

# MMBT3906ZK

Rev.D Mar.-2025

## 描述 / Descriptions

DFN1006-3L 塑封封装 PNP 半导体三极管。

Silicon PNP transistor in a DFN1006-3L Plastic Package.

## 特征 / Features

高  $h_{FE}$  , 低  $V_{CE(sat)}$  , 无卤产品。

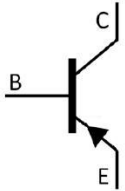
High DC Current Gain, Low Collector to Emitter Saturation Voltage, HF product.

## 用途 / Applications

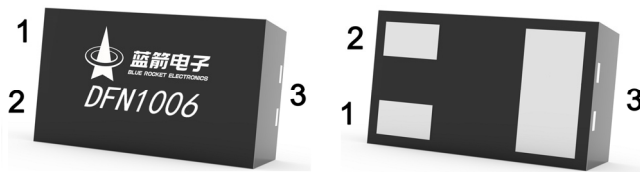
用于普通放大及开关。

General purpose amplifier and switching.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



PIN 1 : Base

PIN 2 : Emitter

PIN 3 : Collector

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

$h_{FE}$ Range	100~300
Marking	• H2AK

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

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	$V_{CBO}$	-40	V
Collector to Emitter Voltage	$V_{CEO}$	-40	V
Emitter to Base Voltage	$V_{EBO}$	-5.0	V
Collector Current	$I_C$	-200	mA
*Collector Power Dissipation	$P_C$	100	mW
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C
Thermal Resistance, Junction to Ambient	$R_{thJA}$	310	°C/W
Thermal Resistance, Junction to Lead	$R_{thJL}$	120	°C/W

\*贴装在 PCB 板上 Mount on the PCBA

**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 to Base Breakdown Voltage	$V_{CBO}$	$I_C = -10\mu A$ $I_E = 0$	-40			V
Collector to Emitter Breakdown Voltage	$V_{CEO}$	$I_C = -1.0mA$ $I_B = 0$	-40			V
Emitter to Base Breakdown Voltage	$V_{EBO}$	$I_E = -10\mu A$ $I_C = 0$	-5.0			V
Collector Cut-Off Current	$I_{CBO}$	$V_{CB} = -30V$ $I_E = 0$			-0.05	$\mu A$
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB} = -3.0V$ $I_C = 0$			-0.05	$\mu A$
DC Current Gain	$h_{FE(1)}$	$V_{CE} = -1.0V$ $I_C = -10mA$	100		300	
	$h_{FE(2)}$	$V_{CE} = -1.0V$ $I_C = -100mA$	30			
	$h_{FE(3)}$	$V_{CE} = -1.0V$ $I_C = -50mA$	60			
	$h_{FE(4)}$	$V_{CE} = -1.0V$ $I_C = -1.0mA$	80			
	$h_{FE(5)}$	$V_{CE} = -1.0V$ $I_C = -0.1mA$	60			
Collector-Emitter Saturation voltage	$V_{CE(sat)(1)}$	$I_C = -10mA$ $I_B = -1.0mA$			-0.25	V
	$V_{CE(sat)(2)}$	$I_C = -50mA$ $I_B = -5.0mA$			-0.4	V
Base-Emitter Saturation Voltage	$V_{BE(sat)(1)}$	$I_C = -10mA$ $I_B = -1.0mA$	-0.65		-0.85	V
	$V_{BE(sat)(2)}$	$I_C = -50mA$ $I_B = -5.0mA$			-0.95	V
Transition Frequency	$f_T$	$V_{CE} = -20V$ $I_C = -10mA$ $f = 100MHz$	250			MHz
Output Capacitance	$C_{ob}$	$V_{CB} = -5.0V$ $f = 1.0MHz$			4.5	pF
Storage Time	$t_{stg}$	$V_{CC} = -3.0V$ $I_C = -10mA$ $I_{B1} = -I_{B2} = -1.0mA$			225	ns
Fall Time	$t_f$	$V_{CC} = -3.0V$ $I_C = -10mA$ $I_{B1} = -I_{B2} = -1.0mA$			75	ns
Delay Time	$t_d$	$V_{CC} = -3.0V$ $V_{BE} = -0.5V$ $I_C = -10mA$ $I_{B1} = -1.0mA$			35	ns
Rise Time	$t_r$	$V_{CC} = -3.0V$ $V_{BE} = -0.5V$ $I_C = -10mA$ $I_{B1} = -1.0mA$			35	ns
Input Capacitance	$C_{ib}$	$V_{EB} = -0.5V$ $f = 1.0MHz$			10	pF

