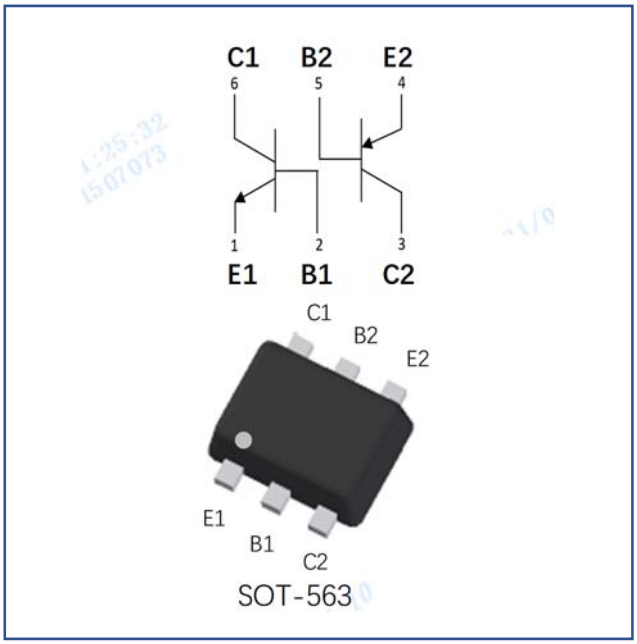
Dual NPN+PNP Small Signal Transistor



Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for auto matic 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				Z1
Collector-base voltage	V_{CBO}	V	I_C=50uA,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=50uA,I_C=0	7
Collector current	I_C	mA		150
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=-50uA,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=-50uA,IC=0	-6
Collector current	I_C	mA		-150
Power dissipation	P_D	mW		150
Junction temperature	T_J	℃		-55 to +150
Storage temperature	T_{STG}	℃		-55 to +150

■ **Electrical Characteristics** (T_a=25℃ Unless otherwise specified)

TR1-NPN

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	I_C=50uA,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=50uA,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	Cob	pF	VCB=12V,IE=0A,f=1MHz		2	3.5

TR2-PNP

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	I_C=-50uA,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=-50uA,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	Cob	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)	℃/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

