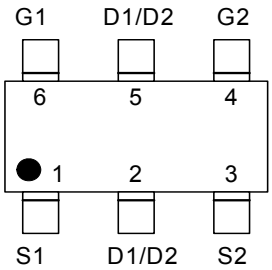
BYD Microelectronics Co., Ltd.

BF8205E

Dual N-Channel MOSFET

General Description

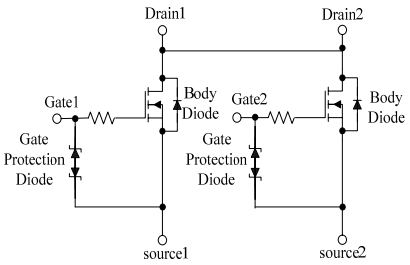
The BF8205E is a dual N-channel MOS Field Effect Transistor, which uses advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch. This device has ESD protection.



Features

- V_{DS} =20 V
- I_D =6A
- Low on-state resistance Fast switching
  $R_{DS(on)}$ ≤ 22mΩ (V_{GS} = 4.5V, I_D = 3.0A)
  $R_{DS(on)}$ ≤ 24mΩ (V_{GS} = 3.8V, I_D = 3.0A)
  $R_{DS(on)}$ ≤ 32mΩ (V_{GS} = 2.5V, I_D = 3.0A)
- Built-in G-S protection diode against ESD.
- Lead Pb-free and Halogen-free

EQUIVALENT CIRCUIT



Absolute Maximum Ratings (Tc = 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
T_J,Tstg	Operating and Storage Temperature Range		-55 to +150	℃

Ordering Information

Part Number	Package	Packaging
BF8205E	SOT23-6	3000pcs Tape& Reel

Thermal Data

Symbol	Parameter	Max.	Unit
Rthj-amb	Thermal Resistance Junction- ambient	100	℃/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}=±12V,V_{DS}=0V			±15	μA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS},I_D= 250uA	0.5	0.7	1.0	V
$R_{DS(on)}$	Drain to Source On-state Resistance	V_{GS}=4.5V,I_D=3A		17	22	mΩ
		V_{GS}=3.8V,I_D=3A		18	24	mΩ
		V_{GS}=2.5V,I_D=3A		23	30	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=4.7Ω (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

