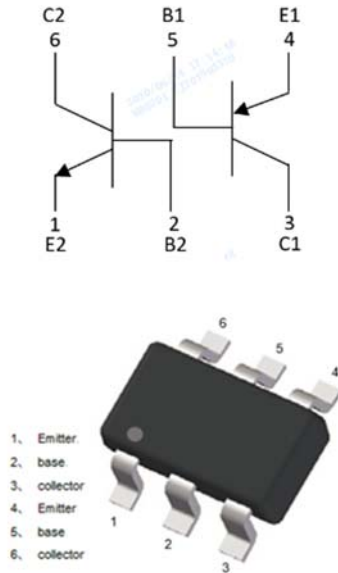


Dual NPN+PNP Small Signal Transistor



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 Maximum Ratings

Item	Symbol	Unit	Conditions	Value
Device marking code				Z1
Collector-base voltage	V_{CB0}	V	$I_C=50\mu\text{A}, I_E=0$	60
Collector-emitter voltage	V_{CE0}	V	$I_C=1\text{mA}, I_B=0$	50
Emitter-base voltage	V_{EB0}	V	$I_E=50\mu\text{A}, I_C=0$	7
Collector current	I_C	mA		150
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 Maximum Ratings

Item	Symbol	Unit	Conditions	Value
Collector-base voltage	V_{CBO}	V	$I_C = -50\mu A, I_E = 0$	-60
Collector-emitter voltage	V_{CEO}	V	$I_C = -1mA, I_B = 0$	-50
Emitter-base voltage	V_{EBO}	V	$I_E = -50\mu A, I_C = 0$	-6
Collector current	I_C	mA		-150
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** ($T_a=25^\circ\text{C}$ Unless otherwise specified)

TR1 NPN Pin1、2、6 Electrical Characteristics

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C=50\mu\text{A}, I_E=0$	60		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C=1\text{mA}, I_B=0$	50		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E=50\mu\text{A}, I_C=0$	7		
Collector-base cut-off current	I_{CBO}	nA	$V_{CB}=60\text{V}$			100
Emitter-base cut-off current	I_{EBO}	nA	$V_{EB}=7\text{V}$			100
DC current gain	h_{FE}		$V_{CE}=6\text{V}, I_C=1\text{mA}$	120		560
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=50\text{mA}, I_B=5\text{mA}$			0.4
Transition frequency	f_T	MHz	$V_{CE}=12\text{V}, I_C=2\text{mA}, f=100\text{MHz}$		180	
Collector-base output capacitance	C_{ob}	pF	$V_{CB}=12\text{V}, I_E=0\text{A}, f=1\text{MHz}$			3.5

TR2 PNP Pin3、4、5 Electrical Characteristics

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C=-50\mu\text{A}, I_E=0$	-60		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C=-1\text{mA}, I_B=0$	-50		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E=50\mu\text{A}, I_C=0$	-7		
Collector-base cut-off current	I_{CBO}	nA	$V_{CB}=-60\text{V}$			-100
Emitter-base cut-off current	I_{EBO}	nA	$V_{EB}=-6\text{V}$			-100
DC current gain	h_{FE}		$V_{CE}=-6\text{V}, I_C=-1\text{mA}$	120		560
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=-50\text{mA}, I_B=-5\text{mA}$			-0.5
Transition frequency	f_T	MHz	$V_{CE}=-12\text{V}, I_C=-2\text{mA}, f=100\text{MHz}$		140	
Collector-base output capacitance	C_{ob}	pF	$V_{CB}=-12\text{V}, I_E=0\text{A}, f=1\text{MHz}$			5

■ **Thermal Characteristics**

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

Note:

