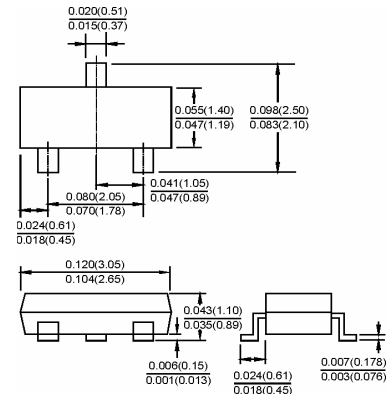


**SOT-23**


1. BASE
2. EMITTER
3. COLLECTOR


**Features**

- ✧ Epitaxial planar die construction
- ✧ Complementary NPN Type available(MMBT2222A)

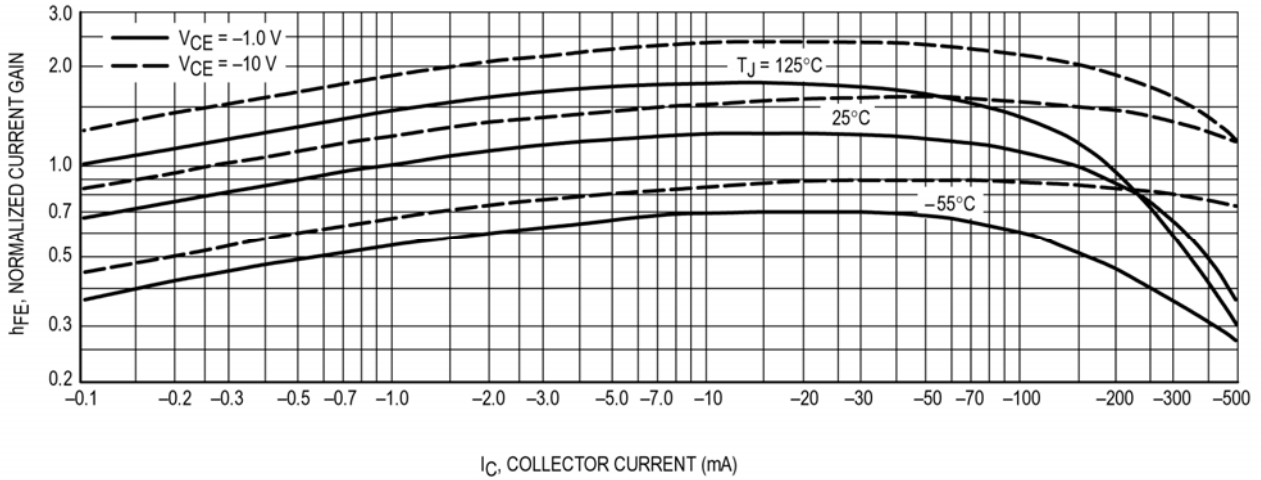
**MARKING:2F**
**Dimensions in inches and (millimeters)**
**MAXIMUM RATINGS**( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	-60	V
$V_{CEO}$	Collector-Emitter Voltage	-60	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current -Continuous	-0.6	A
$P_C$	Collector Dissipation	0.225	W
$T_J$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	-55 to +150	$^{\circ}\text{C}$

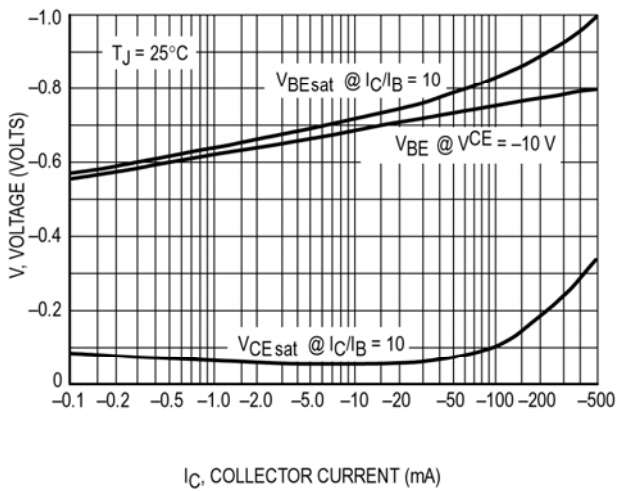
**ELECTRICAL CHARACTERISTICS** ( $T_{amb}=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	-60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-10\text{mA}, I_B=0$	-60			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	-5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-50\text{V}, I_E=0$			-20	nA
Collector cut-off current	$I_{CE0}$	$V_{CE}=-30\text{V}, V_{EB(off)}=-0.5\text{V}$			-50	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-3\text{V}, I_C=0$			-10	nA
DC current gain	$h_{FE(1)}$	$V_{CE}=-10\text{V}, I_C=-0.1\text{mA}$	75			
	$h_{FE(2)}$	$V_{CE}=-10\text{V}, I_C=-1\text{mA}$	100			
	$h_{FE(3)}$	$V_{CE}=-10\text{V}, I_C=-10\text{mA}$	100			
	$h_{FE(4)}$	$V_{CE}=-10\text{V}, I_C=-150\text{mA}$	100		300	
	$h_{FE(5)}$	$V_{CE}=-10\text{V}, I_C=-500\text{mA}$	50			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-150\text{mA}, I_B=-15\text{mA}$			-0.4	V
	$V_{CE(sat)}$	$I_C=-500\text{mA}, I_B=-50\text{mA}$			-1.6	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=-150\text{mA}, I_B=-15\text{mA}$			-1.3	V
	$V_{BE(sat)}$	$I_C=-500\text{mA}, I_B=-50\text{mA}$			-2.6	V
Transition frequency	$f_T$	$V_{CE}=-20\text{V}, I_C=-50\text{mA}, f=100\text{MHz}$	200			MHz
Delay time	$t_d$	$V_{CC}=-30\text{V}, I_C=-150\text{mA}, I_{B1}=-15\text{mA}$			10	nS
Rise time	$t_r$				25	nS
Storage time	$t_s$	$V_{CC}=-6\text{V}, I_C=-150\text{mA}, I_{B1}=-I_{B2}=-15\text{mA}$			225	nS
Fall time	$t_f$				60	nS

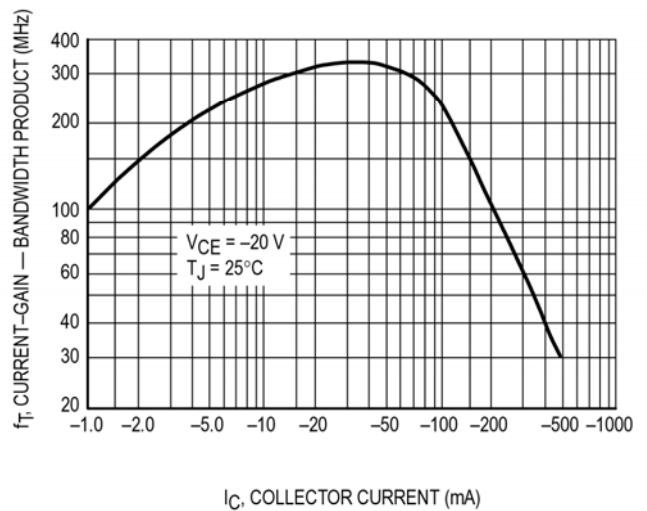
## Typical Characteristics



**DC Current Gain**



**"On" Voltage**



**Current-Gain — Bandwidth Product**