8205A

Dual N-Channel MOSFET

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GENERAL DESCRIPTION

The 8205Ais a dual N-channel MOS Field Effect Transistor which uses advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch .

FEATURES

- V_{DS} =20 V
- I_D =6A
- Low on-state resistance Fast switching
  $R_{DS(on)}$ = 45mΩ (typ.)(V_{GS} = 4.5V, I_D = 2.0A)
  $R_{DS(on)}$ = 48mΩ (typ.)(V_{GS} = 3.85V, I_D = 2.0A)
  $R_{DS(on)}$ = 60mΩ (typ.)(V_{GS} = 2.5V, I_D = 2.0A)
- Lead free product is acquired
- Surface Mount Package

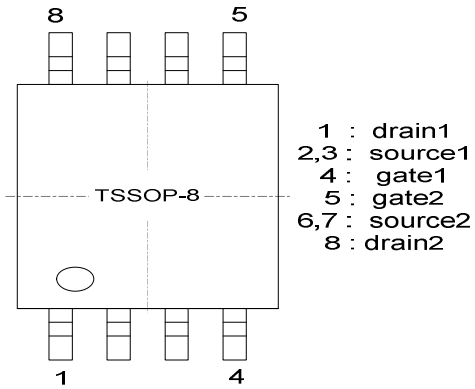
APPLICATION

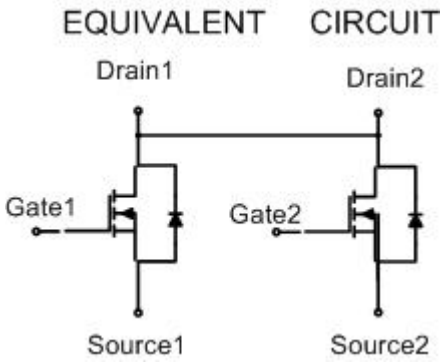
- Battery protection
- Load switch
- Power management

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel size	Tape width	Quantity
8205A	8250A	TSSOP8	Φ180mm	8mm	3000 units

PIN DESCRIPTION





PIN NUM	PIN NAME	PIN FUNCTION
1	D	DRAIN
2	S1	SOURCE1
3	S1	SOURCE1
4	G1	GATE2
5	G2	GATE2
6	S2	SOURCE2
7	S2	SOURCE2
8	D	DRAIN

ABSOLUTE MAXIMUM RATINGS (TA = 25℃)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-source Voltage		20	V
I_D	Drain Current(continuous)at Tc=25℃	(Note1)	6	A
I_{DM}	Drain Current (pulsed)	(Note2)	24	A
V_{GS}	Gate-source Voltage		±12	V
P_D	Power Dissipation (T_C = 25°C)	(Note1)	1.25	W
Tstg	Operating and Storage Temperature Rang		-55 to +150	℃

Notes a. PW<10us,Duty Cycle<1%,V_{GS}=4.5V
b. Mounted on ceramic substrate of 45 cm^2x 2.2mm.
Caution: These values must not be exceeded under any conditions.
Remark: The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

Thermal Data

Symbol	Parameter	Max.	Unit
Rthj-amb	Thermal Resistance Junction- ambient	83	℃/W

Electrical Characteristics (T_C = 25℃)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	I_D=250uA, V_{GS}=0V	20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V			1	μA
I_{GSS}	Gate Leakage Current	V_{GS}=±10V,V_{DS}=0V			±1	μA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS},I_D= 250uA	0.5		1.15	V
$R_{DS(on)}$	Drain to Source On-state Resistance	V_{GS}=4.5V,I_D=2A		45	50	mΩ
		V_{GS}=3.85V,I_D=2A		48	52	mΩ
		V_{GS}=2.5V,I_D=2A		60	70	mΩ
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V,f=1MHz		370		pF
C_{oss}	Output Capacitance			89		pF
C_{rss}	Reverse Transfer Capacitance			9.7		pF
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V,I_D=3A, V_{GS}=4.5V,R_G=4.7 (Note2,3)		200		ns
t_r	Rise Time			236		ns

$t_{d(off)}$	Turn-off Delay Time			36		ns
t_f	Fall Time			165		ns
Q_g	Total Gate Charge	V_{DD}=16V,V_{GS}=4.5V, I_D=6A (Note2,3)		7.5		nC
Q_{gs}	Gate to Source Charge			2.5		nC
Q_{gd}	Gate to Drain Charge			1.3		nC
V_{SD}(*)	Body Diode Forward Voltage	I_F=6A,V_{GS}=0V		0.74	1.2	V
T_{rr}	Reverse Recovery Time	V_{DD}=10V,I_F=6A,di/dt=100A/us (Note2)		80		ns

