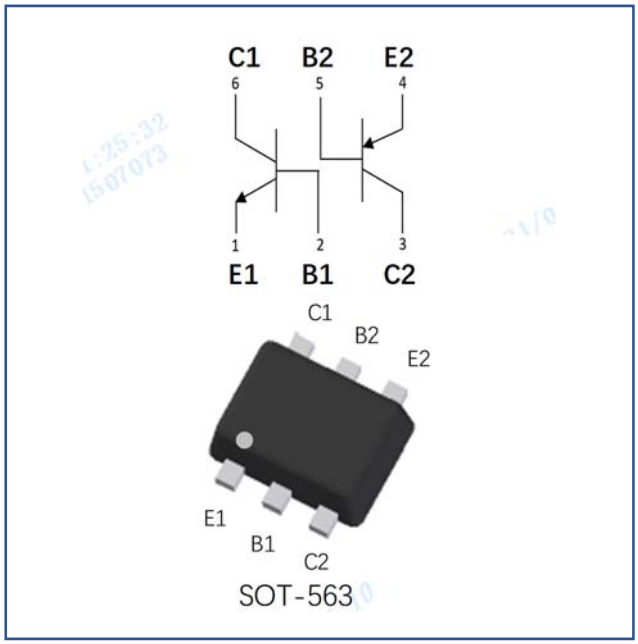
Dual NPN+PNP Small Signal Transistor



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-563
- **Terminals**: Tin plated leads, solderable per J-STD-002 and JESD22-B102

■ **Maximum Ratings** (T_a=25℃ Unless otherwise specified)

TR1-NPN

Item	Symbol	Unit	Conditions	Value
Device marking code				7P
Collector-base voltage	V_{CBO}	V	I_C=10uA,I_E=0	50
Collector-emitter voltage	V_{CEO}	V	I_C=10mA,I_B=0	45
Emitter-base voltage	V_{EBO}	V	I_E=1uA,I_C=0	6
Collector current	I_C	mA		100
Power dissipation	P_D	mW		150
Junction temperature	T_J	℃		-55 to +150
Storage temperature	T_{STG}	℃		-55 to +150

TR2-PNP

Item	Symbol	Unit	Conditions	Value
Collector-base voltage	V_{CBO}	V	I_C=-10uA,I_E=0	-50
Collector-emitter voltage	V_{CEO}	V	I_C =-10mA,I_B=0	-45
Emitter-base voltage	V_{EBO}	V	I_E=-1uA,I_C=0	-5
Collector current	I_C	mA		-100
Power dissipation	P_D	mW		150
Junction temperature	T_J	℃		-55 to +150
Storage temperature	T_{STG}	℃		-55 to +150

■ Electrical Characteristics (Ta=25℃ Unless otherwise specified)

TR1-NPN

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	I_C=10uA,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=1uA,I_C=0	6		
Collector cut-off current	I_{CBO}	nA	V_{CB}=30V,I_B=0			15
Emitter-base cutoff current	I_{EBO}	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	$V_{CE(sat)1}$	V	I_C=10mA,I_B=0.5mA			0.25
	$V_{CE(sat)2}$	V	I_C=100mA,I_B=5mA			0.6
Base-emitter saturation voltage	$V_{BE(sat)1}$	V	I_C=10mA,I_B=0.5mA			1.05
	$V_{BE(sat)2}$	V	I_C=100mA,I_B=5mA			1.1
Base-emitter voltage	V_{BE1}	V	V_{CE}=5V,I_C=2mA			0.7
	V_{BE2}	V	V_{CE}=5V,I_C=10mA			0.72
Transition frequency	f_T	MHz	V_{CE}=5V,I_C=10mA,f=100MHz	100		
Noise figure	N_F	dB	V_{CE}=5V , Ic=0.2mA, f=1kHz,Rg=2KΩ,Δf=200Hz			10