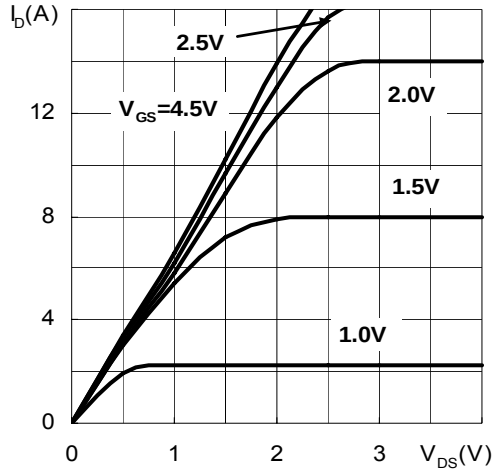


Figure 2 Transfer Characteristics

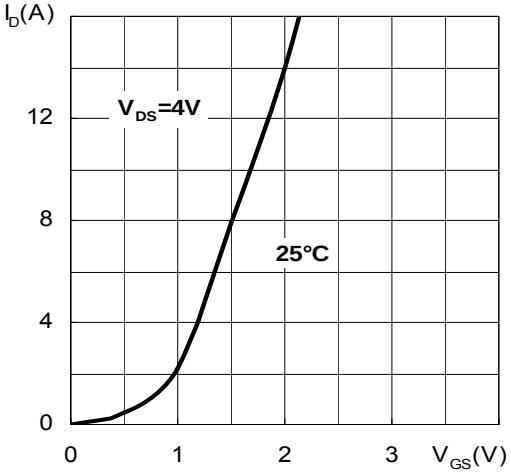


Figure 3 Normalized Threshold Voltage vs. Temperature

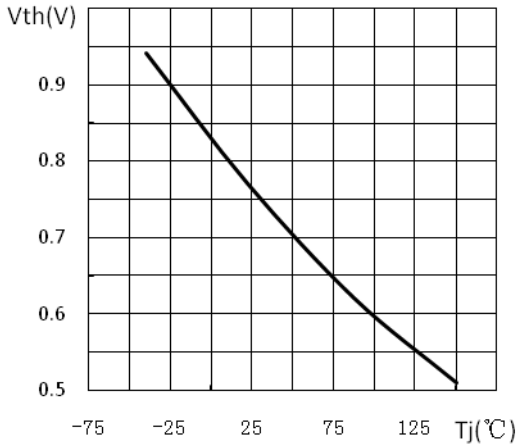


Figure 4 Normalized BV_{DSS} vs.Temperature

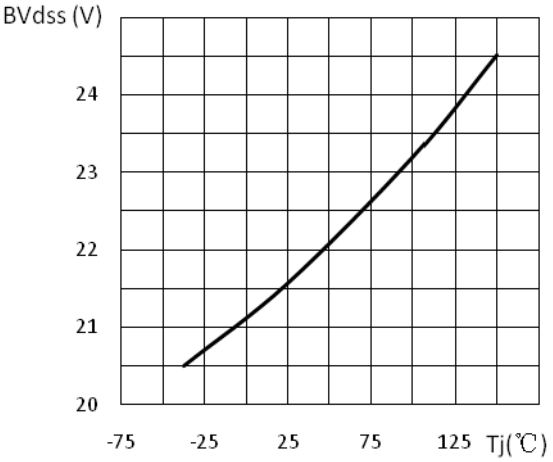


Figure 5 Normalized on Resistance vs Temperature

