

/ Descriptions

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

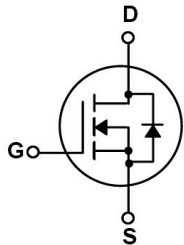
/ Features

Low thermal resistance, fast switching.

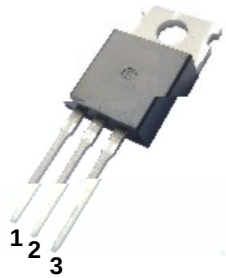
/ Applications

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_{-JC}	1.18	$^\circ\text{C/W}$
Thermal Resistance Junction-ambient	R_{-JA}	62.5	$^\circ\text{C/W}$

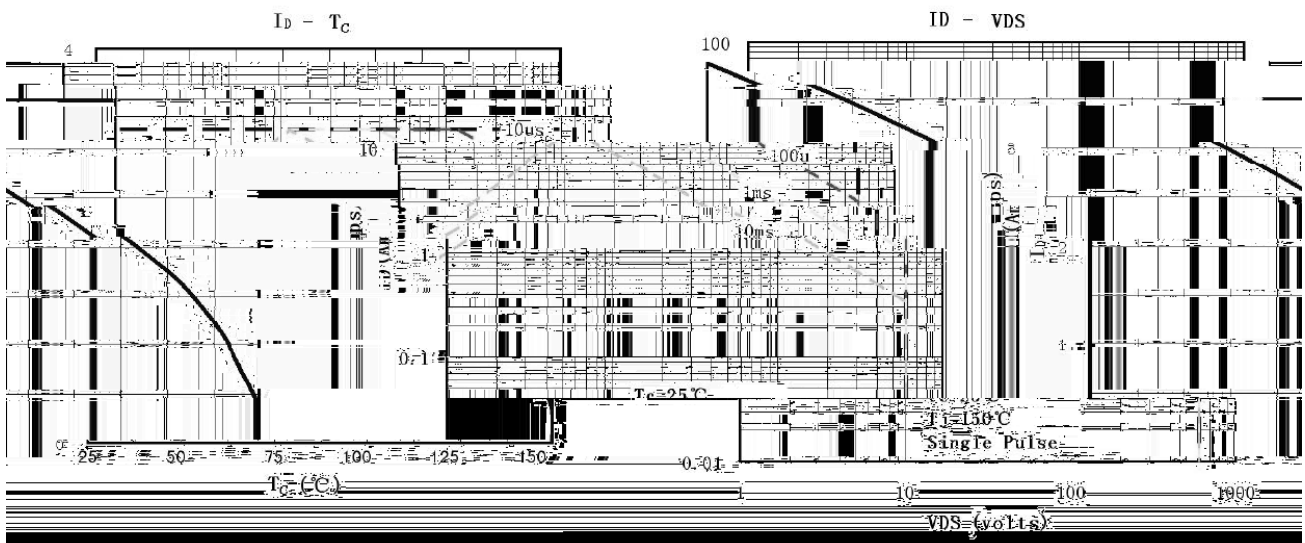
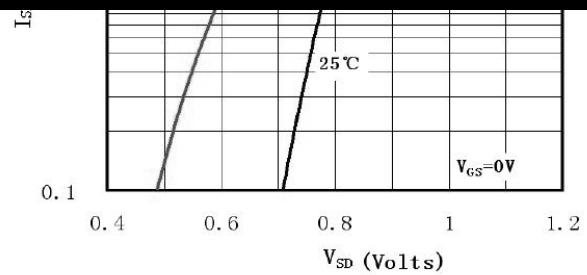
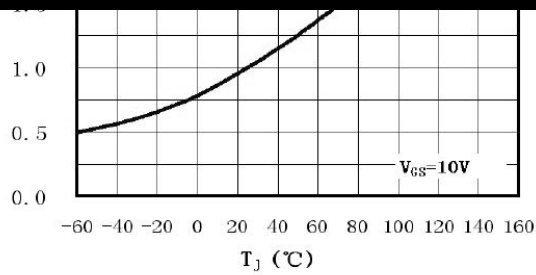
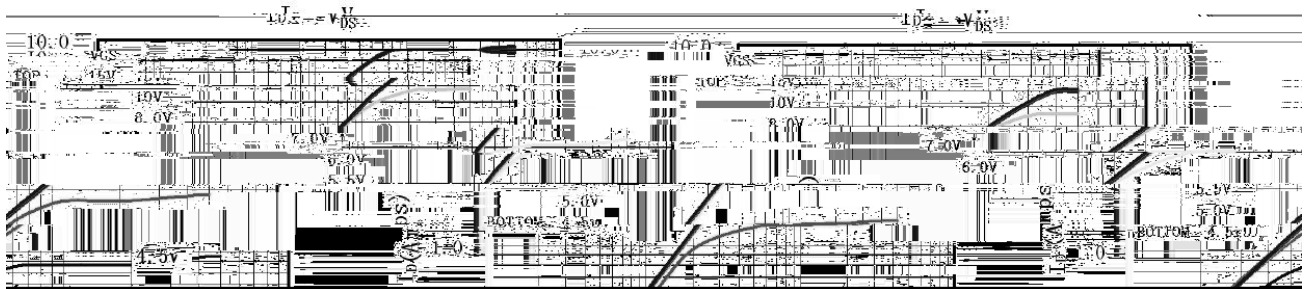
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\text{ A}$	700			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=700V$ $V_{GS}=0V$ $T_j=25^\circ\text{C}$			1	A
		$V_{DS}=560V$ $V_{GS}=0V$ $T_j=125^\circ\text{C}$			10	A
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	
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}$ $I_D=250\text{ A}$	2.0		4.0	V
Reverse Recovery Time	t_{rr}	$I_f=4.0A$ $T_j=25^\circ\text{C}$		250		nS
Reverse Recovery Charge	Q_{rr}	$di/dt=100A/s^{(3)}$		1.5		uC
Input Capacitance	C_{iss}	$V_{GS}=0V$ $V_{DS}=25V$ $V_F=1.0MHz$		520		pF
Turn-Off Delay Time	$t_{d(off)}$	$V_{DD}=350V$ $I_D=4.0A$ $R_G=25\text{ }^{(3)}$		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

