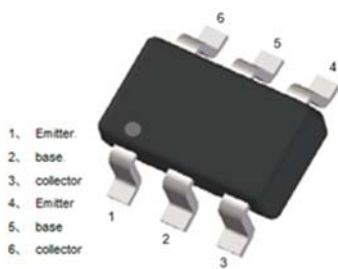
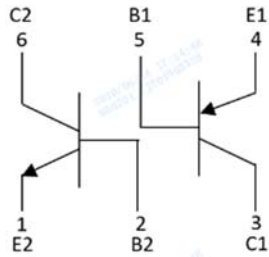


## Dual NPN+PNP Small Signal Transistor



### Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for automatic insertion

### Application

- Signal amplification
- Switching circuit

### Mechanical data

- **Package:** SOT-363S
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102

### ■ Maximum Ratings ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

#### TR1 NPN Pin1、2、6

Item	Symbol	Unit	Conditions	Value
Device marking code				7P
Collector-base voltage	$V_{CBO}$	V	$I_C = 10\mu\text{A}, I_E = 0$	50
Collector-emitter voltage	$V_{CEO}$	V	$I_C = 10\text{mA}, I_B = 0$	45
Emitter-base voltage	$V_{EBO}$	V	$I_E = 1\mu\text{A}, I_C = 0$	6
Collector current	$I_C$	mA		100
Power dissipation	$P_D$	mW		200
Operation junction temperature	$T_j$	$^\circ\text{C}$		-55 to +150
Storage temperature	$T_{STG}$	$^\circ\text{C}$		-55 to +150



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## TR2 PNP Pin3、4、5

Item	Symbol	Unit	Conditions	Value
Collector-base voltage	$V_{CB0}$	V	$I_C = -10\mu A, I_E = 0$	-50
Collector-emitter voltage	$V_{CE0}$	V	$I_C = -10mA, I_B = 0$	-45
Emitter-base voltage	$V_{EB0}$	V	$I_E = -1\mu A, I_C = 0$	-5
Collector current	$I_C$	mA		-100
Power dissipation	$P_D$	mW		200
Operation junction temperature	$T_J$	°C		-55 to +150
Storage temperature	$T_{STG}$	°C		-55 to +150

### ■ Electrical Characteristics ( $T_A = 25^\circ C$ Unless otherwise specified)

## TR1 NPN Pin1、2、6

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CB0}$	V	$I_C = 10\mu A, I_E = 0$	50		
Collector-emitter breakdown voltage	$V_{(BR)CE0}$	V	$I_C = 10mA, I_B = 0$	45		
Emitter-base breakdown voltage	$V_{(BR)EB0}$	V	$I_E = 1\mu A, I_C = 0$	6		
Collector cut-off current	$I_{CB0}$	nA	$V_{CB} = 30V, I_B = 0$			15
Emitter-base cutoff current	$I_{EB0}$	nA	$V_{EB} = 5V, I_C = 0$			100
DC current gain	$h_{FE}$		$V_{CE} = 5V, I_C = 2mA$	200		450
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = 10mA, I_B = 0.5mA$			0.25
			$I_C = 100mA, I_B = 5mA$			0.6
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C = 10mA, I_B = 0.5mA$			1.05
			$I_C = 100mA, I_B = 5mA$			1.1
Base-emitter voltage	$V_{BE}$	V	$V_{CE} = 5V, I_C = 2mA$			0.7
			$V_{CE} = 5V, I_C = 10mA$			0.72
Transition frequency	$f_T$	MHz	$V_{CE} = 5V, I_C = 10mA, f = 100MHz$	100		



