

BRCS200N20SHRA

Rev.A Jul.-2025

/ Descriptions

TO-220 N

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

/ Features

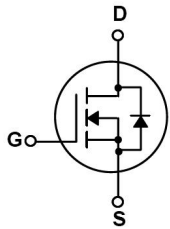
$V_{DS} (V) = 200V$ $I_D = 67A (V_{GS} = 20V)$

HF Product.

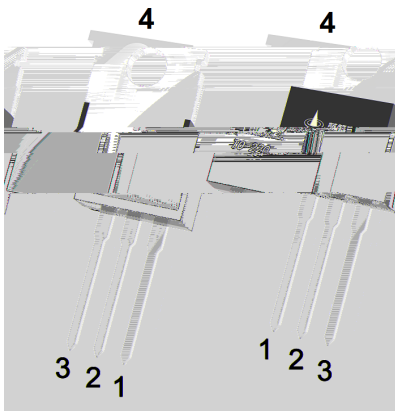
/ Applications

Motor drivers, DC - DC Converter.

/ Equivalent Circuit



/ Pinning



PIN1 G

PIN 2 4 D

PIN 3 S

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	200	V
Drain Current	$I_D(T_C=25^\circ\text{C})$	67	A
	$I_D(T_C=100^\circ\text{C})$	42	A
Pulsed Drain Current*	I_{DM}	175	A
Gate-Source Voltage	V_{GS}	20	V
Single Pulsed Avalanche Energy ($V_{DD}=50\text{V}, L=1.0\text{mH}$)	E_{AS}	685	mJ
Continuous-Source Current	I_S	67	A
Total Power Dissipation	$P_D(T_C=25^\circ\text{C})$	227	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	
Thermal Resistance-Junction to Ambient**	$R_{\theta JA}$	42	/W
Thermal Resistance-Junction to Case	$R_{\theta JC}$	0.55	

Notes

* Pulse width 300 μs , duty cycle $\leq 2\%$ ** Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$

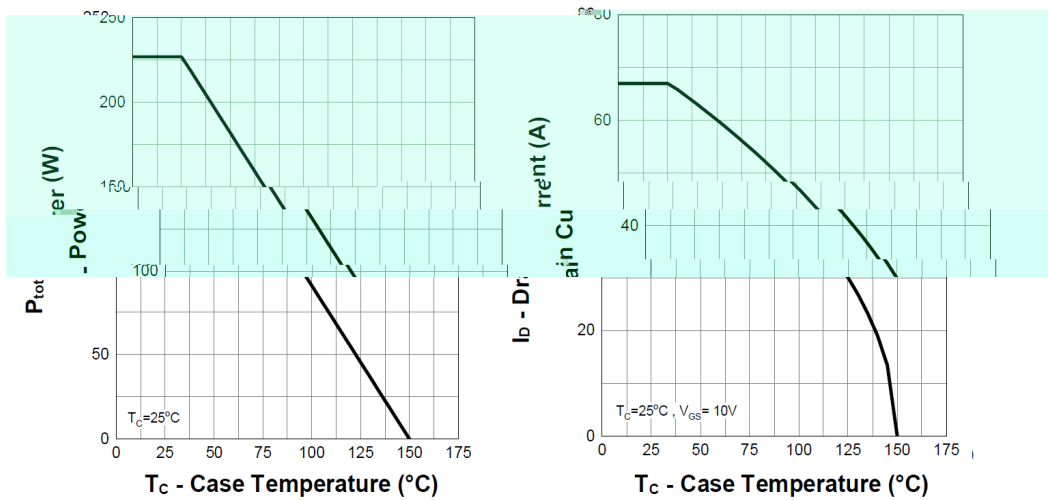
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}$ $I_D=250\mu\text{A}$	200			V
Drain Leakage Current	I_{DSS}	$V_{DS}=160\text{V}$ $V_{GS}=0\text{V}$			1	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}$ $V_{DS}=0\text{V}$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu\text{A}$	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$ $I_D=30\text{A}$		17	20	m Ω
	$R_{DS(on)}$	$V_{GS}=6\text{V}$ $I_D=20\text{A}$		19	22	
Forward On Voltage	V_{SD}	$V_{GS}=0\text{V}$ $I_S=30\text{A}$			1.3	V
Reverse Recovery Time	t_{rr}	$I_{DS} = 30\text{ A}, V_{GS} = 0\text{ V}$ $di_{SD}/dt = 100\text{ A}/\mu\text{s}$		118		nS
Reverse Recovery Charge	Q_{rr}			441		nC
Input Capacitance	C_{iss}	$V_{DS}=100\text{V}$ $V_{GS}=0\text{V}$ $f=1\text{MHz}$		3517		pF
Output Capacitance	C_{oss}			200		
Reverse Transfer Capacitance	C_{rss}			30		
Total Gate Charge	Q_g	$V_{DS}=100\text{V}$ $V_{GS}=10\text{V}$ $I_D=30\text{A}$		59		nC
Gate-Source Charge	Q_{gs}			20		
Gate-Drain Charge	Q_{gd}			14		

