

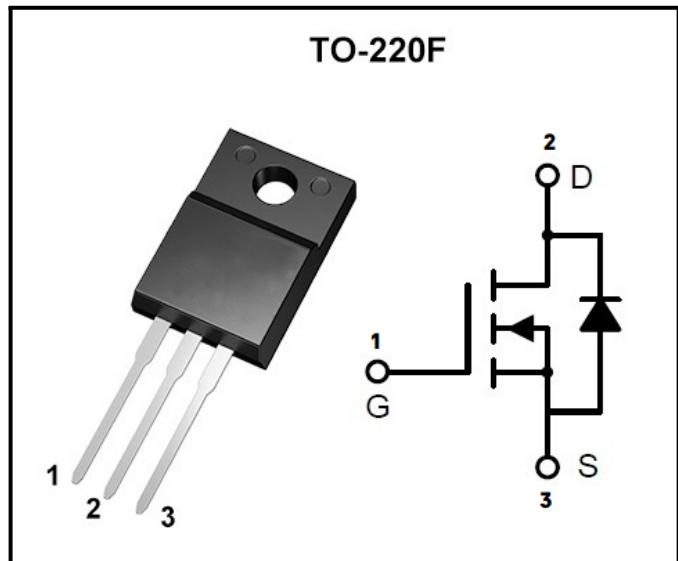
# BMF7N70

N-Channel MOSFET

## Features

- $V_{DSS}=700V$
- $I_D=7A$
- $R_{DS(ON)} @ V_{GS}=10V, TYP=1.4\Omega$
- Fast Switching
- Low Gate Charge

## Package



## Applications

- Power switch circuit of adaptor and charger
- LED power supplies
- Cell Phone Charger
- Standby Power

## 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
BMF7N70/G	TO-220F	50pcs/tube	1kpcs/box 5kpcs/carton

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



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## Maximum Ratings (@ $T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameters		Value	Unit
$V_{DS}$	Drain-Source Voltage		700	V
$V_{GS}$	Gate-Source Voltage		$\pm 30$	V
$I_D$	Continue Drain Current		7	A
$I_{DM}$	Pulsed Drain Current (Note1)		14	A
$P_D$	Power Dissipation	$T_c=25^\circ\text{C}$	63	W
		$T_A=25^\circ\text{C}$	2.5	W
$E_{AS}$	Single Pulse Avalanche Energy (Note1)		245	mJ
$T_{STG}$	Operating Junction and Storage Temperature Range		-55 to +150	$^\circ\text{C}$
$R_{\theta JC}$	Typical Thermal Resistance, Junction to Case		1.97	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Typical Rhermal Resistance, Junction to Ambient		50	$^\circ\text{C}/\text{W}$

## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameters	Conditions	Min.	Typ.	Max.	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{V}$ , $I_D=250\mu\text{A}$	700	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 700\text{V}$ , $V_{GS}=0\text{V}$	—	—	1	$\mu\text{A}$
$I_{GSS}$	Gate- Source Leakage Current	$V_{GS} = \pm 30\text{V}$ , $V_{DS}=0\text{V}$	—	—	$\pm 100$	nA
$V_{GS(\text{TH})}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$ , $I_D=250\mu\text{A}$	2	3.3	4	V
$R_{DS(\text{on})}$	Static Drain-source On Resistance	$V_{GS}=10\text{V}$ , $I_D=3\text{A}$	—	1.4	1.8	$\Omega$
$g_{fs}$	Forward Transconductance	$V_{DS}=20\text{V}$ , $I_D=3\text{A}$	—	2	—	S
$C_{iss}$	Input capacitance	$V_{DS} = 25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$	—	1200	—	pF
$C_{oss}$	Output capacitance		—	93	—	
$C_{rss}$	Reverse transfer capacitance		—	6	—	
$T_{d(\text{on})}$	Turn-on delay time (Note1)	$V_{DD}=350\text{V}$ , $I_D = 6\text{A}$ , $R_G = 10\Omega$ $V_{GS} = 10\text{V}$	—	11	—	ns
$T_r$	Turn-on Rise time (Note1)		—	13	—	
$T_{d(\text{off})}$	Turn -Off Delay Time (Note1)		—	20	—	
$T_f$	Turn -Off Fall time (Note1)		—	33	—	
$Q_{gs}$	Gate to Source Charge (Note1)	$V_{DD}=560\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=6\text{A}$	—	7	—	nC
$Q_{gd}$	Gate to Drain Charge (Note1)		—	4	—	
$Q_g$	Total Gate Charge (Note1)		—	22	—	
$V_{SD}$	Diode Forward Voltage	$I_{SD}=3\text{A}$	—	—	1.2	V
$I_S$	Diode Forward Current	—	—	—	7	A
$I_{SM}$	Diode Pulsed Current	—	—	—	14	A
$T_{rr}$	Reverse Recovery Time (Note1)	$V_{DS}=30\text{V}$ , $V_{GS}=0\text{V}$ , $I_S=1\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$	—	368	—	ns
$Q_{rr}$	Reverse Recovery Charge (Note1)		—	670	—	nC

Note1: Pulse test: 300  $\mu\text{s}$  pulse width, 2% duty cycle.

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Specifications are subject to change without notice.

Please refer to <http://www.born-tw.com> for current information. **Revision: 2022-Jan-1-A**



