

/ Descriptions

TO-220F N MOS

N-CHANNEL MOSFET in a TO-220F Plastic Package.

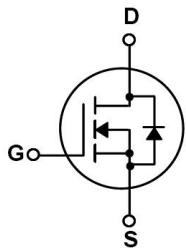
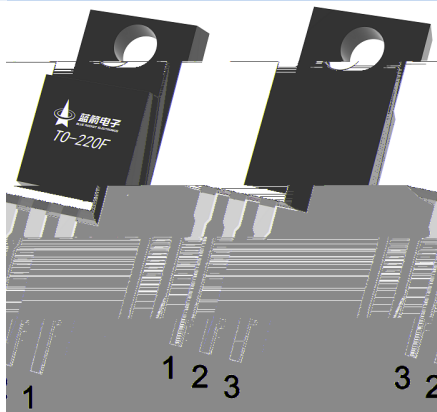
/ Features $V_{DS}=200V$ $I_D=9A$ $R_{DS(on)}@10V \leq 0.4\Omega$ (Type.0.35 Ω)

HF Product.

/ Applications

LED

Networking, Load Switch, LED applications.

/ Equivalent Circuit**/ Pinning**

PIN1 G

PIN 2 D

PIN 3 S

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	200	V
Drain Current	$I_D(T_C=25^{\circ}C)$	9	A
Drain Current - Pulsed	I_{DM}	36	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulsed Avalanche Energy(L=10mH)	E_{AS}	166	mJ
Avalanche Current(L=10mH)	I_{AS}	5	A
Power Dissipation	$P_D(T_C=25^{\circ}C)$	30	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	
Maximum Junction-to-Ambient	$R_{\theta JA}$	100	/W
Maximum Junction-to-Case	$R_{\theta JC}$	4.17	

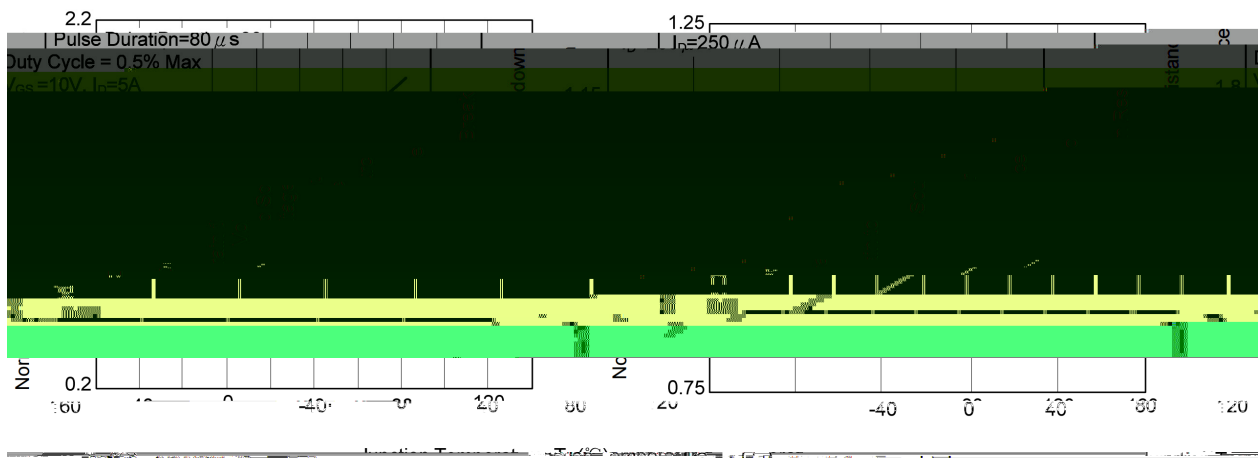
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	200			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=200V$ $V_{GS}=0V$			1	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2	3	4	V
Total gate charge	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=4.5A$		0.35	0.4	Ω
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$, $f=1MHz$		1.7		Ω
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$		630		pF
Output Capacitance	C_{oss}			270		
Reverse Transfer Capacitance	C_{rss}			50		
Total Gate Charge	Q_g	$V_{GS}=10V$, $V_{DS}=160V$, $I_G=1.5mA$, $I_D=9A$		21	30	nC
Gate Source Charge	Q_{gs}			11.2	20	
Gate Drain Charge	Q_{gd}			9.5	15	