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## TR2 PNP Pin3、4、5

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C=-10\mu A, I_E=0$	-50		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C=-10mA, I_B=0$	-45		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E=-10\mu A, I_C=0$	-6		
Collector cut-off current	$I_{CBO}$	nA	$V_{CB}=-50V, I_B=0$			-15
Emitter-base cutoff current	$I_{EBO}$	nA	$V_{EB}=-6V, I_C=0$			-100
DC current gain	$h_{FE}$		$V_{CE}=-5V, I_C=-2mA$	200		450
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=-10mA, I_B=-0.5mA$			-0.3
			$I_C=-100mA, I_B=-5mA$			-0.65
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C=-10mA, I_B=-0.5mA$			-1
			$I_C=-100mA, I_B=-5mA$			-1
Base-emitter voltage	$V_{BE}$	V	$V_{CE}=-5V, I_C=-2mA$			-0.75
			$V_{CE}=-5V, I_C=-10mA$			-0.82
Transition frequency	$f_T$	MHz	$V_{CE}=-5V, I_C=-10mA, f=100MHz$	100		
Noise figure	$N_F$	dB	$V_{CE}=-5V, I_C=-0.2mA,$ $f=1kHz, R_g=2K\Omega, \Delta f=200Hz$			10

### ■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	$R_{\theta J-A}^{(1)}$	$^{\circ}C/W$	625
Thermal resistance, junction-to-case	$R_{\theta J-C}^{(1)}$	$^{\circ}C/W$	500

#### Note:

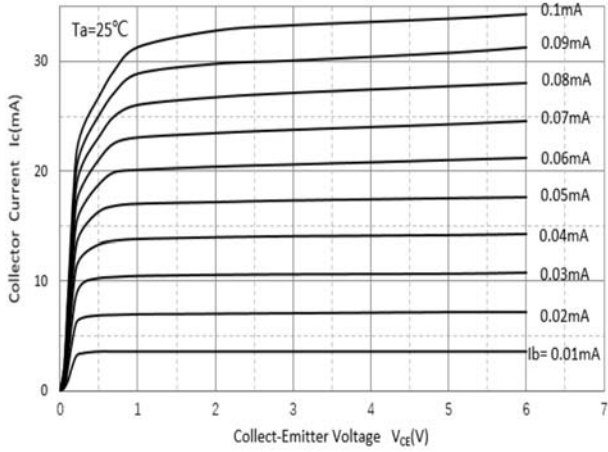
(1) Device mounted on PCB, single-sided copper, with standard footprint