/ Electrical Characteristics(Ta=25)

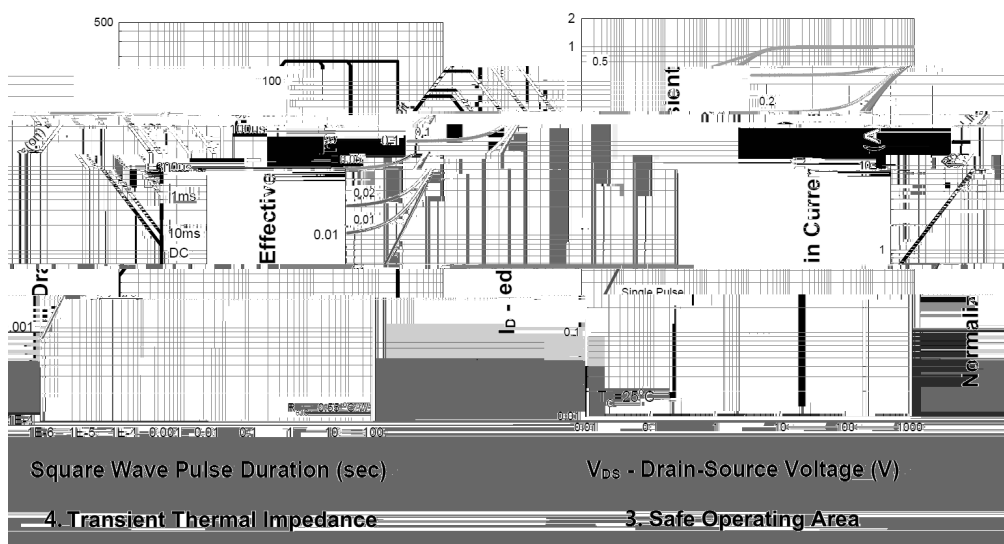
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GEN}=10V$ $V_{DS}=100V$ $R_L=3.3\Omega$ $R_G=3.9\Omega$ $I_{DS}=30A$		16		ns
Turn-On Rise Time	t_r			82		
Turn-Off Delay Time	$t_{d(off)}$			38		
Turn-Off Fall Time	t_f			86		