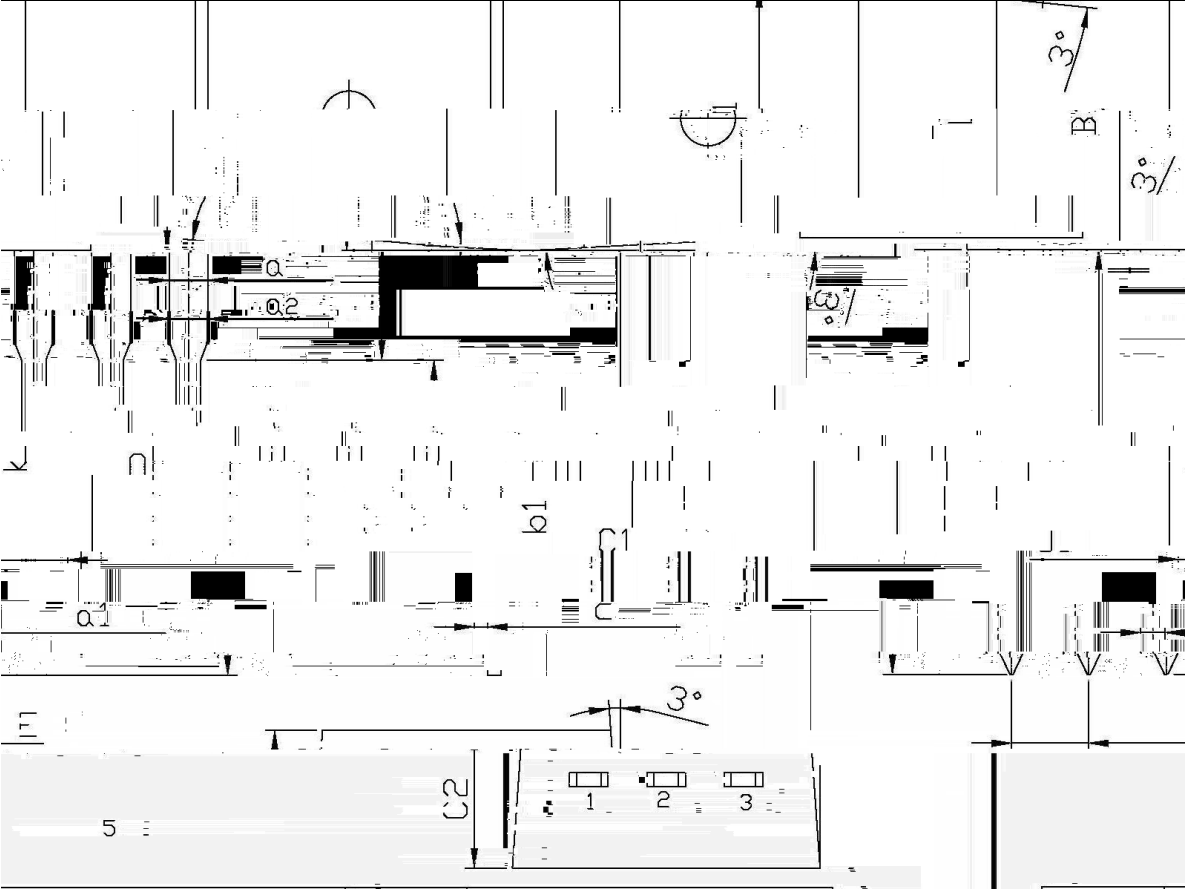
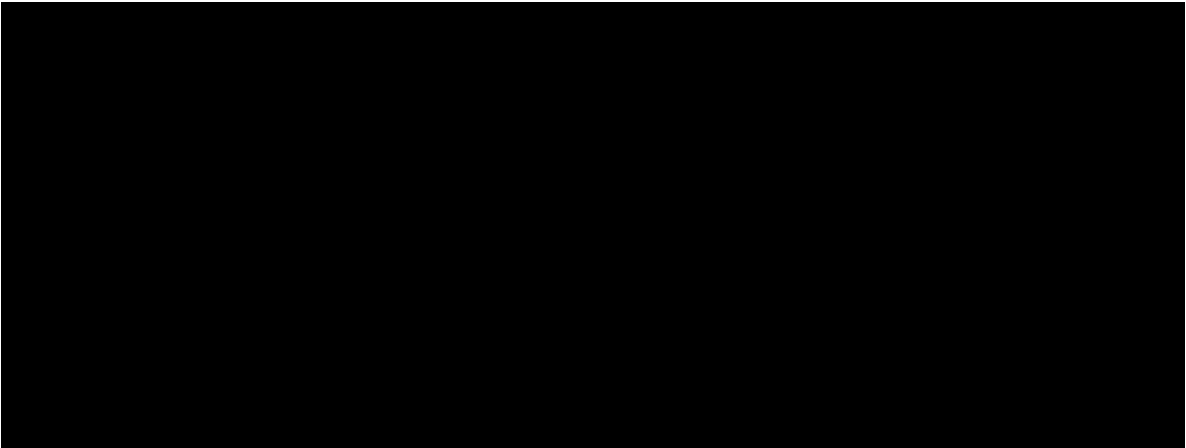
(Notes):

