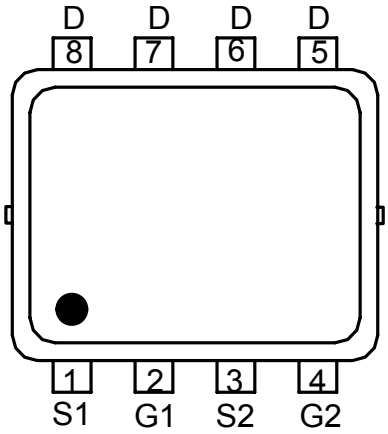
BYD Microelectronics Co., Ltd.

BF9028DND-A

20V N-Channel MOSFET

General Description

The BF9028DND-A is a Dual N-Channel MOS Field Effect Transistor, which is applied to electronic systems as a power switch. This device has ESD-protection and low resistance characteristics.



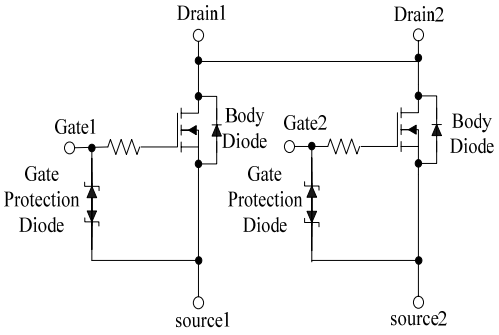
Features

- V_{DS} = 20V
- I_D =6A
- Low on-state resistance
- $R_{DS(on)}$ = 16.0mΩ TYP(V_{GS} = 4.5V, I_D = 3.0A)
- $R_{DS(on)}$ = 17.5mΩ TYP(V_{GS} = 3.8V, I_D = 3.0A)
- $R_{DS(on)}$ = 20.0mΩ TYP(V_{GS} = 3.0V, I_D = 3.0A)
- $R_{DS(on)}$ = 23.0mΩ TYP(V_{GS} = 2.5V, I_D = 3.0A)
- Built-in G-S protection diode against ESD
- Lead Pb-free and Halogen-free

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	20	V
Gate to Source Voltage	V_{GS}	±10	V
Drain Current (DC)	$I_{D(DC)}$	6	A
Drain Current (pulse)[a]	$I_{D(pulse)}$	24	A
Maximun Power Dissipation[b]	P_D	2.0	W
Channel Temperature	T_{ch}	150	℃
Storage Temperature	T_{stg}	-55~+150	℃

EQUIVALENT CIRCUIT



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.

Ordering Information

Part Number	BF9028DND-A
Package	DFN3*3-8L

Electrical Characteristics (T_A = 25℃)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 20V,V_{GS}=0V	—	—	10	μA
Gate Leakage Current	I_{GSS}	V_{GS}= ± 10V,V_{DS}=0V	—	—	±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D= 0.25mA	0.5	0.8	1.5	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS}= 10V, I_D= 3A	—	4	—	S
Drain to Source On-state Resistance	$R_{DS(on)}$	V_{GS}= 4.5V,I_D= 3A	—	16	22	mΩ
		V_{GS}= 3.8V,I_D= 3A	—	17.5	24	mΩ
		V_{GS}= 3.0V,I_D= 3A	—	20	26	mΩ
		V_{GS}= 2.5V,I_D= 3A	—	23	30	mΩ
Input Capacitance	C_{iss}	V_{DS}= 10V ,V_{GS}=0V,f=1MHZ	—	1200	—	pF
Output Capacitance	C_{oss}		—	260	—	pF
Reverse Transfer Capacitance	C_{rss}		—	250	—	pF
Turn-on Delay Time	$t_{d(on)}$	V_{DS}= 10V,I_D= 3A, V_{GS}= 4.5V, R_G=10Ω	—	160	—	ns
Rise Time	t_r		—	500	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	2600	—	ns
Fall Time	t_f		—	1600	—	ns
Total Gate Charge	Q_G	V_{DS}= 16V,V_{GS}= 4.5V, I_D=6A	—	10	—	nC
Gate to Source Charge	Q_{GS}		—	2.5	—	nC
Gate to Drain Charge	Q_{GD}		—	3.5	—	nC
Body Diode Forward Voltage	$V_{F(S-D)}$	I_F=6A,V_{GS}=0V	—	0.7	1.2	V

