

/ Descriptions

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

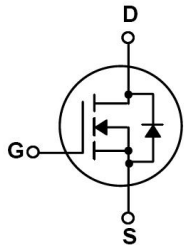
/ Features

Low thermal resistance, fast switching.

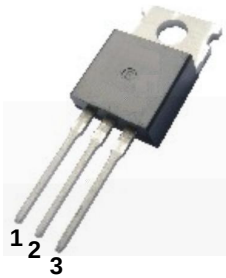
/ Applications

For Electronic transformer, Switch mode power supply.

/ Equivalent Circuit



/ Pinning



PIN1 G PIN 2 D PIN 3 S

/ h_{FE} Classifications & Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	700	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current	$I_D(T_c=25^{\circ}\text{C})$	4.0	A
Drain Current	$I_D(T_c=100^{\circ}\text{C})$	2.5	A
Drain Current - Pulsed	$I_{DM}^{(1)}$	16	A
Single Pulsed Avalanche Energy	$E_{AS}^{(2)}$	260	mJ
Power Dissipation	P_{tot}	106	W
Junction Temperature Range	T_j	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^{\circ}\text{C}$
Thermal Resistance Junction-case	$R_{\theta-JC}$	1.18	$^{\circ}\text{C/W}$
Thermal Resistance Junction-ambient	$R_{\theta-JA}$	62.5	$^{\circ}\text{C/W}$