TR2-PNP

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	I_C=-10uA,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=-1uA,I_C=0	-6		
Collector-base cut-off current	I_{CBO}	nA	V_{CB}=-30V,I_E=0			-15
Emitter-base cut-off current	I_{EBO}	nA	V_{EB}=-5V,I_C=0			-100
Dc current gain	h_{FE}		V_{CE}=-5V,I_C=-2mA	220		475
Collector-emitter saturation voltage	$V_{CE(sat)1}$	V	I_C=-10mA,I_B=-0.5mA			-0.3
	$V_{CE(sat)2}$	V	I_C=-100mA,I_B=-5mA			-0.65
Baser-emitter saturation voltage	$V_{BE(sat)1}$	V	I_C=-10mA,I_B=-0.5mA			-1
	$V_{BE(sat)2}$	V	I_C=-100mA,I_B=-5mA			-1
Base-emitter voltage	V_{BE1}	V	V_{CE}=-5V,I_C=-2mA			-0.75
	V_{BE2}	V	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,Ic=-0.2mA, f=1kHz,Rg=2KΩ,Δf=200Hz			10

■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	$R_{\theta J-A}$(1)	℃/W	833
Thermal resistance, junction-to-case	$R_{\theta J-C}$(1)	℃/W	667

Note:

（1）Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 25.4mm*25.4mm copper pad areas