Notes:
1. Surface Mounted on FR4 Board, t≤10sec
2. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%
3. Essentially independent of operating temperature
(*)Pulsed: Pulse duration

Typical characteristics (25℃ unless noted)

Figure 1 Output Characteristics

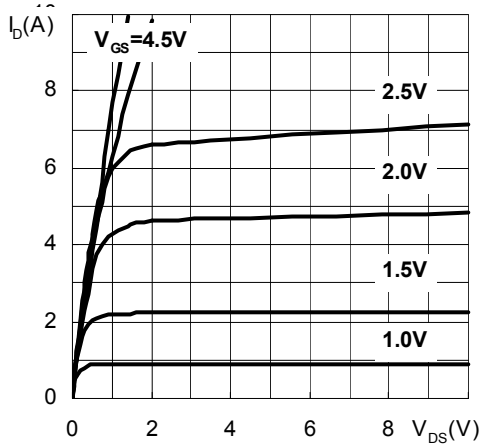


Figure 2 Transfer Characteristics

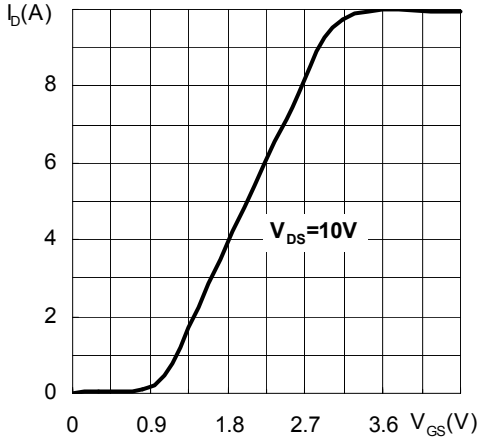


Figure 3 Threshold Voltage vs. Temperature

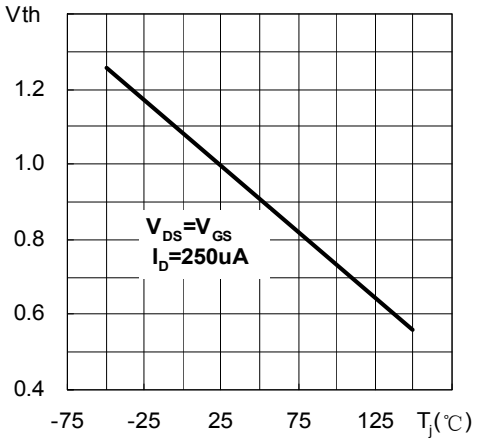


Figure 4 BVDSS vs.Temperature

