

# BRG20N120D

Rev.D Oct.-2015

## 描述 / Descriptions

TO-3P 塑封封装绝缘栅双极晶体管。Insulated-Gate Bipolar Transistor in a TO-3P Plastic Package.

## 特征 / Features

低栅极电荷、正温度系数、低饱和压降、RoHS 产品。

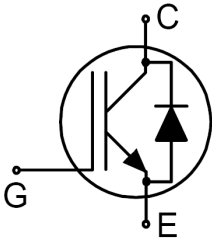
Low gate charge, Low saturation voltage, Positive temperature coefficient, RoHS product.

## 用途 / Applications

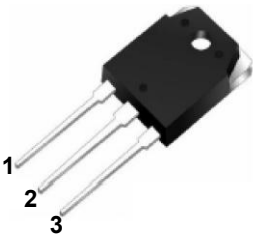
逆变器、变频器、电磁炉、不间断电源。

General purpose inverter, Frequency converters, Induction Heating(IH), Uninterrupted Power Supply(UPS).

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



PIN1 : Gate

PIN 2 : Collector

PIN 3 : Emitter

## 放大及印章代码 / $h_{FE}$ Classifications & Marking

见印章说明。See Marking Instructions.

**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector-emitter voltage	$V_{CES}$	1200	V
Gate-emitter voltage	$V_{GES}$	±20	V
Collector current	$I_C$	40	A
Collector current@ $T_C=100^\circ\text{C}$		20	A
Collector peak current, $T_P$ limited by $T_{JMAX}$	$I_{CM}$	60	A
Diode forward current@ $T_C=100^\circ\text{C}$	$I_F$	20	A
Diode maximum forward current	$I_{FM}$	60	A
Power dissipation( $T_C=25^\circ\text{C}$ )	$P_D$	240	W
Power dissipation( $T_C=100^\circ\text{C}$ )		96	W
Operating junction and storage temperature range	$T_J, T_{stg}$	-55~150	°C
Maximum temperature for soldering	$T_L$	300	°C
IGBT thermal resistance,junction-case	$R_{th(j-c)}$	0.52	°C/W
Diode thermal resistance,junction-case	$R_{th(j-C)}$	2.4	°C/W
Thermal resistance,junction-ambient	$R_{th(j-a)}$	40	°C/W

**电性能参数 / Electrical Characteristics(Ta=25°C)**

参数 Parameter	符号 Symbol	测试条件 Test Conditions		最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Collector-emitter breakdown voltage	$V_{CES}$	$V_{GE}=0V$	$I_{CE}=250\mu A$	1200	-	-	V
Zero gate voltage Collector current	$I_{CES}$	$V_{GE}=0V$	$V_{CE}=1200V$	-	-	1	mA
Gate-body leakage current	$I_{GES}$	$V_{GE}=\pm 20V$	$V_{CE}=0V$	-	-	±250	nA
Gate threshold voltage	$V_{GE(th)}$	$I_C=15mA$	$V_{CE}=V_{GE}$	3.5	-	7.5	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=20A$	$V_{GE}=15V$	-	2	2.5	V
Input capacitance	$C_{ies}$	$V_{CE}=25V$ $f=1MHz$	$V_{GE}=0V$	-	3030	-	pF
Output capacitance	$C_{oes}$			-	76	-	
Reverse transfer capacitance	$C_{res}$			-	125	-	

