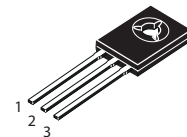


### NPN Epitaxial Planar Transistors

 Lead(Pb)-Free

1. EMITTER
2. COLLECTOR
3. BASE



**TO-18C**

#### ABSOLUTE MAXIMUM RATINGS(TA=25°C)

Rating	Symbol	2SD669	2SD669A	Unit
Collector-Emitter Voltage	$V_{CBO}$	180	180	V
Collector-Base Voltage	$V_{CEO}$	120	160	V
Emitter-Base Voltage	$V_{EBO}$	5.0	5.0	V
Collector Current	$I_C$	1.5		A
Power Dissipation	$P_D$	1.0		W
Junction Temperature	$T_j$	150		°C
Storage , Temperature	$T_{stg}$	-55 to +150		°C

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

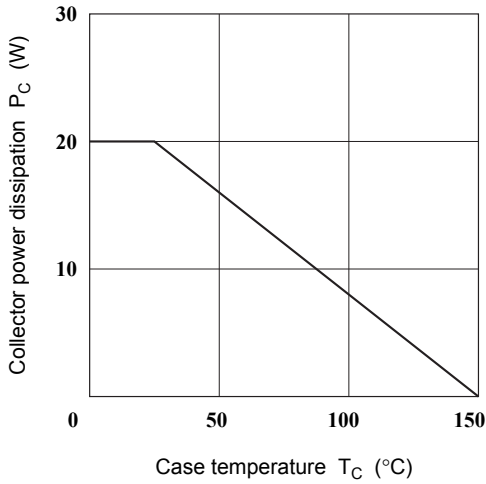
Characteristics	Symbol	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage $I_C = 1.0\text{mA}, I_E = 0$	$V_{(BR)CBO}$	180	-	-	V
Collector-Base Breakdown Voltage $I_C = 10\text{mA}, I_B = 0$	$V_{(BR)CEO}$	120	-	-	V
2SD669 2SD669A		160			
Emitter-Base Breakdown Voltage $I_C = 0, I_E = 1.0\text{mA}$	$V_{(BR)EBO}$	5.0	-	-	V
Collector Cutoff Current $V_{CB} = 160\text{V}, I_E = 0$	$I_{CBO}$	-	-	10	$\mu\text{A}$
Emitter Cutoff Current $V_{EB} = 4.0\text{V}, I_C = 0$	$I_{EBO}$	-	-	10	mA

**ON CHARACTERISTICS**

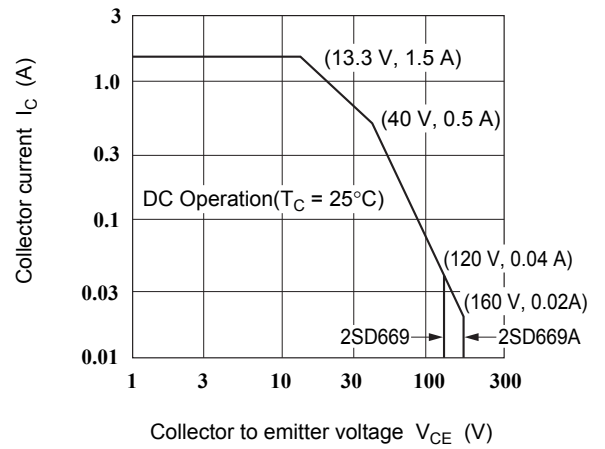
DC Current Gain $V_{CE} = 5.0\text{V}, I_C = 150\text{mA}$	2SD669 2SD669A	$h_{FE(1)}$	60	-	320	-
			60		200	
$V_{CE} = 5.0\text{V}, I_C = 500\text{mA}$		$h_{FE(2)}$	30	-	-	
Collector-Emitter Saturation Voltage $I_C = 500\text{mA}, I_B = 50\text{mA}$		$V_{CE(sat)}$	-	-	1.0	V
Base-Emitter ON Voltage $V_{CE} = 5.0\text{V}, I_C = 150\text{mA}$		$V_{BE(ON)}$	-	-	1.5	V
Transition frequency $V_{CE} = 5.0\text{V}, I_C = 150\text{mA}$		$f_T$	-	140	-	MHz
Collector Output Capacitance $V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$		$C_{ob}$	-	14	-	pF

