

BMx4N65

N-Channel MOSFET

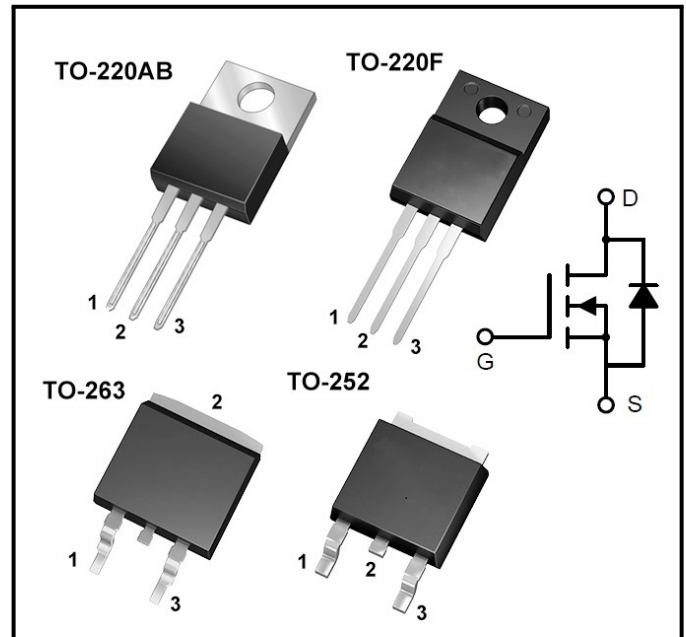
Features

- $V_{DS}=650V$
- $I_D=4A$
- $R_{DS(ON)} @V_{GS}=10V, MAX=2.8\Omega$
- Fast Switching
- Low Gate Charge

Applications

- Power switch circuit of adaptor and charger

Package



Mechanical Data

- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275°C maximum, 10s per JESD 22-B106
- Case: Molded plastic
- Mounting Position: Any

Ordering information

Order code	Package	Base qty	Delivery mode
BME4N65/G	TO-220AB	50pcs/tube	1kpcs/box 5kpcs/carton
BMF4N65/G	TO-220F	50pcs/tube	1kpcs/box 5kpcs/carton
BMK4N65/G	TO-263	50pcs/tube	1kpcs/box 5kpcs/carton
BMK4N65-R/G	TO-263	800pcs/reel	800pcs/box 4kpcs/carton
BMI4N65/G	TO-252	2500pcs/reel	5kpcs/box 25kpcs/carton

Note: The order code with "G" means using a thick frame.



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Maximum Ratings (@T_A=25°C unless otherwise noted)

Symbol	Parameters	Value			Unit
		TO-220AB/TO-263	TO-220F	TO-252	
V _{DS}	Drain-Source Voltage	650			V
V _{GS}	Gate-Source Voltage	±30			V
I _D	Continue Drain Current	4			A
I _{DM}	Pulsed Drain Current (Note1)	16			A
P _D	Power Dissipation	75	30	75	W
E _{AS}	Single Pulse Avalanche Energy (Note1)	200			mJ
T _J	Junction Temperature Range	150			°C
T _{STG}	Storage Temperature Range	-55 to +150			°C
R _{θJC}	Thermal Resistance, Junction to Case	1.67	4.17	1.67	°C/W
R _{θJA}	Rhermal Resistance, Junction to Ambient	62.5	62.5	100	°C/W

Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameters	Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D =250uA	650	—	—	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 650V, V _{GS} =0V	—	—	1	μA
I _{GSS}	Gate- Source Leakage Current	V _{GS} = ±30V, V _{DS} =0V	—	—	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D =250uA	2	—	4	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} =10V, I _D =2A	—	—	2.8	Ω
g _{fs}	Forward Transconductance	V _{DS} =15V, I _D =2A	—	3.5	—	S
C _{iss}	Input capacitance	V _{DS} = 25V, V _{GS} =0V, f = 1MHz	—	610	—	pF
C _{oss}	Output capacitance		—	53	—	
C _{rss}	Reverse transfer capacitance		—	4	—	
T _{d(on)}	Turn-on delay time (Note1)	V _{DD} =325V, I _D =4A, R _G =10Ω	—	14	—	ns
T _r	Turn-on Rise time (Note1)		—	16	—	
T _{d(off)}	Turn -Off Delay Time (Note1)		—	32	—	
T _f	Turn -Off Fall time (Note1)		—	11	—	
Q _{gs}	Gate to Source Charge (Note1)	V _{DD} =520V, V _{GS} =10V, I _D =4A	—	3	—	nC
Q _{gd}	Gate to Drain Charge (Note1)		—	7	—	
Q _g	Total Gate Charge (Note1)		—	15	—	
V _{SD}	Diode Forward Voltage	I _{SD} =4A	—	—	1.4	V
I _S	Diode Forward Current	—	—	—	4	A
I _{SM}	Diode Pulsed Current	—	—	—	16	A
T _{rr}	Reverse Recovery Time (Note1)	I _{SD} =4A, V _{GS} =0V,	—	250	—	ns
Q _{rr}	Reverse Recovery Charge (Note1)	dI _F /dt=100A/μs	—	1.2	—	μC

Note1: Pulse test: 300 μs pulse width, 2% duty cycle.

