

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

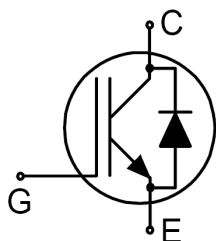
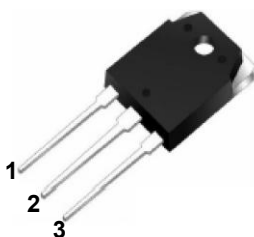
低栅极电荷、正温度系数、低饱和压降、RoHS 产品。

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}	$-55 \sim 150$	$^\circ\text{C}$
Maximum temperature for soldering	T_L	300	$^\circ\text{C}$
IGBT thermal resistance,junction-case	$R_{th(j-c)}$	0.52	$^\circ\text{C/W}$
Diode thermal resistance,junction-case	$R_{th(j-C)}$	2.4	$^\circ\text{C/W}$
Thermal resistance,junction-ambient	$R_{th(j-a)}$	40	$^\circ\text{C/W}$

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	-	

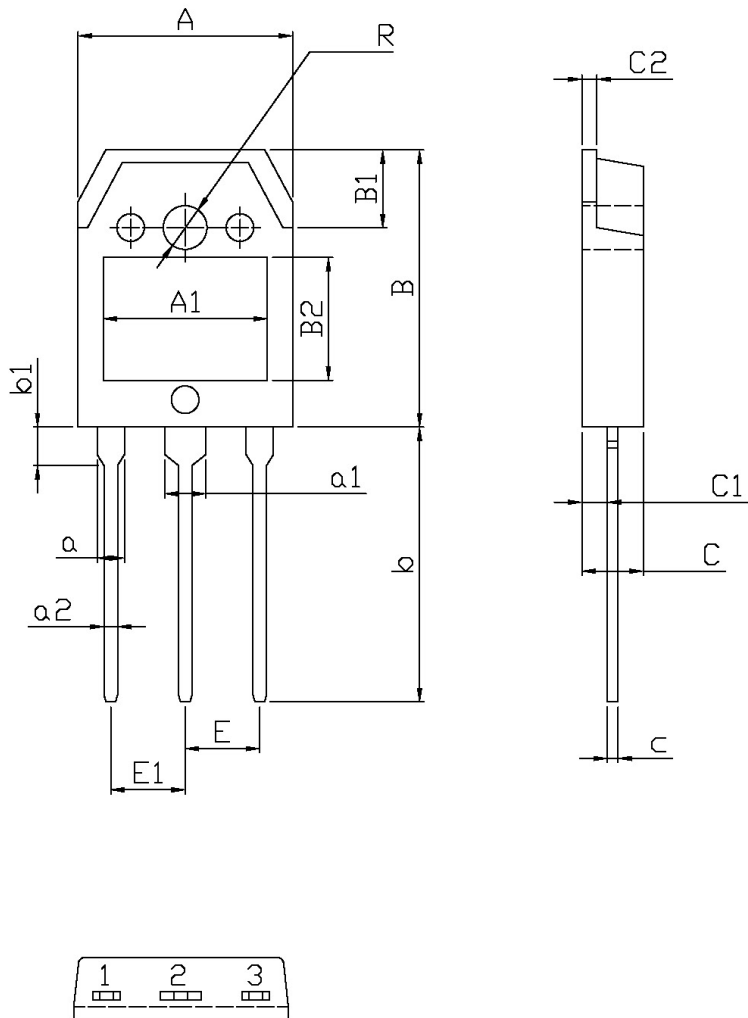
电性能参数 / Electrical Characteristics(Ta=25°C)

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}	$V_{CC}=600V$ $I_C=20A$, $V_{GE}=15V$ Inductive Load	-	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

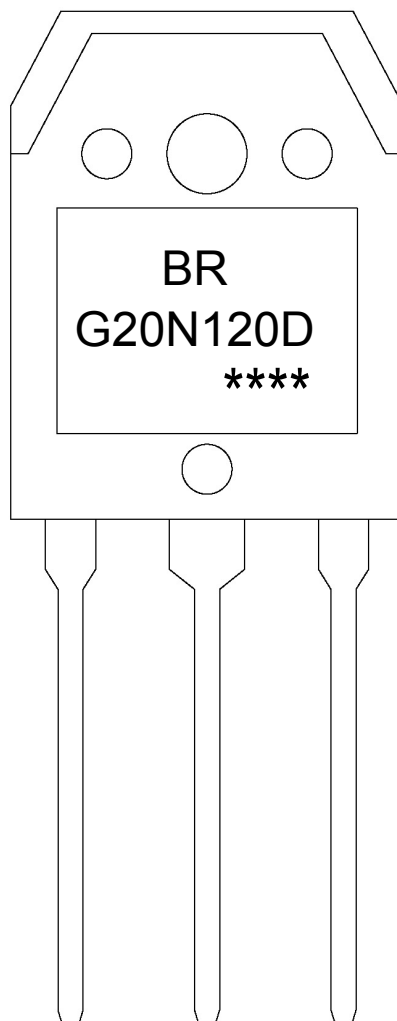
T□-3P

单位: mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	15.4	16.0	a2	0.8	1.2
R	3.1	3.5	E	5.45	
B	19.8	20.8	E1	5.45	
B1	5.5	5.9	C	4.3	4.7
B2	9.0		C1	1.2	1.6
A1	12.0		C2	1.4	1.6
b	19.6	20.6	c	0.5	0.7
b1	3.0	3.4			
a	1.8	2.2			
a1	2.8	3.2			

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。

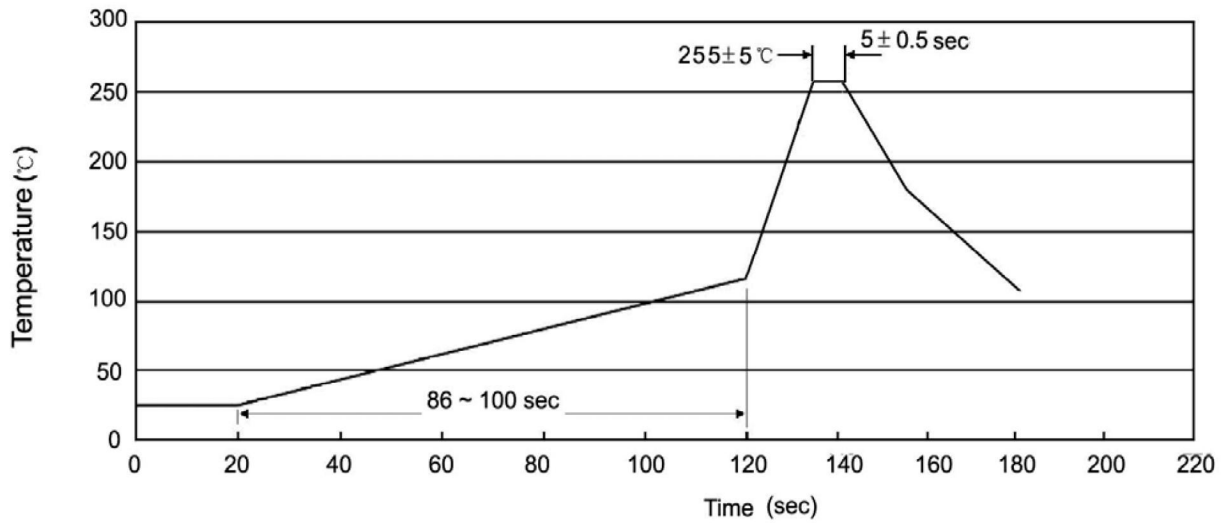
Note:

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 ³)		
	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