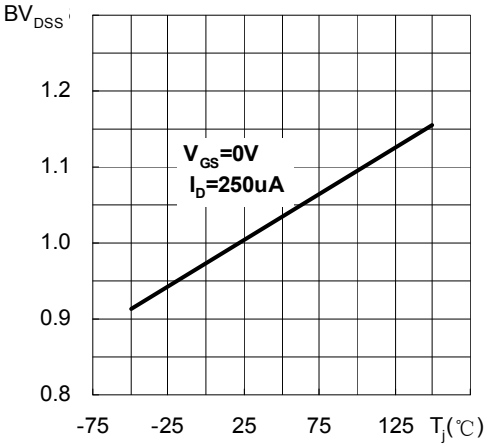


Figure 5 RDSON vs. Temperature

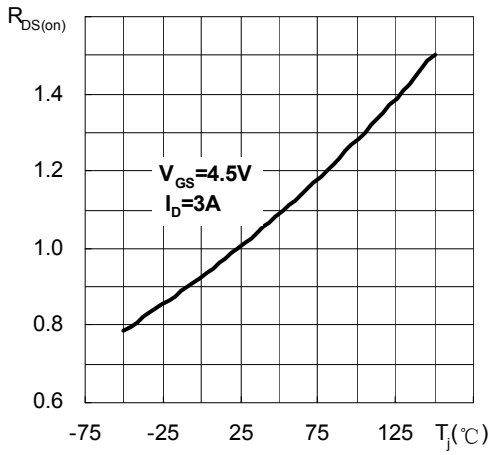


Figure 6 Source-drain diode forward characteristics

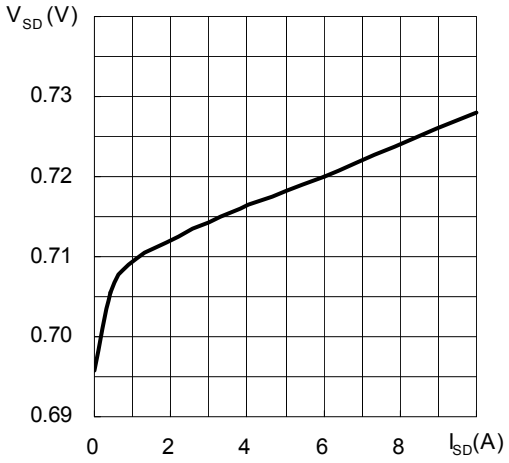


Figure 7 Capacitance

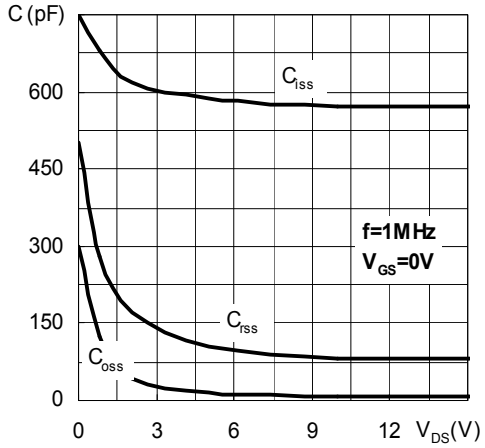


Figure 8 Gate Charge

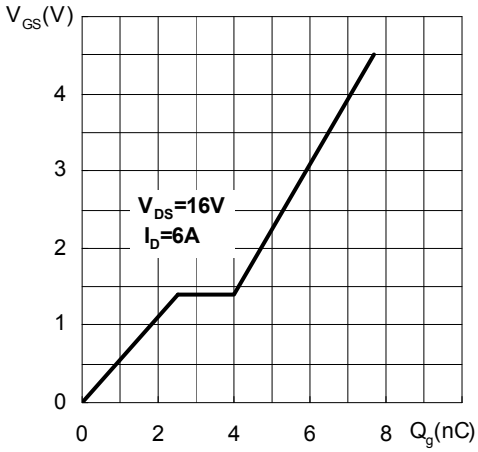


Figure 9 Safe Operating Area

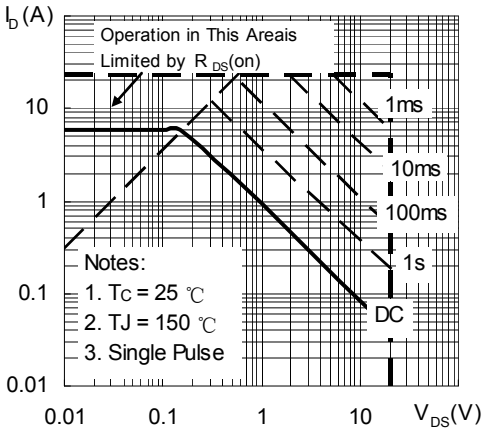


Figure 10 Maximum Drain Current vs Case Temperature

