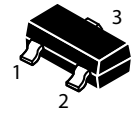
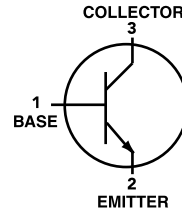


**NPN General Purpose Transistors**

 Lead(Pb)-Free


**SOT-23**
**MAXIMUM RATINGS(T<sub>a</sub>=25°C)**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Collector-Base Voltage	V <sub>CBO</sub>	60	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Collector Current - Continuous	I <sub>C</sub>	150	mA
Total Device Dissipation FR-5 Board T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	556	°C/W
Total Device Dissipation Alumina Substrate, T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	417	°C/W
Junction Temperature	T <sub>j</sub>	-55 to+150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

**ELECTRICAL CHARACTERISTICS**

Characteristics	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Collector Cutoff Current $V_{CB} = 60V, I_E = 0$	$I_{CBO}$	-	-	0.1	$\mu A$
Emitter Cutoff Current $V_{EB} = 5V, I_C = 0$	$I_{EBO}$	-	-	0.1	$\mu A$

**ON CHARACTERISTICS**

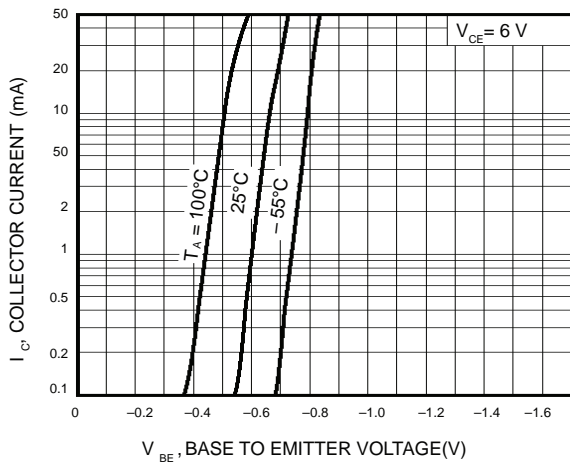
Collector-Emitter Saturation Voltage $I_C = 100mA, I_B = 10mA$	$V_{CE(sat)}$	-	0.15	0.3	V
Base-Emitter Saturation Voltage $I_C = 100mA, I_B = 10mA$	$V_{BE(sat)}$	-	0.86	1.0	V
Base-Emitter On Voltage $I_C = 1mA, V_{CE} = 6.0V$	$V_{BE}$	0.55	0.62	0.65	V
DC Current Transfer Ratio $V_{CE} = 6V, I_C = 1mA$	$h_{FE}$	120	-	560	

**SMALL-SIGNAL CHARACTERISTICS**

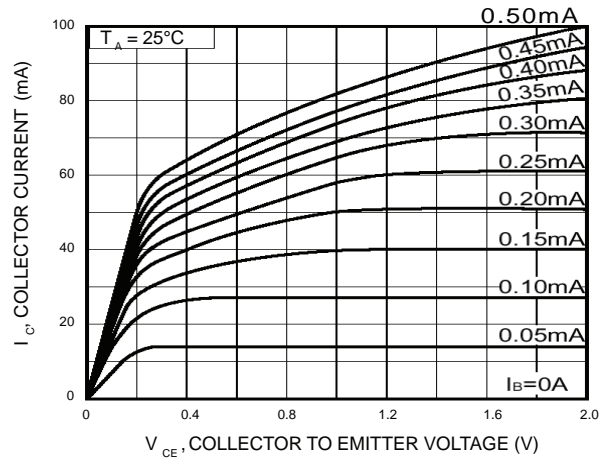
Transition frequency $V_{CE} = 6V, I_C = 10mA$	$f_T$	-	250	-	MHz
Output Capacitance( $V_{CE} = 6V, I_E = 0, f = 1.0MHz$ )	$C_{ob}$	-	3	-	Pf

**CLASSIFICATION  $h_{FE}$** 

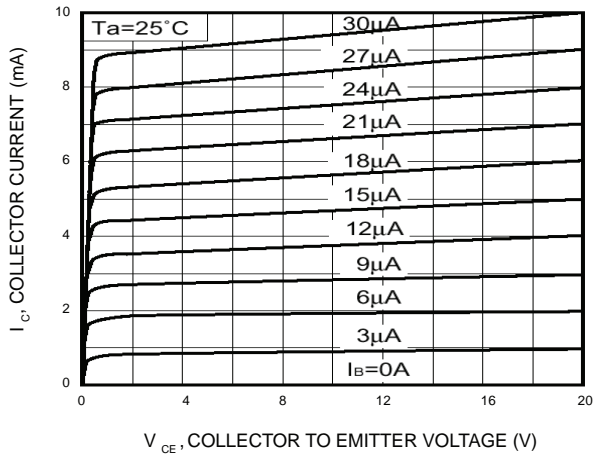
Rank	Q	R	S
Range	120-270	180-390	270-560
Marking	L5	L6	L7



