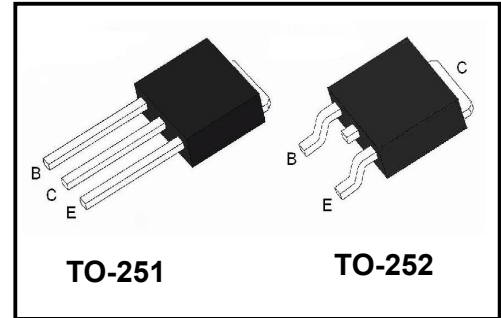


**NPN Plastic-Encapsulate Transistors  
High Current Switching Applications**
**Features**

- Low collector-to-emitter saturation voltage
- Excellent linearity of  $h_{FE}$ .
- Complement to 2SB1204.


**Absolute Maximum Ratings (Ta=25°C)**

Parameter	Symbol	Value	Unit	
Collector-Base Voltage	$BV_{CBO}$	60	V	
Collector-Emitter Voltage	$BV_{CEO}$	50	V	
Emitter-Base Voltage	$BV_{EBO}$	6	V	
Collector Current	$I_C$	8	A	
Collector Current (Pulse)	$I_{CP}$	12	A	
Collector Power Dissipation	$P_C$	Ta=25°C	1	W
		Ta=25°C	20	
Junction Temperature	$T_j$	150	°C	
Storage Temperature	$T_{stg}$	-55~+150	°C	

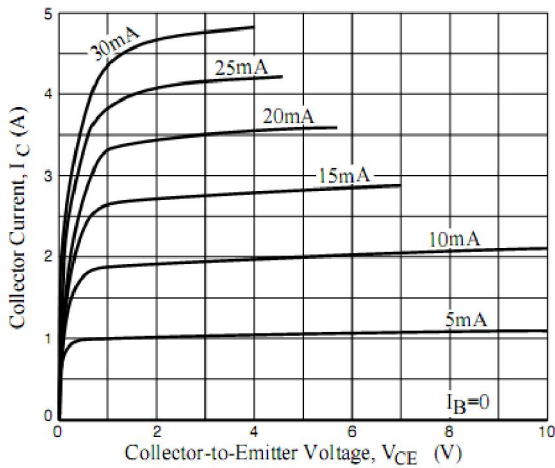
**Electrical Characteristics (Ta=25°C)**

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Collector-base breakdown voltage	$BV_{CBO}$	$I_C = 10\mu A, I_E = 0$	60			V
Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C = 1mA, I_B = 0$	50			V
Emitter-base breakdown voltage	$BV_{EBO}$	$I_E = 10\mu A, I_C = 0$	6			V
Collector cut-off current	$I_{CBO}$	$V_{CB} = 40V, I_E = 0$			-1	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 4V, I_C = 0$			-1	$\mu A$
DC current gain	$h_{FE}$	$V_{CE} = 2V, I_C = 0.5A$	70		400	
		$V_{CE} = 2V, I_C = 6A$	35			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 4A, I_B = 0.2A$			0.4	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 4A, I_B = 0.2A$			1.3	V
Transition frequency	$f_T$	$V_{CE} = 5V, I_B = 1A$	100			MHz
Output capacitance	$C_{ob}$	$V_{CB} = 10V, f = 1MHz$		65		pF