**CLASSIFICATION OF  $h_{FE(1)}$** 

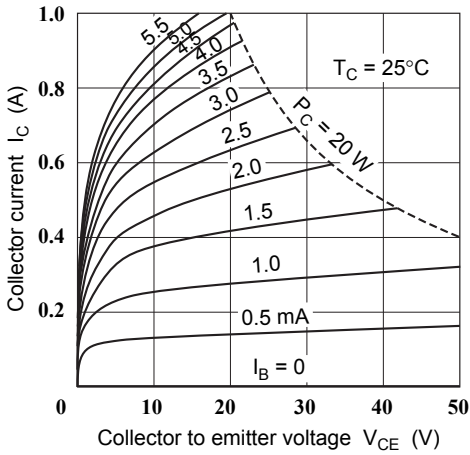
Rank		B	C	D
Range	2SD669	60-120	100-200	160-320
	2SD669A	60-120	100-200	-



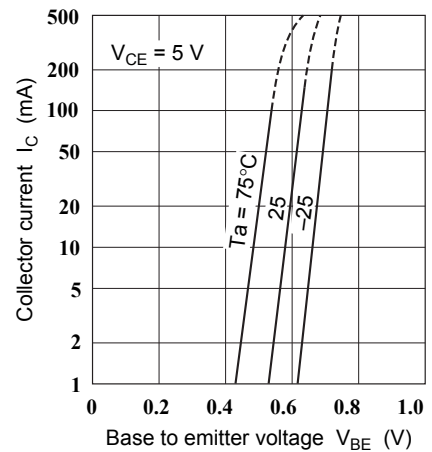
**Fig.1 Maximum Collector Dissipation Curve**



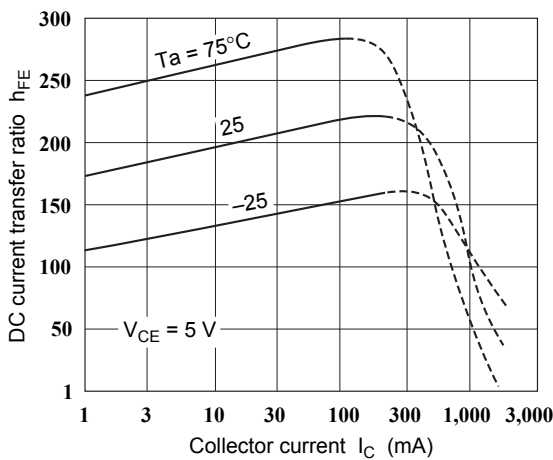
**Fig.2 Area of Safe Operation**



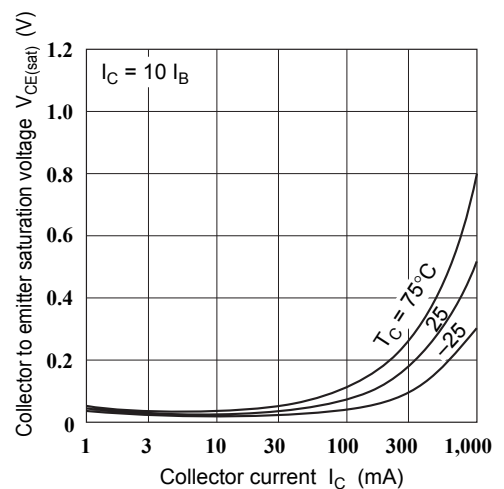
**Fig.3 Typical Output Characteristics**



