

/ Descriptions

TO-220 NPN Silicon NPN transistor in a TO-220 Plastic Package.

/ Features

Low collector-to-emitter saturation voltage, high-speed switching, high allowable power dissipation.

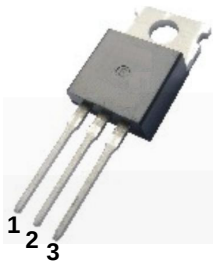
/ Applications

DC-DC converter, relay drivers, lamp drivers motor drivers.

/ Equivalent Circuit



/ Pinning



PIN1 Base PIN 2 Collector PIN 3 Emitter

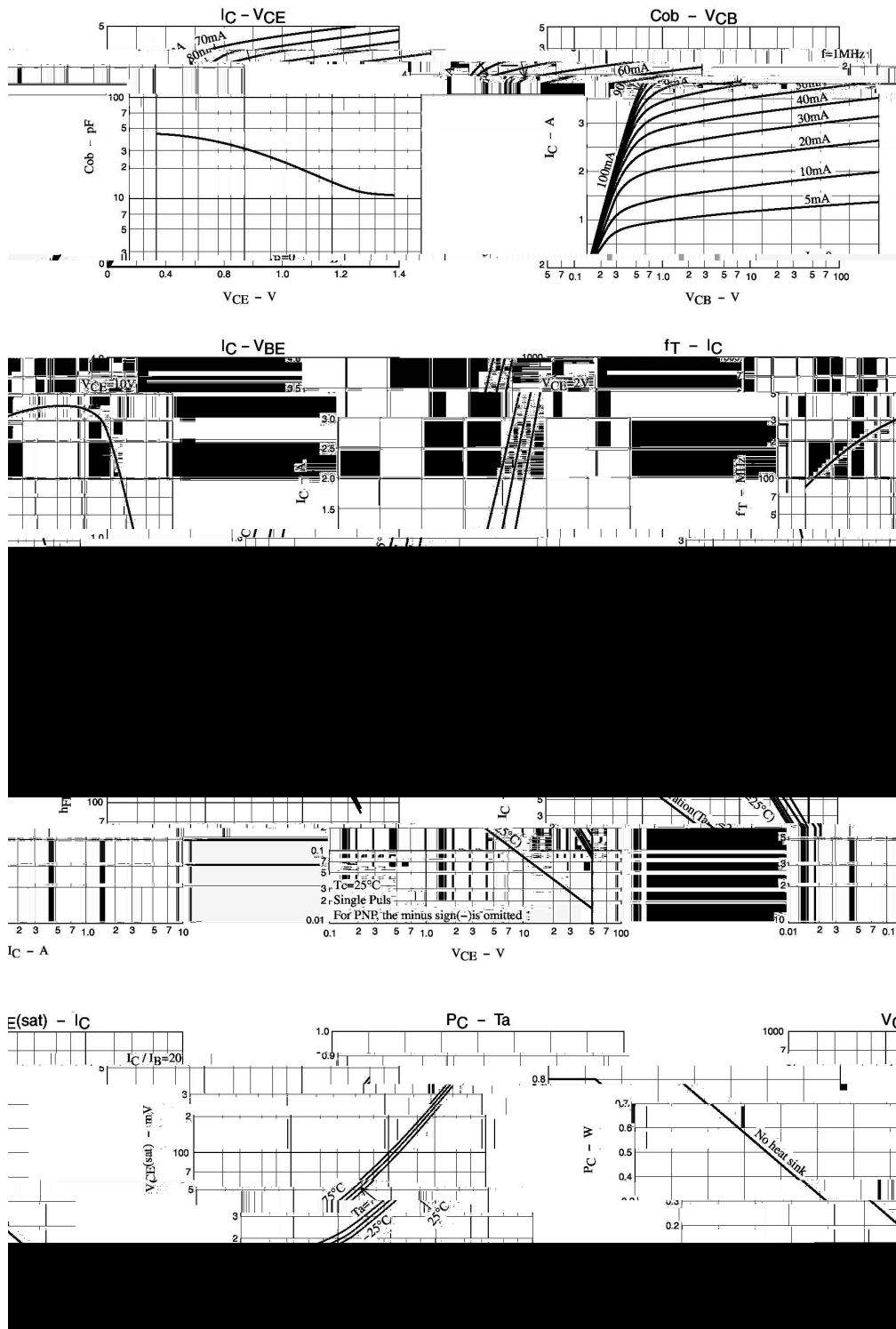
/ h_{FE} Classifications & Marking

See Marking Instructions.

