



# MMBT4401

Rev.B Dec.-2021

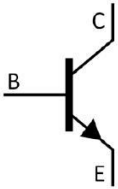
/D

Silicon NPN transistor in a SOT-23 Plastic Package.

Moisture Sensitivity Level: 1, ESD Rating: Human Body Model; 4 kV, Machine Model; 400 V.HF Product.

C

Medium power amplifier and switch requiring collector currents up to 500 mA.



PIN 1 Base    PIN 2 Emitter    PIN 3 Collector

## / $h_{FE}$ Classifications & Marking

$h_{FE}$ Range	100~300
Marking	H2X

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DATA SHEET

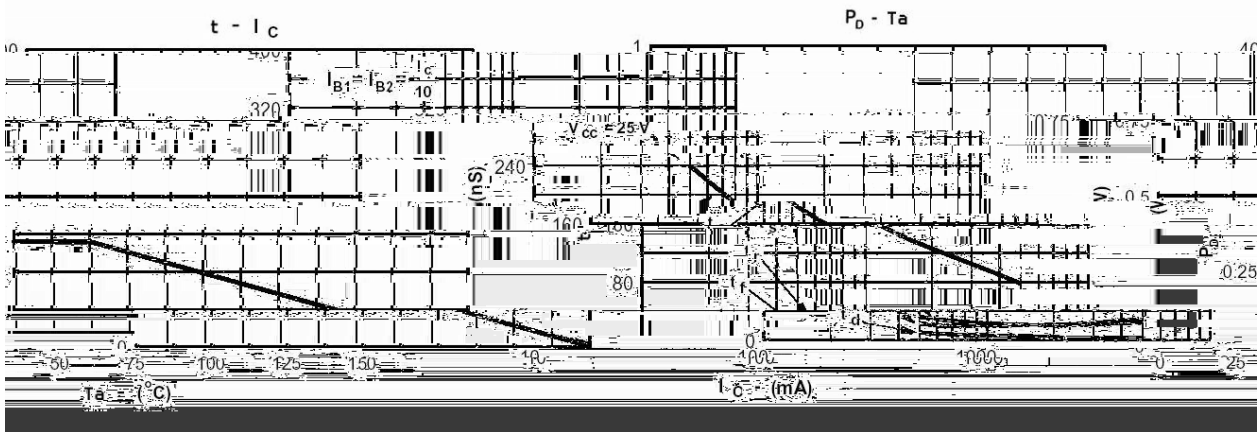
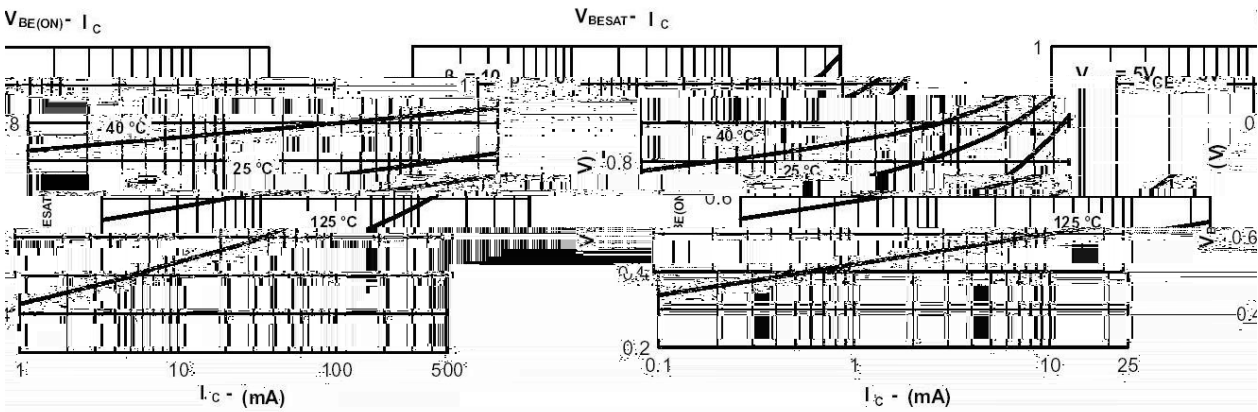
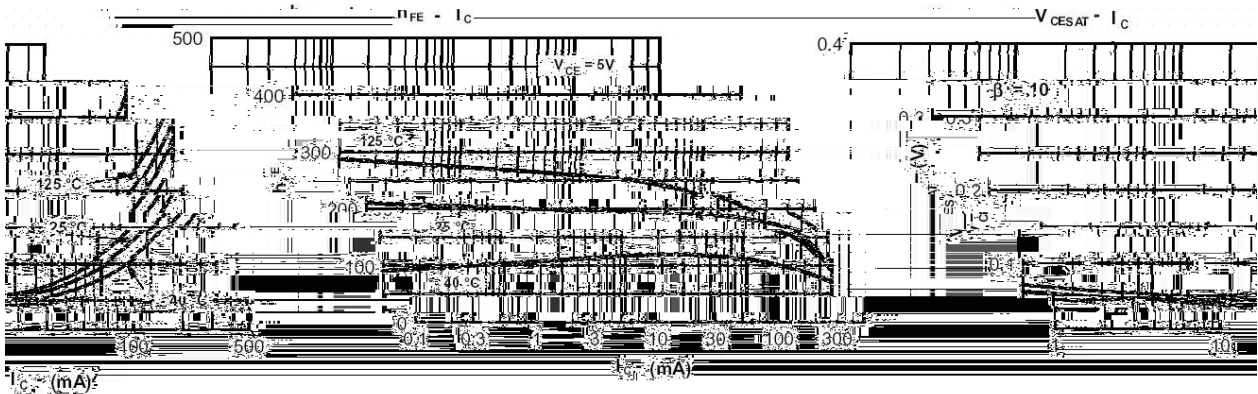