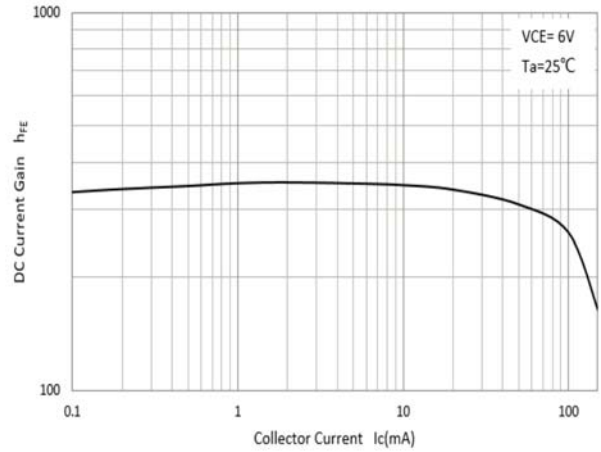
## ■ Characteristics

TR1 NPN Pin1、2、6

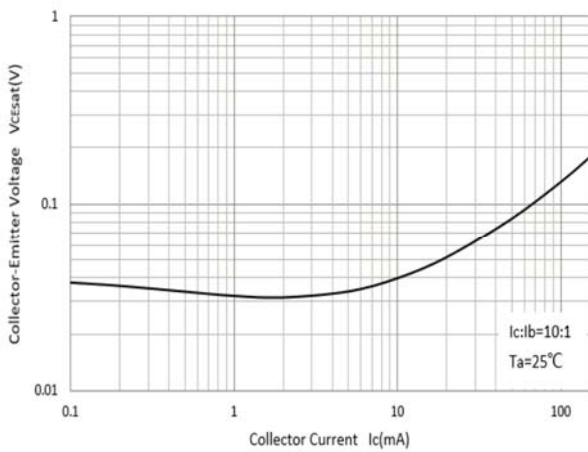
**Fig 1: Static Characteristics**



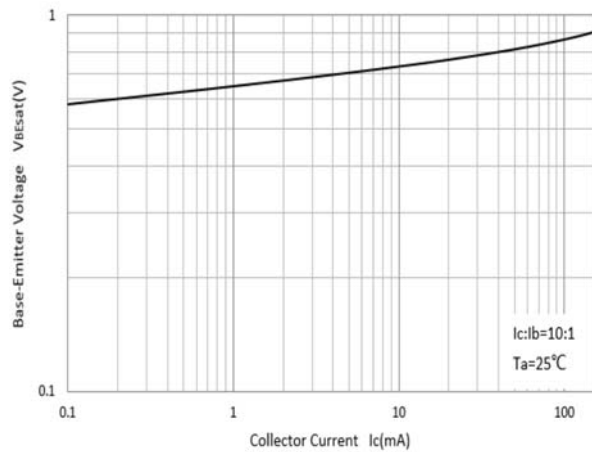
**Fig 2: DC Current Gain Characteristics**



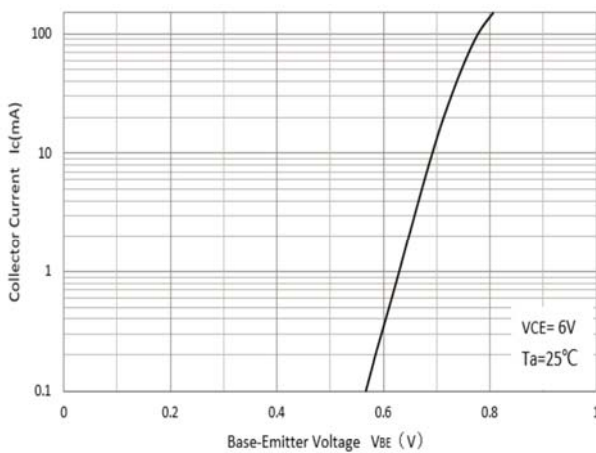
**Fig 3: Collector-Emitter Saturation Voltage**



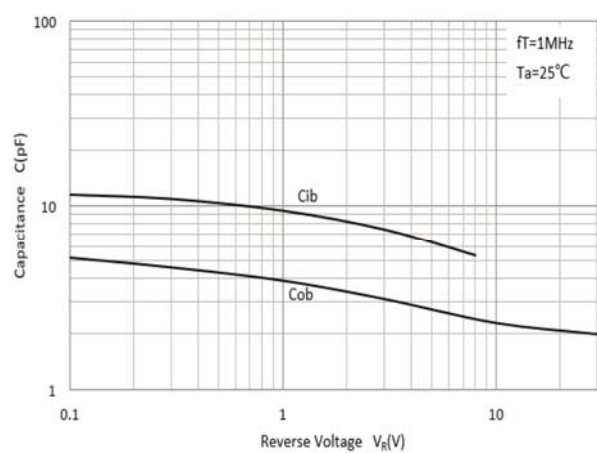
**Fig 4: Base-Emitter Saturation Voltage**



