

# MMDT2222A

Rev.C Oct.-2021

## 描述 / Descriptions

SOT-363 塑封封装双 NPN 半导体三极管。Double silicon NPN transistor in a SOT-363 Plastic Package.

## 特征 / Features

集电极电流可达到 600mA。无卤产品。

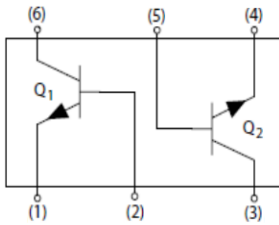
Collector currents up to 600 mA. HF Product.

## 用途 / Applications

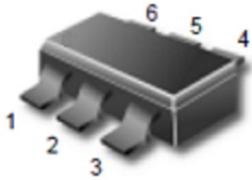
用于普通放大。

General purpose amplifier.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



PIN 1、4 : Emitter

PIN 2、5 : Base

PIN 3、6 : Collector

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

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 to Base Voltage	$V_{CBO}$	75	V
Collector to Emitter Voltage	$V_{CEO}$	40	V
Emitter to Base Voltage	$V_{EBO}$	6.0	V
Collector Current	$I_C$	600	mA
Total Package Dissipation <sup>Note1</sup>	$P_D$	150	mW
Junction Temperature	$T_J$	-55~+150	°C
Storage Temperature Range	$T_{stg}$	-55~+150	°C

Note1 : Device mounted on FR4 glass epoxy printed circuit board using the minimum recommended footprint.

**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-Base Breakdown Voltage	$V_{CBO}$	$I_C = 10\mu A$ $I_E = 0$	75			V
Collector-Emitter Breakdown Voltage	$V_{CEO}$	$I_C = 10mA$ $I_B = 0$	40			V
Emitter-Base Breakdown Voltage	$V_{EBO}$	$I_E = 10\mu A$ $I_C = 0$	6.0			V
Collector Cut-Off Current	$I_{CEX}$	$V_{CE} = 60V$ $V_{EB(off)} = 3V$			10	nA
Collector Cut-Off Current	$I_{CBO}$	$V_{CB} = 60V$ $I_E = 0$			0.01	$\mu A$
		$V_{CB} = 60V$ $I_E = 0$ $T_A = 125^\circ C$			10	$\mu A$
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB} = 3.0V$ $I_C = 0$			100	nA
Base Cut-Off Current	$I_{BL}$	$V_{CE} = 60V$ $V_{EB(off)} = 3V$			20	nA
DC Current Gain	$h_{FE(1)}$	$V_{CE} = 10V$ $I_C = 0.1mA$	35			
	$h_{FE(2)}$	$V_{CE} = 10V$ $I_C = 1.0mA$	50			
	$h_{FE(3)}$	$V_{CE} = 10V$ $I_C = 10mA$	75			
	$h_{FE(4)}$	$V_{CE} = 10V$ $I_C = 10mA$ $T_A = -55^\circ C$	35			
	$h_{FE(5)}$	$V_{CE} = 10V$ $I_C = 150mA$ (Note 2)	100		300	
	$h_{FE(6)}$	$V_{CE} = 1.0V$ $I_C = 150mA$ (Note 2)	50			
	$h_{FE(7)}$	$V_{CE} = 10V$ $I_C = 500mA$ (Note 2)	40			