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

Figure 1: Output characteristic

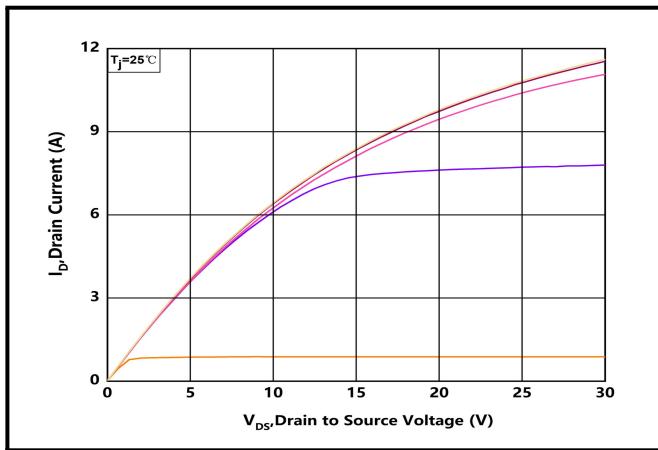


Figure 2: Transfer Characteristic

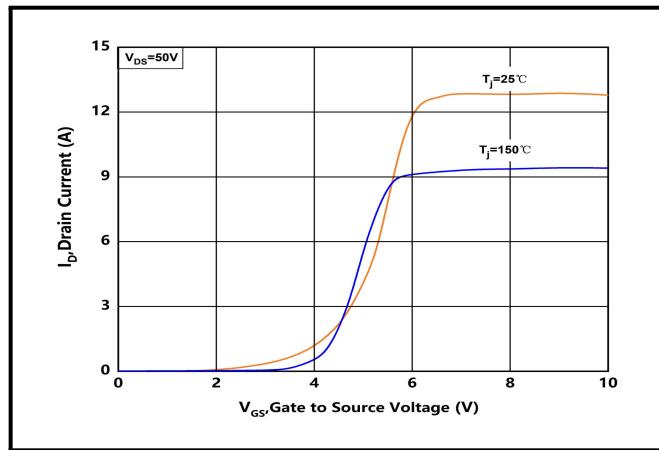


Figure 3:  $R_{DS(on)}$  vs.  $I_D$

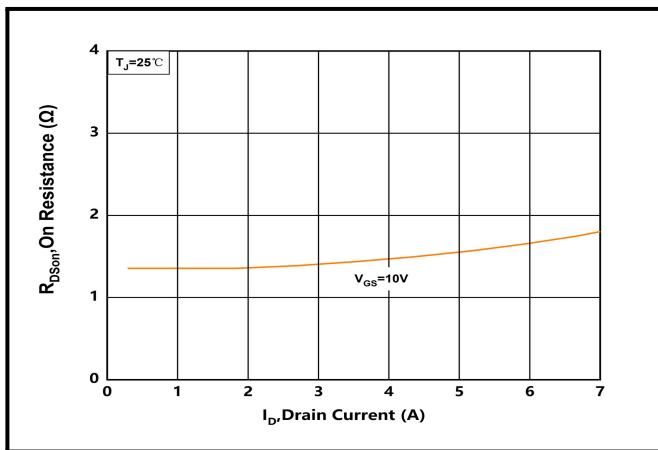


Figure 4:  $R_{DS(on)}$  vs. Junction Temperature

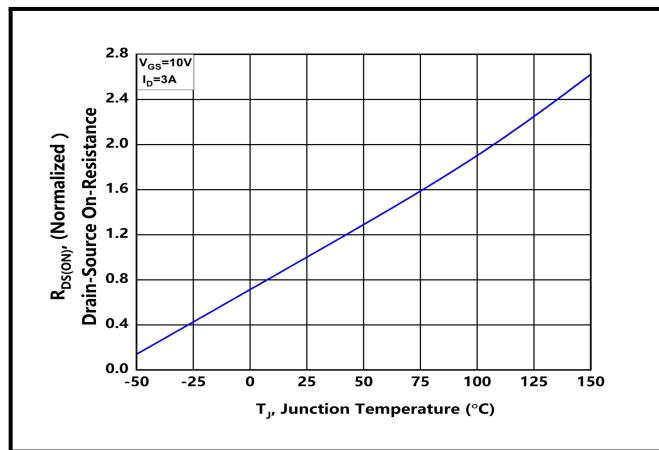


Figure 5:  $V_{gs(th)}$  vs. Junction Temperature

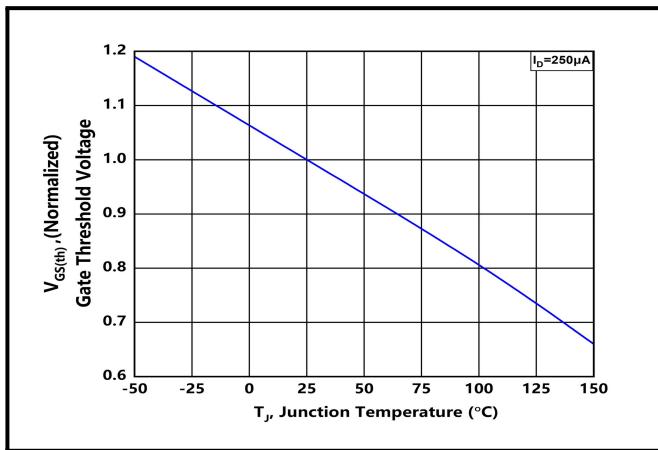
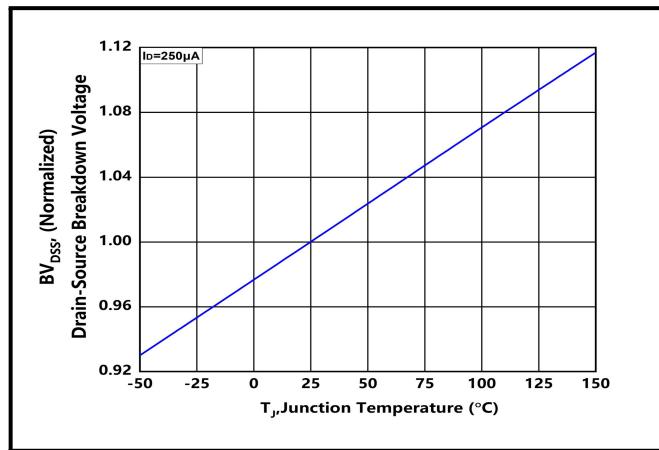