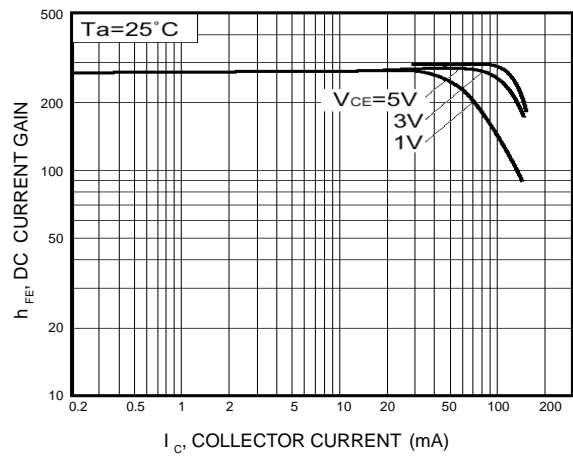
**Fig.1** Grounded emitter propagation characteristics



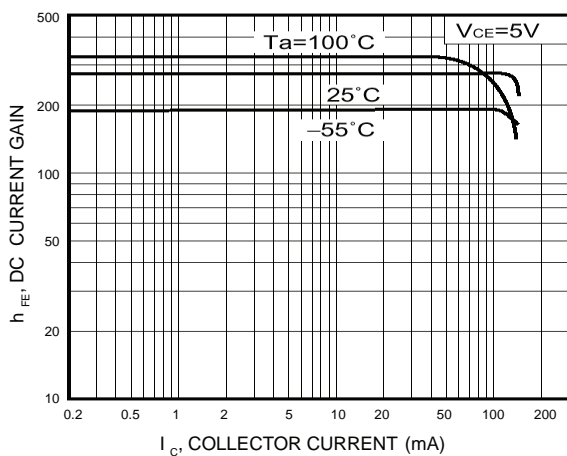
**Fig.2** Grounded emitter output characteristics(I)



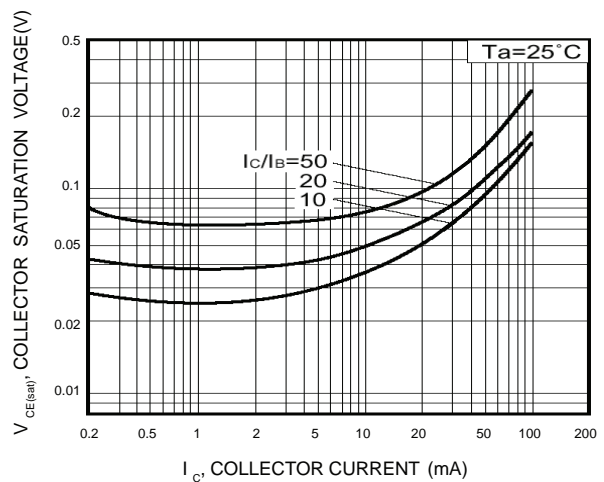
**Fig.3** Grounded emitter output characteristics(II)



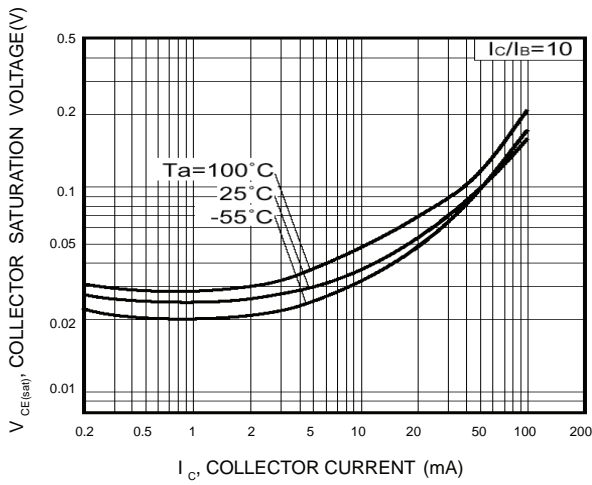
**Fig.4** DC current gain vs. collector current (I)