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



■ Characteristics

TR1 NPN Pin1、2、6 Characteristics

Fig 1: Static Characteristics

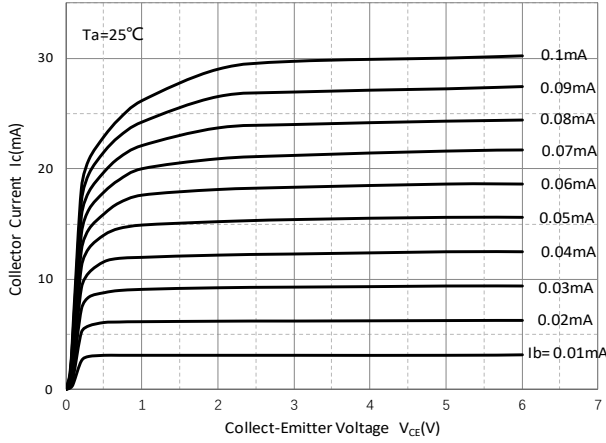


Fig 2: DC Current Gain

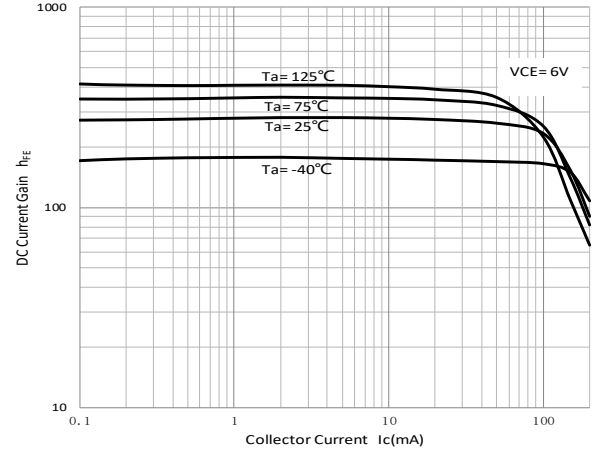


Fig 3: Collector-emittor saturation voltage

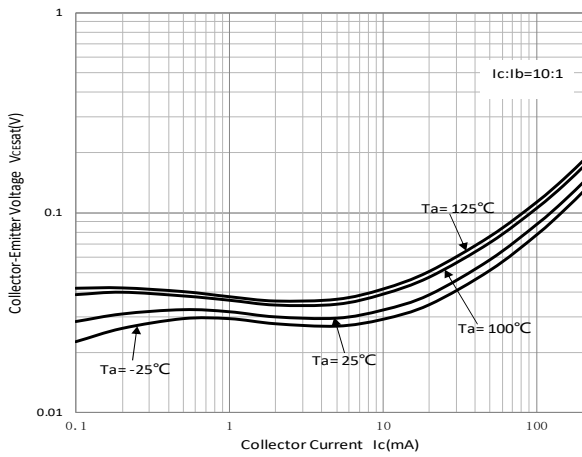


Fig 4: Base-emittor saturation voltage

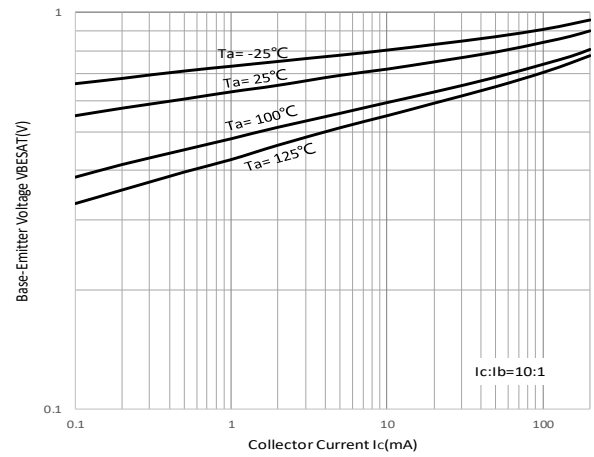


Fig 5: Base-emittor on voltage

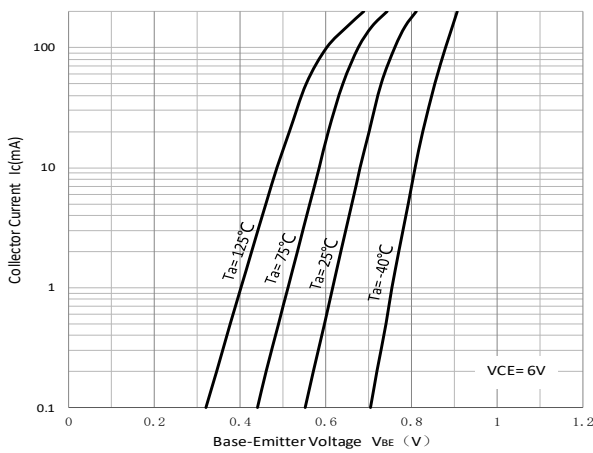


Fig 6: Cob/Cib-VCB/VEB

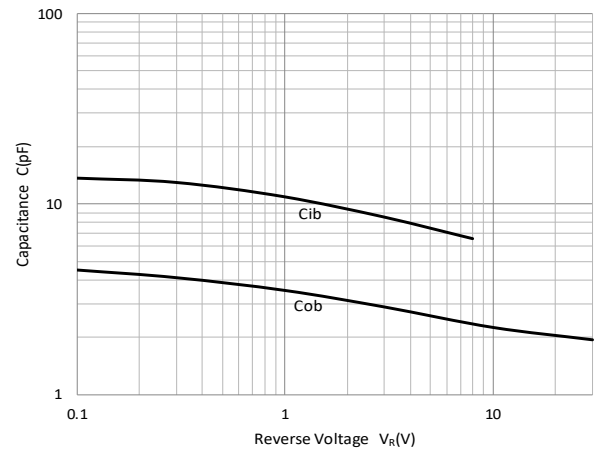
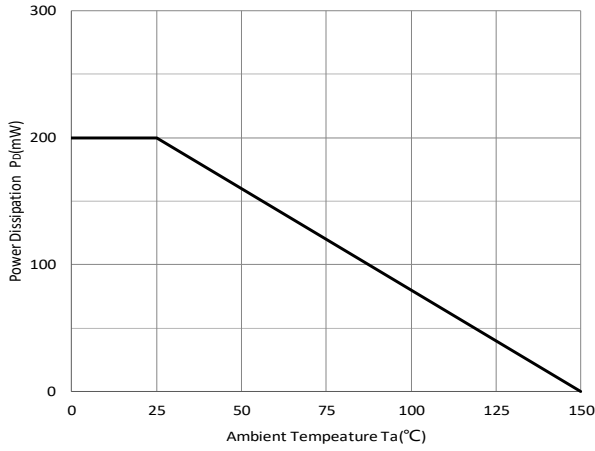