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	V_{CBO}	80	V
Collector to Emitter Voltage	V_{CEO}	50	V
Collector to Emitter Voltage	V_{CES}	80	V
Emitter to Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous	I_C	5.0	A
Peak Collector Current	I_{CP}	7.5	A
Base Current - Continuous	I_B	1.2	A
Collector Power Dissipation	P_C	2	W
	$P_C(T_C=25^\circ\text{C})$	15	W
Junction Temperature	T_J	150	
Storage Temperature Range	T_{stg}	-55 150	

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector to Base Breakdown Voltage	V_{CBO}	$I_C=0.01\text{mA}$ $I_E=0$	80			V
Collector to Emitter Breakdown Voltage	V_{CES}	$I_C=0.1\text{mA}$ $R_{BE}=0$	80			V
Collector to Emitter Breakdown Voltage	V_{CEO}	$I_C=1.0\text{mA}$ $R_{BE}=\infty$	50			V
Emitter to Base Breakdown Voltage	V_{EBO}	$I_C=0.01\text{mA}$ $I_C=0$	6.0			V
Collector Cut-Off Current	I_{CBO}	$V_{CB}=40\text{V}$ $I_E=0$			1.0	μA
Emitter Cut-Off Current	I_{EBO}	$V_{EB}=4.0\text{V}$ $I_C=0$			1.0	μA
DC Current Gain	h_{FE}	$V_{CE}=2.0\text{V}$ $I_C=0.5\text{A}$	200		560	
Collector to Emitter Saturation Voltage	$V_{CE(sat)(1)}$	$I_C=1.0\text{A}$ $I_B=0.05\text{A}$		0.09	0.135	V
	$V_{CE(sat)(2)}$	$I_C=2.0\text{A}$ $I_B=0.1\text{A}$		0.16	0.24	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$V_{CE}=2.0\text{V}$ $I_C=0.1\text{A}$		0.89	1.2	V

/ Electrical Characteristic Curve



Technical drawing of a mechanical part, likely a bracket or support, showing dimensions and a table of values.

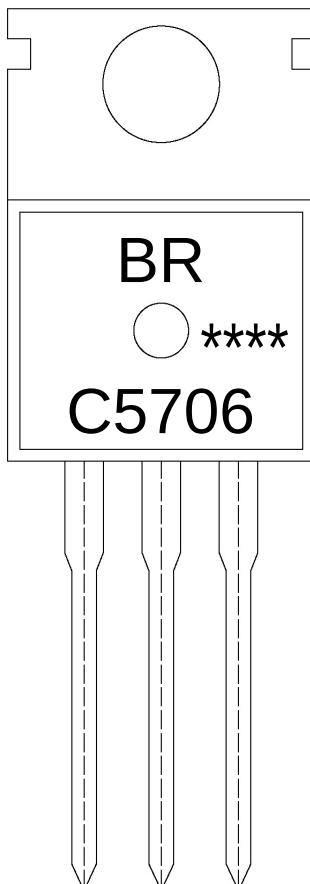
Dimensions:

- A : Horizontal distance from the left edge to the center of the circular hole.
- C : Horizontal distance from the right edge to the center of the circular hole.
- L : Total horizontal length of the part.
- $B1$: Vertical distance from the top edge to the center of the circular hole.
- a : Horizontal distance from the center of the circular hole to the center of the vertical slot.
- $b1$: Vertical distance from the bottom edge to the center of the vertical slot.
- $C1$: Horizontal distance from the right edge to the center of the vertical slot.
- $a1$: Horizontal distance from the center of the vertical slot to the center of the circular hole.
- $L1$: Total horizontal length of the part (repeated).
- 3° : Angle of the slanted surface.
- 3° : Angle of the slanted surface (repeated).
- 3° : Angle of the slanted surface (repeated).

Table:

Symbol	Dimensions in millimeters		Symbol	Dimensions in millimeters	
	Min	Max		Min	Max
Δ	9.8	10.2	C	1.2	1.4
R	3.56	3.64	B	6.3	6.7
$B1$	9.0	9.4	L	15.7	16.3
a	1.22	1.32	$a1$	0.4	0.6
$b1$	2.34	2.74	$C1$	1.3	1.7
$a1$	0.2	0.5	$L1$	1.45	1.55

/ Marking Instructions



BR

C5706

Note:

BR: Company Code

C5706: 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 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	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

/ 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-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

/ Notices