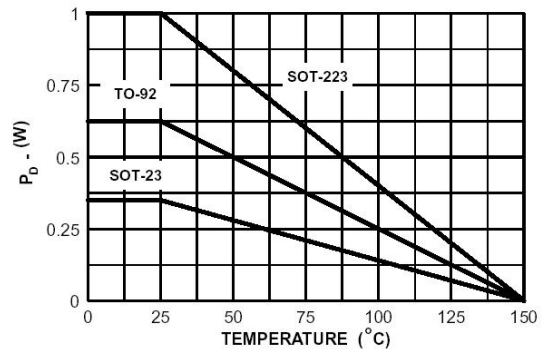
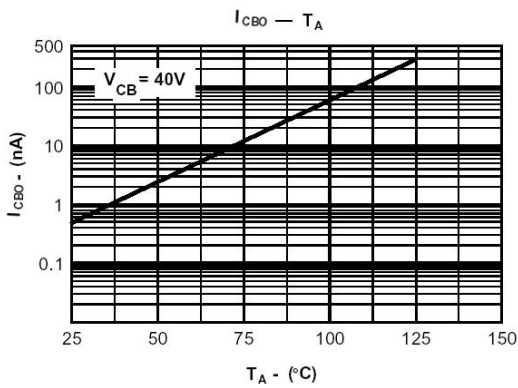
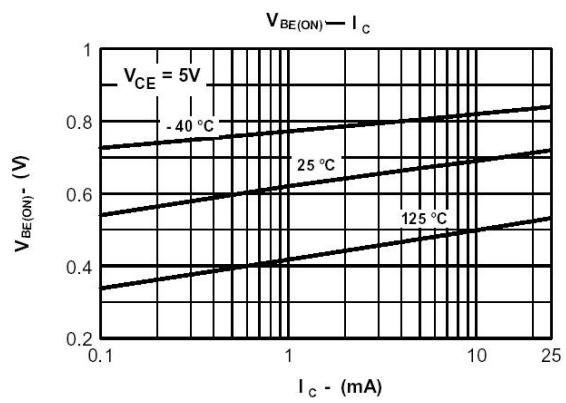
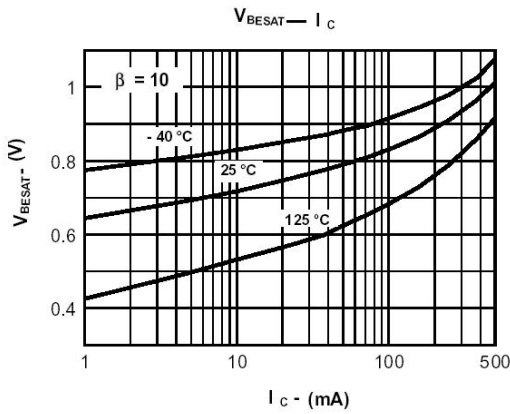
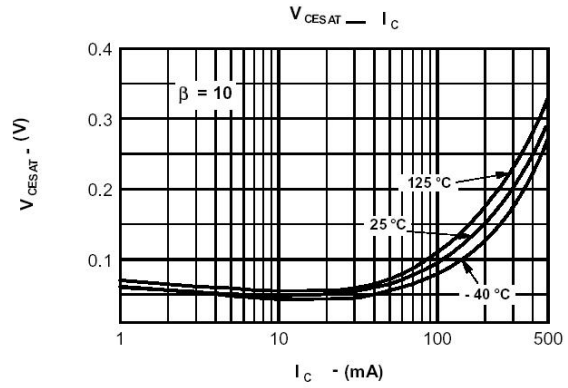
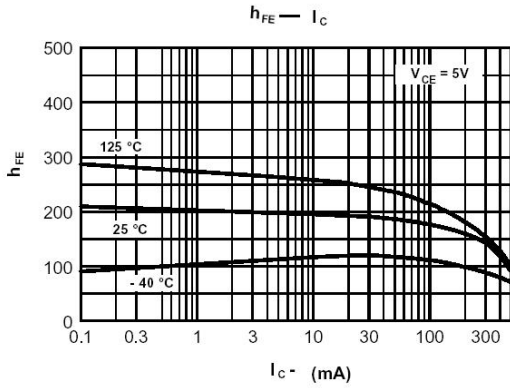
## 电性能参数 / Electrical Characteristics(Ta=25°C)