Fig 7: P_D-T_a Curve



TR2 PNP Pin3、4、5 Characteristics

Fig 1: Static Characteristics

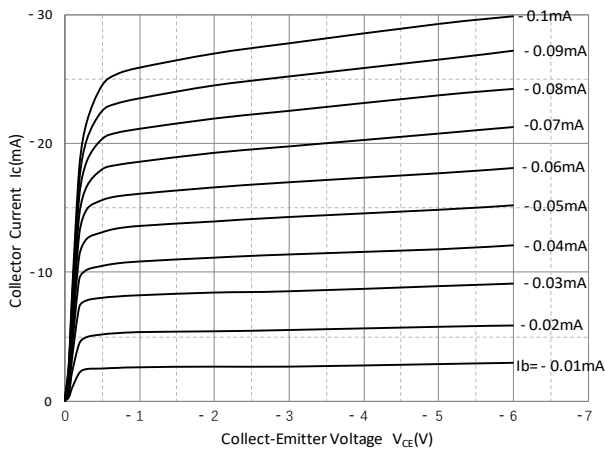


Fig 2: DC Current Gain

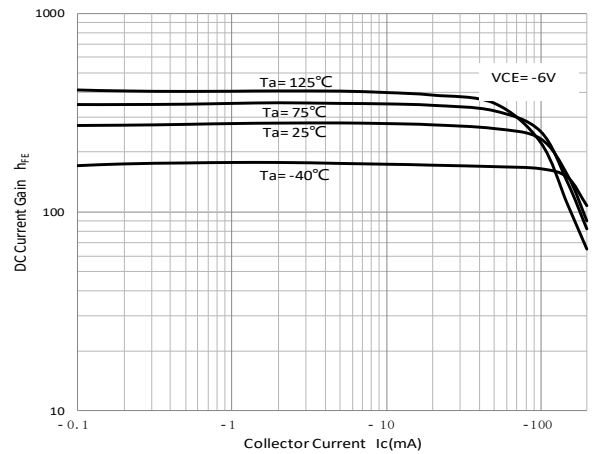


Fig 3: Collector-emitter saturation voltage

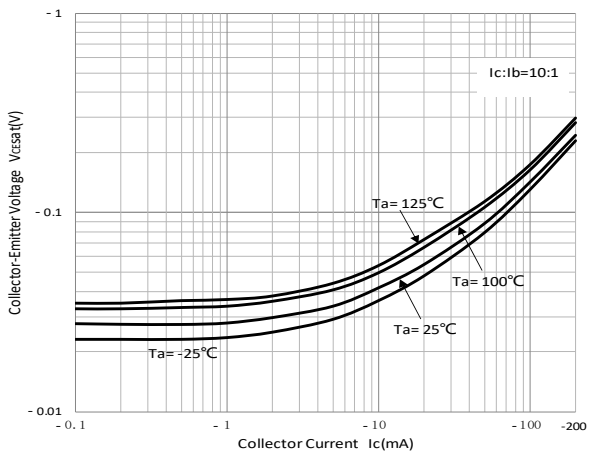


Fig 4: Base-emitter saturation voltage

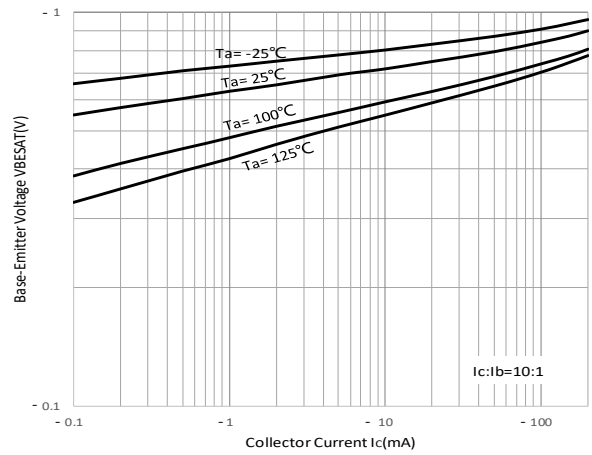
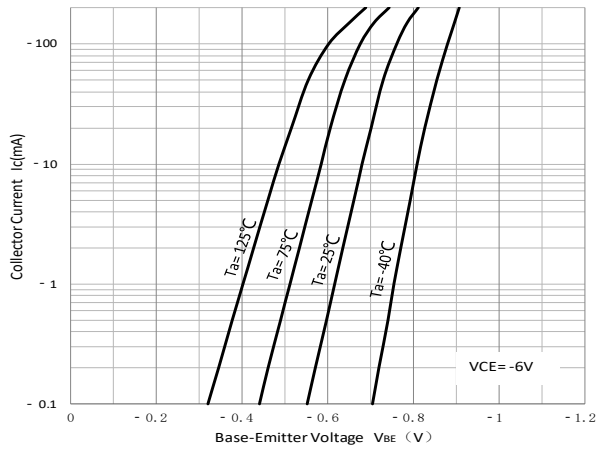




Fig 5: Base-emitter on voltage





