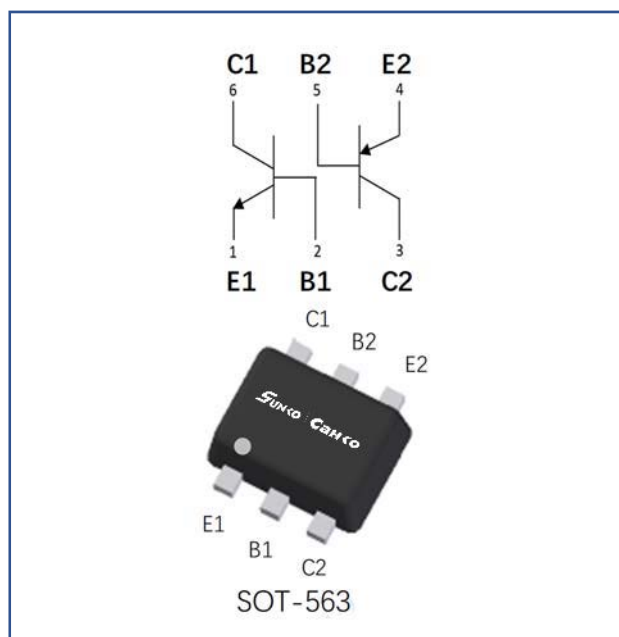


EMZ7

Dual NPN+PNP Small Signal Transistor



Features

- Moisture sensitivity level 1
- Halogen free and
- 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** ($T_a=25^{\circ}\text{C}$ Unless otherwise specified)

TR1-NPN

Item	Symbol	Unit	Conditions	Value
Device marking code				Z7
Collector-base voltage	V_{CBO}	V	$I_C=100\mu\text{A}, I_E=0$	15
Collector-emitter voltage	V_{CEO}	V	$I_C=1\text{mA}, I_B=0$	12
Emitter-base voltage	V_{EBO}	V	$I_E=100\mu\text{A}, I_C=0$	6
Collector current	I_C	mA		500
Power dissipation	P_D	mW		150
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

Item	Symbol	Unit	Conditions	Value
Collector-base voltage	V_{CBO}	V	$I_C = -100\mu A, I_E = 0$	-15
Collector-emitter voltage	V_{CEO}	V	$I_C = -1mA, I_B = 0$	-12
Emitter-Base voltage	V_{EBO}	V	$I_E = -100\mu A, I_C = 0$	-6
Collector current	I_C	mA		-500
Power dissipation	P_D	mW		150
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

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C = 100\mu A, I_E = 0$	15		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C = 1mA, I_B = 0$	12		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E = 100\mu A, I_C = 0$	6		
Collector-base cut-off current	I_{CBO}	nA	$V_{CB} = 15V, I_E = 0$			100
Emitter-base cut-off current	I_{EBO}	nA	$V_{EB} = 5V, I_C = 0$			100
DC current gain	h_{FE}		$V_{CE} = 2V, I_C = 10mA$	200		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = 200mA, I_B = 10mA$			0.22
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C = 200mA, I_B = 10mA$			1
Output capacitance	C_{ob}	pF	$V_{CB} = 10V, I_E = 0, f = 1MHz$			6

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TR2-PNP

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C = -100\mu A, I_E = 0$	-15		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C = -1mA, I_B = 0$	-12		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E = -100\mu A, I_C = 0$	-6		
Collector-Base cut-off current	I_{CBO}	nA	$V_{CB} = -15V, I_E = 0$			-100
Emitter-Base Cut-off current	I_{EBO}	nA	$V_{EB} = -5V, I_C = 0$			-100
DC current gain	h_{FE}		$V_{CE} = -2V, I_C = -10mA$	200		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = -200mA, I_B = -10mA$			-0.22
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C = -200mA, I_B = -10mA$			-1
Output Capacitance	C_{ob}	pF	$V_{CB} = -10V, I_E = 0, f = 1MHz$			10