Typical characteristics (25℃ unless noted)

Figure 1 Threshold Voltage vs. Temperature

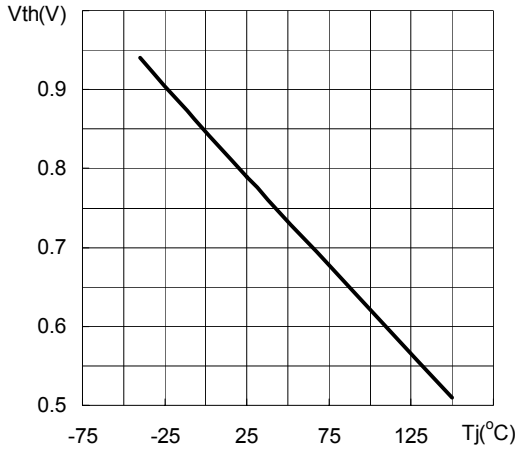


Figure 2 BV_{DSS} vs. Temperature

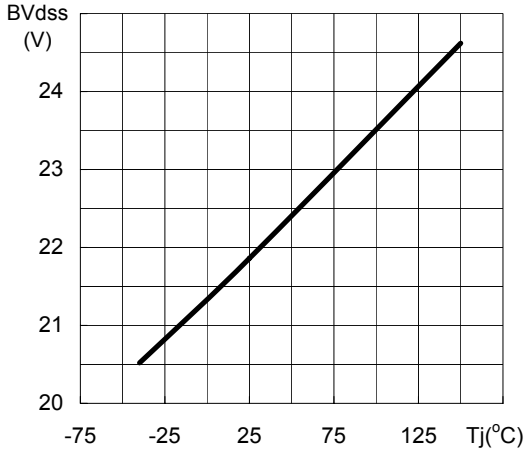


Figure 3 I_{DSS} vs. Temperature

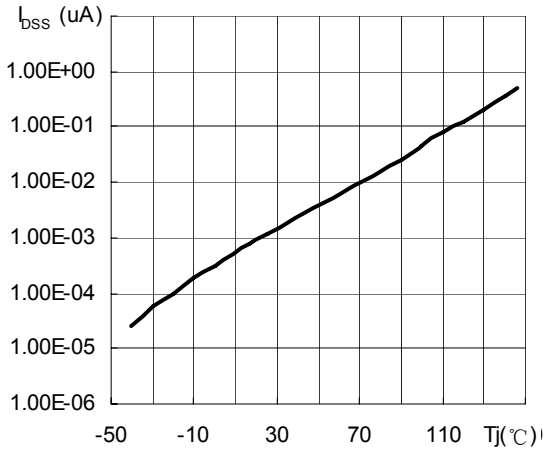


Figure 4 I_{GSS} vs. Temperature

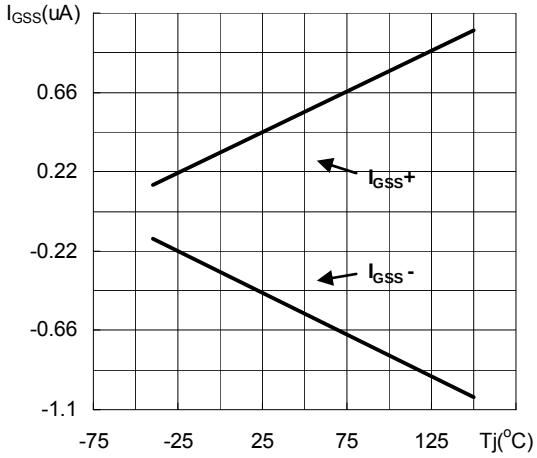


Figure 5 On-Resistance vs. Temperature

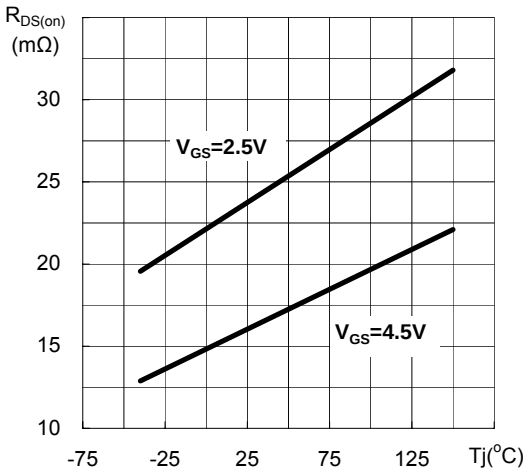


Figure 6 On-Resistance vs. Drain Current