/ Electrical Characteristic Curve



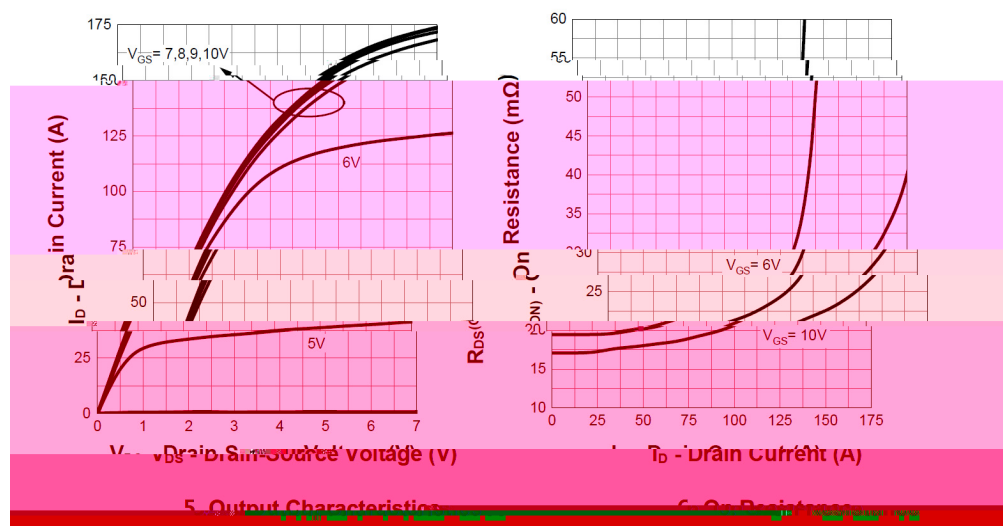
1. Power Capability

2. Current Capability



4. Transient Thermal Impedance

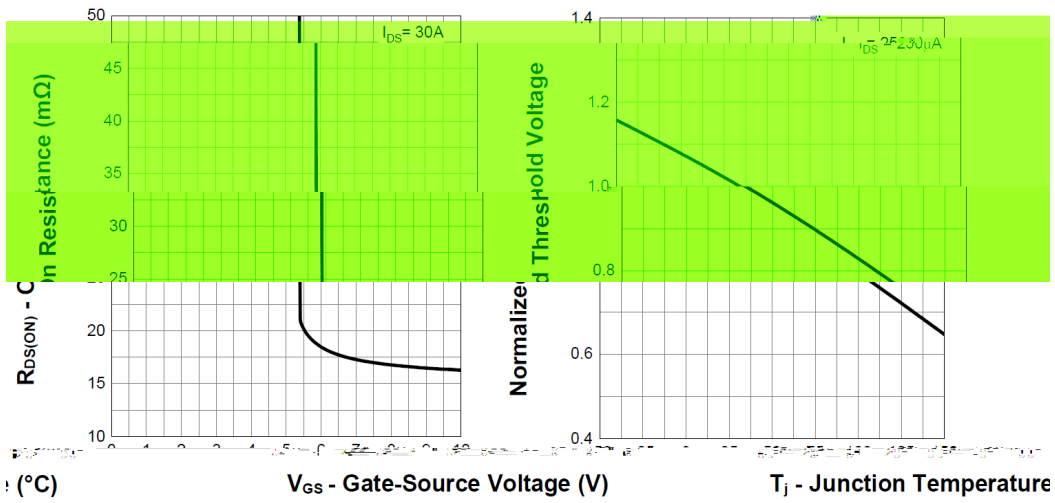
3. Safe Operating Area



5. Output Characteristics

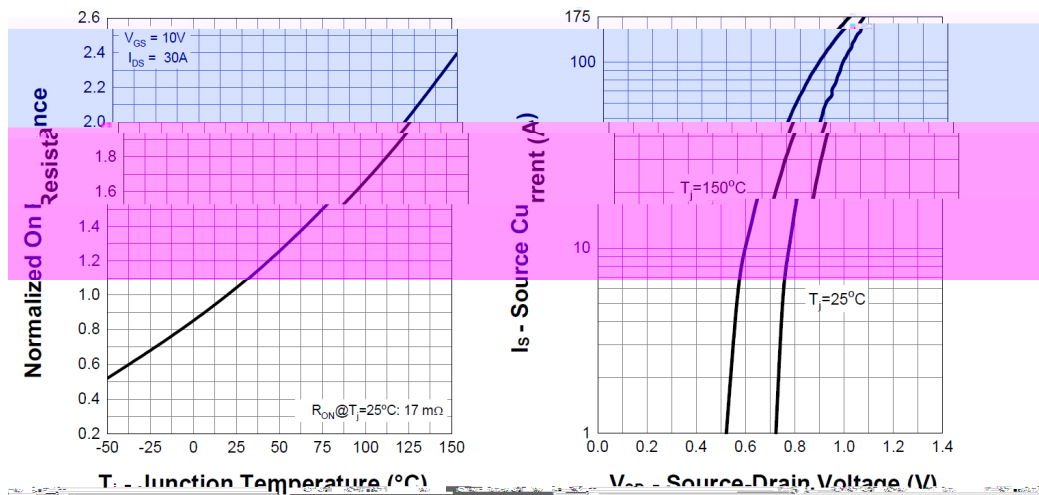
6. On-Resistance