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Specifications are subject to change without notice.

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Revision: 2022-Jan-1-A



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Typical Performance Characteristics($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 1: Safe Operating Area

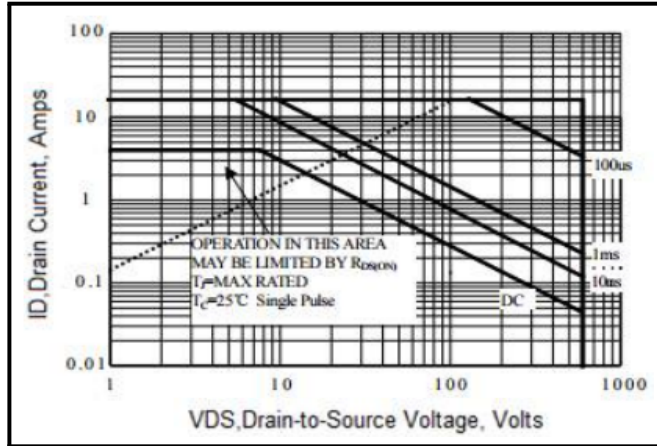


Figure 2: Drain Current vs. Case Temperature

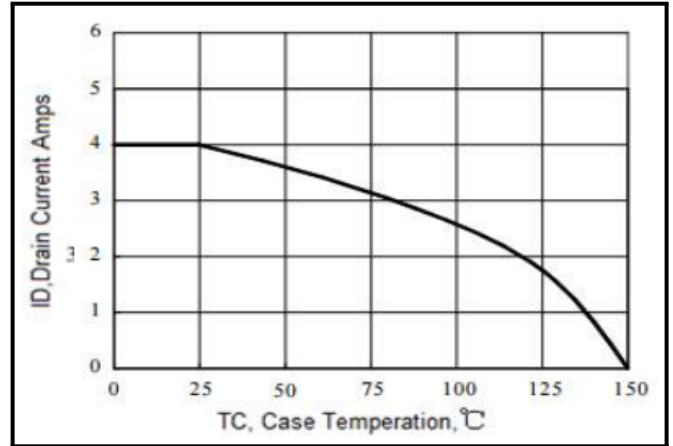