**Fig 5: Base-emitter on voltage**

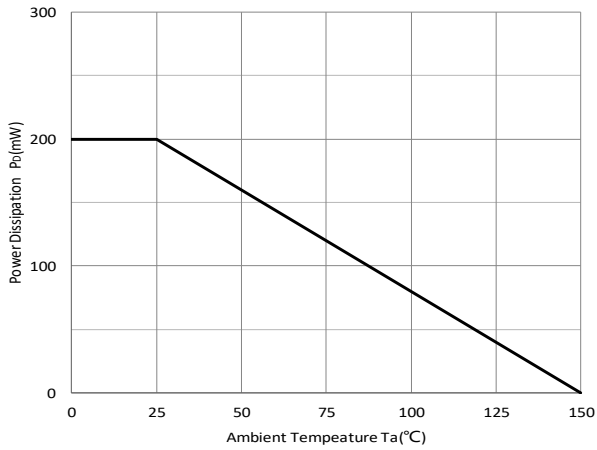


**Fig 6: Cob/Cib-V<sub>CB</sub>/V<sub>EB</sub>**



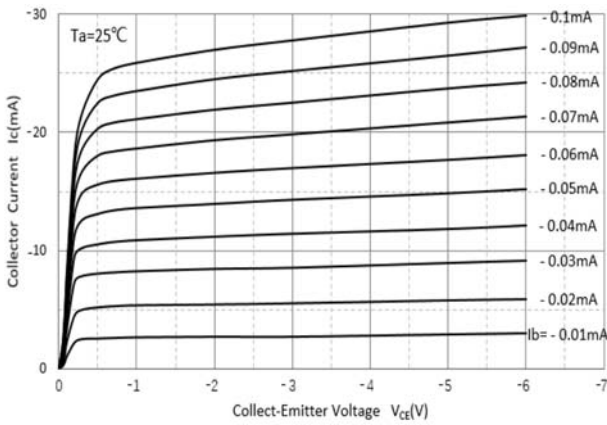


**Fig 7: P<sub>D</sub>-T<sub>a</sub> Curve**

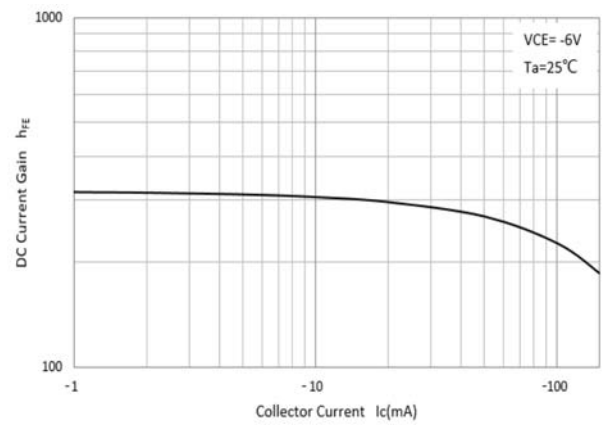


TR2 PNP Pin3、4、5

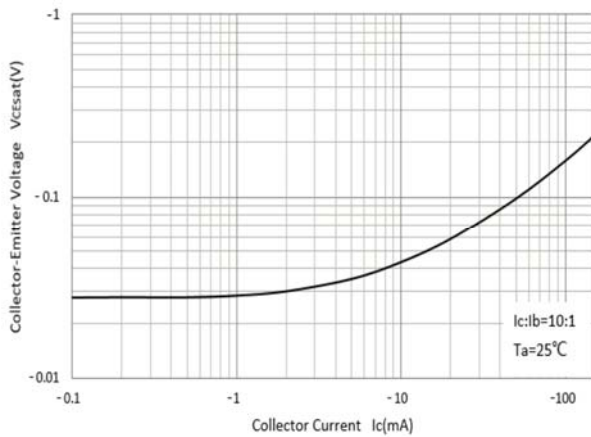
**Fig 1: Static Characteristics**



**Fig 2: DC Current Gain Characteristics**



**Fig 3: Collector-Emitter Saturation Voltage**



**Fig 4: Base-Emitter Saturation Voltage**

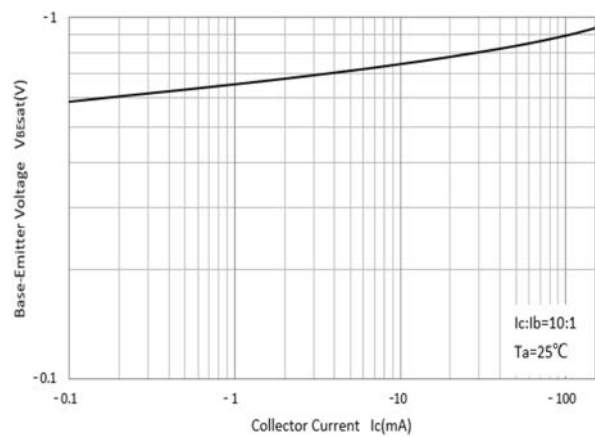




Fig 5: Base-emitter on voltage

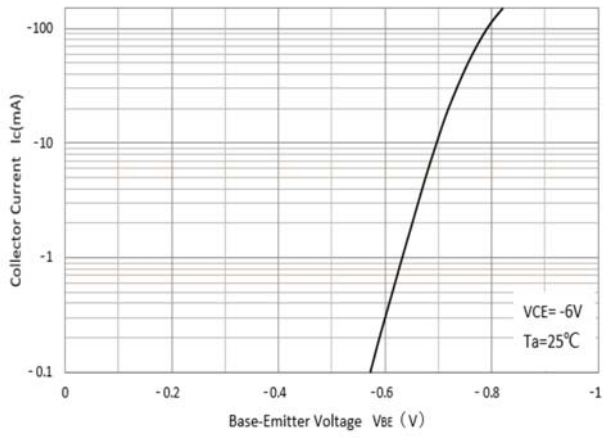
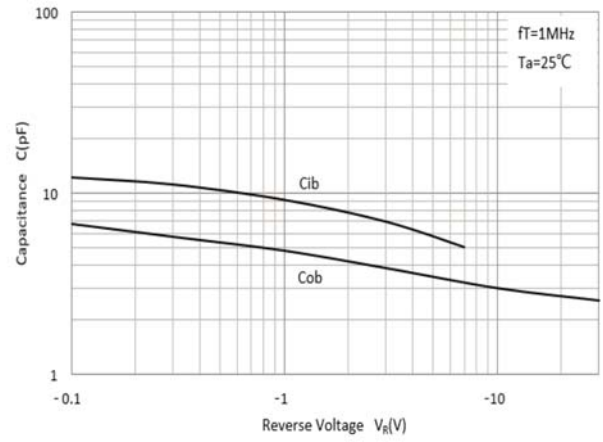


Fig 6: Cob/Cib- $V_{CB}/V_{EB}$