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

/ Electrical Characteristic Curve

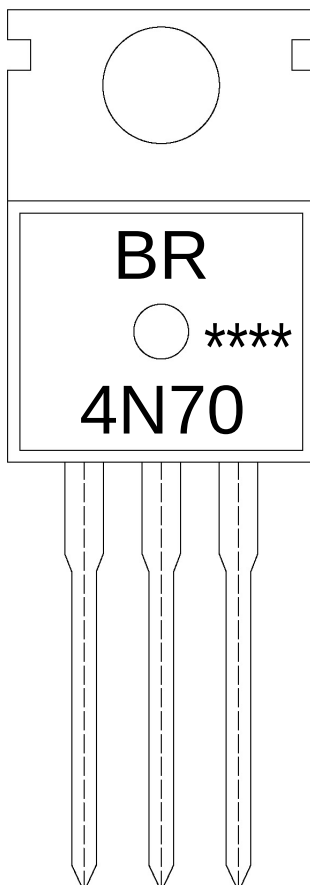


/ Package Dimensions



Dimensions in Millimeters			Dimensions in Millimeters		
Symbol	Min	Max	Symbol	Min	Max
	9.8	10.2		1.2	1.4
	3.56	3.8		6.3	6.7
	15.7	16.1		9.3	9.4
	2.6	3.6		2.2	2.6
	9.6	10.6		0.7	0.9
	3.0	3.2		3.2	3.6
	1.25	1.45		1.25	1.45

/ Marking Instructions



BR

4N70

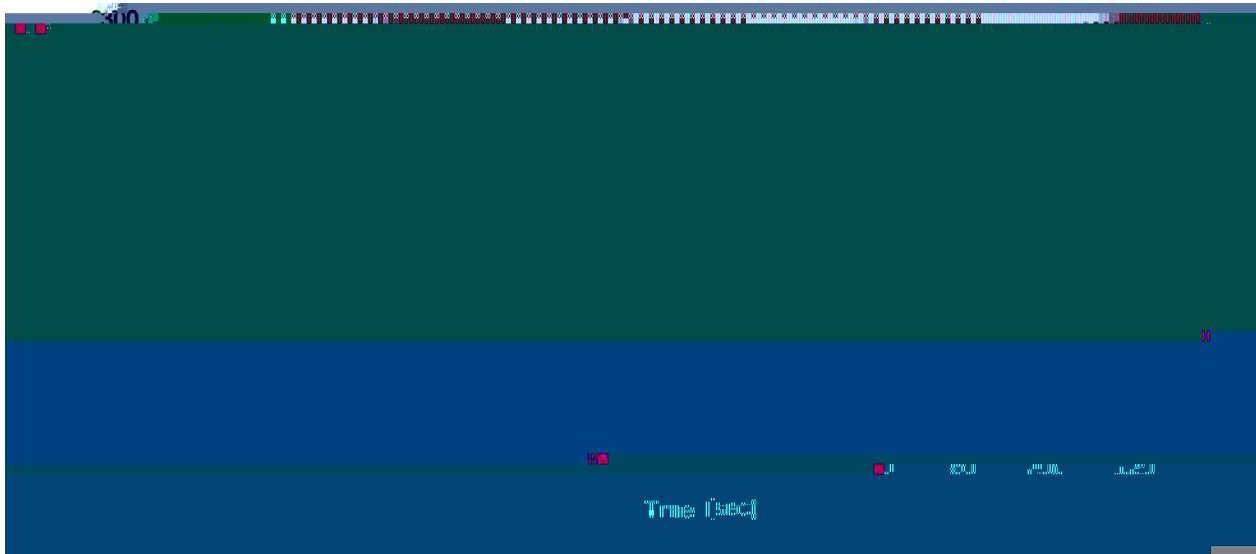
Note:

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