Parameter	Symbol	Rating	Unit
Collector to Base Voltage	$V_{CBO}$	60	V
Collector to Emitter Voltage	$V_{CEO}$	40	V
Emitter to Base Voltage	$V_{EBO}$	6.0	V
Collector Current	$I_C$	600	mA
Collector Power Dissipation	$P_C$	350	mW
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C



Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector to Emitter Breakdown Voltage	$V_{CEO}$	$I_C=1.0mA$ $I_B=0$	40			V
Collector to Base Breakdown Voltage	$V_{CBO}$	$I_C=0.1mA$ $I_E=0$	60			V
Emitter to Base Breakdown Voltage	$V_{EBO}$	$I_E=0.1mA$ $I_C=0$	6.0			V
Collector Cut-Off Current	$I_{CBO}$	$V_{CE}=60V$ $I_E=0$			50	nA
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=6.0V$ $I_C=0$			50	nA
DC Current Gain	$h_{FE(1)}$	$V_{CE}=1.0V$ $I_C=150mA$	100		300	
	$h_{FE(2)}$	$V_{CE}=2.0V$ $I_C=500mA$	40			
	$h_{FE(3)}$	$V_{CE}=1.0V$ $I_C=10mA$	80			
	$h_{FE(4)}$	$V_{CE}=1.0V$ $I_C=1.0mA$	40			
	$h_{FE(5)}$	$V_{CE}=1.0V$ $I_C=0.1mA$	20			
Collector-Emitter Saturation Voltage	$V_{CE(sat)(1)}$	$I_C=150mA$ $I_B=15mA$			0.4	V
	$V_{CE(sat)(2)}$	$I_C=500mA$ $I_B=50mA$			0.75	V
Base-Emitter Saturation Voltage	$V_{BE(sat)(1)}$	$I_C=150mA$ $I_B=15mA$	0.75		0.95	V
	$V_{BE(sat)(2)}$	$I_C=500mA$ $I_B=50mA$			1.2	V
Transition Frequency	$f_T$	$V_{CE}=10V$ $I_C=20mA$ $f=100MHz$	250			MHz
Delay Time	$t_d$	$V_{CC}=30V$ $I_C=150mA$			15	ns
Rise Time	$t_r$	$I_{B1}=15mA$			20	ns
Storage Time	$t_s$	$V_{CC}=30V$ $I_C=150mA$			25	ns
Fall Time	$t_f$	$I_{B1}=-I_{B2}=15mA$			30	ns