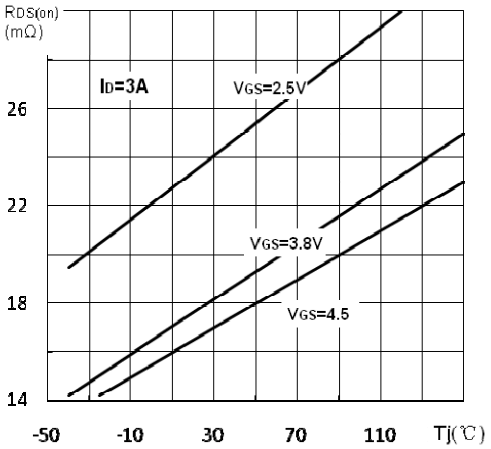


Figure 6 Source-drain diode forward characteristics

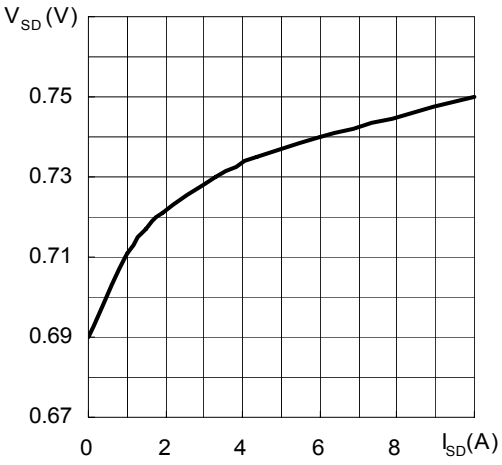


Figure 7 Capacitance

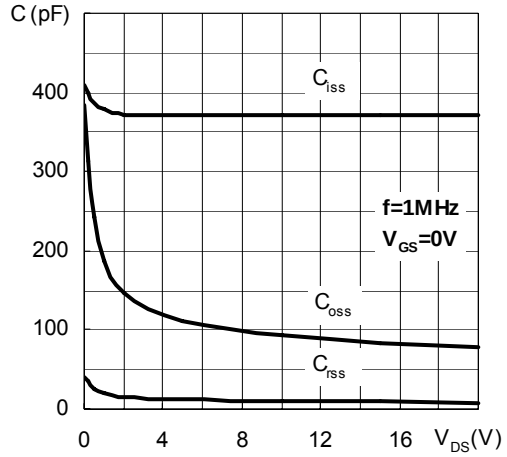


Figure 8 Gate Charge

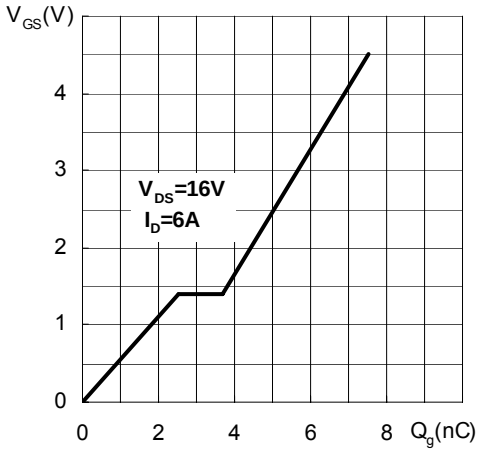


Figure 9 Safe Operating Area Temperature

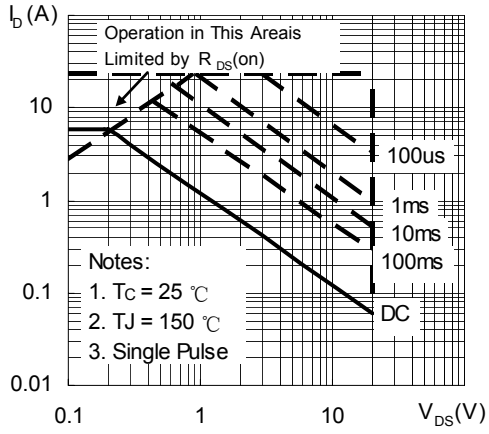