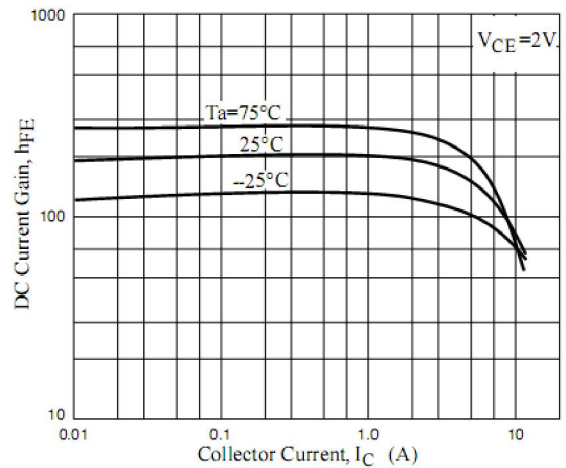
 **$h_{FE}$  Classification**

Classification	Q	R	S	T
Range	70~140	100~200	140~280	200~400

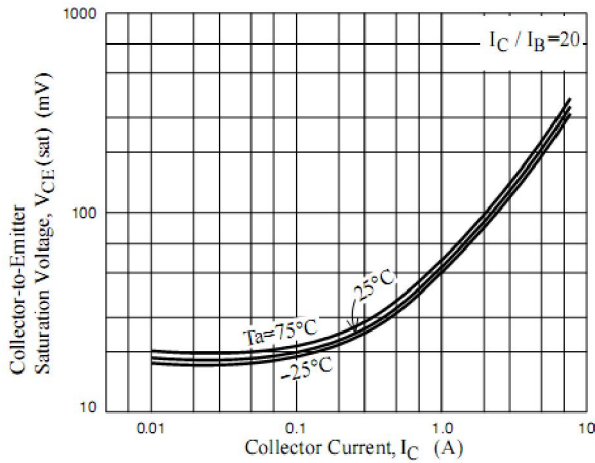
**Typical Characteristics**



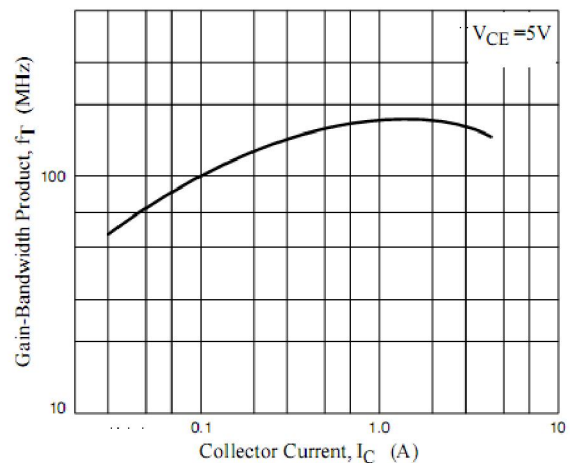
**Fig.1 Static characteristics**



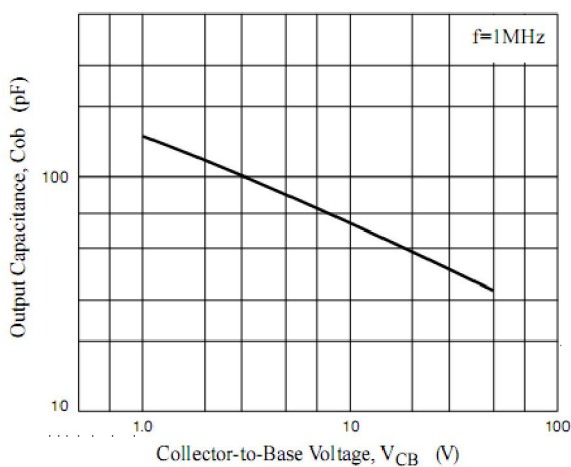
**Fig.2 DC Current Gain**



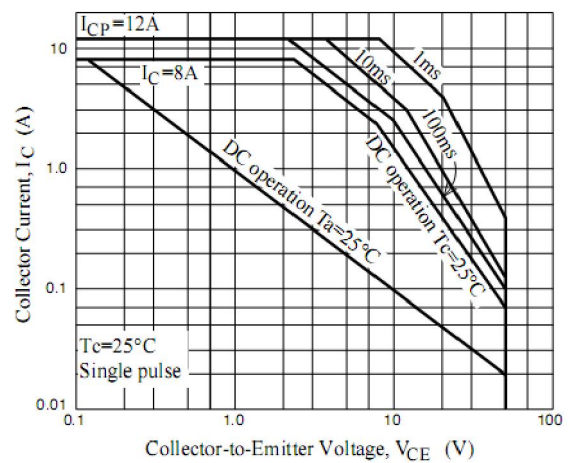
**Fig.3 Saturation voltage**



**Fig.4 Gain bandwidth product**



**Fig.5. Collector output capacitance**



**Figure 6. Safe Operating Area**

**Package Outline Dimensions**

TO-251	Symbol	Millimeter		Inches	
		Min.	Max.	Min.	Max.
	A	2.20	2.50	0.087	0.098
	A1	0.00	0.15	0.000	0.006
	B	1.20	1.60	0.047	0.063
	b	0.50	0.70	0.020	0.028
	b1	0.70	0.90	0.028	0.035
	c	0.40	0.60	0.016	0.024
	c1	0.40	0.60	0.016	0.024
	D	6.35	6.65	0.250	0.262
	D1	5.20	5.40	0.205	0.213
	E	5.40	5.70	0.213	0.224
	e	2.20	2.40	0.087	0.094
	e1	4.40	4.80	0.173	0.189
	L	9.60	10.20	0.378	0.402
	A	2.20	2.50	0.087	0.098
A1	0.00	0.15	0.000	0.006	
A2	2.20	2.40	0.087	0.094	
B	1.20	1.60	0.047	0.063	
b	0.50	0.70	0.020	0.028	
b1	0.70	0.90	0.028	0.035	
c	0.40	0.60	0.016	0.024	
c1	0.40	0.60	0.016	0.024	
D	6.35	6.65	0.250	0.262	
D1	5.20	5.40	0.205	0.213	
E	5.40	5.70	0.213	0.224	
e	2.20	2.40	0.087	0.094	
e1	4.40	4.80	0.173	0.189	
L	9.60	10.20	0.378	0.402	
L1	2.70	3.10	0.106	0.122	
L2	1.40	1.80	0.055	0.071	
L3	0.90	1.50	0.035	0.059	
θ	0°	8°	0°	8°	

**Product Specification Classification**

Part Number	Package	Marking	Pack
2SD1804	TO-251	YFW 2SD1804 XXXXX	1000PCS/bag
2SD1804	TO-252	YFW 2SD1804 XXXXX	2500PCS/Tape