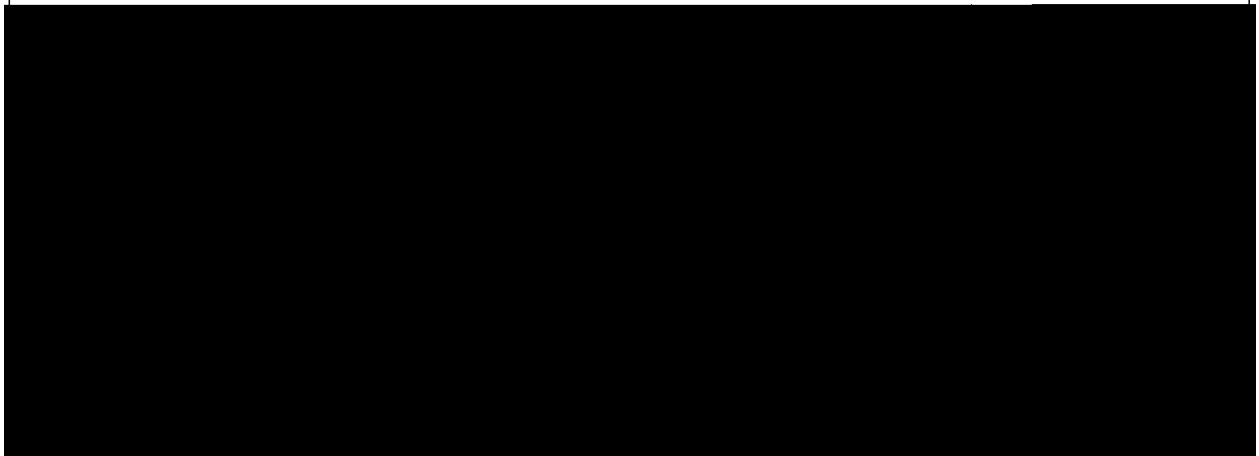
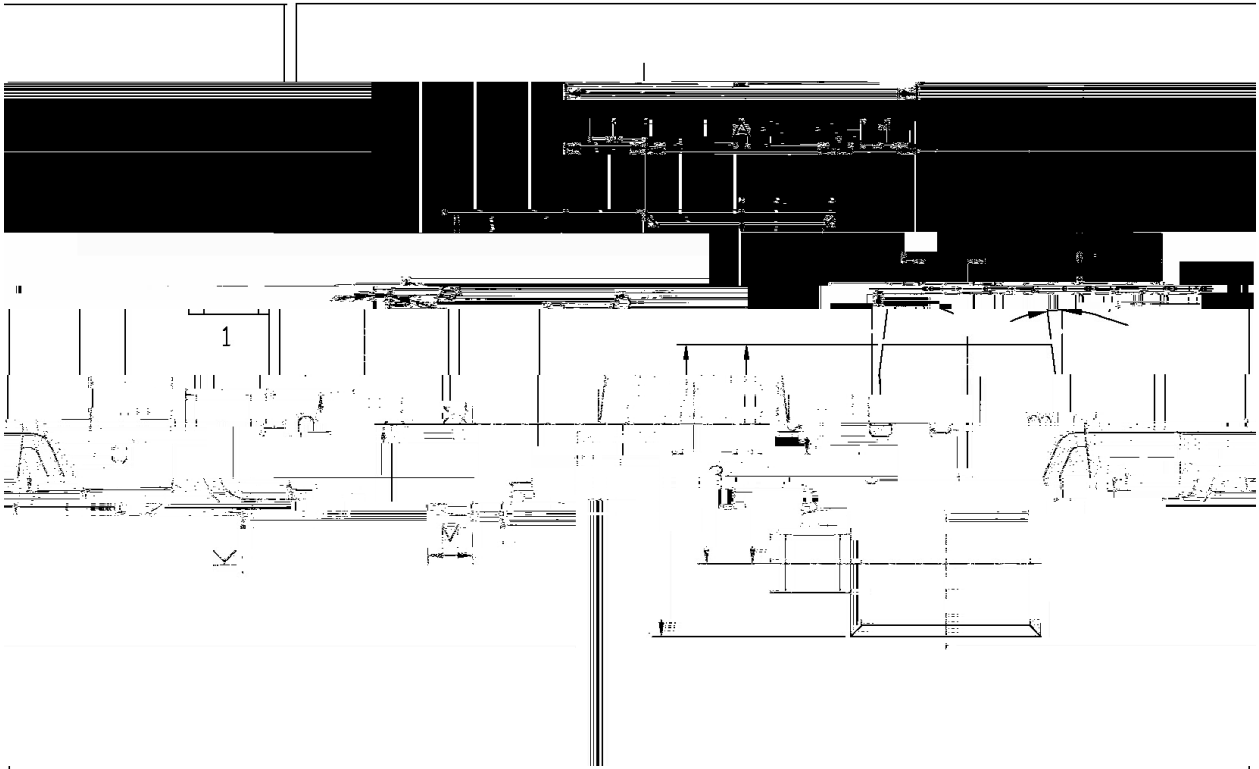
**/ Electrical Characteristic Curve**



