描述 / Descriptions

TO-220F 塑封封装 NPN 半导体三极管。Silicon NPN transistor in a TO-220F Plastic Package.

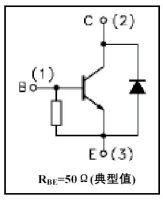
特征 / Features

开关速度快、高击穿电压(V_{CBO}=1500V)、可靠性高、采用 MBIT 技术、内置阻尼二极管。
High Speed, high breakdown voltage(V_{CBO}=1500V),high reliability(Adoption of HVP process.), Adoption of MBIT process. On-chip damper diode.

用途 / Applications

彩色电视机行输出放大。
Color TV Horizontal Deflection Output Applications.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1：Base 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.

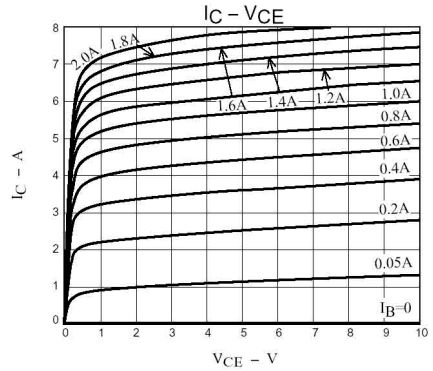
极限参数 / Absolute Maximum Ratings(Ta=25℃)

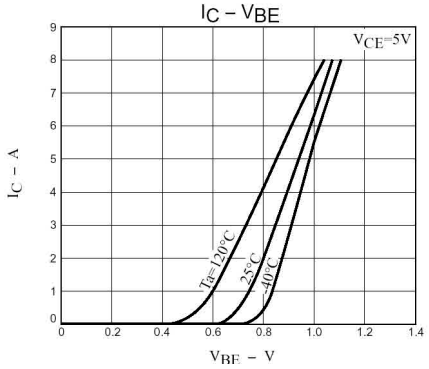
参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	$V_{CBO(sus)}$	1500	V
Collector to Emitter Voltage	V_{CEO}	800	V
Emitter to Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous	I_C	8.0	A
Collector Current – Continuous(Pulse)	I_{CP}	20	A
Collector Power Dissipation	P_C	2.0	W
Collector Power Dissipation	P_C (T_c=25℃)	35	W
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55～150	℃

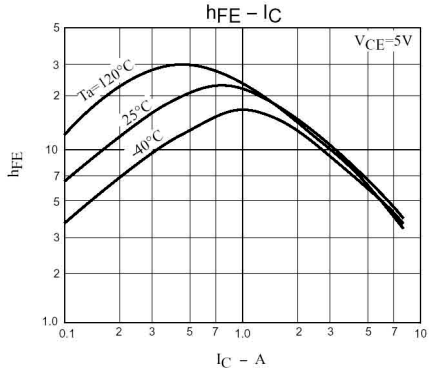
电性能参数 / Electrical Characteristics(Ta=25℃)

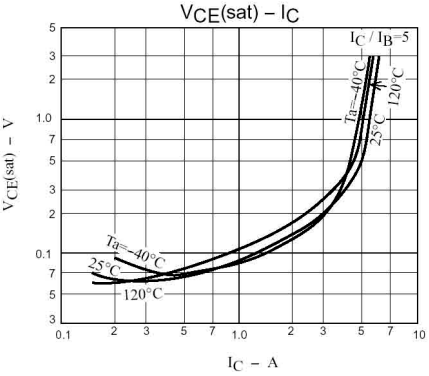
参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Collector Sustain Voltage	$V_{CEO(sus)}$	I_C=100mA I_B=0	800			V
Collector Cut-Off Current	I_{ces}	V_{CB}=1500V R_{BE}=0			1.0	mA
Collector Cut-Off Current	I_{CBO}	V_{CB}=800V I_E=0			10	μA
Emitter Cut-Off Current	I_{EBO}	V_{EB}=4.0V I_C=0	40		130	mA
DC Current Gain	$h_{FE(1)}$	V_{CE}=5.0V I_C=5.0A	5		8	
	$h_{FE(2)}$	V_{CE}=5.0V I_C=1.0A	10			
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=4.5A I_B=0.9A			3.0	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=4.5A I_B=0.9A			1.5	V
Diode Forward Voltage	V_F	I_{EC}=7.0A			2.0	V
Fall Time	t_f	I_C=3.0A I_{B1}=0.6A I_{B2}=1.2A			0.3	μS

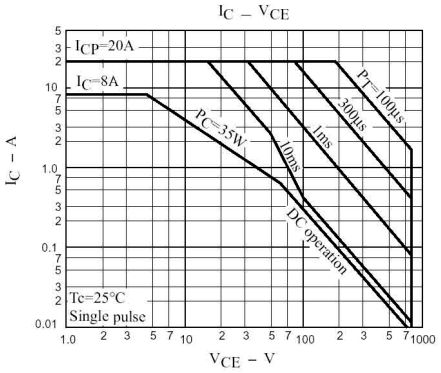
电参数曲线图 / Electrical Characteristic Curve