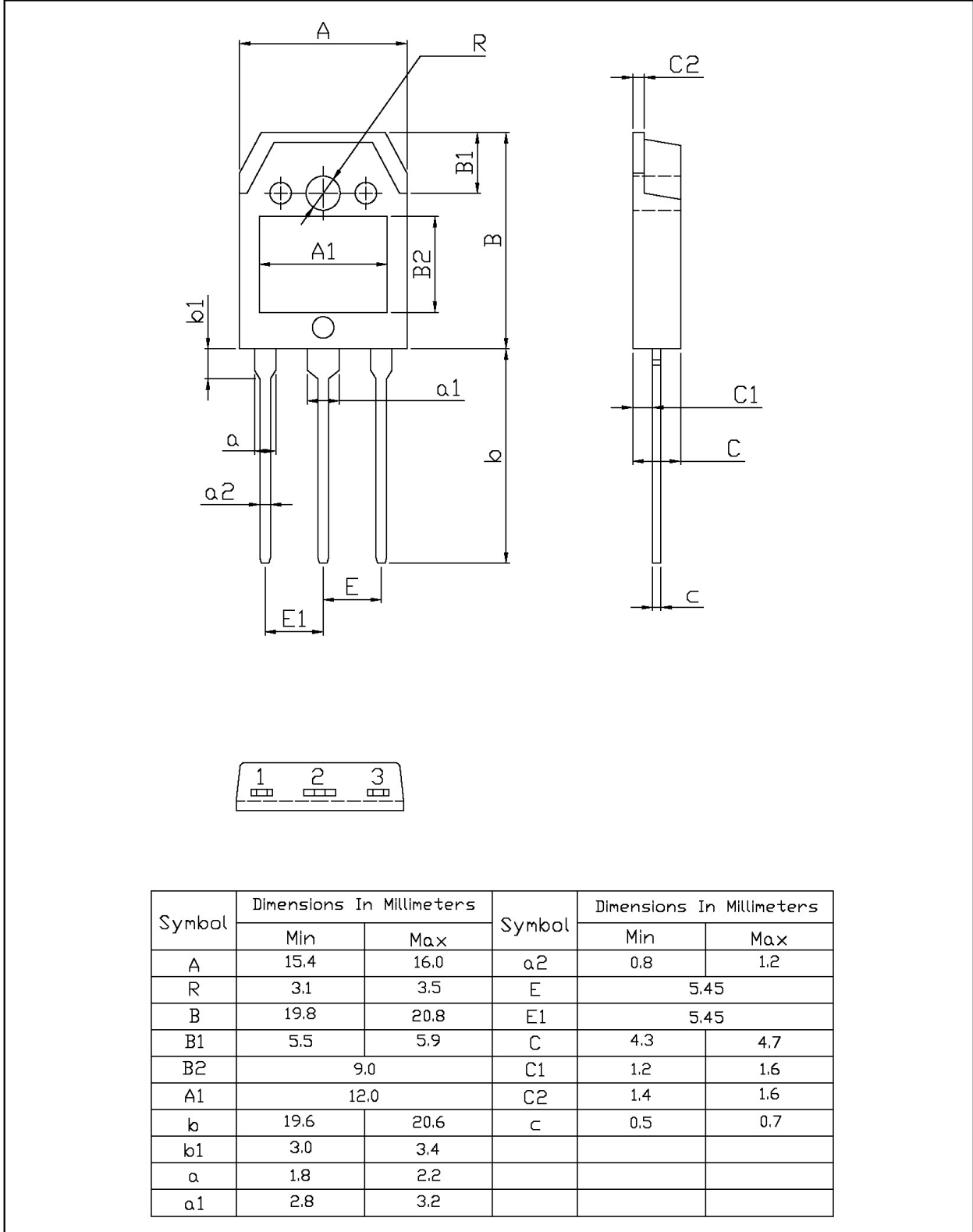
## 电性能参数 / Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Turn-on delay time	$t_{d(ON)}$	$V_{CC}=600V$ $I_C=20A$ , $R_G=10\Omega$ $V_{GE}=15V$ Inductive Load	-	41	-	ns
Rise time	$t_r$		-	38	-	
Turn-off delay time	$t_{d(OFF)}$		-	206	-	
Fall time	$t_f$		-	341	-	
Turn-On Switching Loss	$E_{on}$		-	1	2.1	mJ
Turn-Off Switching Loss	$E_{off}$		-	1.2	1.5	
Total Switching Loss	$E_{ts}$		-	2.1	3.6	
Total gate charge	$Q_G$	$V_{CC}=600V$ $I_C=20A$ $V_{GE}=15V$	-	154	224	nC
Gate-emitter charge	$Q_{G-E}$		-	16	25	
Gate-collector charge	$Q_{G-C}$		-	56	80	
Diode forward voltage	$V_F$	$I_F=20A$	-	1.3	2.7	V
Reverse recovery time	$T_{rr}$	$I_F=20A$ $di/dt=200A/\mu S$	-	430	481	ns
Diode Peak Reverse Recovery Current	$I_{rr}$		-	37	60	A
Reverse recovery charge	$Q_{rr}$		-	0.9	1.1	nC