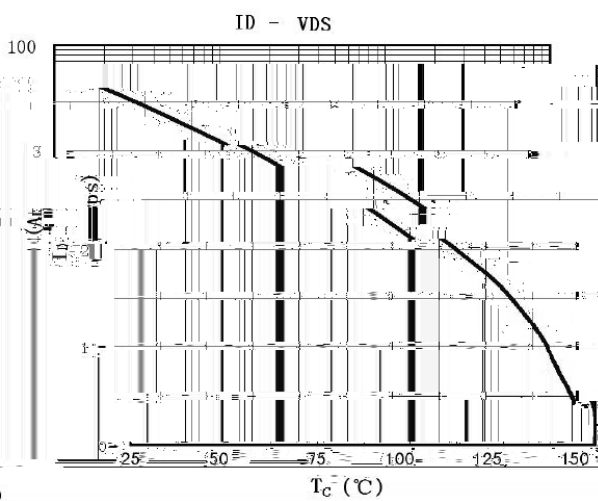
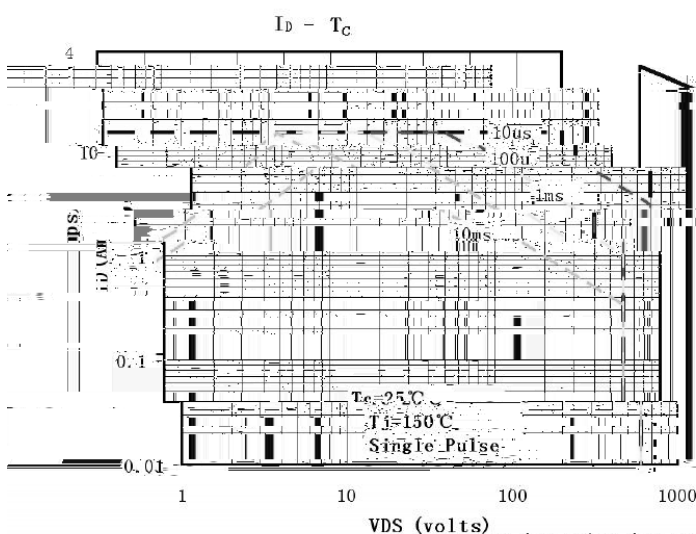
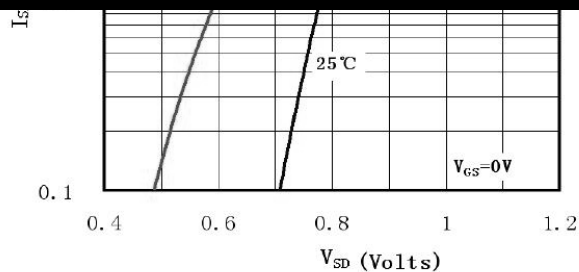
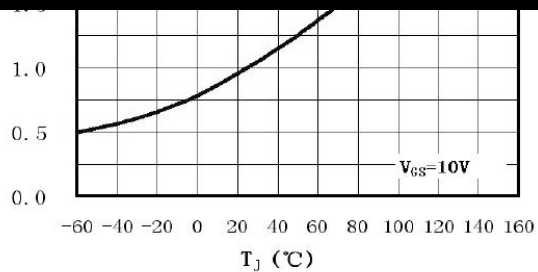
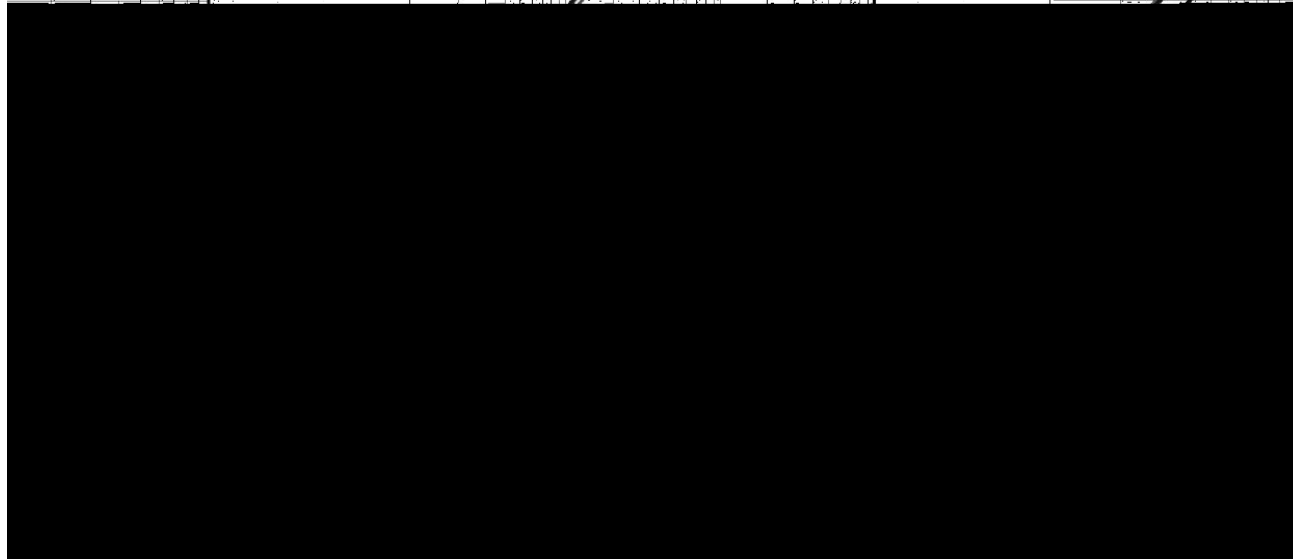
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	700			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=700V$ $V_{GS}=0V$ $T_j=25^{\circ}\text{C}$			1	μA
		$V_{DS}=560V$ $V_{GS}=0V$ $T_j=125^{\circ}\text{C}$			10	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=\pm 30V$			± 100	nA
Continuous Diode Forward Current	I_S				4.0	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=4.0A$ $V_{GS}=0V^{(3)}$ $T_j=25^{\circ}\text{C}$			1.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.0A^{(3)}$			2.8	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}$ $I_D=250\mu A$	2.0		4.0	V
Reverse Recovery Time	t_{rr}	$I_f=4.0A$ $T_j=25^{\circ}\text{C}$ $di/dt=100A/\mu s^{(3)}$		250		nS
Reverse Recovery Charge	Q_{rr}			1.5		μC
Input Capacitance	C_{iss}	$V_{GS}=0V$ $V_{DS}=25V$ $V_F=1.0MHz$		520		pF
Turn-Off Delay Time	$t_{d(off)}$	$V_{DD}=350V$ $I_D=4.0A$ $R_G=25\Omega^{(3)}$		25		ns
Forward Transconductance	g_{fs}	$V_{DS}=40V$ $I_D=2.0A^{(3)}$		4.0		S
Total Gate Charge	Q_g	$I_D=4.0A$ $V_{DS}=560V$ $V_{GS}=10V^{(3)}$		17.4		nC
Gate-to-Source Charge	Q_{gs}			4.8		nC
Gate-to-Drain Charge	Q_{gd}			5.4		nC