■ Thermal Characteristics

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

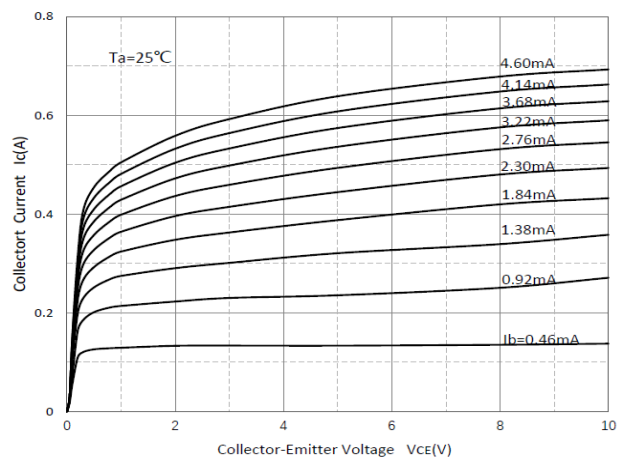


Fig 2: DC Current Gain Characteristics

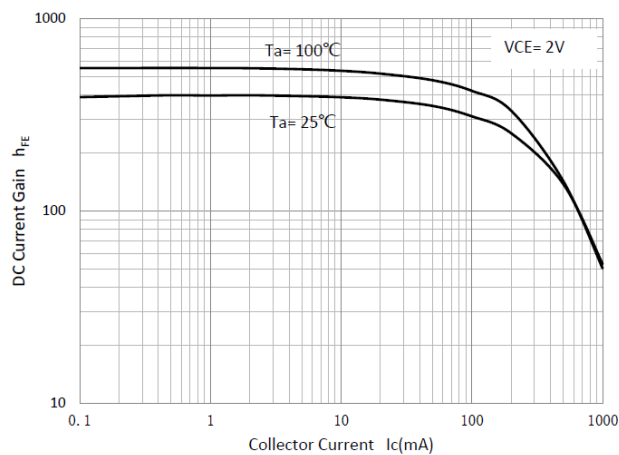


Fig 3: Collector-Emitter Saturation Voltage