Figure 3: Output Characteristics

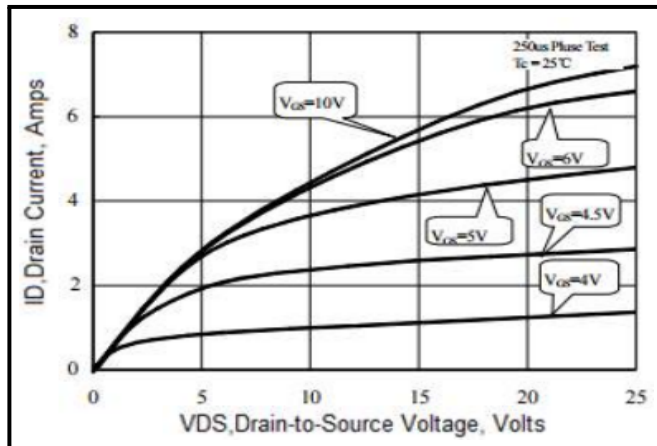


Figure 4: $R_{DS(on)}$ vs. I_D

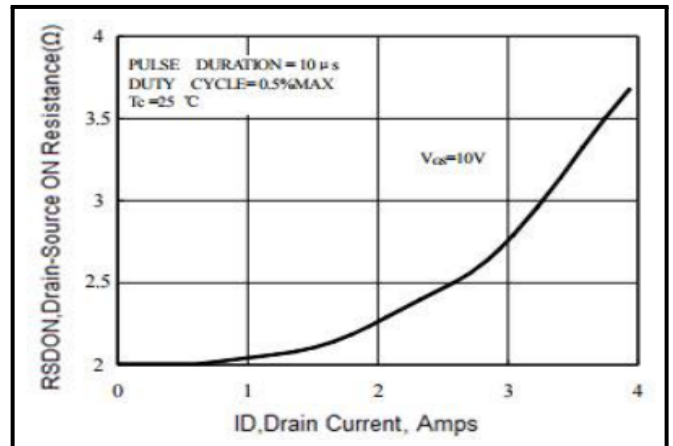


Figure 5: Capacitance Characteristics

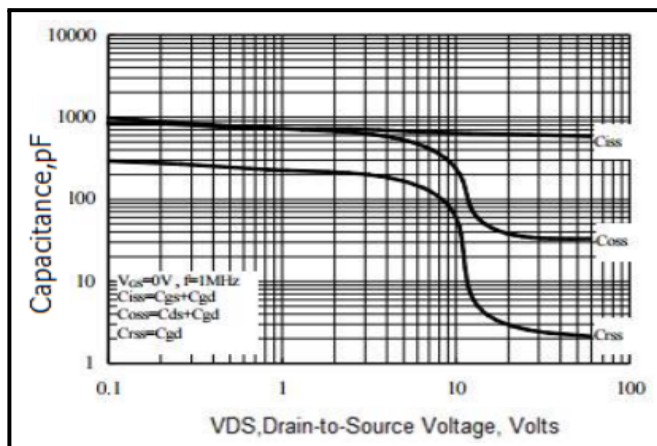
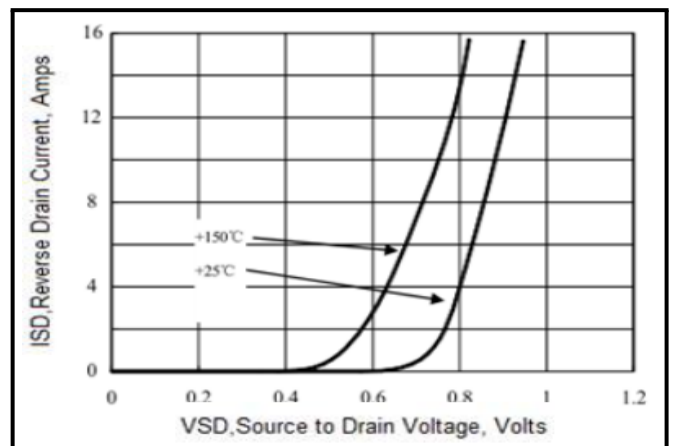


Figure 6: I_{SD} vs. V_{SD}



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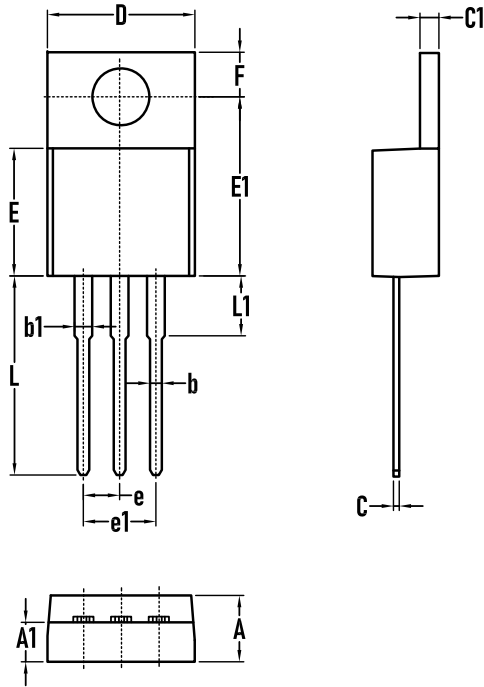
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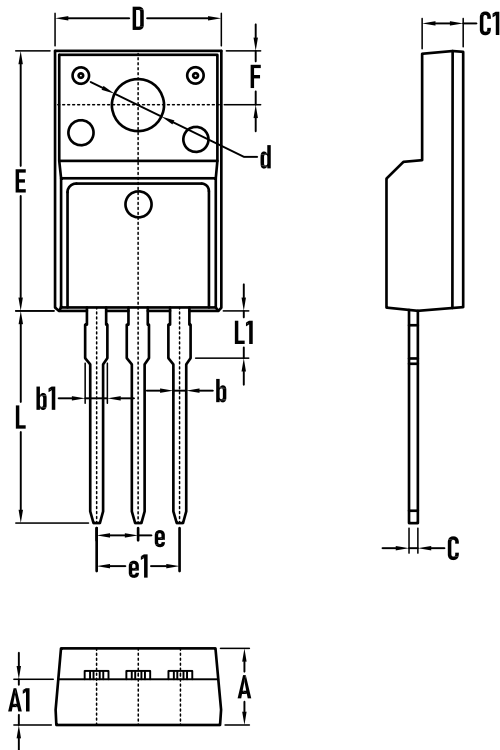
N-Channel MOSFET