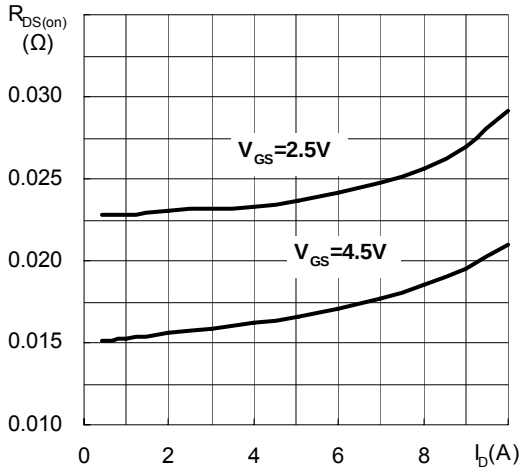


Figure 7 On-Resistance vs. Gate-to-Source Voltage

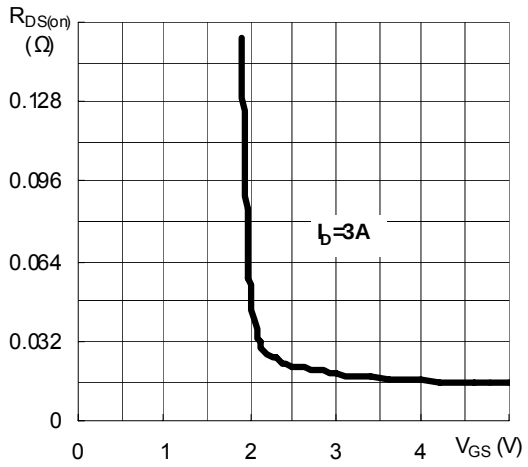


Figure 8 Drain to Source Voltage vs. Drain Current

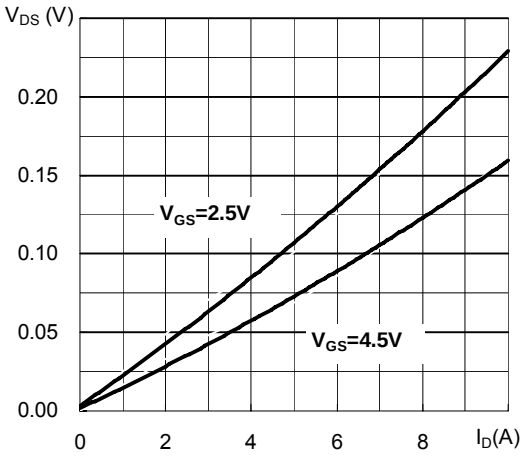


Figure 9 Gate Charge

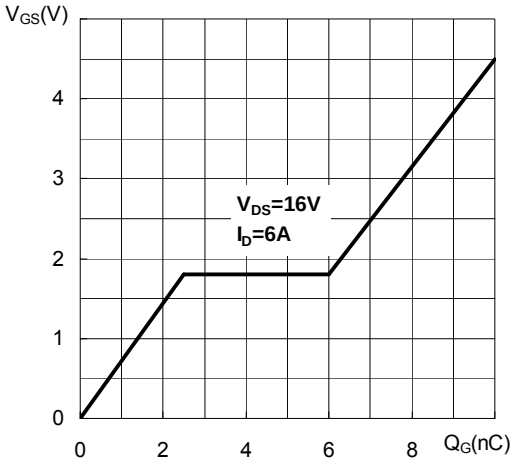
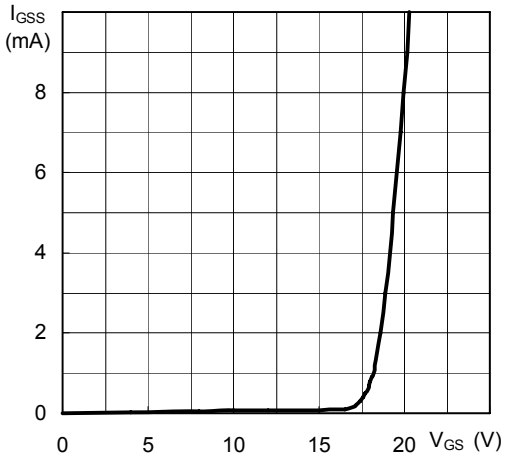
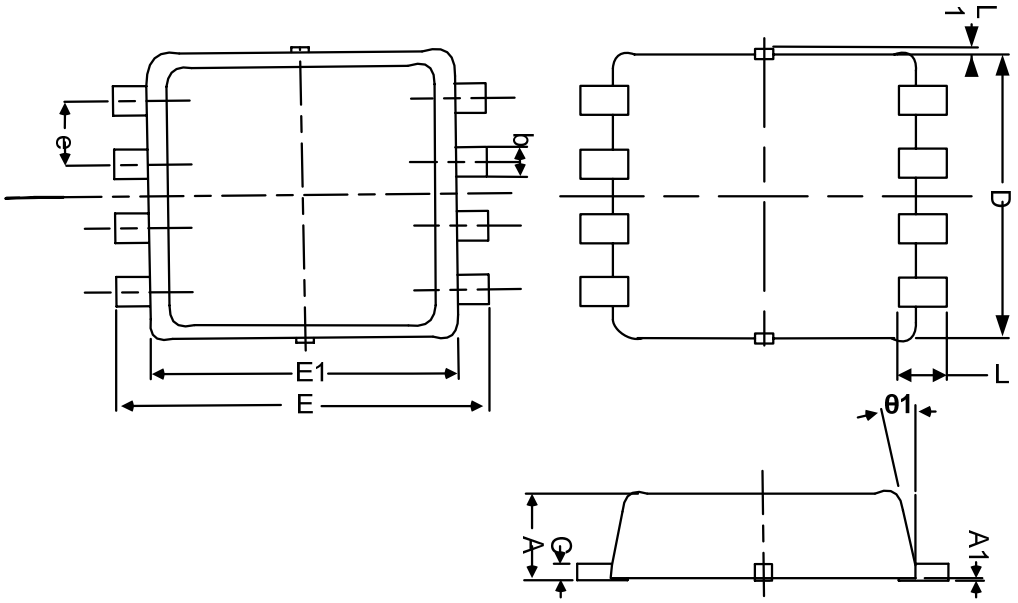


Figure 10 Gate-Current vs.Gate-Source Voltage



Package Drawing



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.70	0.80	0.90	0.0276	0.0315	0.0354
A1	0.00	0.00	0.05	0.000	0.000	0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
C	0.08	0.152	0.25	0.003	0.006	0.010
D	2.80	2.90	3.00	0.110	0.114	0.118
E	2.70	2.80	2.90	0.106	0.110	0.114
E1	2.20	2.30	2.40	0.087	0.091	0.094
e	0.65BSC				0.026BSC	
L	0.2	0.375	0.450	0.008	0.0148	0.0177
L1	0.000	0.000	0.100	0.000	0.000	0.004
θ	0°	10°	12°	0°	10°	12°

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