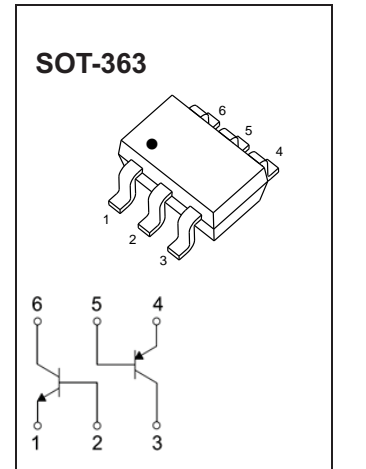


Features

- Epoxy meets UL-94 V-0 flammability rating
- Surface mount package ideally Suited for Automatic Insertion
- NPN/PNP
- Compliant to Halogen-free

Mechanical Data

- **Package:** SOT-363
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** K46



Maximum Ratings NPN (Ta=25°C Unless otherwise specified)

Symbol	Parameter	Value	Units
V _{CBO}	Collector-Base Voltage	60	V
V _{CEO}	Collector-Emitter Voltage	40	V
V _{EBO}	Emitter-Base Voltage	6	V
I _C	Collector Current -Continuous	0.2	A
P _C	Collector Power Dissipation	0.2	W
T _J , T _{stg}	Operation Junction and Storage Temperature Range	-55~+150	°C

TR1 NPN Pin1、2、6 Electrical Characteristics (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 10μA, I _E =0	60		V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = 1mA, I _B =0	40		V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E = 10μA, I _C =0	6		V
Collector cut-off current	I _{CBO}	V _{CB} = 30 V, I _E =0		0.05	μA
Collector cut-off current	I _{CEO}	V _{CE} = 30 V, I _B =0		0.5	μA
Emitter cut-off current	I _{EBO}	V _{EB} = 5V, I _C =0		0.05	μA
DC current gain	h _{FE(1)}	V _{CE} = 1V, I _C = 0.1mA	40		
	h _{FE(2)}	V _{CE} = 1V, I _C = 1mA	70		
	h _{FE(3)}	V _{CE} = 1V, I _C = 10mA	100	300	
	h _{FE(4)}	V _{CE} = 1V, I _C = 50mA	60		
	h _{FE(5)}	V _{CE} = 1V, I _C = 100mA	30		
Collector-emitter saturation voltage	V _{CE(sat)1}	I _C =10 mA, I _B = 1mA		0.2	V
	V _{CE(sat)2}	I _C =50 mA, I _B = 5mA		0.3	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _C = 10 mA, I _B = 1mA	0.65	0.85	V
	V _{BE(sat)2}	I _C = 50 mA, I _B = 5mA		0.95	V
Transition frequency	f _T	V _{CE} =20V, I _C =20mA, f=100MHz	300		MHz
Output capacitance	C _{ob}	V _{CB} =5V, I _E =0, f=1MHz		4	pF
Delay time	t _d	V _{CC} =3V, V _{BE} =0.5V		35	nS
Rise time	t _r	I _C =10mA, I _{B1} =- I _{B2} =1mA		35	nS
Storage time	t _s	V _{CC} =3V, I _C =10mA		200	nS
Fall time	t _f	I _{B1} =-I _{B2} = 1mA		50	nS

Maximum Ratings PNP (Ta=25°C Unless otherwise specified)

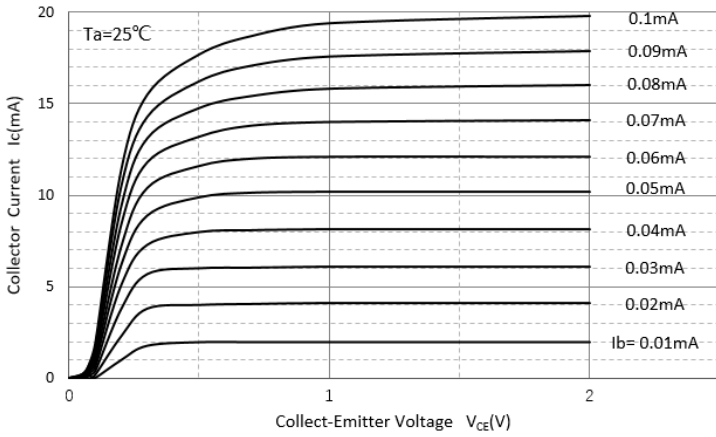
Symbol	Parameter	Value	Units
V _{CB0}	Collector-Base Voltage	-40	V
V _{CEO}	Collector-Emitter Voltage	-40	V
V _{EBO}	Emitter-Base Voltage	-5	V
I _C	Collector Current -Continuous	-0.2	A
P _C	Collector Power Dissipation	0.2	W
T _J , T _{stg}	Operation Junction and Storage Temperature Range	-55~+150	°C