Figure 6:  $BV_{DSS}$  vs. Junction Temperature



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

Figure 7: Capacitance Characteristic

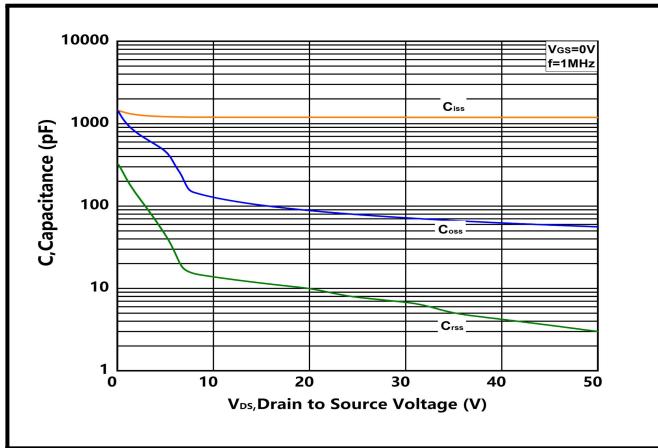


Figure 8: Typical Gate Charge vs.  $V_{\text{GS}}$

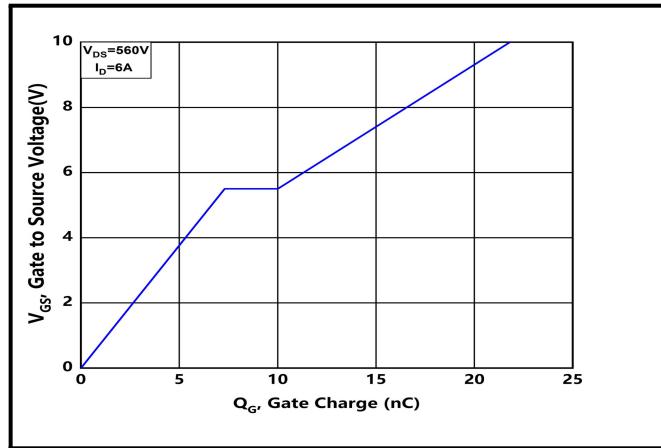


Figure 9: Body Diode Characteristic

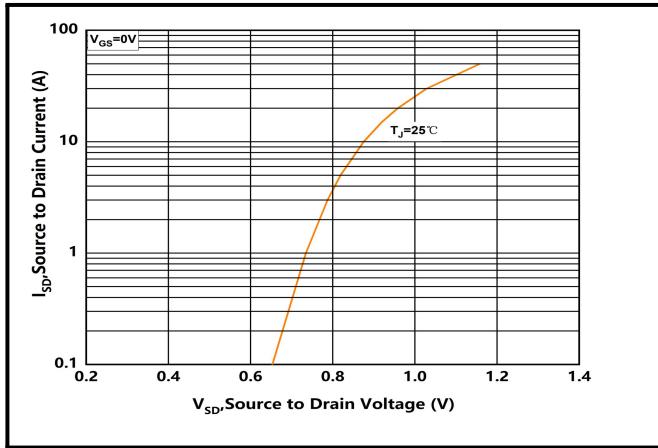


Figure 10:  $P_{\text{D}}$  Derating vs. Case Temperature