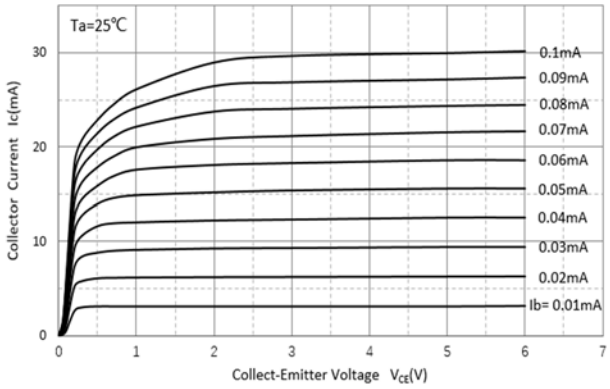


Fig 2：DC Current Gain Characteristics

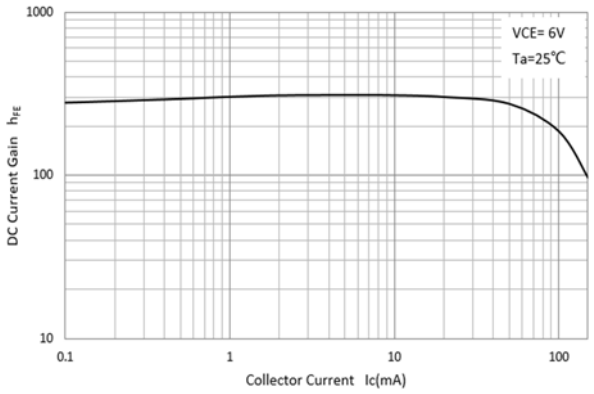


Fig 3：Collector-Emitter Saturation Voltage

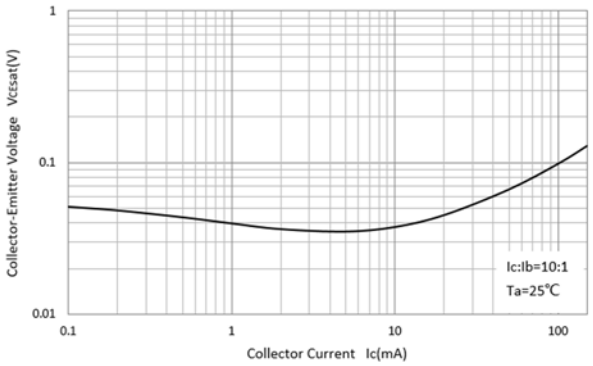


Fig 4：Base-Emitter Saturation Voltage

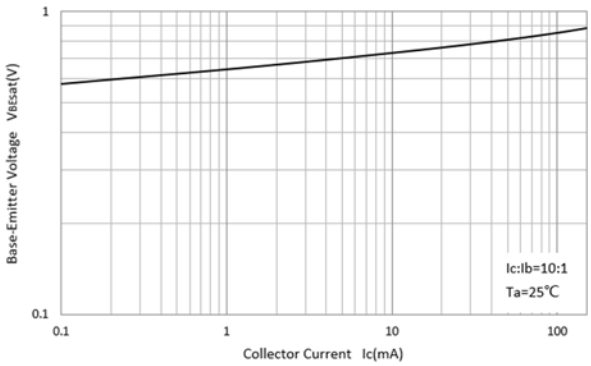


Fig 5：Base-Emitter On Voltage

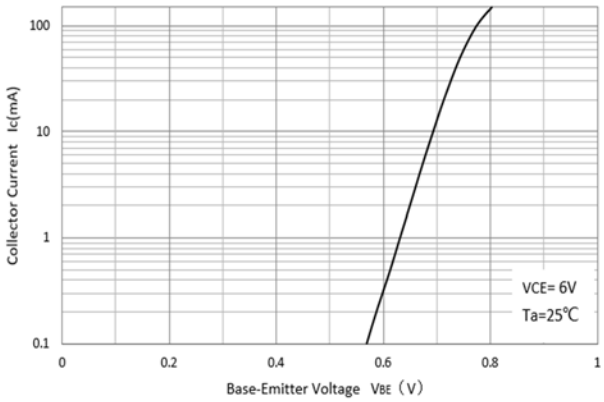


Fig 6：Cob/Cib-V_{CB}/V_{EB}

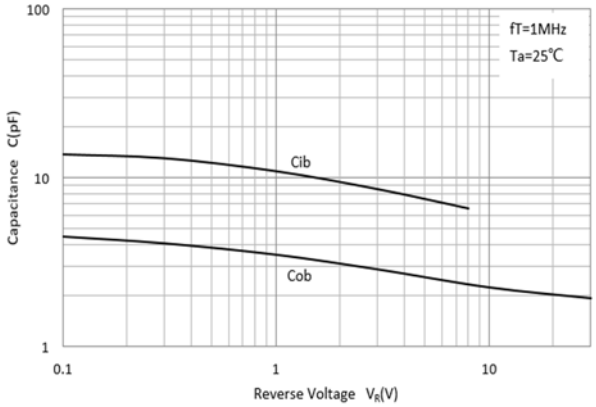
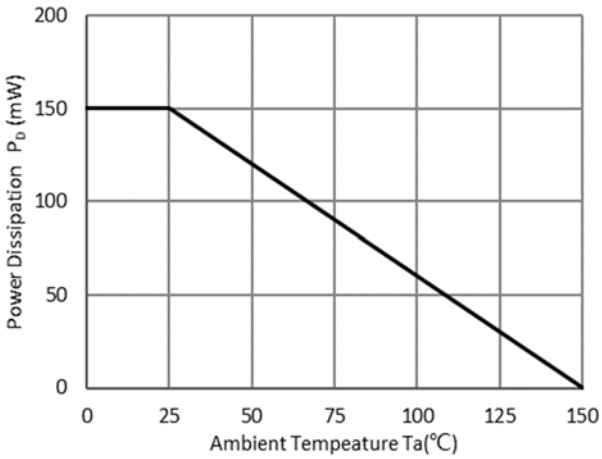