Figure 10 Maximum Drain Current vs Case

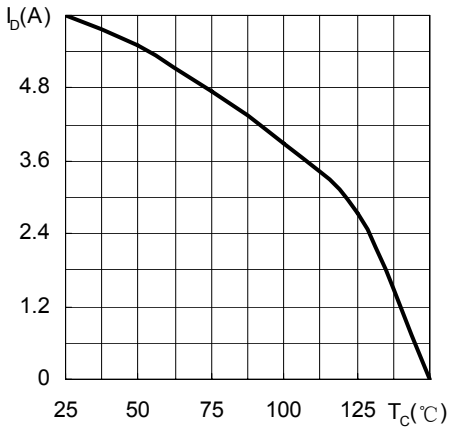


Figure 11 On-Resistance vs. Gate-to-Source Voltage

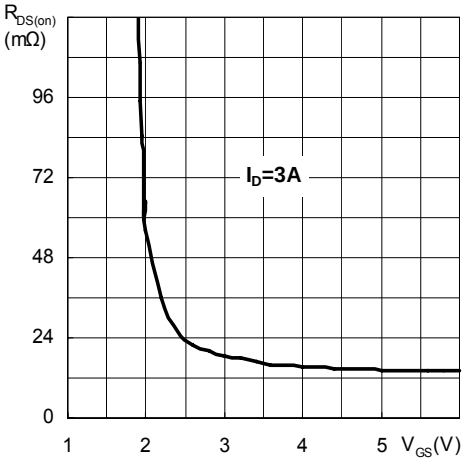


Figure 12 Gate-Current vs.Gate-Source Voltage

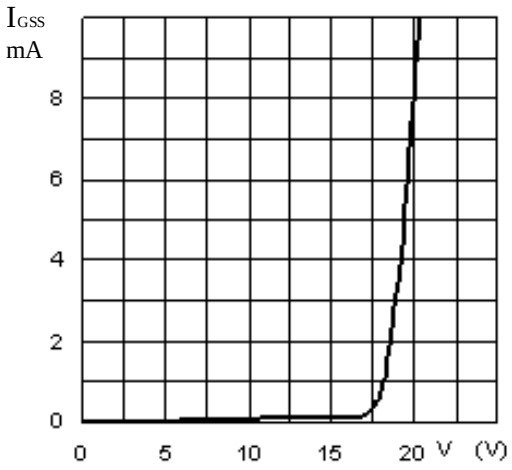
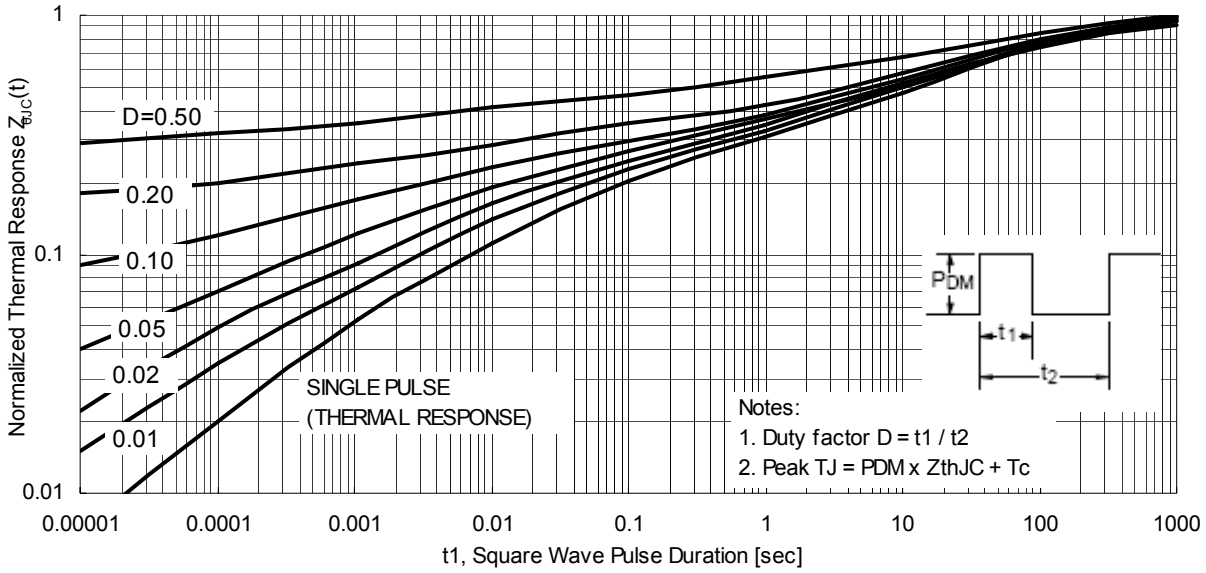
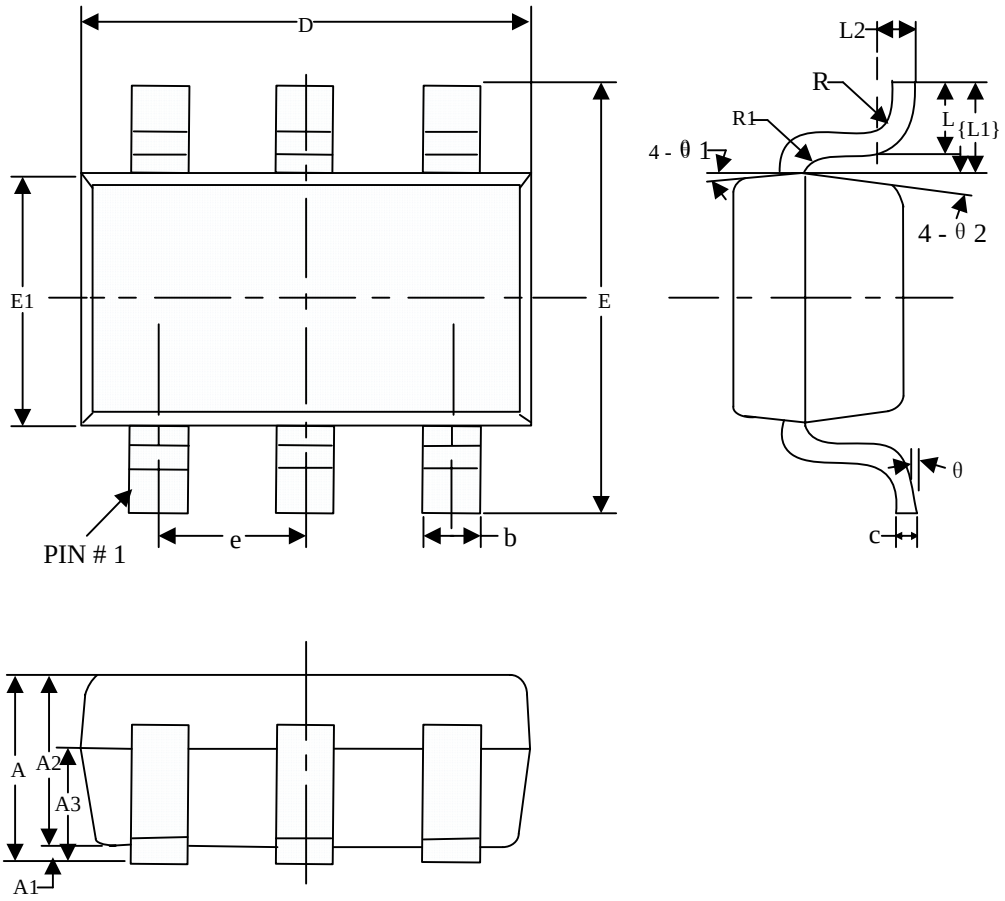