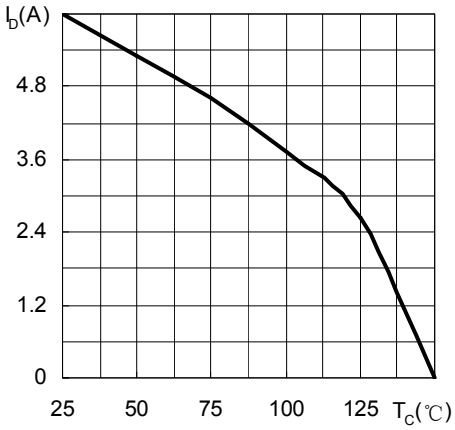
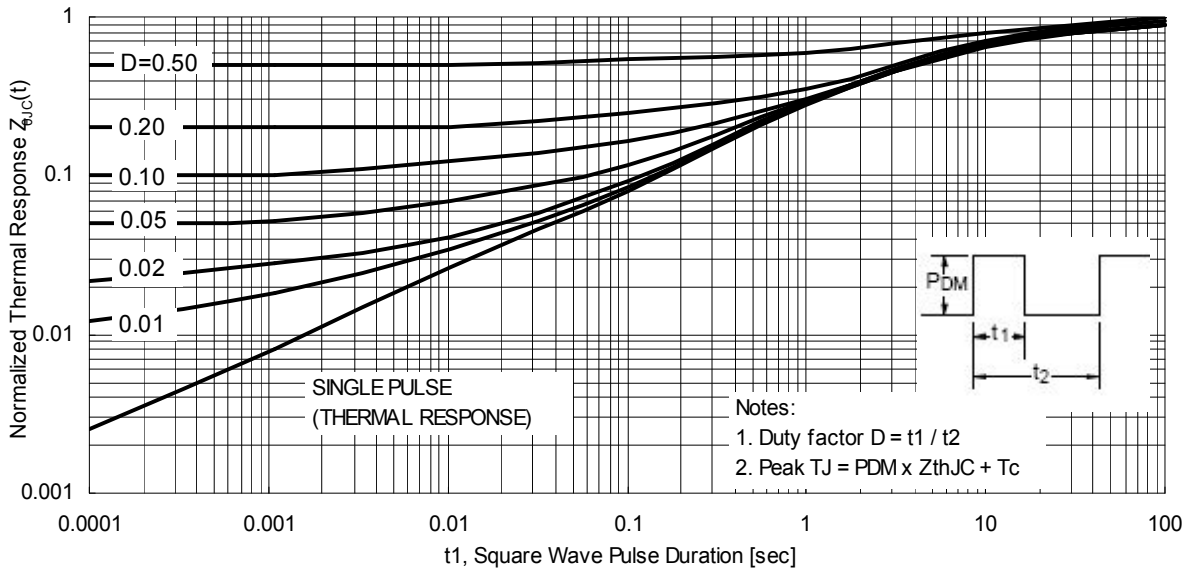
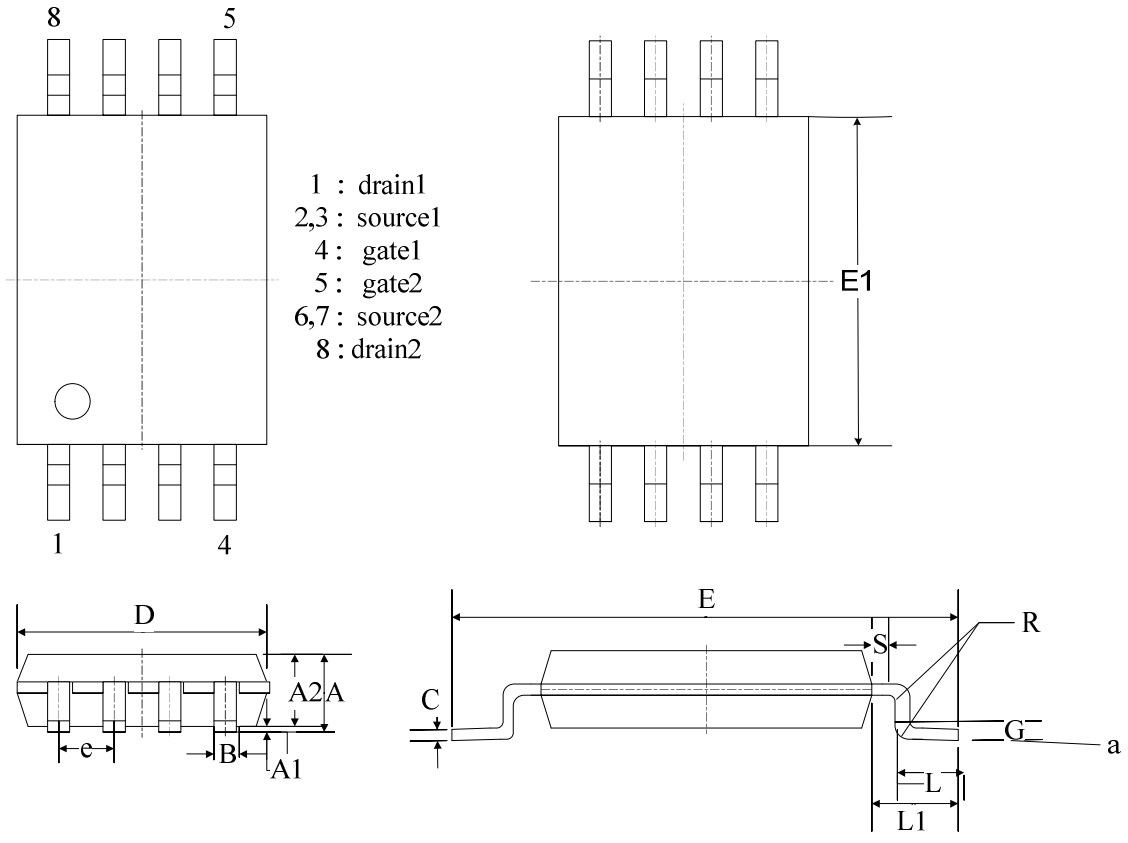


Figure 11 Maximum Transient Thermal impedance



Package Drawing



Dimensions（unit：mm）

DIM		A	A(1)	A(2)	B	C	D	E	E1	e	G	L	L1	a	R	S
MM	Min.	1.05	0.05	0.99	0.19		2.9	6.2	4.3	0.65 BSC	0.254 GAGE PLANE	0.45	0.9	0°	0.09	0.2
	Nom.	1.1	0.1	1.02	0.25	0.127	3	6.4	4.4			0.6	1	4°		
	Max.	1.2	0.15	1.05	0.3		3.2	6.6	4.5			0.75	1.1	8°		

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