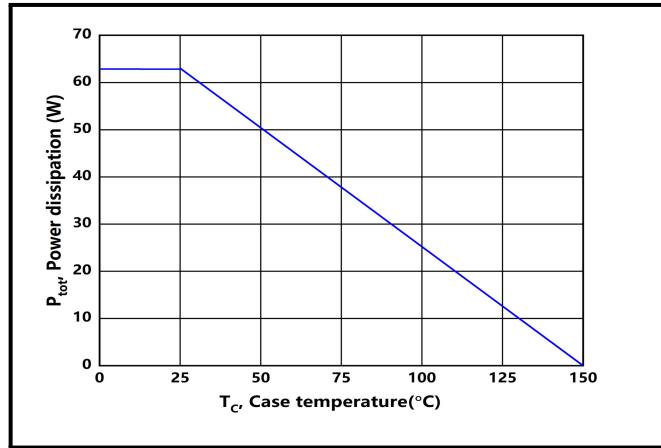


Figure 11: Safe Operating Area

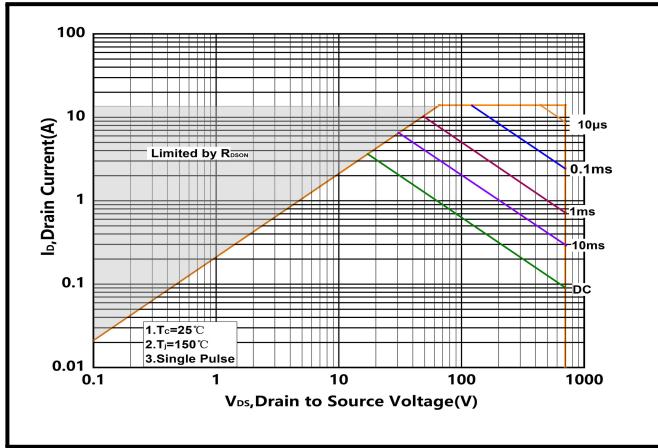
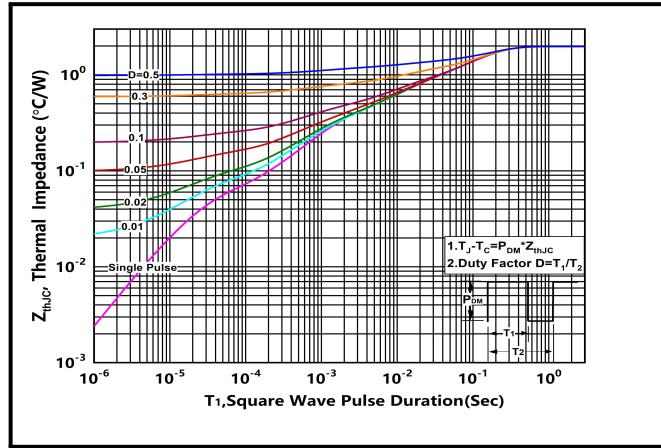


Figure 12: Thermal Impedance (Junction-Case)



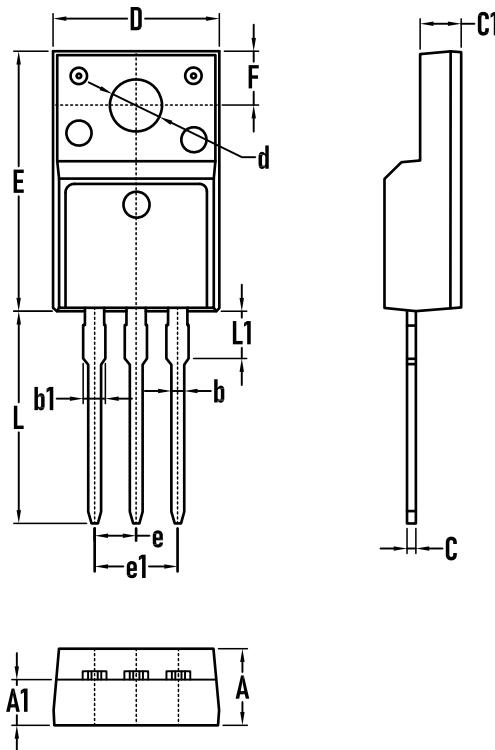
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**Packaging Tape - TO-220F**



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