Figure 13 Maximum Transient Thermal impedance



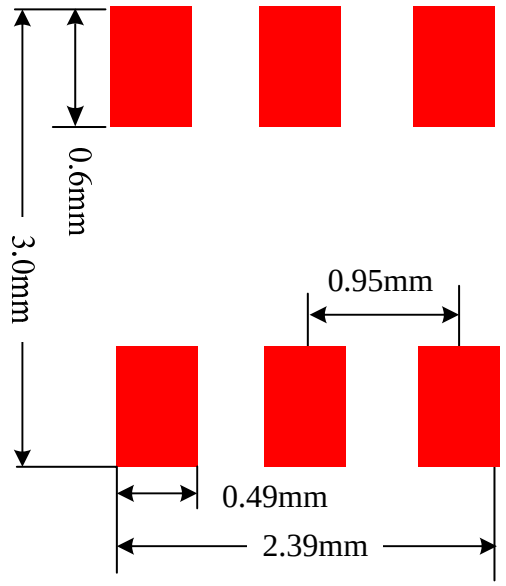
Package Drawing



Dimensions（unit：mm）

SYMBOL	MIN	NOM	MAX		SYMBOL	MIN	NOM	MAX
A	-	-	1.30		e	0.85	0.95	1.05
A1	0	-	0.15		L	0.35	0.45	0.60
A2	0.90	1.10	1.30		L1		0.59REF	
A3	0.60	0.65	0.70		L2		0.25BSC	
b	0.39	-	0.49		R	0.05	-	-
c	0.12	-	0.19		R1	0.05	-	0.02
D	2.85	2.95	3.15		θ	0°	-	8°
E	2.60	2.80	3.00		θ1	3°	5°	7°
E1	1.55	1.65	1.75		θ2	6°	8°	10°

PCB Layout Guide



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