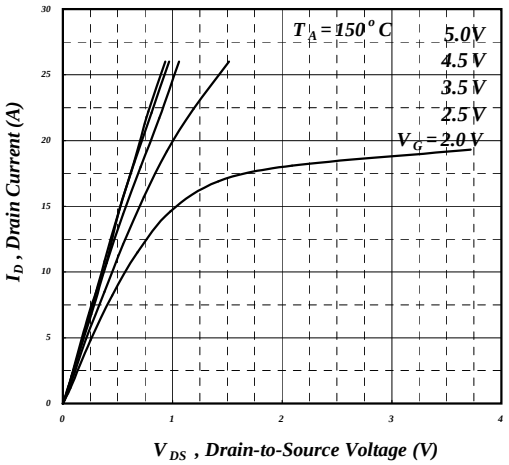


Fig 2. Typical Output Characteristics

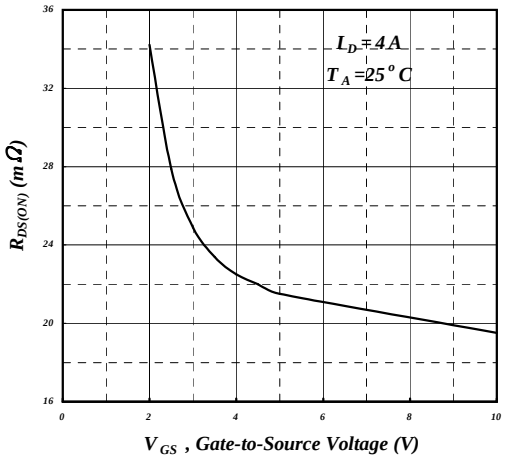


Fig 3. On-Resistance v.s. Gate Voltage

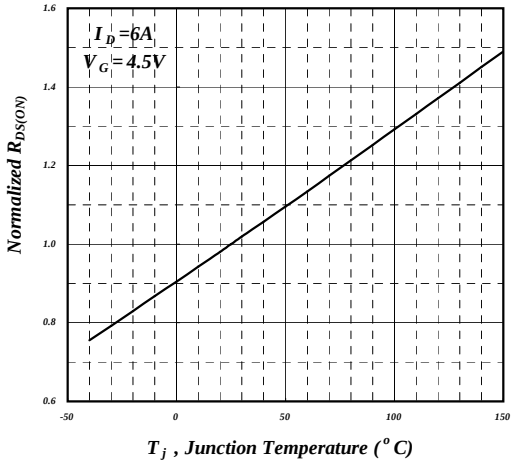


Fig 4. Normalized On-Resistance v.s. Temperature

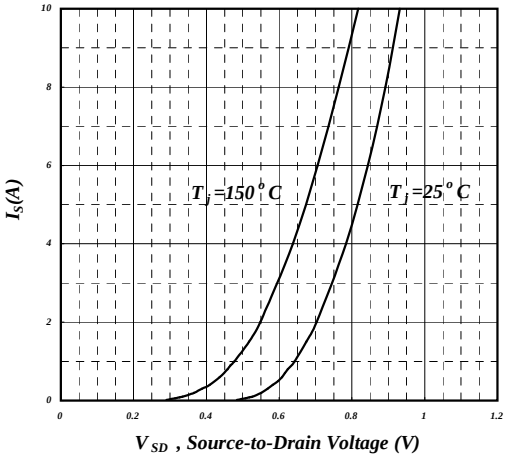


Fig 5. Forward Characteristic of Reverse Diode