■Characteristics

TR1-NPN

Fig 1：Static Characteristics

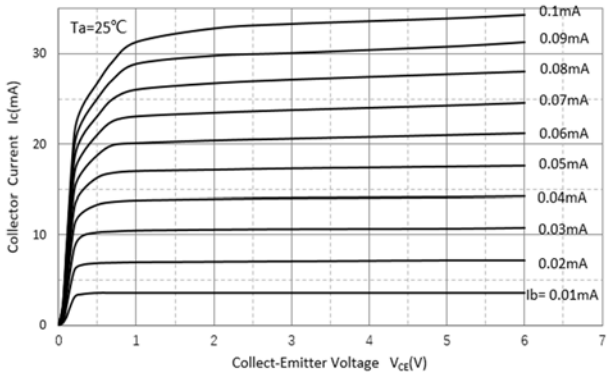


Fig 2：DC Current Gain Characteristics

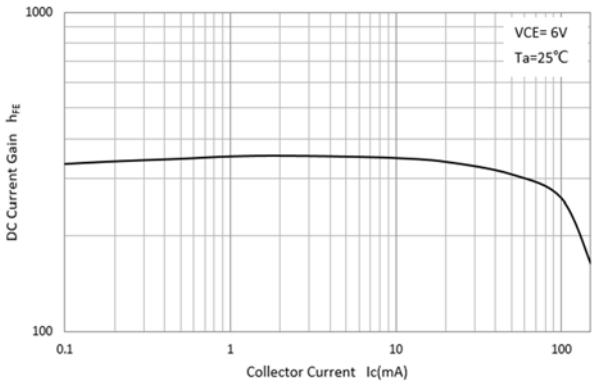


Fig 3：Collector-Emitter Saturation Voltage

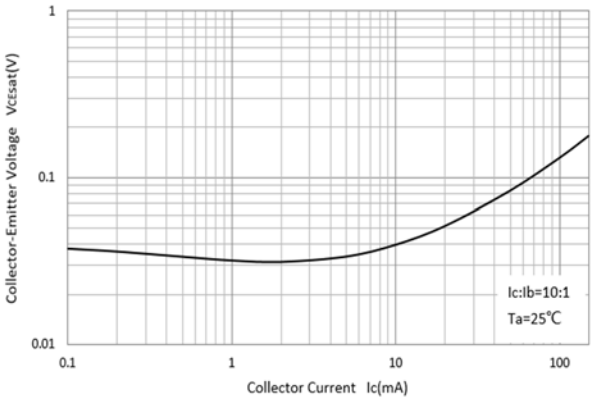


Fig 4：Base-Emitter Saturation Voltage

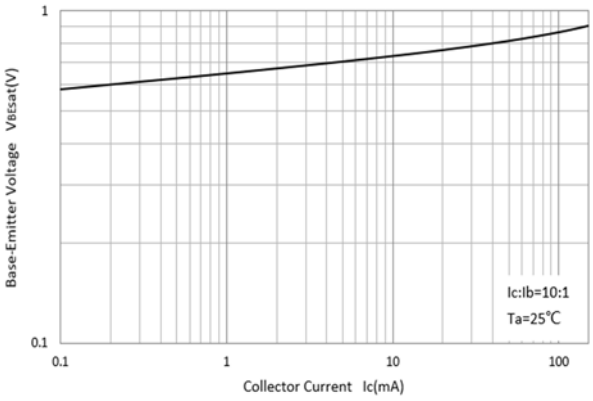


Fig 5：Base-Emitter On Voltage

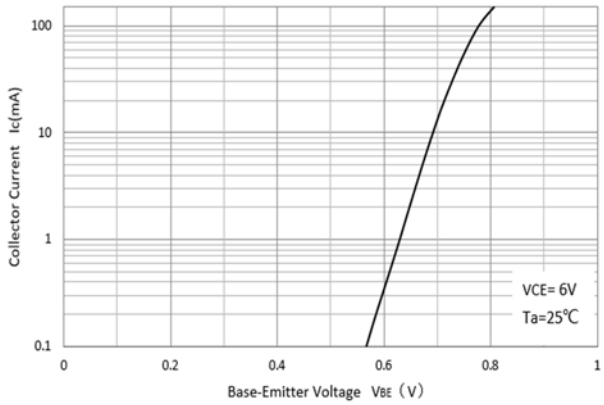


Fig 6：Cob/Cib-V_{CB}/V_{EB}

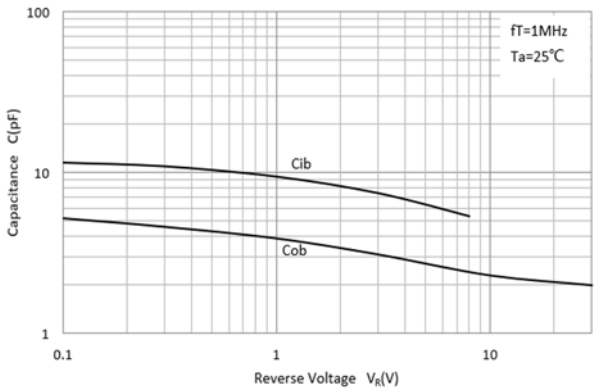
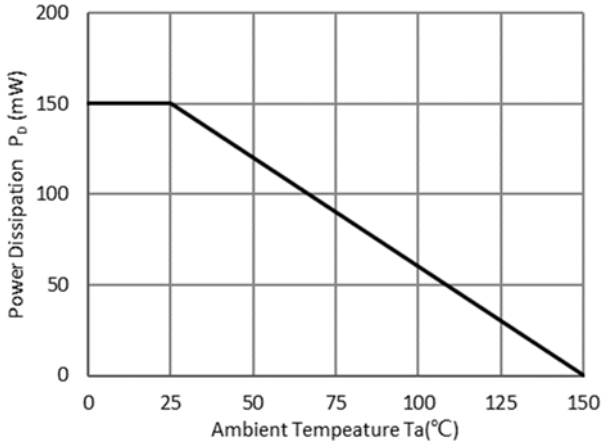