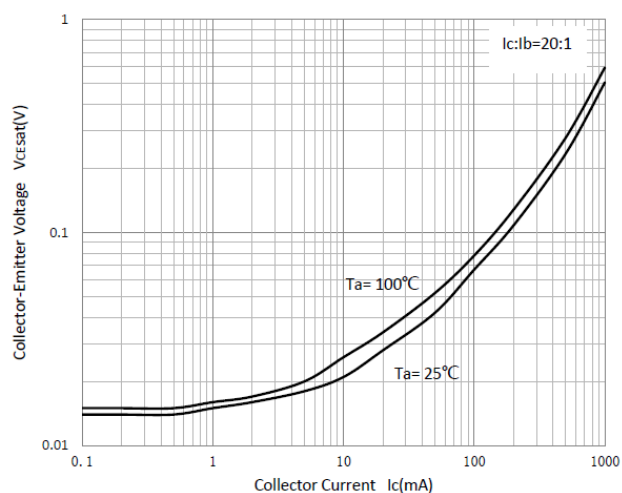


Fig 4: Base-Emitter Saturation Voltage

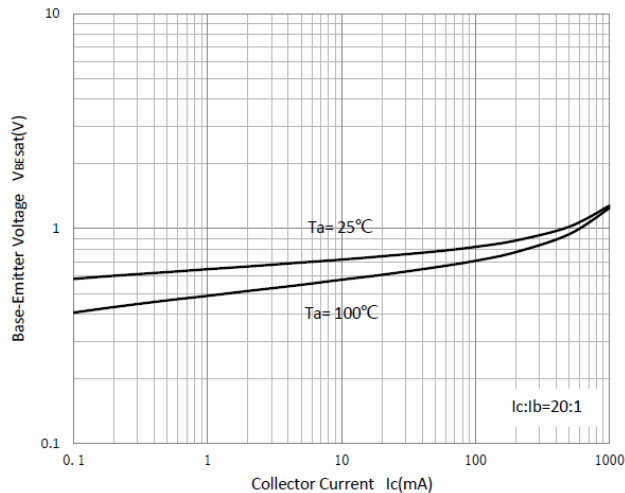


Fig 5: Base-Emitter On Voltage

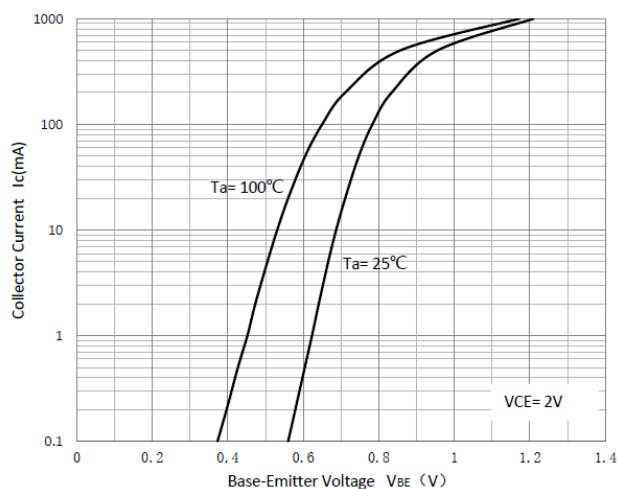
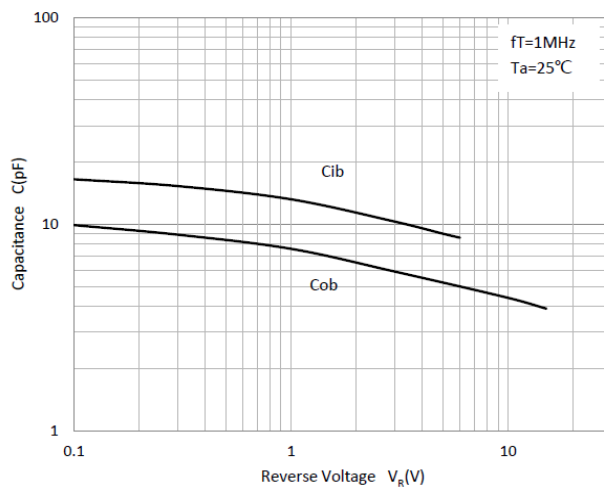