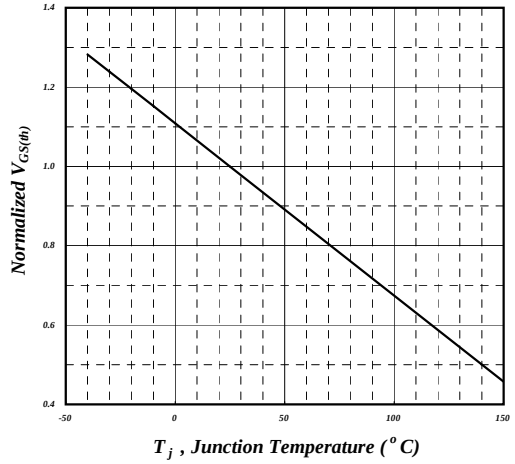


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

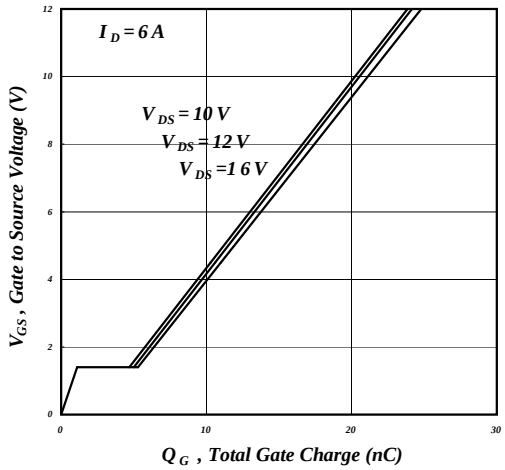


Fig 7. Gate Charge Characteristics

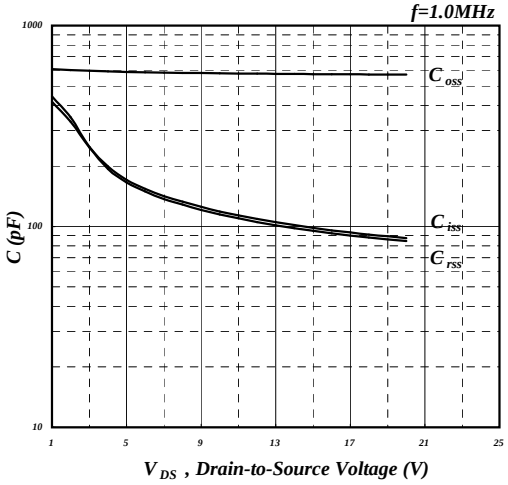


Fig 8. Typical Capacitance Characteristics

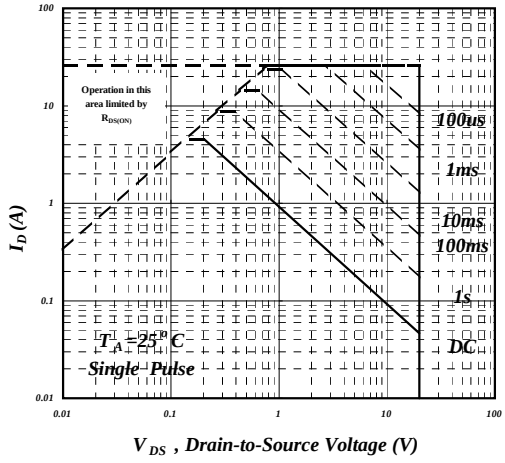


Fig 9. Maximum Safe Operating Area