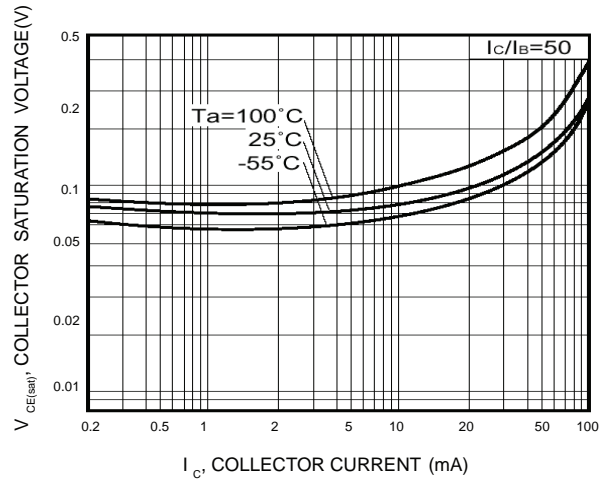
**Fig.5** DC current gain vs. collector current (II)



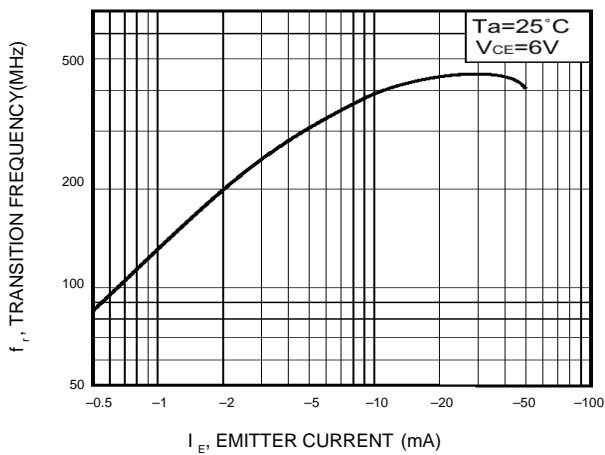
**Fig.6** Collector-emitter saturation voltage vs. collector current



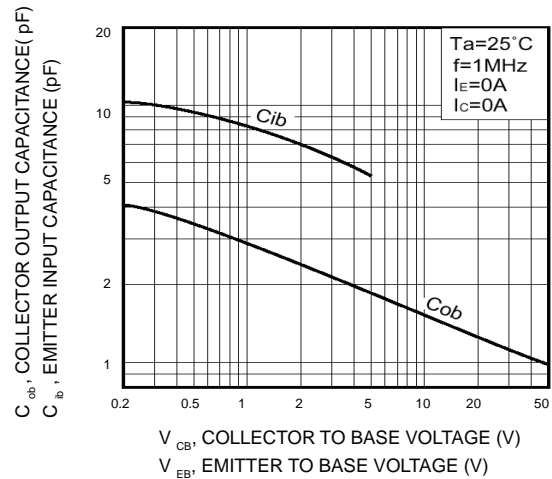
**Fig.7 Collector-emitter saturation voltage vs. collector current (I)**



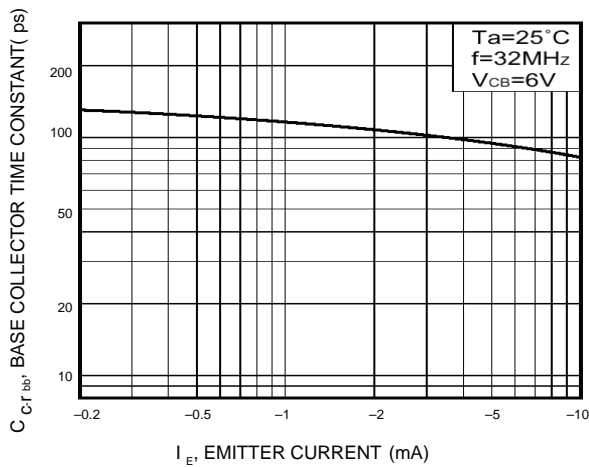
**Fig.8 Collector-emitter saturation voltage vs. collector current (II)**



**Fig.9 Gain bandwidth product vs. emitter current**

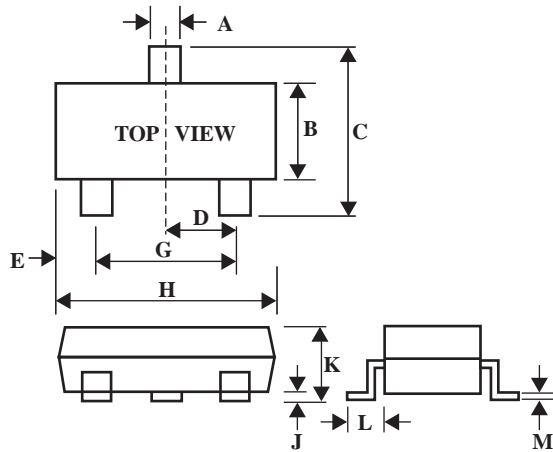


**Fig.10 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage**



**Fig.11 Base-collector time constant vs. emitter current**

**SOT-23 Outline Dimension**



SOT-23		
Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25

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