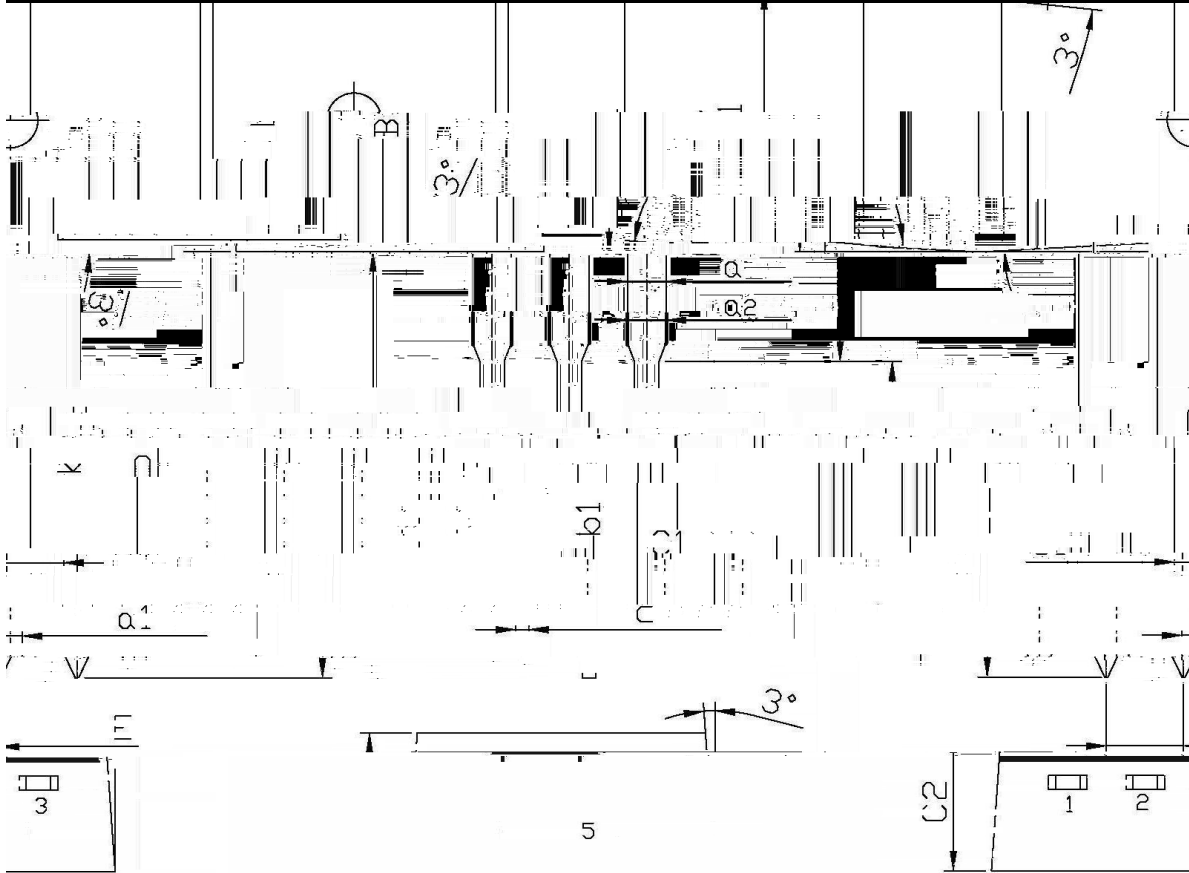
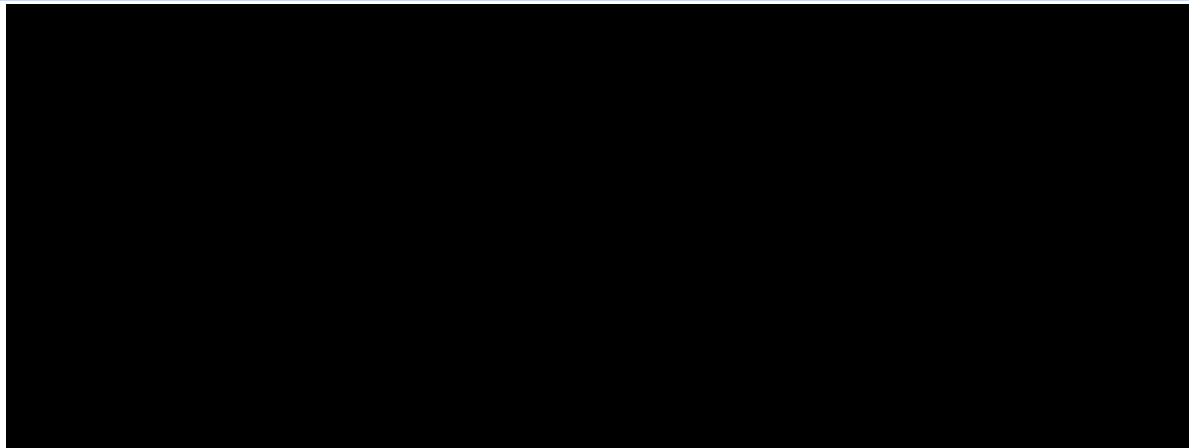
(Notes):