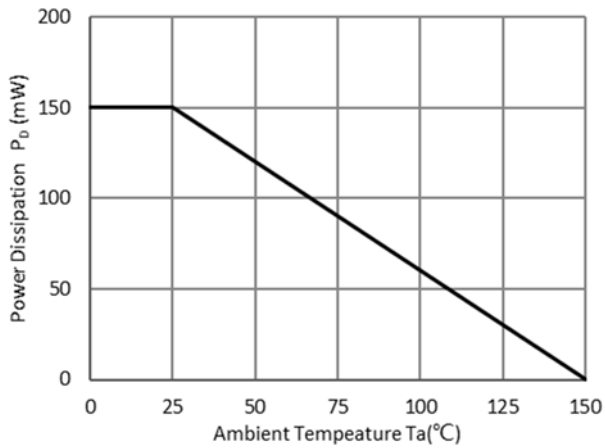
Fig 6: Cob/Cib- V_{CB}/V_{EB}



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Fig 7: P_D - T_a Curve



TR2-PNP

Fig 1: Static Characteristics

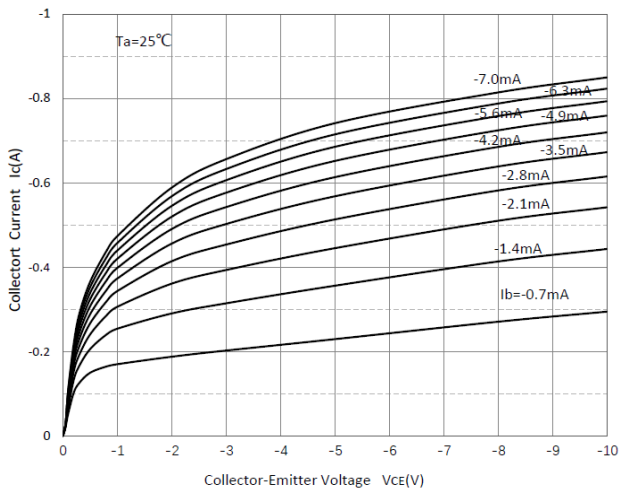


Fig 2: DC Current Gain Characteristics

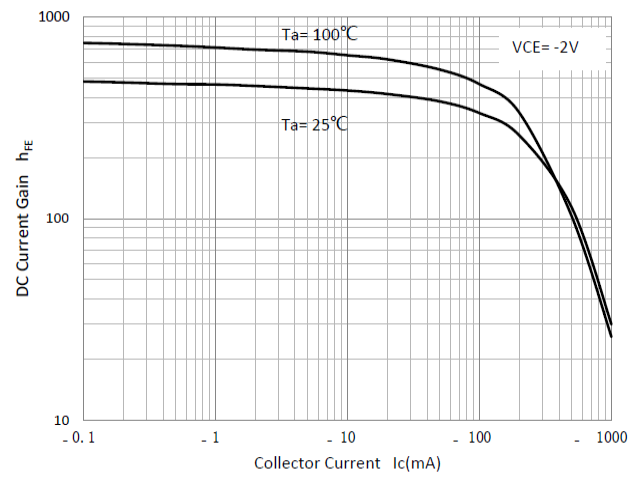


Fig 3: Collector-Emitter Saturation Voltage

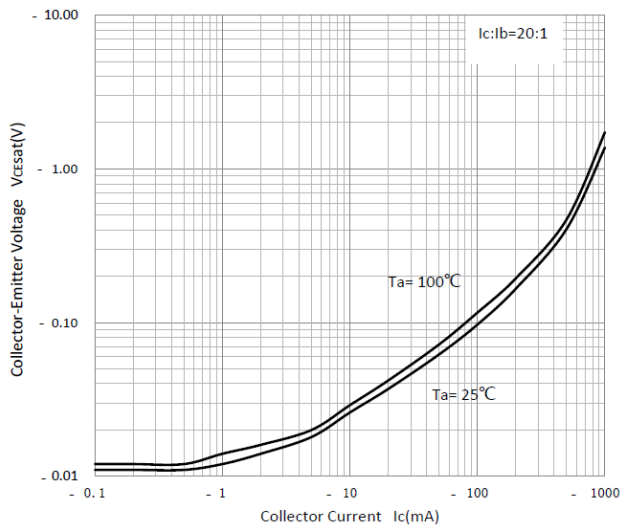
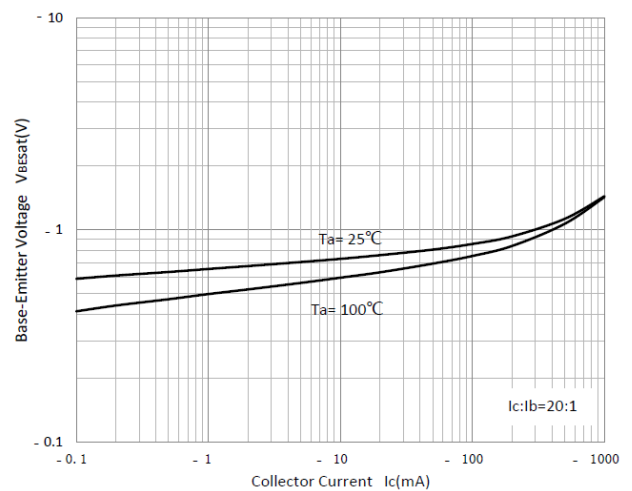


Fig 4: Base-Emitter Saturation Voltage



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Fig 5: Base-Emitter On Voltage