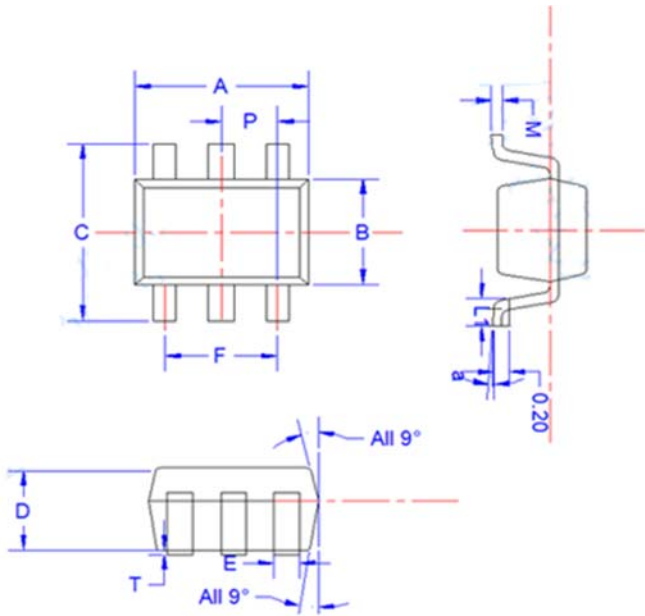
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## ■ Ordering Information

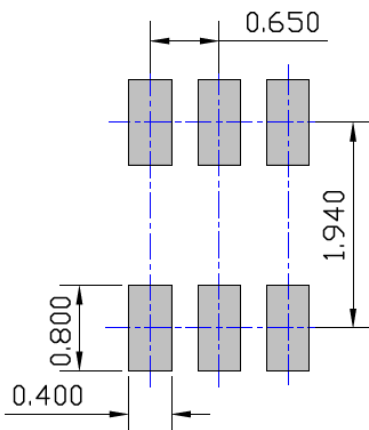
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
BC847PNS	F2	Approximate 0.009	3000	30000	120000	7" reel
BC847PNS	F3	Approximate 0.009	10000	/	210000	7" reel

## ■ Outline Dimensions



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
E	0.15	0.25	0.35
B	1.15	1.25	1.35
C	2.00	2.10	2.20
P	0.650BSC		
A	1.80	2.00	2.20
T	0.00	0.05	0.100
D	0.90	0.95	1.00
L1	0.20	0.30	0.40
a	4°±4°		
M	0.10	0.15	0.25

## ■ Suggested Pad Layout



UNIT: mm



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