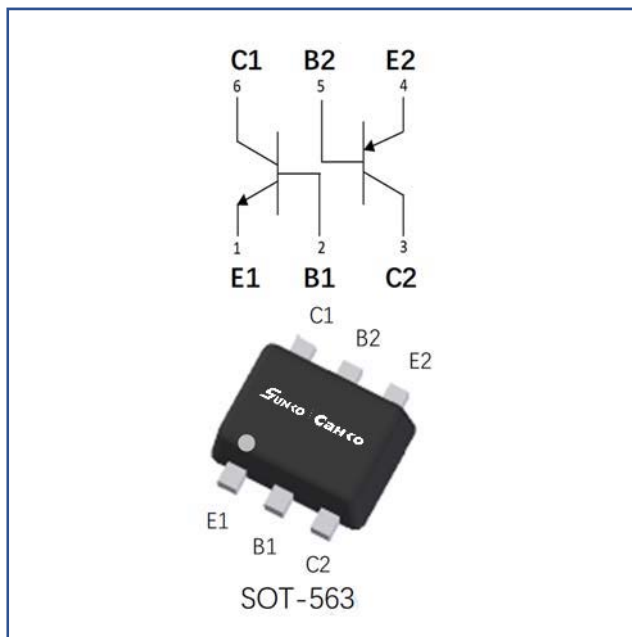


EMZ1

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				Z1
Collector-base voltage	V_{CBO}	V	$I_C=50\mu\text{A}, I_E=0$	60
Collector-emitter voltage	V_{CEO}	V	$I_C=1\text{mA}, I_B=0$	50
Emitter-base voltage	V_{EBO}	V	$I_E=50\mu\text{A}, I_C=0$	7
Collector current	I_C	mA		150
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