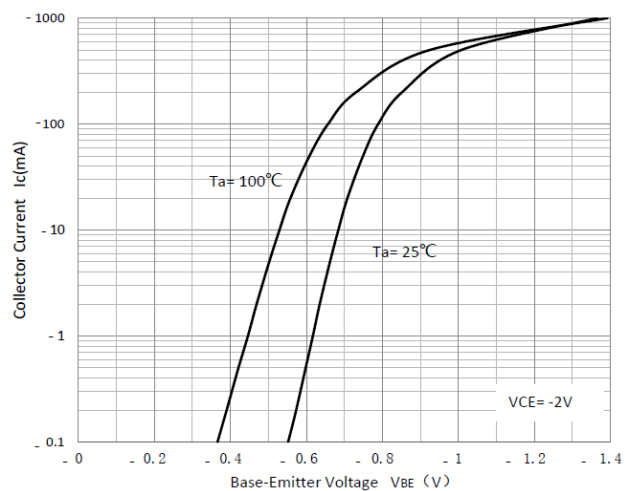


Fig 6: $C_{ob}/C_{ib}-V_{CB}/V_{EB}$

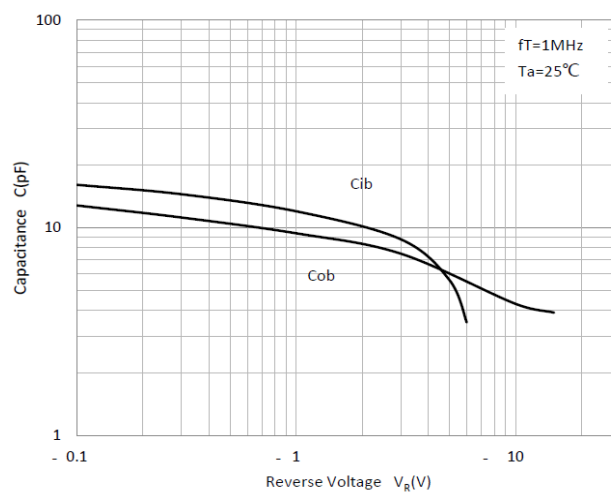
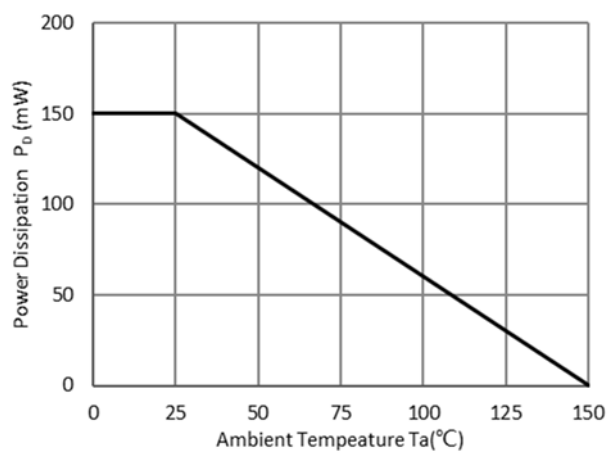


Fig 7: P_D - T_a Curve

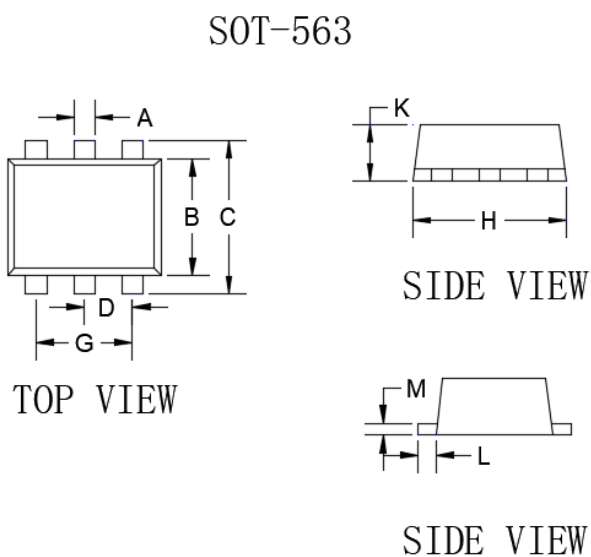


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■ Ordering Information

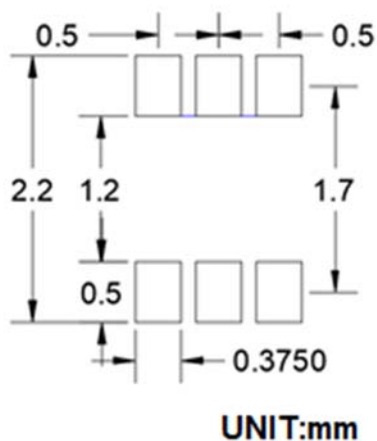
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
EMZ7	F2	Approximate 0.0035	3000	30000	120000	7" reel

■ Outline Dimensions



DIM	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	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



EMZ7

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