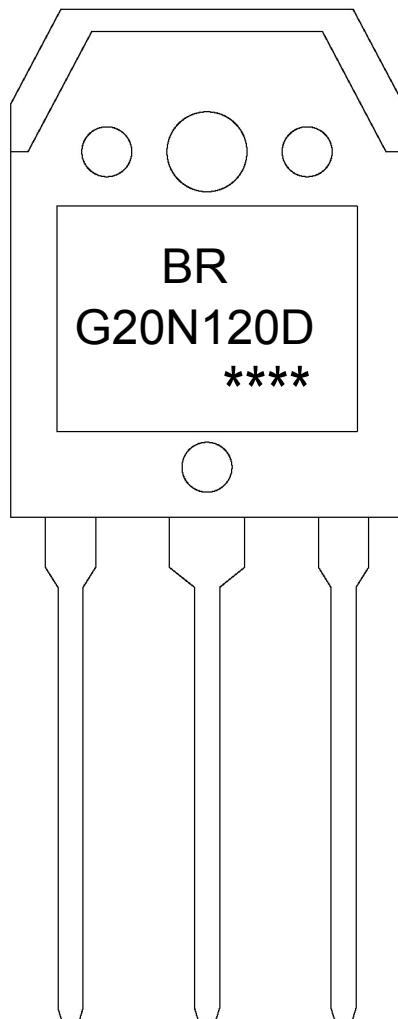
外形尺寸图 / Package Dimensions

TO-3P

单位: mm



印章说明 / Marking Instructions



说明：

BR: 为公司代码

G20N120D : 为产品型号

\*\*\*\* : 为生产批号代码，随生产批号变化。

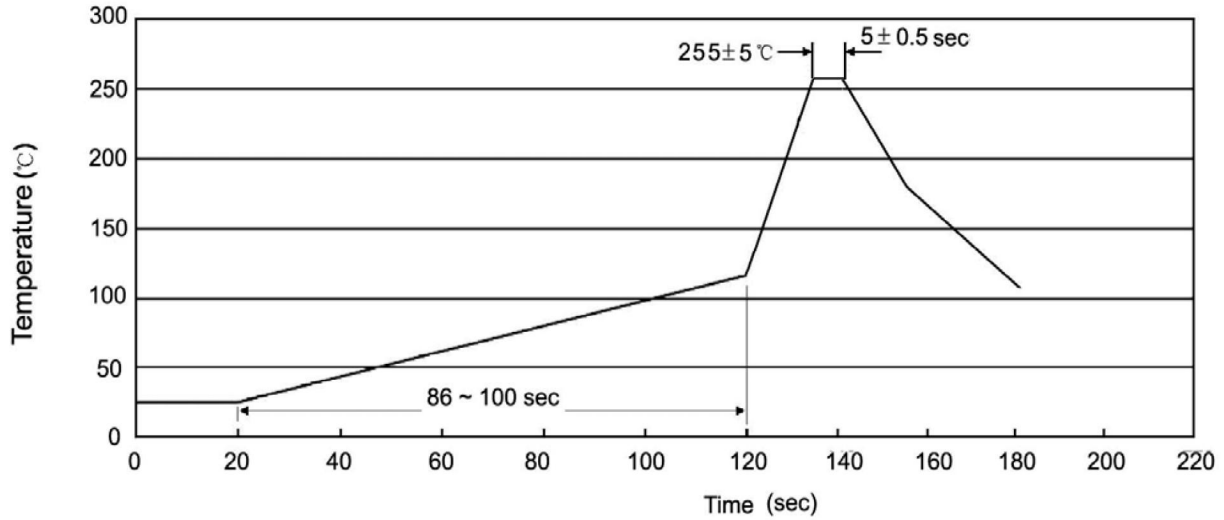
Note:

BR: Company Code.

G20N120D: Product Type.

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

**波峰焊温度曲线图(无铅) / Temperature Profile for Dip Soldering(Pb-Free)**



说明：

- 1、预热温度 25~150°C，时间 60~90sec;
- 2、峰值温度 255±5°C，时间持续为 5±0.5sec;
- 3、焊接制程冷却速度为 2~10°C/sec.

Note:

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

**耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions**

温度：270±5°C      时间：10±1 sec.      Temp.:270±5°C      Time:10±1 sec

**包装规格 / Packaging SPEC.**

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-3P	30	15	450	5	2250	497.5×46×8	555×164×50	575×290×180

**使用说明 / Notices**