

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

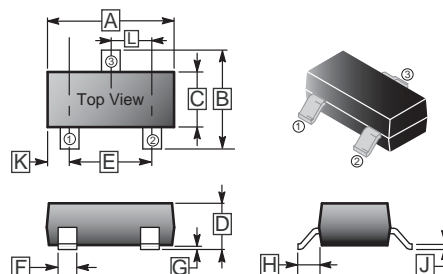
**SOT-23**

**FEATURES**

- Very low  $V_{CE(sat)}$ .  $V_{CE(sat)} < 0.4\text{ V}$  (Typ.)  
( $I_C / I_B = 500\text{mA} / 50\text{mA}$ )
- Complements to 2SB1197

**CLASSIFICATION OF  $h_{FE}$**

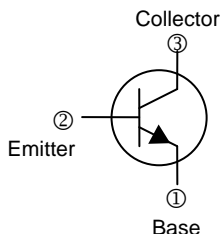
Product-Rank	2SD1781-Q	2SD1781-R
Range	120 ~ 270	180 ~ 390
Marking	AFQ	AFR



**PACKAGE INFORMATION**

Package	MPQ	LeaderSize
SOT-23	3K	7' inch

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.80	3.00	G	0.10	REF.
B	2.25	2.55	H	0.55	REF.
C	1.20	1.40	J	0.08	0.15
D	0.90	1.15	K	0.5	REF.
E	1.80	2.00	L	0.95	TYP.
F	0.30	0.50			



**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

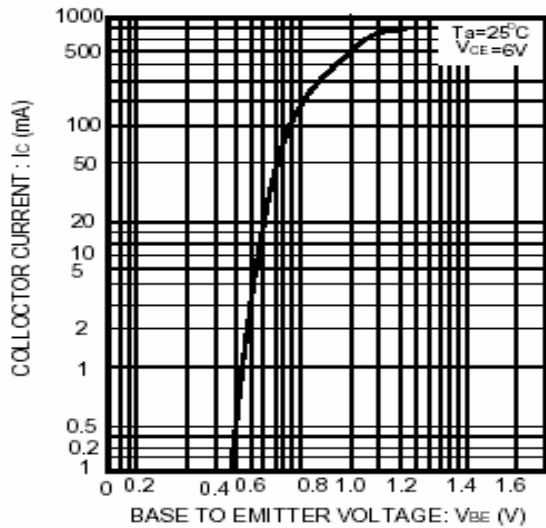
Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	$V_{CBO}$	40	V
Collector to Emitter Voltage	$V_{CEO}$	32	V
Emitter to Base Voltage	$V_{EBO}$	5	V
Collector Current - Continuous	$I_C$	0.8	A
Collector Power Dissipation	$P_C$	200	mW
Junction and Storage Temperature	$T_J, T_{STG}$	150, -55~150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

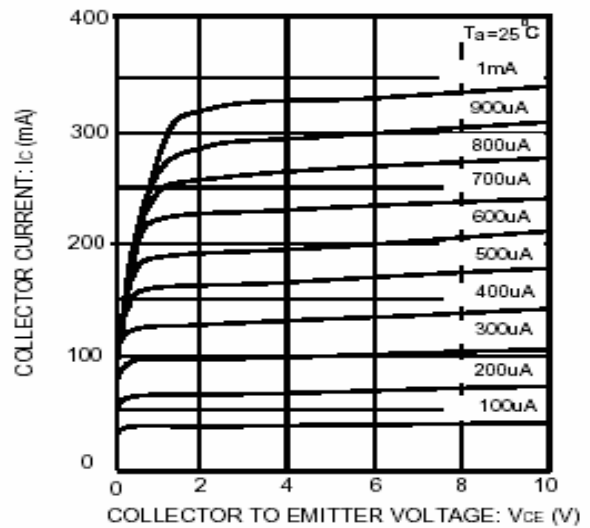
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Collector-Base Breakdown Voltage	$BV_{CBO}$	40	-	-	V	$I_C = 50\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	32	-	-	V	$I_C = 1\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	5	-	-	V	$I_E = 50\mu\text{A}, I_C = 0$
Collector Cut-off Current	$I_{CBO}$	-	-	0.5	$\mu\text{A}$	$V_{CB} = 20\text{V}, I_E = 0$
Emitter Cut-off Current	$I_{EBO}$	-	-	0.5	$\mu\text{A}$	$V_{EB} = 4\text{V}, I_C = 0$
DC Current Gain	$h_{FE}$	120	-	390		$I_C = 100\text{mA}, V_{CE} = 3\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_C = 500\text{mA}, I_B = 50\text{mA}$
Transition Frequency	$f_T$	-	150	-	MHz	$V_{CE} = 5\text{V}, I_C = 50\text{mA}, f = 100\text{MHz}$
Collector Output Capacitance	$C_{ob}$	-	10	-	pF	$V_{CB} = 10\text{V}, I_E = 0, f = 1.0\text{MHz}$