电参数曲线图 / Electrical Characteristic Curve

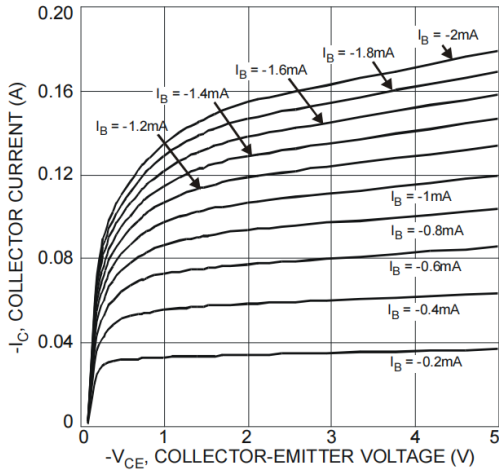


Fig. 1 Typical Collector Current vs. Collector-Emitter Voltage

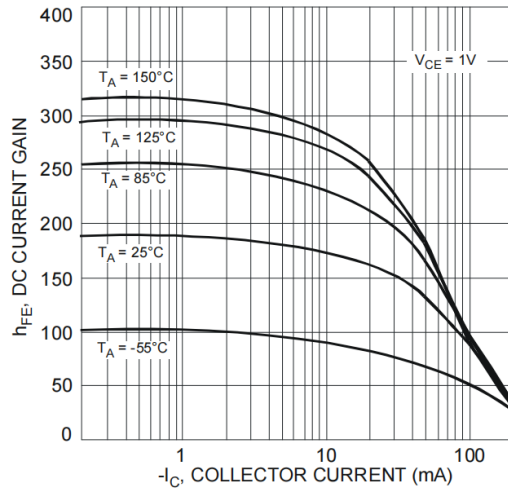


Fig. 2 Typical DC Current Gain vs. Collector Current

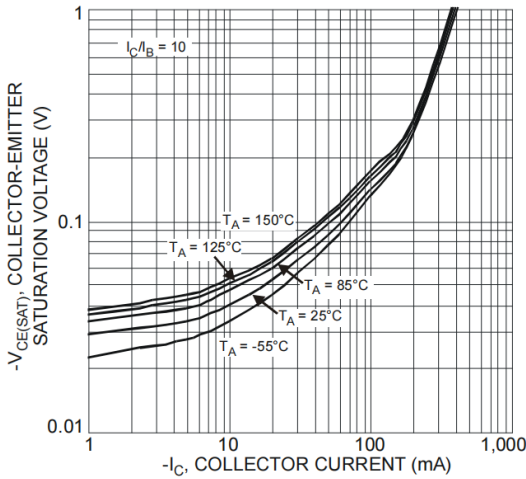


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

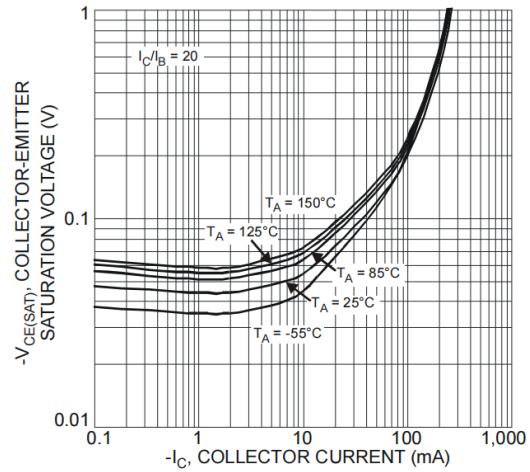


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

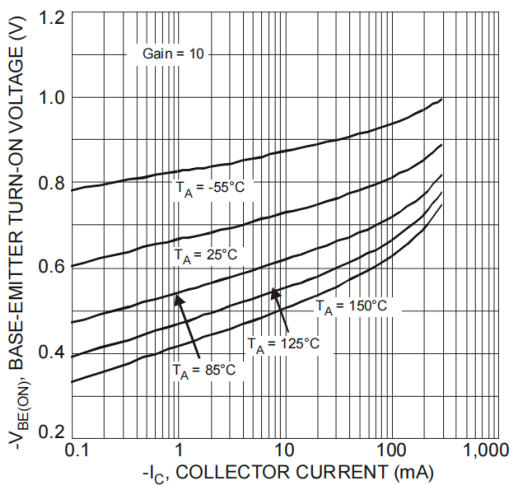


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

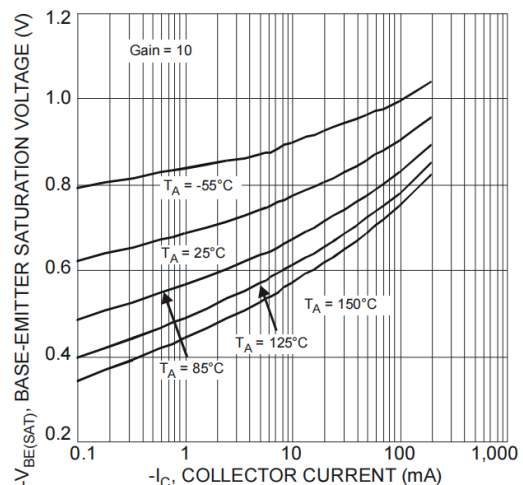
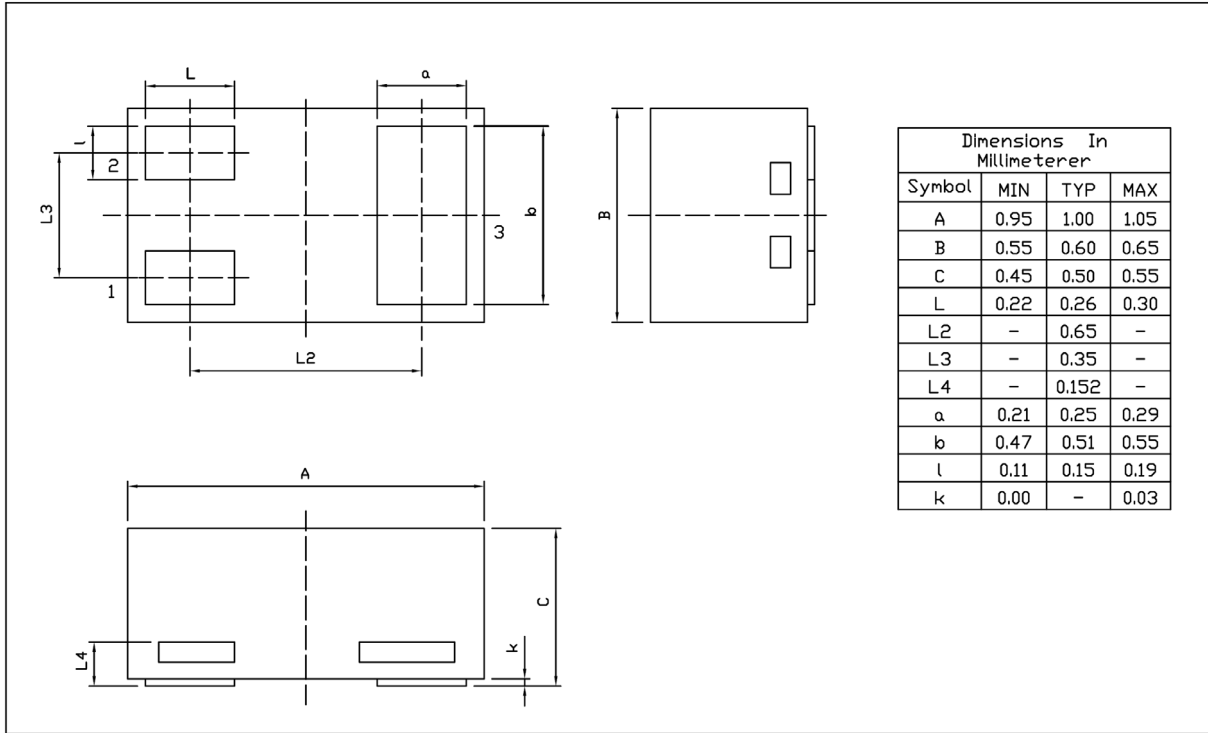


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

**外形尺寸图 / Package Dimensions**

DFN1006-3L