Fig 7：P_D-Ta Curve



TR2-PNP

Fig 1：Static Characteristics

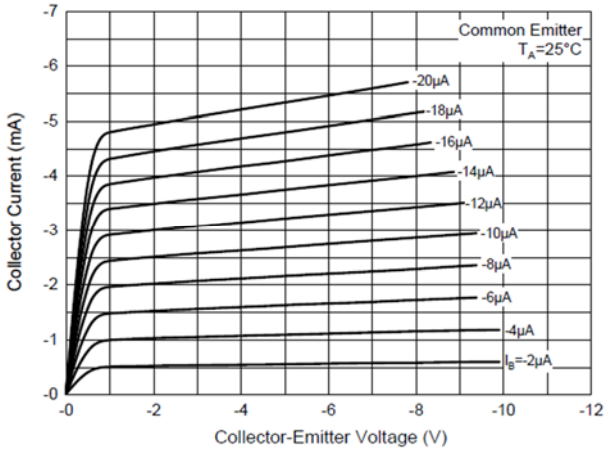


Fig 2：DC Current Gain Characteristics

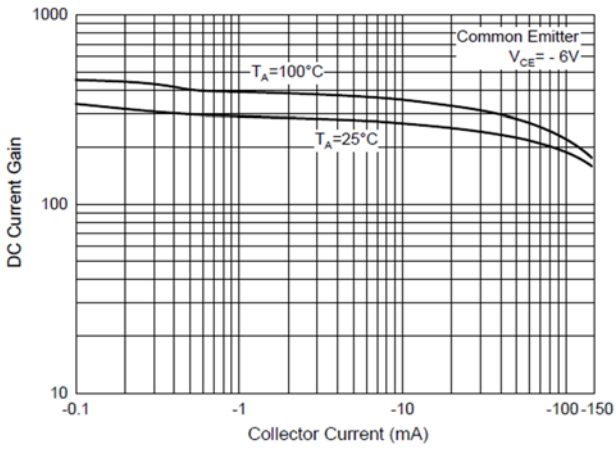


Fig 3：Collector-Emitter Saturation Voltage

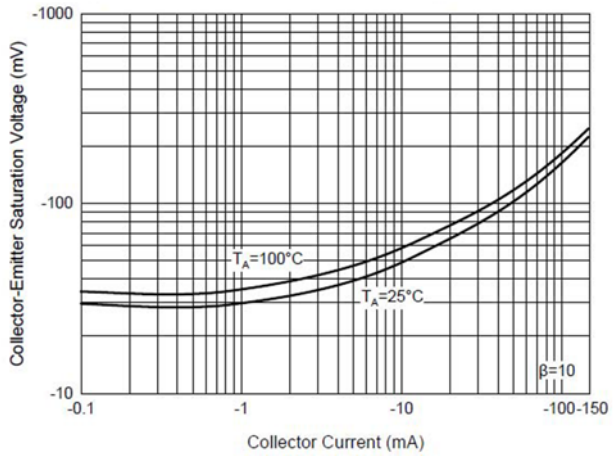


Fig 4：Base-Emitter Saturation Voltage

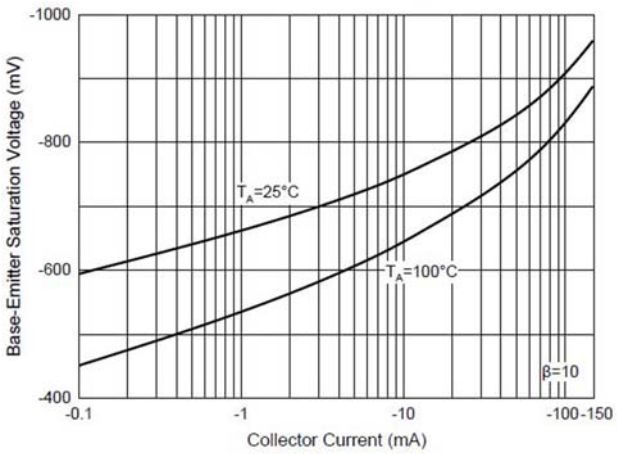


Fig 5：Base-Emitter Voltage

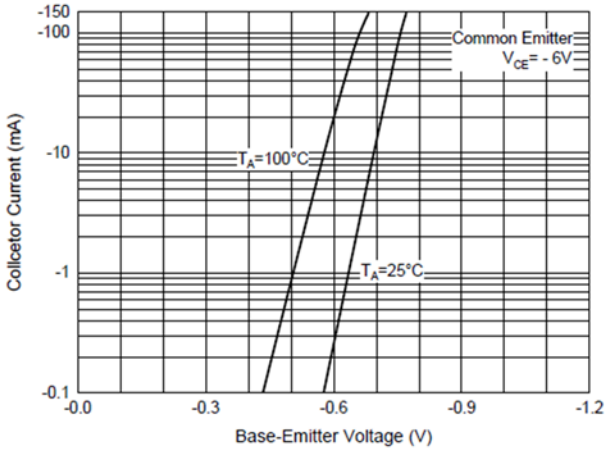