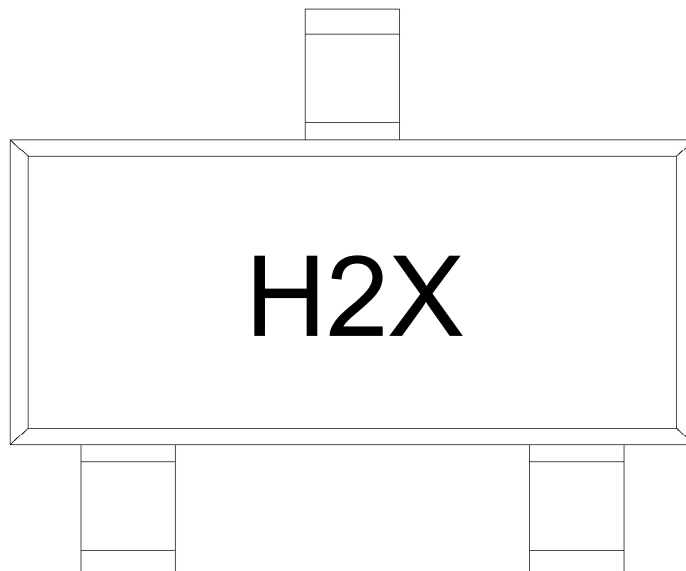
/ Package Dimensions

SOT-223

单位: mm



**/ Marking Instructions**



H

2X

Note:

H            Company Code

2X            Product Type Code

( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)


Note:

- |   |         |           |  |
|---|---------|-----------|--|
| 1 | 150 180 | 60 90sec; | 1.Preheating:150~180°C, Time:60~90sec.   |
| 2 | 245±5   | 5±0.5sec; | 2.Peak Temp.:245±5°C, Duration:5±0.5sec. |
| 3 | 2       | 10°C/sec. | 3. Cooling Speed: 2~10°C/sec.            |

/ Resistance to Soldering Heat Test Conditions

260±5°C                      10±1 sec.                      Temp.:260±5°C                      Time:10±1 sec

/ Packaging SPEC.

/ 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-23	3,000	10	30,000	6	180,000	7" x8	180×120×180	390×385×205