Packaging Tape - TO-220AB



Symbol	Millimeters		
	MIN.	TYP.	MAX.
A	4.30	4.50	4.70
A1	2.52	2.67	2.82
b	0.71	0.81	0.91
b1	1.17	1.27	1.37
C	0.30	0.40	0.50
C1	1.17	1.27	1.37
D	9.90	10.00	10.20
E	8.50	8.70	8.90
E1	12.00	12.25	12.50
e	2.44	2.54	2.64
e1	4.88	5.08	5.26
F	2.60	2.75	2.80
L	13.00	13.50	14.00
L1	3.80	4.00	4.20

Packaging Tape - TO-220F



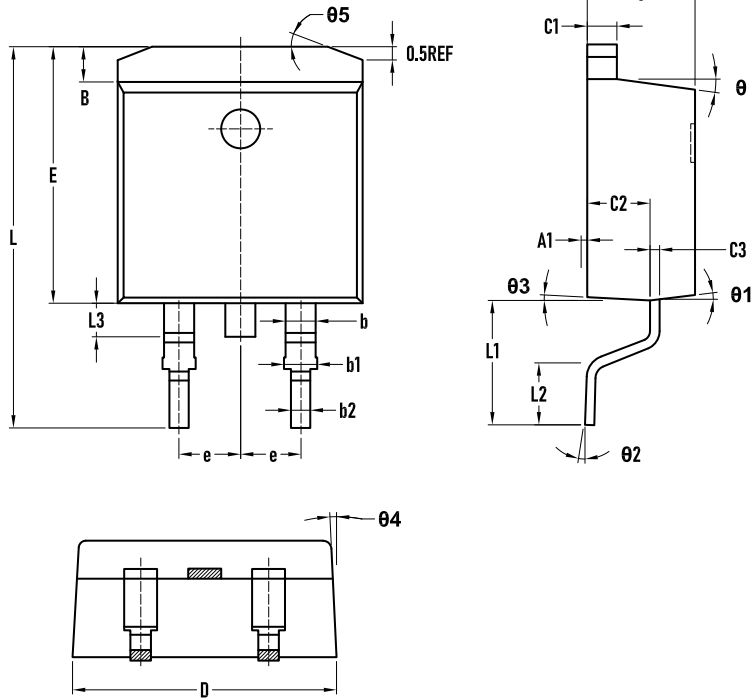
Symbol	Millimeters		
	MIN.	TYP.	MAX.
A	4.30	4.60	4.80
A1	2.70	2.80	2.90
b	0.70	0.80	0.90
b1	1.20	1.30	1.40
C	0.40	0.50	0.60
C1	2.40	2.60	2.80
D	9.90	10.00	10.20
E	15.20	15.60	16.00
e	2.44	2.54	2.64
e1	4.88	5.08	5.26
F	3.00	3.30	3.60
L	12.70	13.20	13.70
L1	2.70	2.90	3.10
d	3.10	3.20	3.30



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Packaging Tape - TO-263



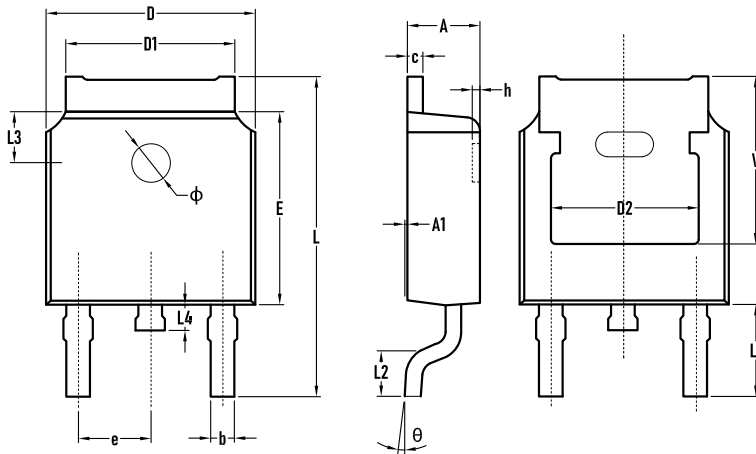
Symbol	Millimeters		
	MIN.	TYP.	MAX.
A1	0	—	0.25
B	1.32	1.37	1.42
b	—	1.27	—
b1	1.30	1.40	1.45
b2	—	0.81	—
C	4.52	4.57	4.62
C1	—	1.27	—
C2	2.64	2.69	2.74
C3	—	0.38	—
D	10.11	10.16	10.21
E	10.02	10.07	10.12
e	—	2.54	—0
L	14.65	14.95	15.25
L1	4.60	4.90	5.20
L2	2.25	2.45	2.65
L3	1.10	1.30	1.50
Θ	6°	7°	8°
Θ1	6°	7°	8°
Θ2	0°	—	8°
Θ3	2°	3°	4°
Θ4	2°	3°	4°
Θ5	—	—	20°



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Packaging Tape - TO-252



Symbol	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
ϕ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