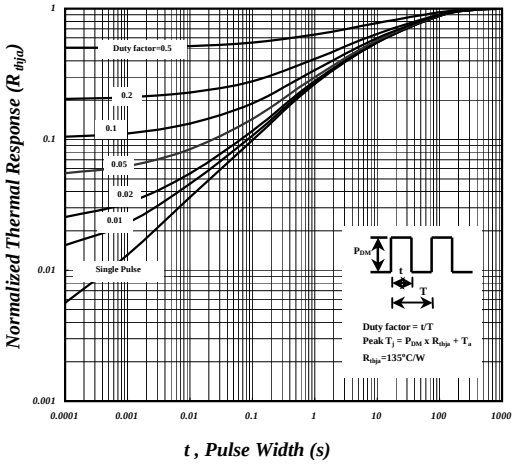


Fig 10. Effective Transient Thermal Impedance

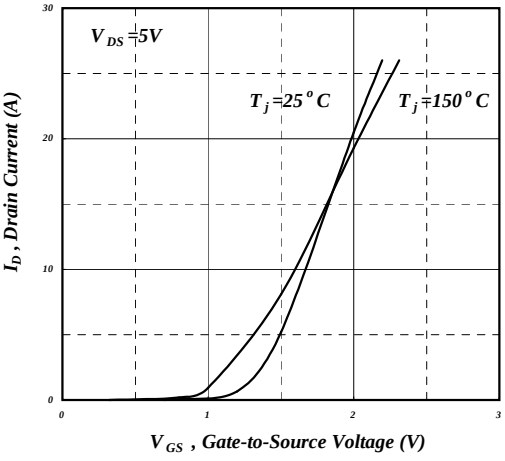


Fig 11. Transfer Characteristics

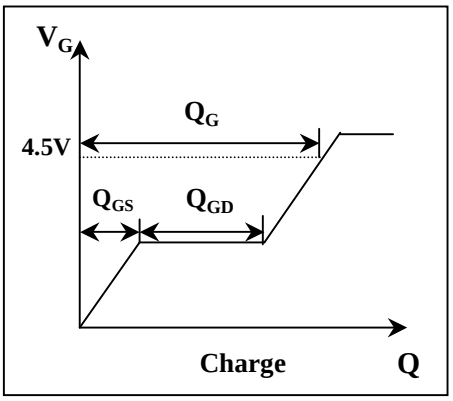
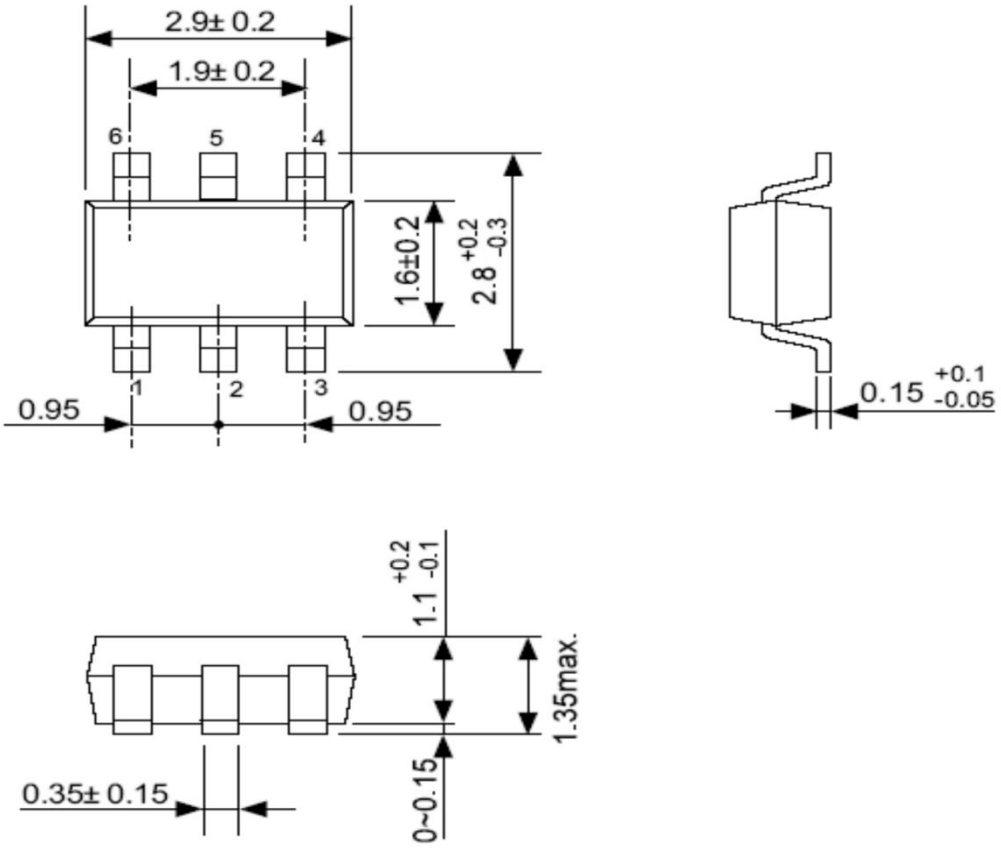


Fig 12. Gate Charge Waveform

SOT23-6 PACKAGE INFORMATION



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