Fig 7：P_D-Ta Curve



TR2-PNP

Fig 1：Static Characteristics

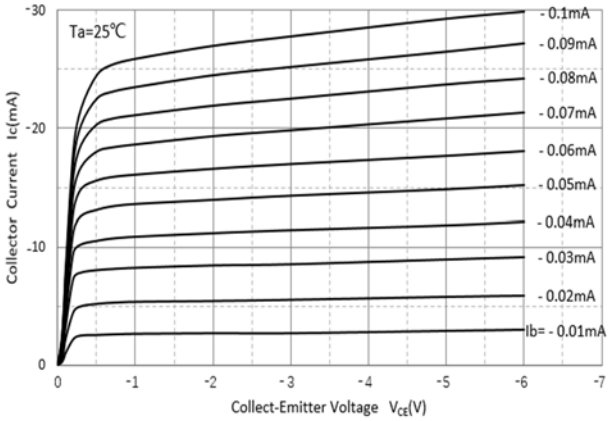


Fig 2：DC Current Gain Characteristics

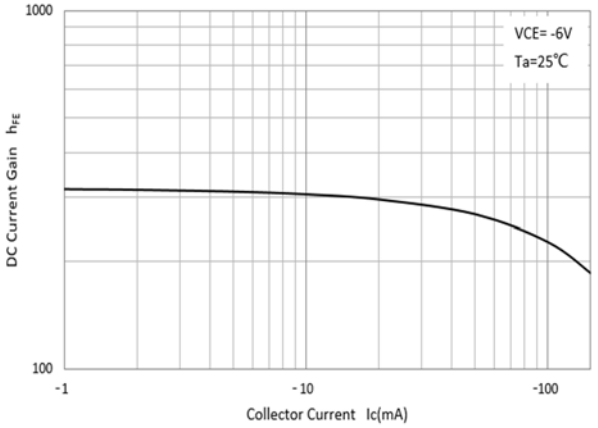


Fig 3：Collector-Emitter Saturation Voltage

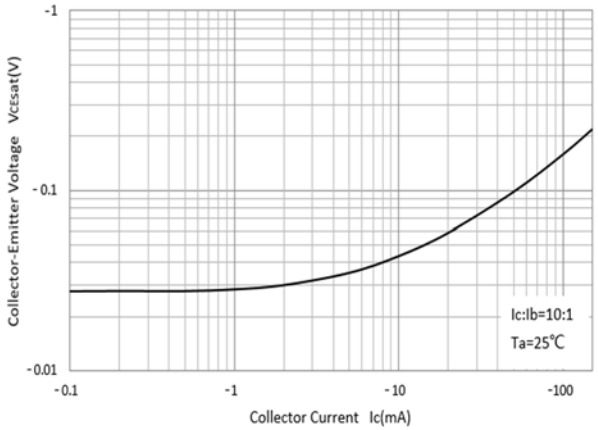


Fig 4：Base-Emitter Saturation Voltage

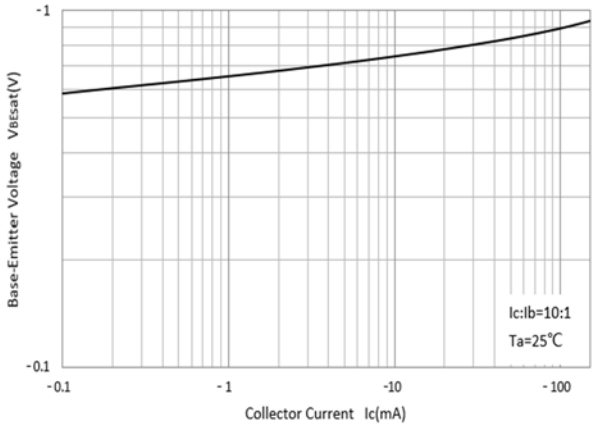


Fig 5：Base-Emitter On Voltage

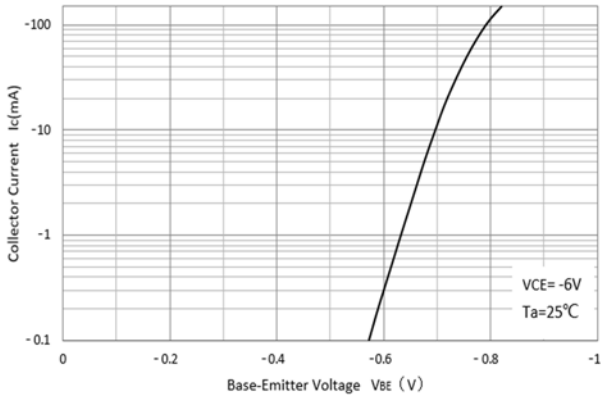


Fig 6：Cob/Cib-V_{CB}/V_{EB}

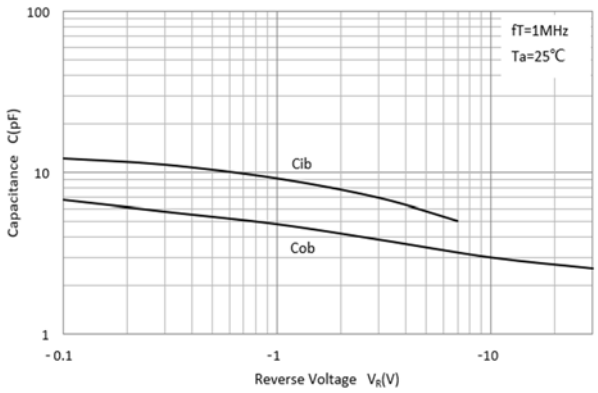
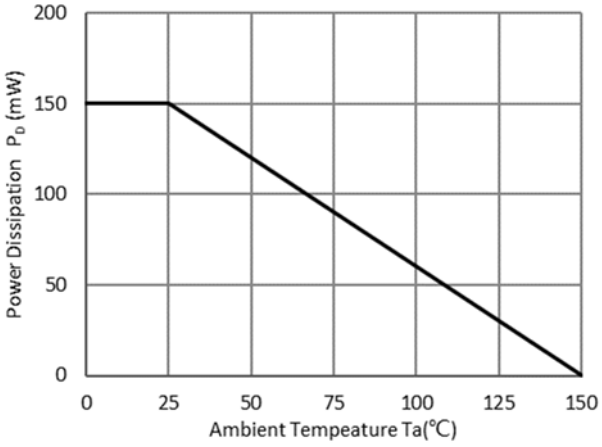


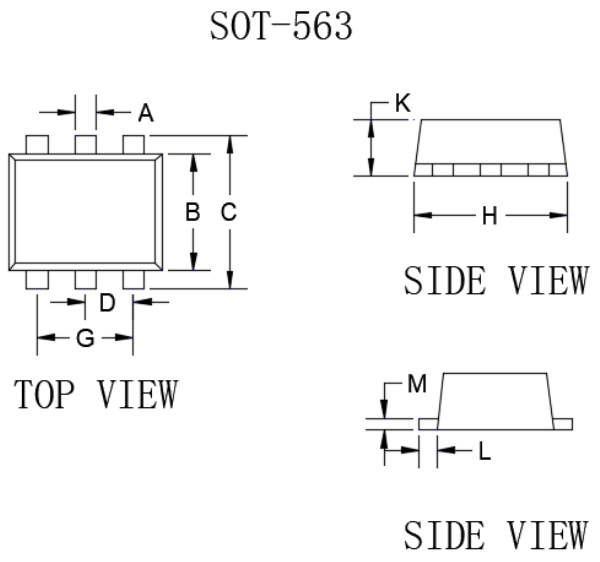