EMZ1

TR2-PNP

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

EMZ1

TR2-PNP

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

■ Thermal Characteristics

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

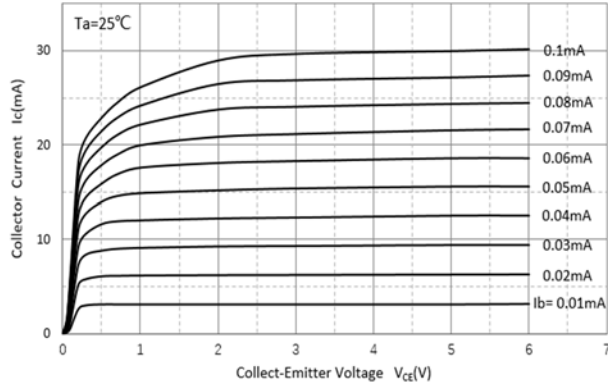


Fig 2: DC Current Gain Characteristics

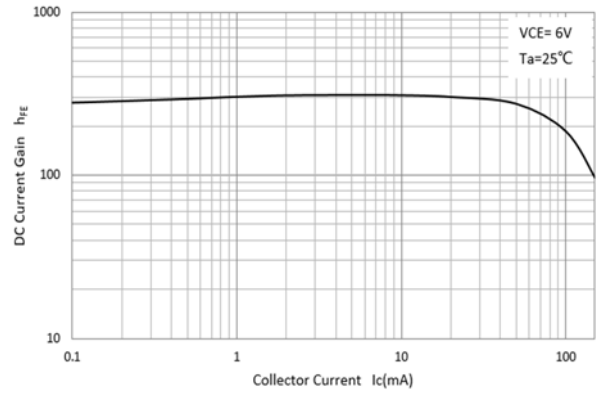


Fig 3: Collector-Emitter Saturation Voltage

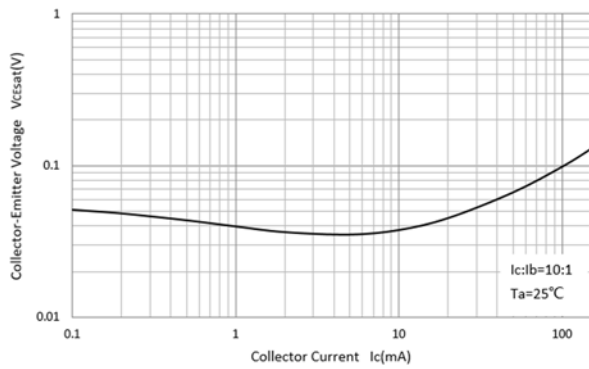


Fig 4: Base-Emitter Saturation Voltage

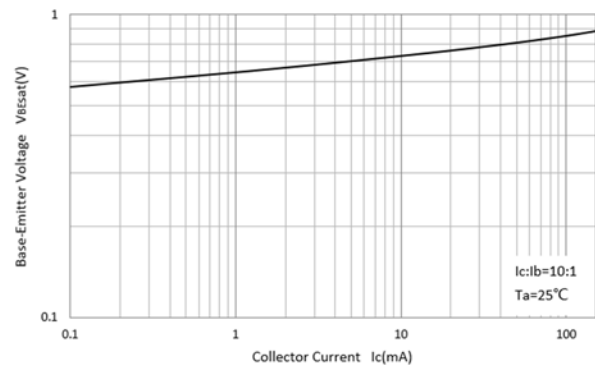


Fig 5: Base-Emitter On Voltage

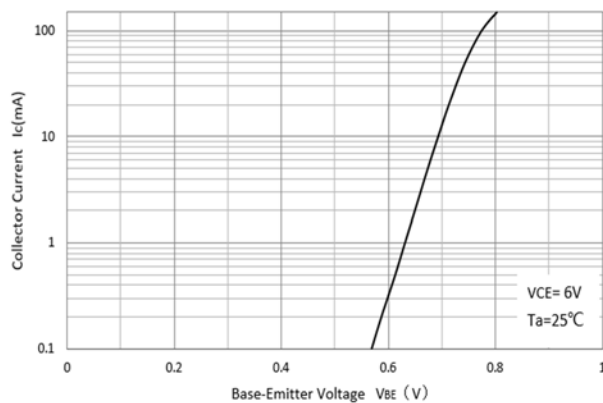
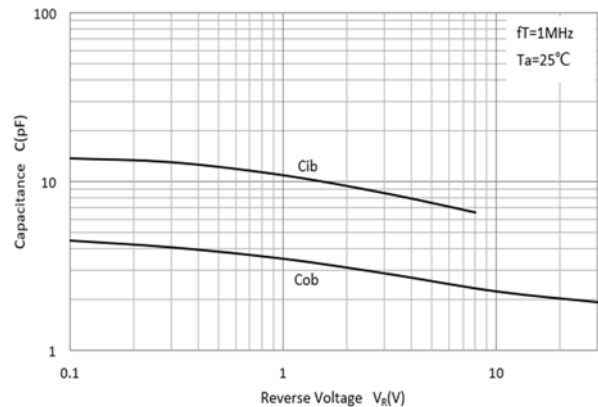
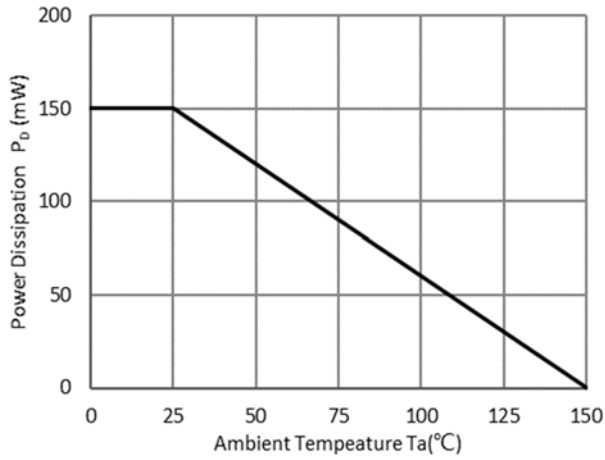