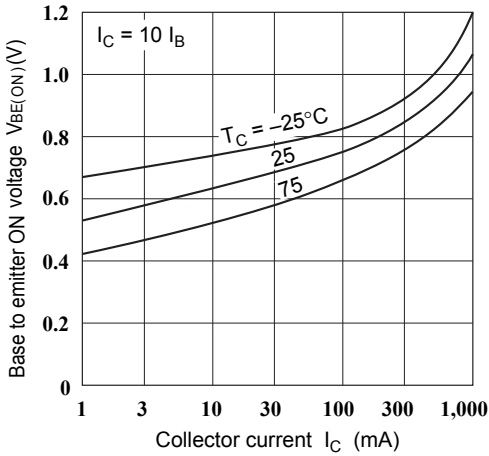
**Fig.4 Typical Transfer Characteristics**



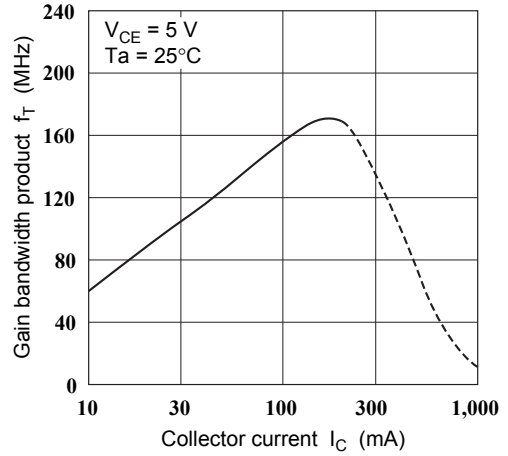
**Fig.5 DC Current Transfer Ratio vs. Collector Current**



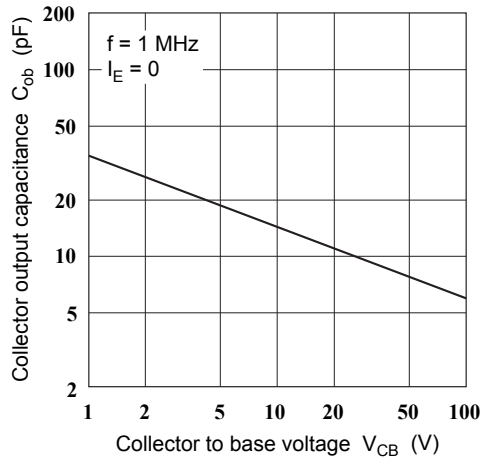
**Fig.6 Collector to Emitter Saturation Voltage vs. Collector Current**



**Fig.7 Base to Emitter ON Voltage vs. Collector Current**



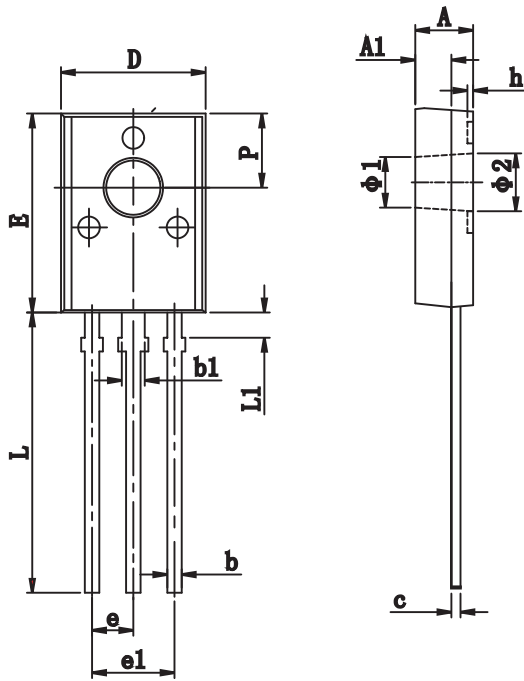
**Fig.8 Gain Bandwidth Product vs. Collector Current**



**Fig.9 Collector Output Capacitance vs. Collector to Base Voltage**

TO-126C Outline Dimensions

unit:mm



TO-126C		
Dim	Min	Max
A	3.000	3.400
A1	1.800	2.200
b	0.660	0.860
b1	1.170	1.370
c	0.450	0.600
D	7.800	8.200
E	10.800	11.200
e	2.280 TYP	
e1	4.460	4.660
L	15.100	15.500
L1	1.300	1.500
P	4.040	4.240
Φ1	2.700	2.900
Φ2	3.100	3.300