Fig 7：P_D-Ta Curve



■Ordering Information

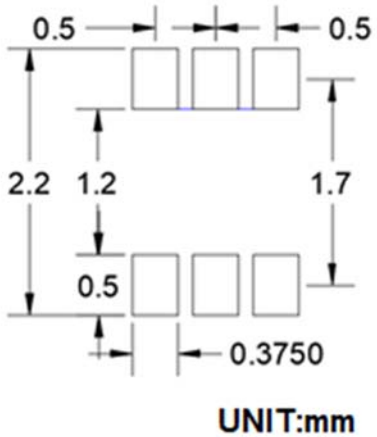
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
BC847VPN	F2	Approximate 0.0035	3000	30000	120000	7” reel

■ Outline Dimensions



DIMENSIONS				
DIM	INCHES		MM	
	MIN	MAX	MN	MAX
A	0.006	0.011	0.150	0.300
B	0.043	0.051	1.100	1.300
C	0.059	0.067	1.500	1.700
D	0.016	0.024	0.400	0.600
G	0.035	0.043	0.900	1.100
H	0.059	0.067	1.500	1.700
K	0.021	0.026	0.550	0.650
L	0.004	0.011	0.100	0.300
M	0.004	0.007	0.100	0.180

■ Suggested Pad Layout



UNIT:mm

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