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 Saturation Voltage	$V_{CE(sat)}(1)$	$I_C=150mA$ $I_B=15mA$			0.3	V
	$V_{CE(sat)}(2)$	$I_C=500mA$ $I_B=50mA$			1.0	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}(1)$	$I_C=150mA$ $I_B=15mA$	0.6		1.2	V
	$V_{BE(sat)}(2)$	$I_C=500mA$ $I_B=50mA$			2.0	V
Transition Frequency(Note 3)	$f_T$	$V_{CE}=20V$ $I_C=20mA$ $f=100MHz$	300			MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V$ $I_E=0$ $f=1.0MHz$			8.0	pF
Input Capacitance	$C_{ib}$	$V_{EB}=0.5V$ $I_C=0$ $f=1.0MHz$			25	
Input Impedance	$h_{ie}$	$I_C=1.0mA$ $V_{CE}=10V$ $f=1.0kHz$	2.0		8.0	kΩ
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$	0.25		1.25	
Voltage Feedback Ratio	$h_{re}$	$I_C=1.0mA$ $V_{CE}=10V$ $f=1.0kHz$			8.0	$\times 10^{-4}$
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$			4.0	
Small-Signal Current Gain	$h_{fe}$	$I_C=1.0mA$ $V_{CE}=10V$ $f=1.0kHz$	50		300	-
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$	75		375	-
Output Admittance	$h_{oe}$	$I_C=1.0mA$ $V_{CE}=10V$ $f=1.0kHz$	5.0		35	μmhos
		$I_C=10mA$ $V_{CE}=10V$ $f=1.0kHz$	25		200	
Collector Base Time Constant	$r_b, C_c$	$I_E=20mA$ $V_{CB}=20V$ $f=31.8MHz$			150	Ps
Noise Figure	NF	$I_C=100\mu A$ $V_{CE}=10V$ $R_S=1.0k\Omega$ $f=1.0kHz$			4.0	dB
Turn-on Time	$t_d$	$V_{CC}=30V$ $I_C=150mA$ $V_{BE(OFF)}=-0.5V$			10	ns
Storage Time	$t_r$	$I_{B1}=15mA$			25	ns
Fall Time	$t_s$	$V_{CC}=30V$ $I_C=150mA$			225	ns
	$t_f$	$I_{B1}=I_{B2}=15mA$			60	ns

Note2 . Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$ .

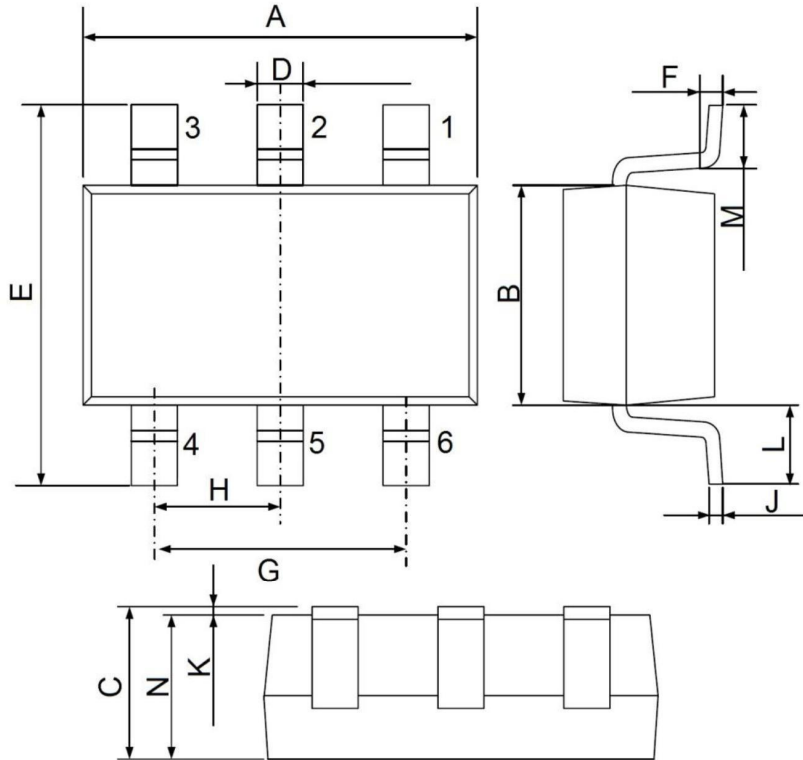
Note3: $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.