- ① : / Repetitive rating: Pulse width limited by maximum junction temperature
 ② : =25 $^{\circ}\text{C}$, $V_{DD}=50V$, $L=30mH$, $R_G=25\Omega$, $I_{AS}=4.0A$ /Starting $T_j=25^{\circ}\text{C}$, $V_{DD}=50V$, $L=30mH$, $R_G=25\Omega$, $I_{AS}=4.0A$
 ③ : $\leq 300\mu s$ ≤ 2 / Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

/ Electrical Characteristic Curve

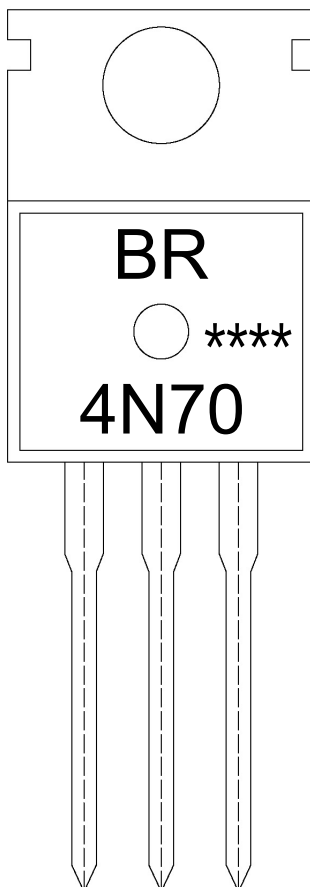


/ Package Dimensions



Dimensions in Millimeters			Dimensions in Millimeters		
Symbol	Min	Max	Symbol	Min	Max
A	9.8	10.2	C	1.2	1.4
B	2.55	3.30	D	6.35	6.3
J	15.7	16.1	B1	9.0	9.0
b	2.26	2.36	C1	2.2	2.2
b1	9.6	10.6	a1	0.7	0.7
C	0.4	0.6	E	13.2	13.2
DCE	14.3	14.7	F	23.4	27.4
			G	0.2	0.25
			H	14.5	14.5

/ Marking Instructions



BR

4N70

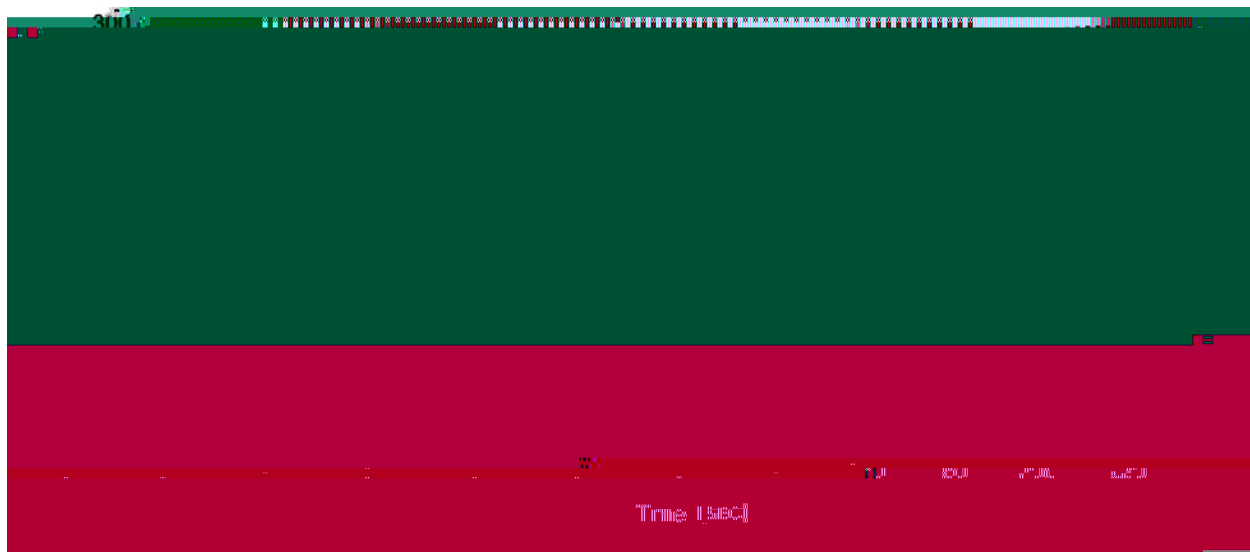
Note:

BR: Company Code

4N70: 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

/ Packaging SPEC.

/ BULK

Package Type	Units					Dimension (unit: mm ³)		
	Units/Bag /	Bags/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Bag	Inner Box	Outer Box
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)		
	Units/Tube /	Tubes/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Tube	Inner Box	Outer Box
TO-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

/ Notices