Fig 6: Cob/Cib- V_{CB}/V_{EB}



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Fig 7: P_D - T_a Curve



TR2-PNP

Fig 1: Static Characteristics

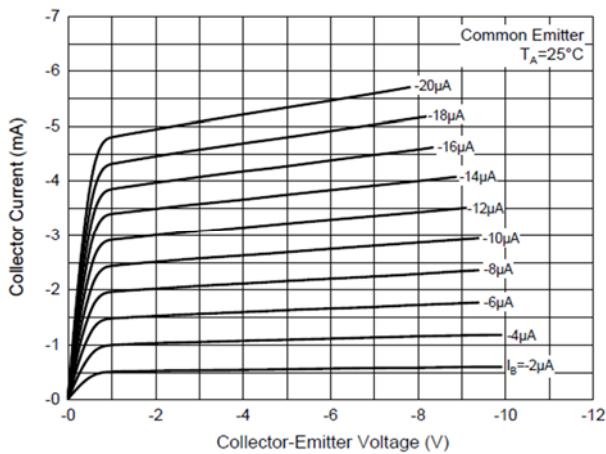


Fig 2: DC Current Gain Characteristics

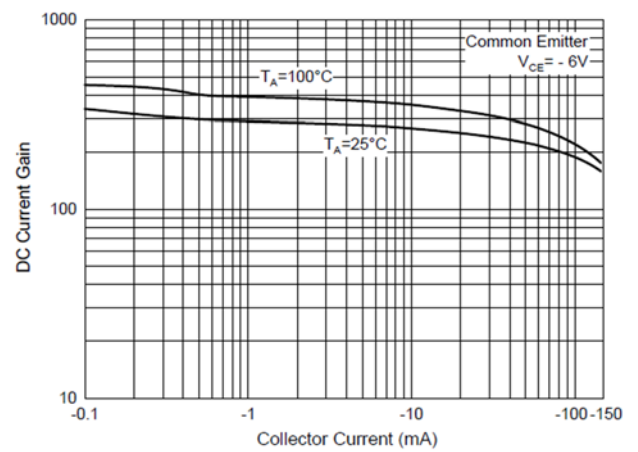


Fig 3: Collector-Emitter Saturation Voltage

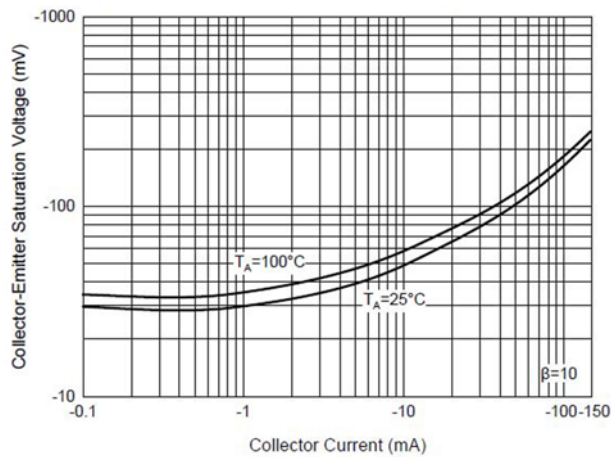
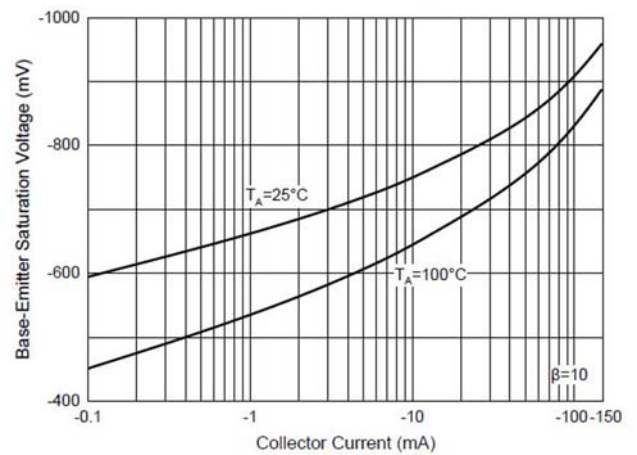


Fig 4: Base-Emitter Saturation Voltage



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Fig 5: Base-Emitter Voltage

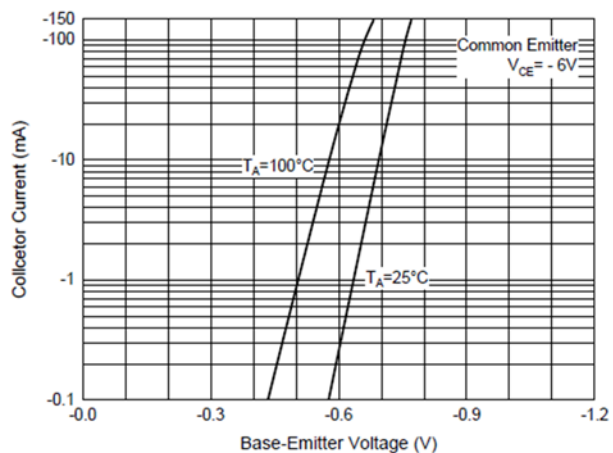
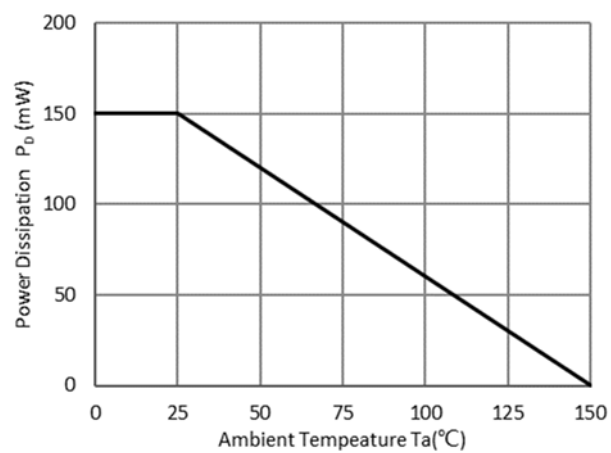


Fig 6: P_D - T_a Curve



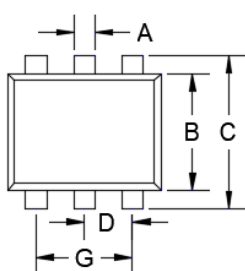
EMZ1

■ Ordering Information

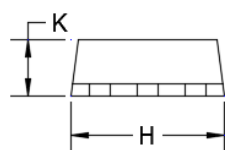
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
EMZ1	F2	Approximate 0.0035	3000	30000	120000	7" reel

■ Outline Dimensions

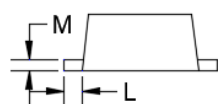
SOT-563



TOP VIEW



SIDE VIEW

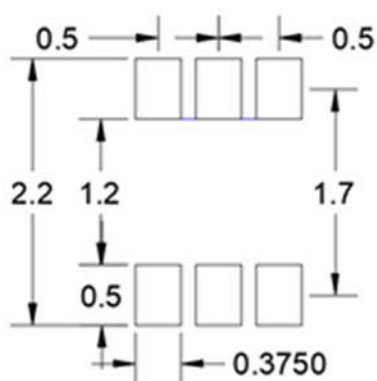


SIDE VIEW

DIMENSIONS

DIM	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



UNIT:mm

EMZ1

Disclaimer

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