电参数曲线图 / Electrical Characteristic Curve



外形尺寸图 / Package Dimensions

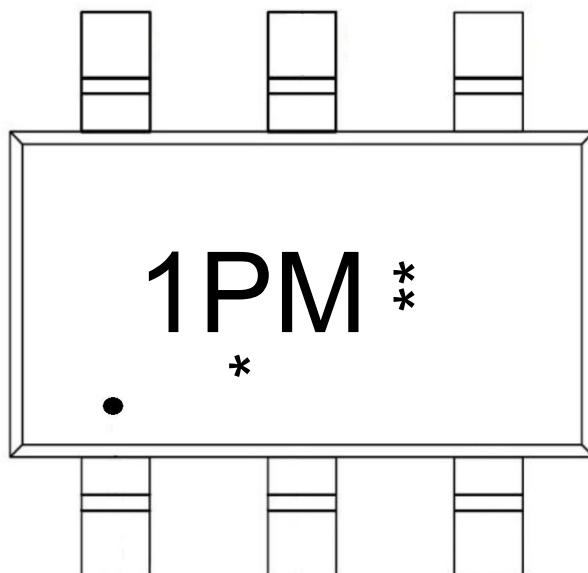
### SOT-363-6L



UNIT: mm

DIM	MIN	MAX
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	1.95	2.25
F	0.20 Typ.	
G	1.20	1.40
H	0.65 Typ.	
J	0.08	0.15
K	0.00	0.10
L	0.525 Ref.	
M	0.26	0.46
N	0.90	1.10

印章说明 / Marking Instructions



说明：

●： 为“1”脚

1PM： 为型号代码

\*\*\*： 为生产批号代码，随生产批号变化

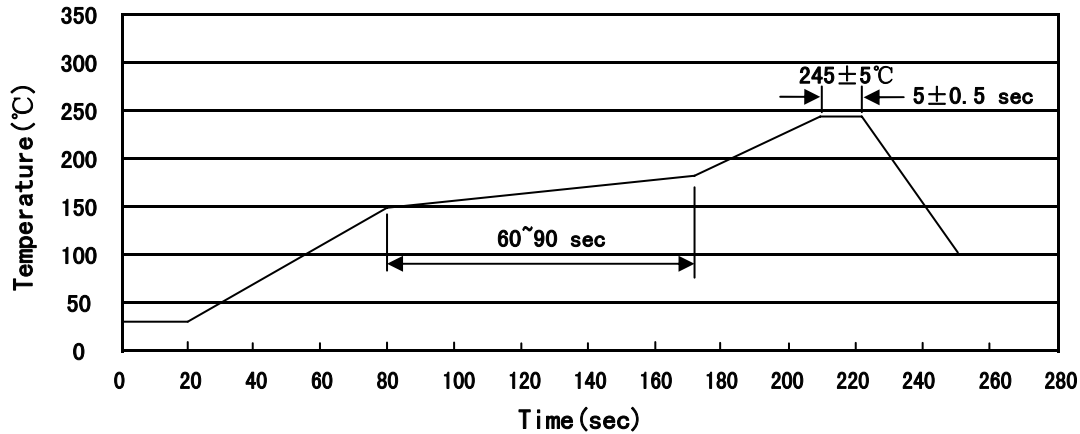
Note:

●： “1” Pin

1PM： Product Type Code

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

**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
SOT-363	3,000	10	30,000	6	180000	7" x8	180×120×180	390×385×205

**使用说明 / Notices**