Unit:mm



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印章说明 / Marking Instructions



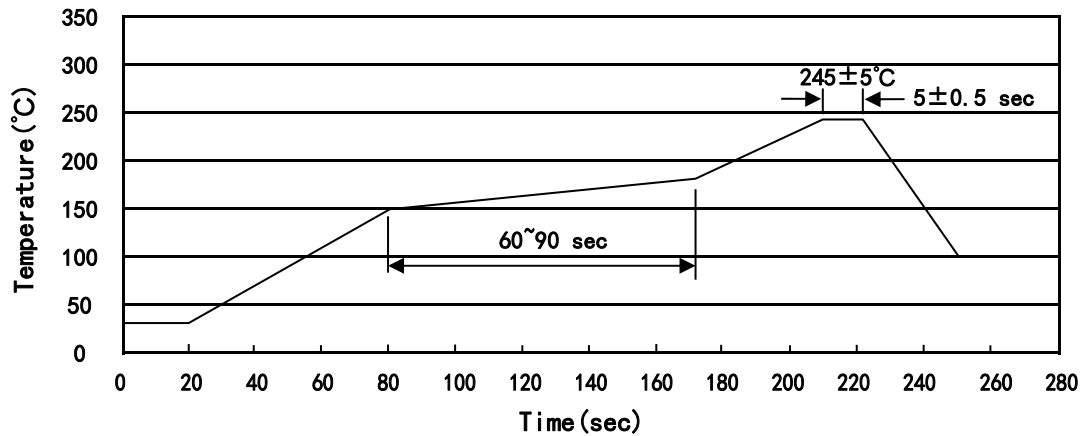
说明：

- ： 区分标识
- H： 为公司代码
- 2AK： 为型号代码

Note:

- ： Identify
- H： Company Code
- 2AK： Product Type Code

回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)



说明：

- 1、预热温度 150~180°C，时间 60~90sec;
- 2、峰值温度 245±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:150~180°C, Time:60~90sec.
- 2.Peak Temp.:245±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：260±5°C

时间：10±1 sec.

Temp.:260±5°C

Time:10±1 sec

包装规格 / Packaging SPEC.

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
DFN1006-3L	10,000	10	100,000	6	600,000	7" ×8	180×120×180	390×385×205

使用说明 / Notices