/ Electrical Characteristic Curve



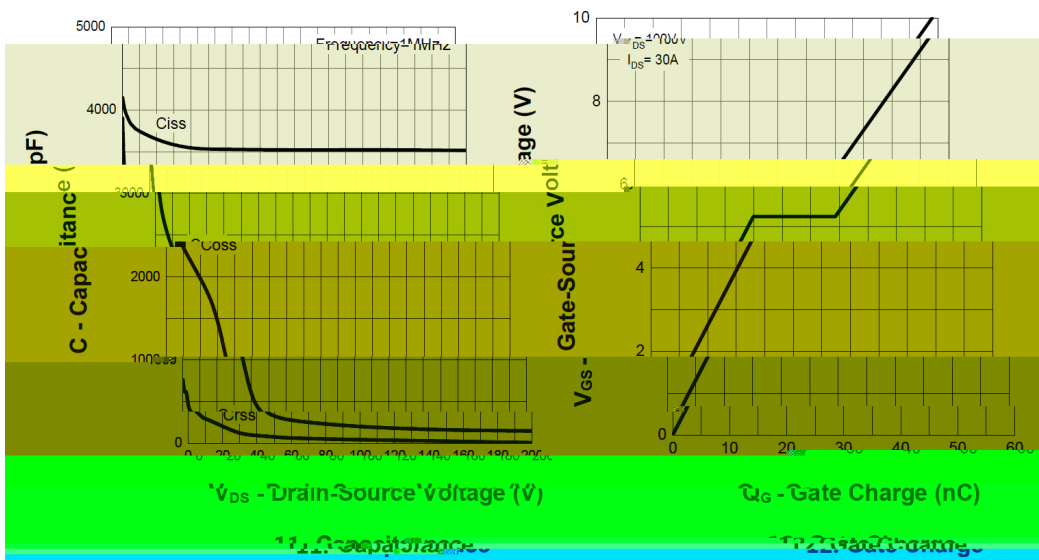
7. Transfer Characteristics

8. Normalized Threshold V



9. Normalized On-Resistance

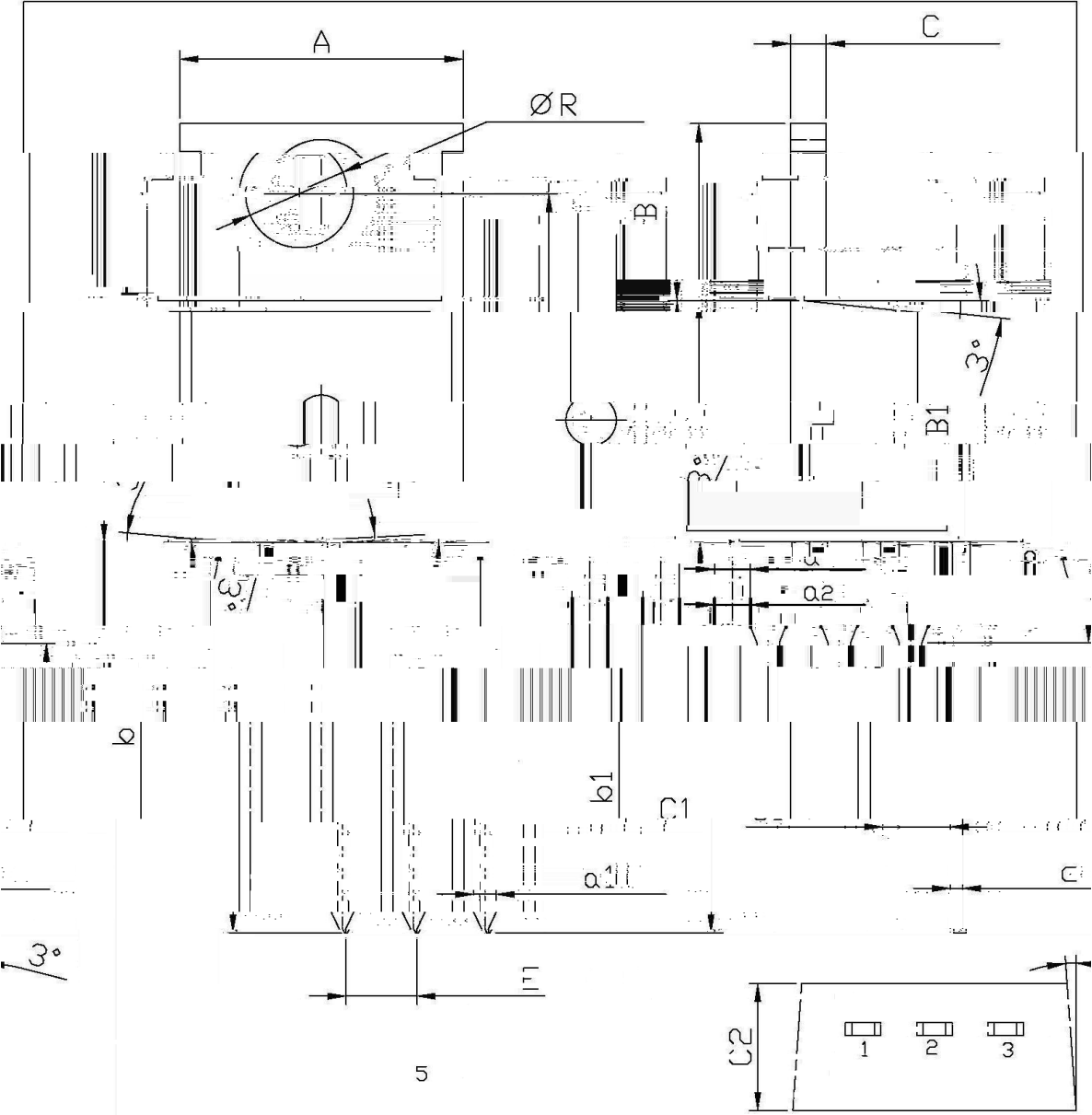
10. Diode Forward Current



/ Package Dimensions

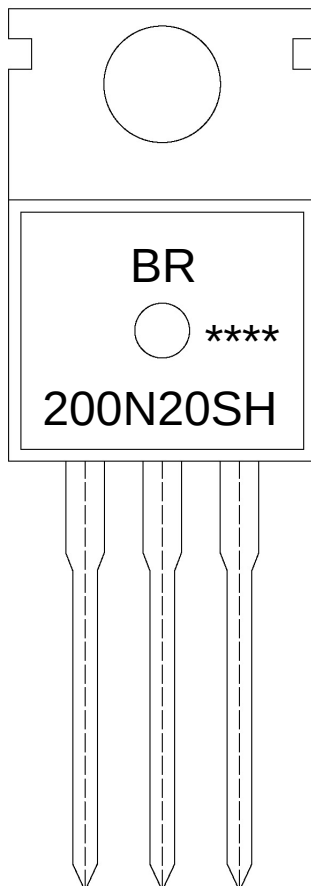
T0-220

单位: mm



Dimensions In Millimeters			Dimensions In Millimeters		