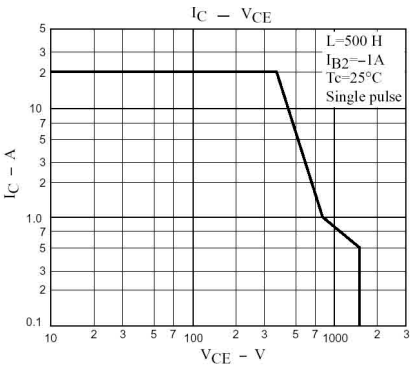


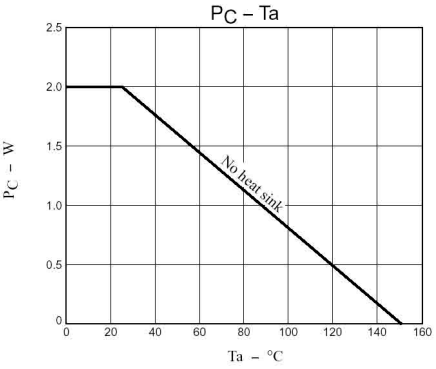


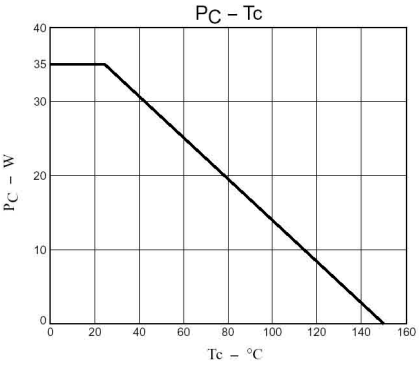






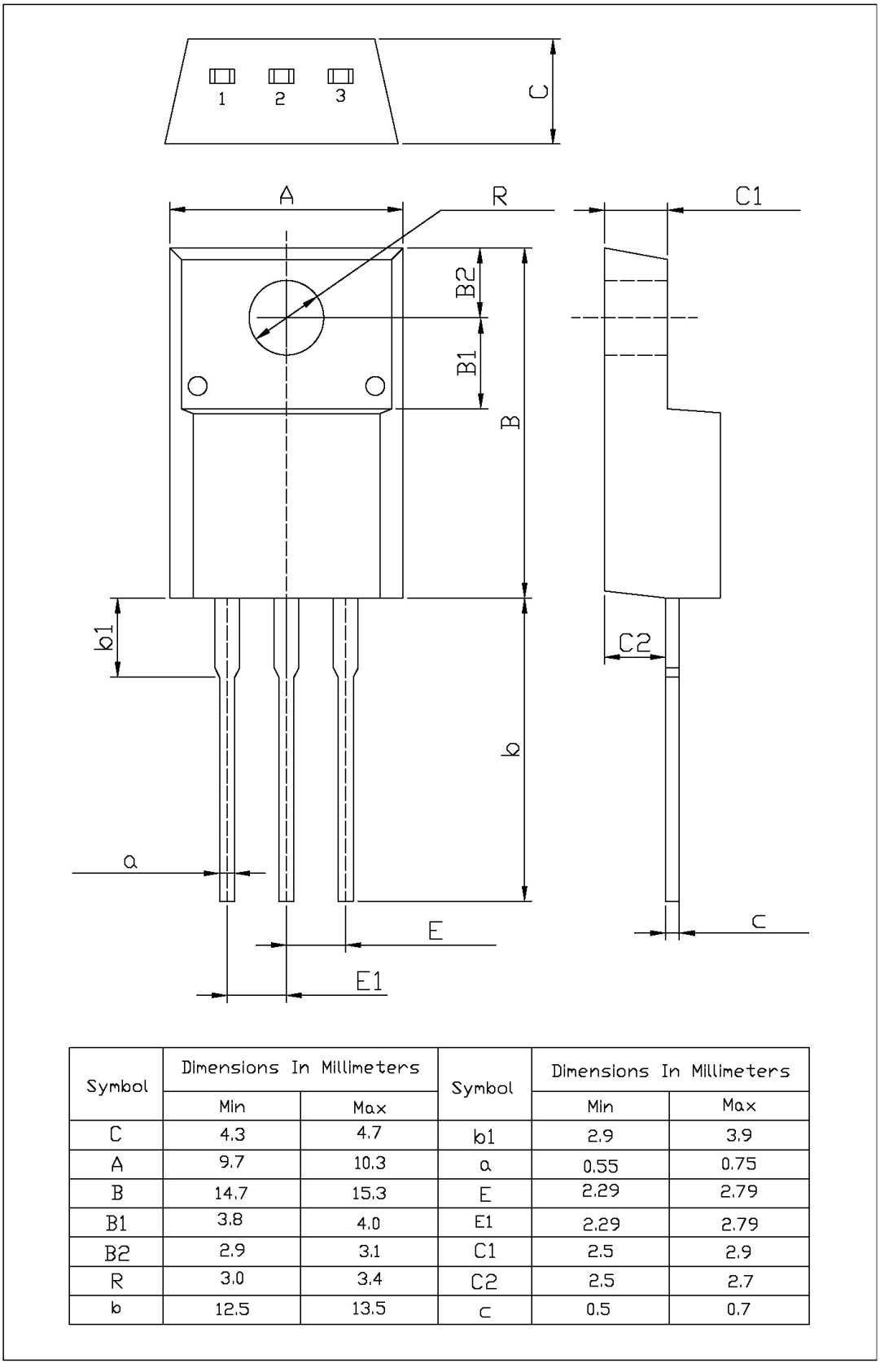






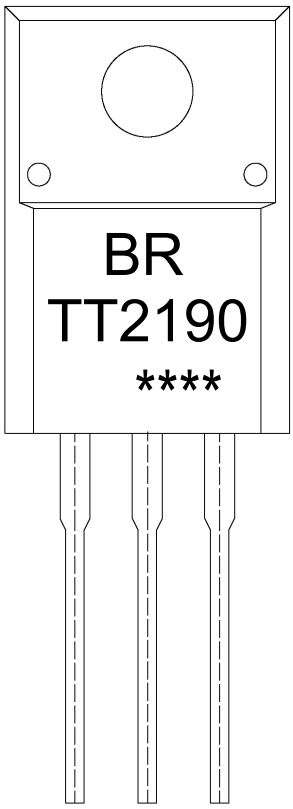
外形尺寸图 / Package Dimensions

TO-220F 单位：mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
C	4.3	4.7	b1	2.9	3.9
A	9.7	10.3	a	0.55	0.75
B	14.7	15.3	E	2.29	2.79
B1	3.8	4.0	E1	2.29	2.79
B2	2.9	3.1	C1	2.5	2.9
R	3.0	3.4	C2	2.5	2.7
b	12.5	13.5	c	0.5	0.7

印章说明 / Marking Instructions



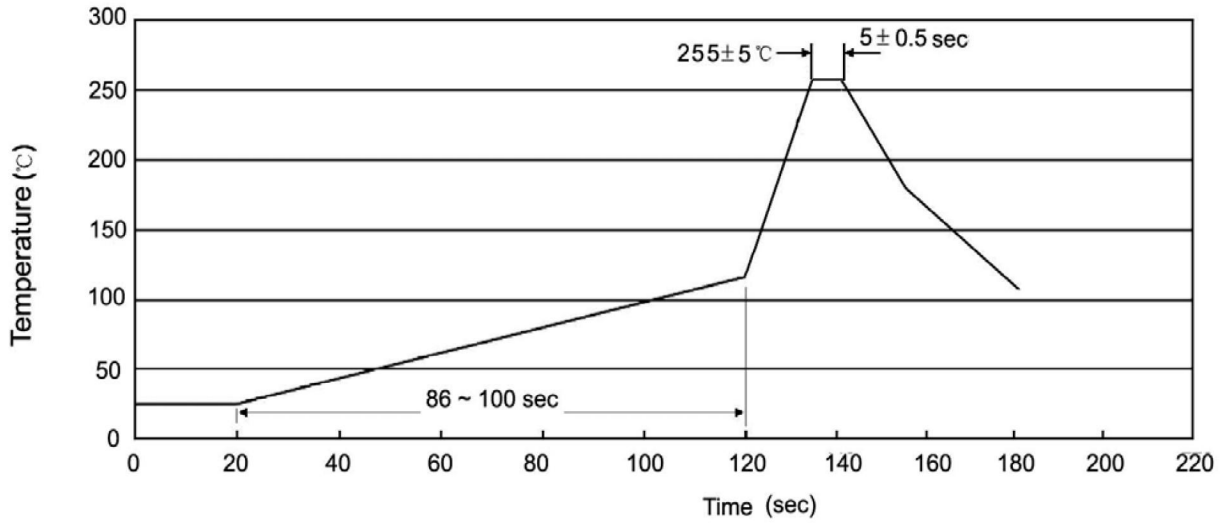
说明：

BR：	为公司代码
TT2190：	为型号代码
****：	为生产批号代码，随生产批号变化。

Note:

BR:	Company Code.
TT2190:	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℃，时间 60～90sec;

2、峰值温度 255±5℃，时间持续为 5±0.5sec;

3、焊接制程冷却速度为 2～10℃/sec.

Note:

1.Preheating:25~150℃, Time:60~90sec.

2.Peak Temp.:255±5℃, Duration:5±0.5sec.

3. Cooling Speed: 2~10℃/sec.

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

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

包装规格 / Packaging SPEC.

散件包装 / BULK

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm³)		
	Units/Bag 只/袋	Bags/Inner Box 袋/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Bag 袋	Inner Box 盒	Outer Box 箱
TO-220/F	200	10	2,000	5	10,000	135×190	237×172×102	560×245×195

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm³)		
	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-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

使用说明 / Notices