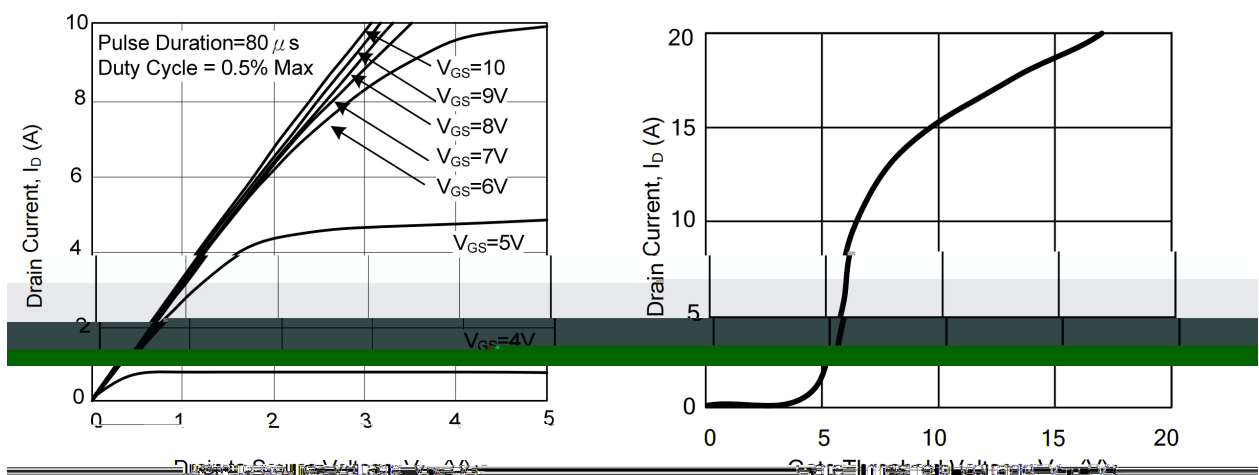
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=90V$ $R_L=9.6\ \Omega$ $R_{GEN}=9.1\ \Omega$		15	32	ns
Turn-On Rise Time	t_r			33	53	
Turn-Off Delay Time	$t_{d(off)}$			40	55	
Turn-Off Fall Time	t_f			30	45	
Maximum Continuous Drain-Source Diode Forward Current	I_S				9	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				36	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\ V,$ $I_S = 9.0A$			1.2	V
Reverse Recovery Time	t_{rr}	$V_{GS} = 0V,$ $I_S = 9.0A,$ $di_F/dt = 100\ A/\mu s$		455		nS
Reverse Recovery Charge	Q_{rr}			3.5		nC

