

**NPN Silicon Transistor** 

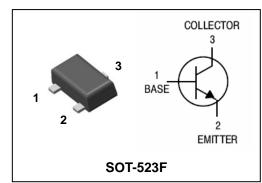
#### **Descriptions**

- Small signal application
- Switching application

#### **Features**

- Low collector saturation voltage
- Low collector output capacitance
- Complementary pair with MMBT3906EF

#### **PIN Connection**



### **Ordering Information**

Type NO.	Marking	Package Code
MMBT3904EF	<u>Z</u> <u>□</u> ① ②	SOT-523F
	①Device Code ② Year&Week Code	

**Absolute maximum ratings** 

Ta=25°C

Characteristic	Symbol	Rating	Unit
Collector-Base voltage	$V_{CBO}$	60	V
Collector-Emitter voltage	$V_{\sf CEO}$	40	V
Emitter-base voltage	$V_{EBO}$	6	V
Collector current	I <sub>C</sub>	200	mA
Collector Power dissipation	P <sub>C</sub>	150	mW
Junction temperature	T <sub>J</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

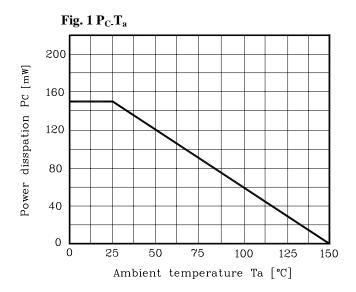
## **Electrical Characteristics**

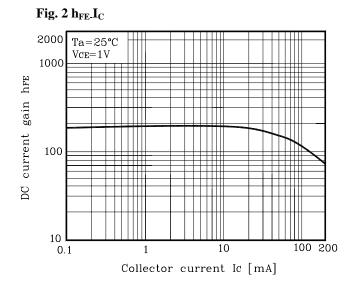
Ta=25°C

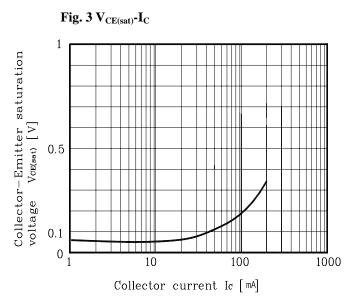
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base breakdown voltage	BV <sub>CBO</sub>	$I_C = 10 \mu A, I_E = 0$	60	-	-	V
Collector-Emitterbreakdown voltage	BV <sub>CEO</sub>	$I_C=1mA$ , $I_B=0$	40	-	-	٧
Emitter-Base breakdown voltage	$BV_{EBO}$	$I_E = 10 \mu A, I_C = 0$	6	-	-	٧
Collector cut-off current	I <sub>CEX</sub>	$V_{CE} = 30V, V_{BE} = -3V$	-	-	50	nA
DC current gain	h <sub>FE</sub>	$V_{CE}=1V$ , $I_{C}=10mA$	100	-	300	-
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	$I_C=50$ mA, $I_B=5$ mA	-	-	0.3	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =20V, I <sub>C</sub> =10mA, f=100MHz	300	-	-	MHz
Collector output capacitance	C <sub>ob</sub>	$V_{CB}=5V$ , $I_{E}=0$ , $f=1MHz$	-	-	4	рF
Turn on delay time	t <sub>d</sub>	$V_{CC}=3V$ , $V_{BE(off)}=0.5V$	-	-	35	ns
Rise time	t <sub>r</sub>	$I_C=10\text{mA}, I_{B1}=1\text{mA}$	-	-	35	ns
Storage time	t <sub>s</sub>	$V_{CC}=3V_{A}I_{C}=10mA_{A}$	-	_	200	ns
Fall Time	t <sub>f</sub>	$I_{B1} = -I_{B2} = 1 \text{mA}$	-	_	50	ns

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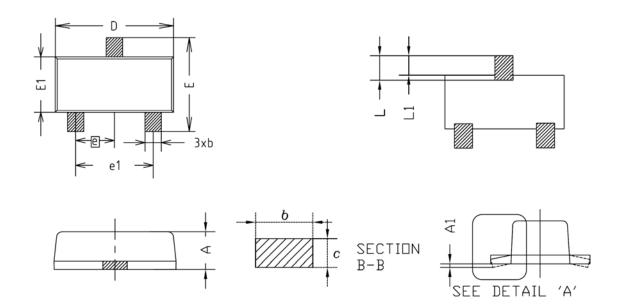
### **Electrical Characteristic Curves**





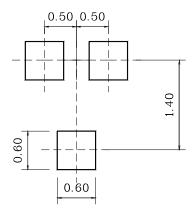


## **Outline Dimension**



SYMBOL	MILLIMETERS			NOTE
STABOL	MINIMUM	NOMINAL	MAXIMUM	NUIL
Α	0.63	0.68	0.73	
A1	0.00	_	0.10	
A2	_	_	_	
b	0.25	0.30	0.35	
_	0.04	0.11	0.20	
D	1.50	1.60	1.70	
Ε	1.50	1.60	1.70	
E1	0.78	0.88	0.98	
е	0.50BSC			
e1	0.90	-	1.10	
L	0.34	0.44	0.54	
L1	0.28	0.34	0.43	

#### \*Recommend PCB solder land [Unit: mm]



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