**CHARACTERISTICS CURVE**

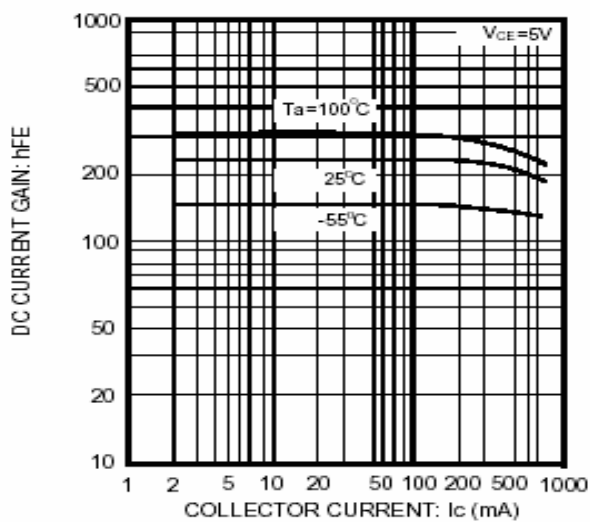
**Fig.1 Grounded emitter propagation characteristics**



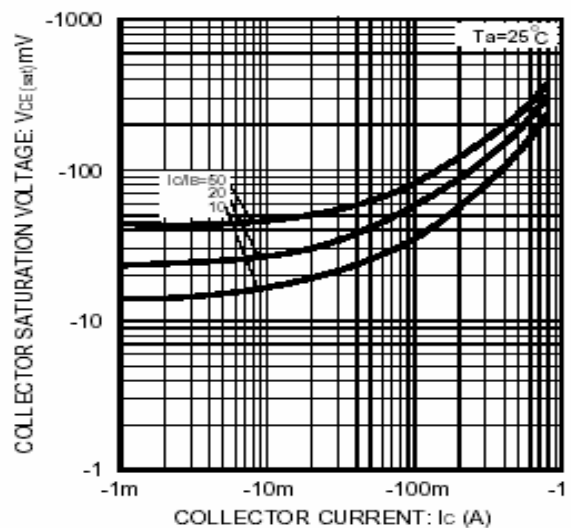
**Fig.2 Grounded emitter output characteristics**



**Fig.3 DC Current gain vs. collector current**

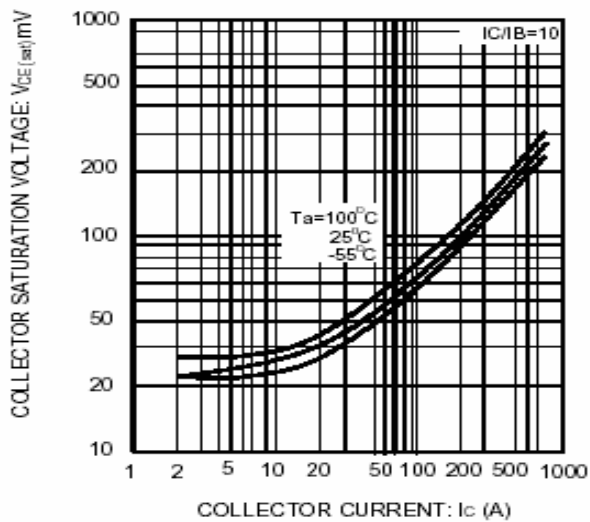


**Fig.4 Collector-emitter saturation voltage vs. collector current (1)**

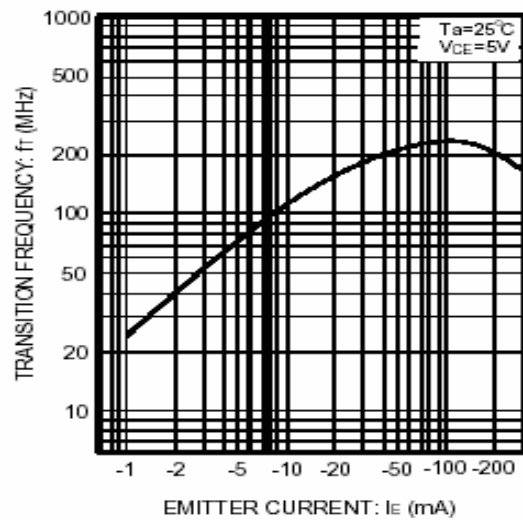


**CHARACTERISTICS CURVE**

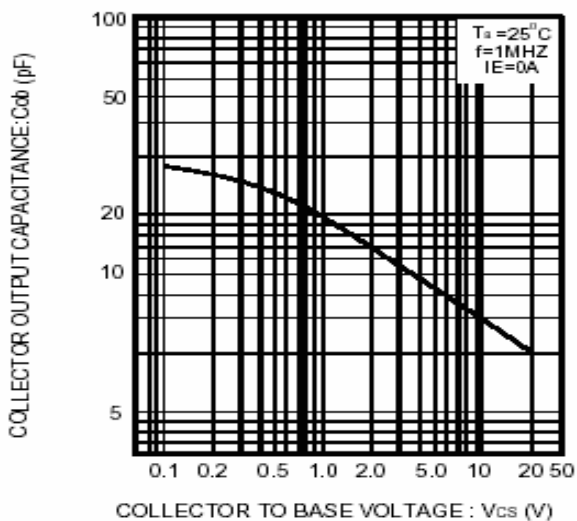
**Fig.5 Collector-emitter saturation voltage vs. collector current (2)**



**Fig.6 Gain bandwidthproduct vs. emitter current**



**Fig.7 Collector output capacitance vs. collector-base voltage**



**Fig.8 Emitter input capacitance vs emitter-base voltage**