/ Electrical Characteristic Curve

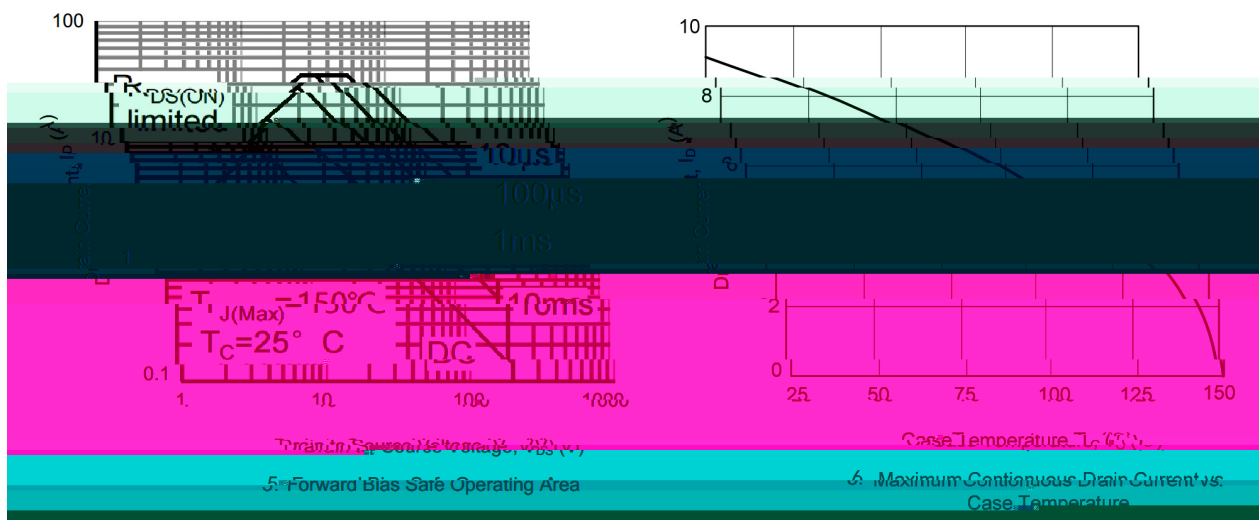


2. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature



3. Saturation Characteristics

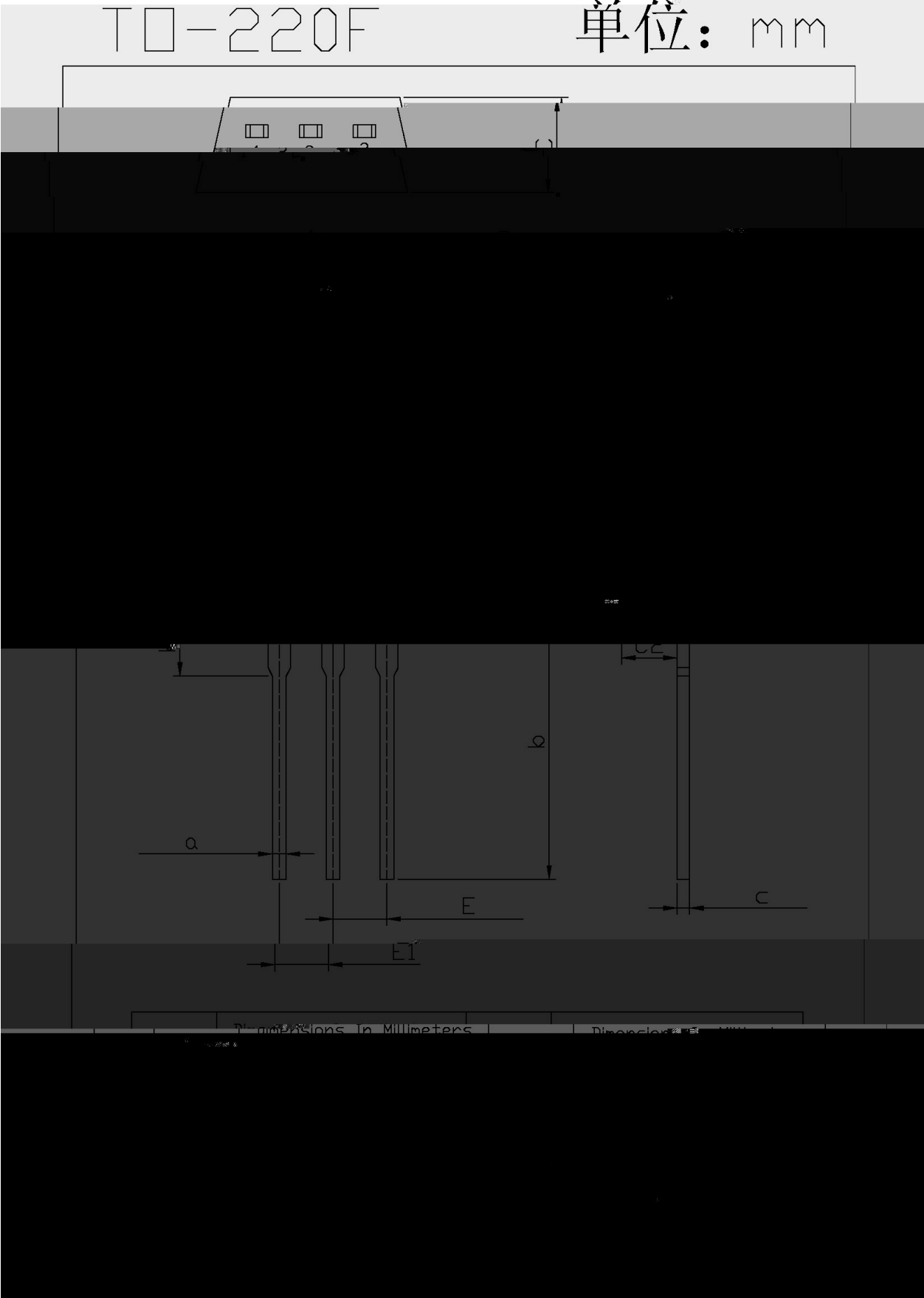
4. Drain Current vs. Gate Threshold Voltage