Symbol	Min	Max	Symbol	Min	Max
A	9.8	10.2	C	1.2	1.4
R	3.56	3.64	B	6.3	6.7
L	15.7	16.1	B1	9.0	9.4
b	12.6	13.6	C1	2.2	2.6

/ Marking Instructions



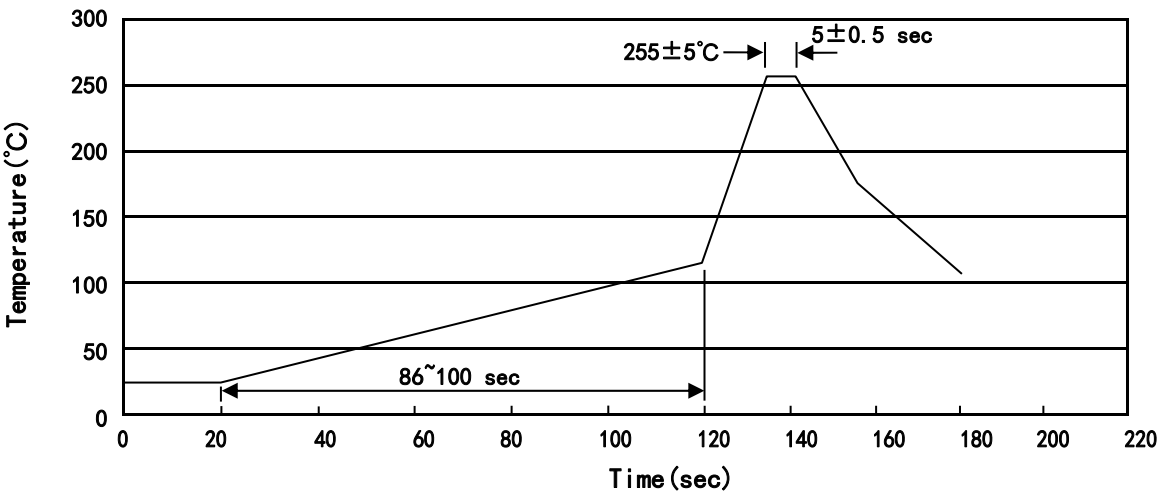
Note:

BR: Company Code

200N20SH: Product Type Code

****: 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