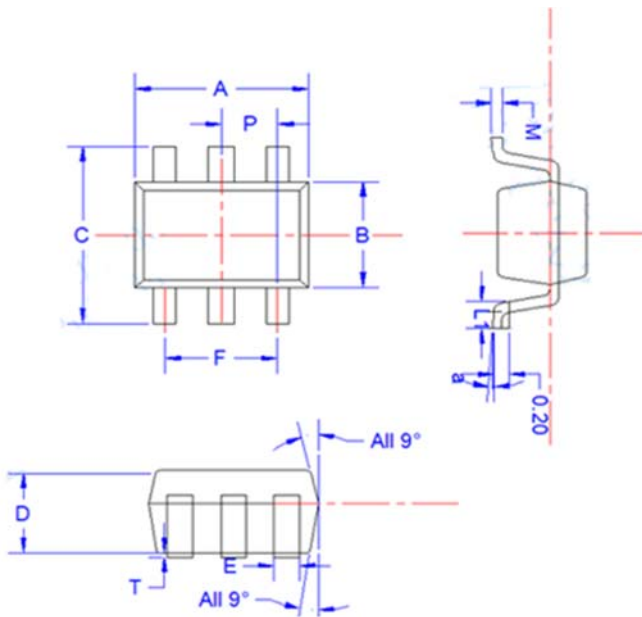
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■ Ordering Information

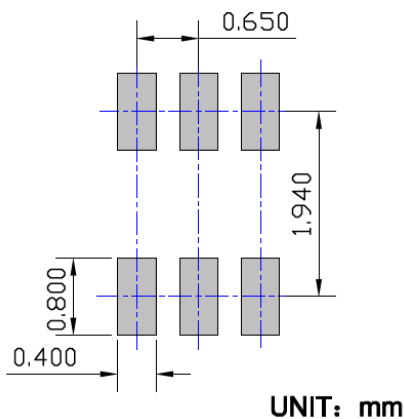
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
UMZ1NS	F2	Approximate 0.009	3000	30000	120000	7" reel
UMZ1NS	F3	Approximate 0.009	10000	/	210000	7" reel

■ 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





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