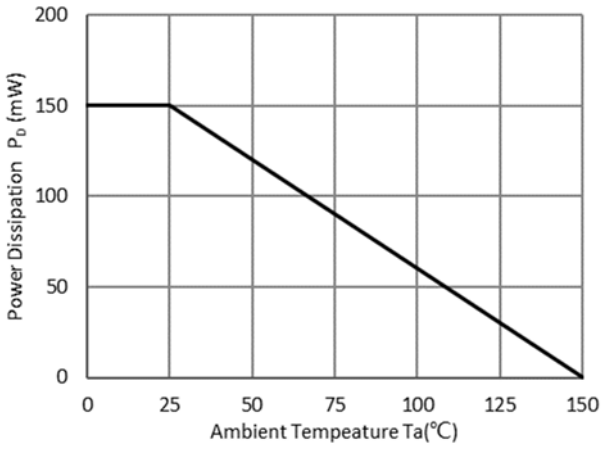


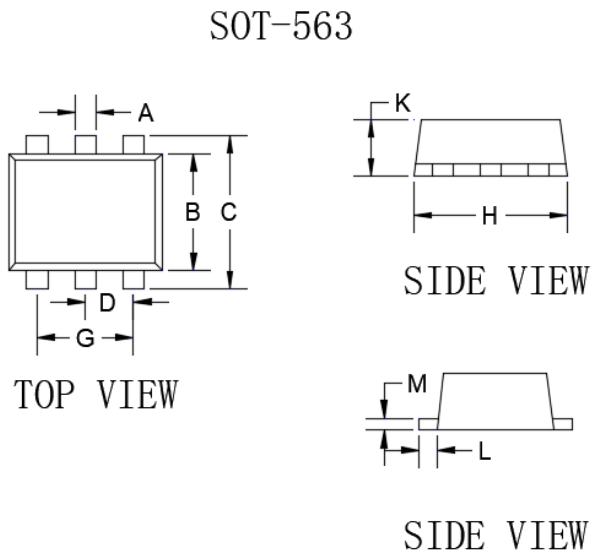
Fig 6：P_D-Ta Curve



■Ordering Information

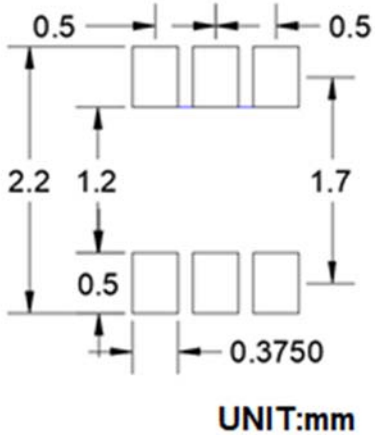
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
EMZ1	F2	Approximate 0.0035	3000	30000	120000	7” reel

■ 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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