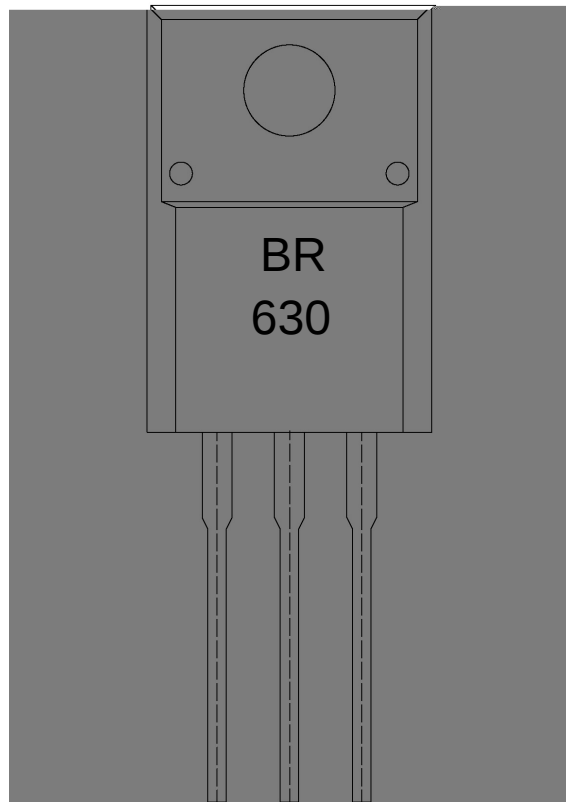
5. Forward Bias Safe Operating Area

6. Maximum Continuous Drain Current vs. Case Temperature

/ Package Dimensions



/ Marking Instructions



BR

630

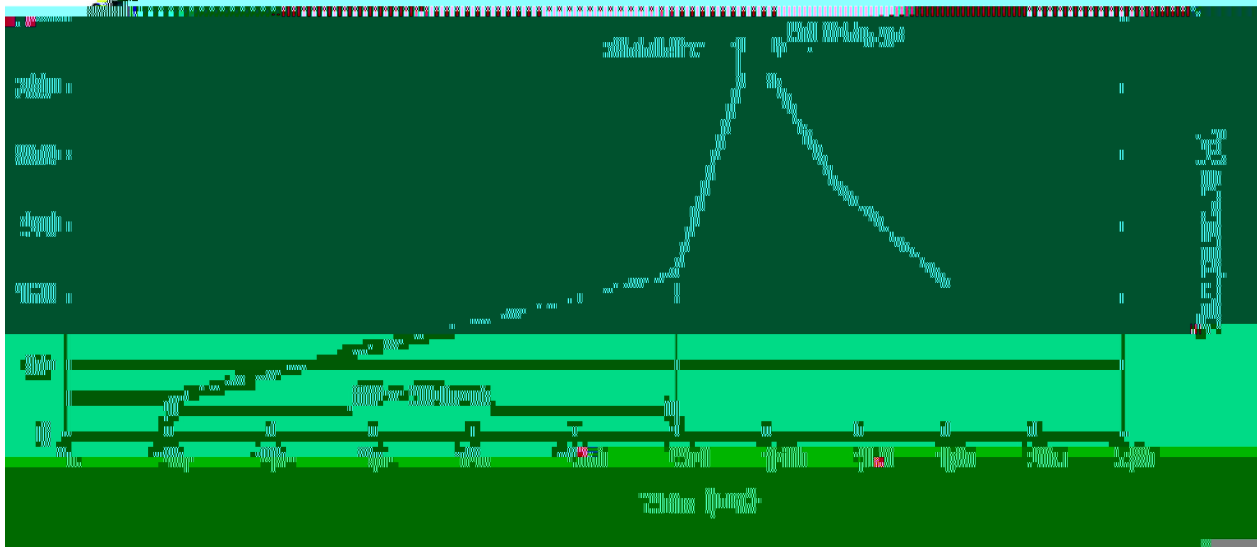
Note:

BR: Company Code

630: Product Type

****: Lot No. Code, code change with Lot No

() / Temperature Profile for Dip Soldering(Pb-Free)



Note:

- | | | | | | |
|---|-------|-----|-----------|---|--------------------------------------|
| 1 | 25 | 150 | 60 | 90sec; | 1.Preheating:25~150 , Time:60~90sec. |
| 2 | 255±5 | | 5±0.5sec; | 2.Peak Temp.:255±5 , Duration:5±0.5sec. | |
| 3 | | 2 | 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

/ Resistance to Soldering Heat Test Conditions

270±5	10±1 sec.	Temp.:270±5	Time:10±1 sec
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/ Packaging SPEC.

/ BULK

Package Type	Units					Dimension (unit mm ³)		
TO-220/F	200	10	2,000	5	10,000	135×190	237×172×102	560×245×195

/ TUBE

Package Type	Units					Dimension (unit mm ³)		
TO-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

/ Notices