TR2 PNP Pin3、4、5 Electrical Characteristics (Ta=25°C unless otherwise specified)

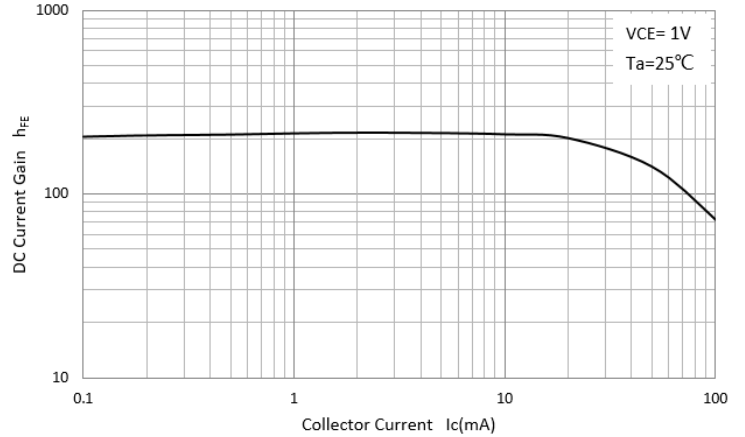
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C =-10μA, I _E =0	-40			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C =-1mA, I _B =0	-40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E =-10μA, I _C =0	-5			V
Collector cut-off current	I _{CBO}	V _{CB} =-30V, I _E =0			-0.05	μA
Emitter cut-off current	I _{EBO}	V _{EB} =-5V, I _C =0			-0.05	μA
DC current gain	h _{FE(1)}	V _{CE} =-1V, I _C =-0.1mA	40			
	h _{FE(2)}	V _{CE} =-1V, I _C =-1mA	70			
	h _{FE(3)}	V _{CE} =-1V, I _C =-10mA	100		300	
	h _{FE(4)}	V _{CE} =-1V, I _C =-50mA	60			
	h _{FE(5)}	V _{CE} =-1V, I _C =-100mA	30			
Collector-emitter saturation voltage	V _{CE(sat)1}	I _C =-10mA, I _B =-1mA			-0.25	V
	V _{CE(sat)2}	I _C =-50mA, I _B =-5mA			-0.4	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _C =-10mA, I _B =-1mA	-0.65		-0.85	V
	V _{BE(sat)2}	I _C =-50mA, I _B =-5mA			-0.95	V
Transition frequency	f _T	V _{CE} =-20V, I _C =-10mA, f=100MHz	250			MHz
Collector output capacitance	C _{ob}	V _{CB} =-5V, I _E =0, f=1MHz			4.5	pF
Delay time	t _d	V _{CC} =-3V, V _{BE} =-0.5V			35	nS
Rise time	t _r	I _C =-10mA, I _{B1} =-I _{B2} =-1mA			35	nS
Storage time	t _s	V _{CC} =-3V, I _C =-10mA			225	nS
Fall time	t _f	I _{B1} =-I _{B2} =-1mA			75	nS

TR1 NPN Pin1、2、6 Characteristics (Typical)

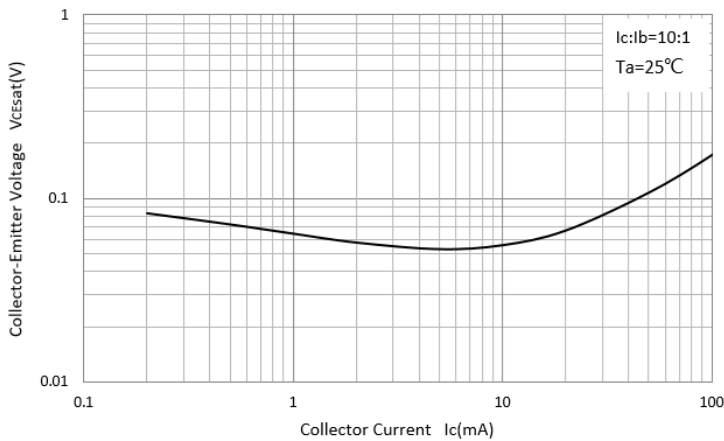
Static Characteristic



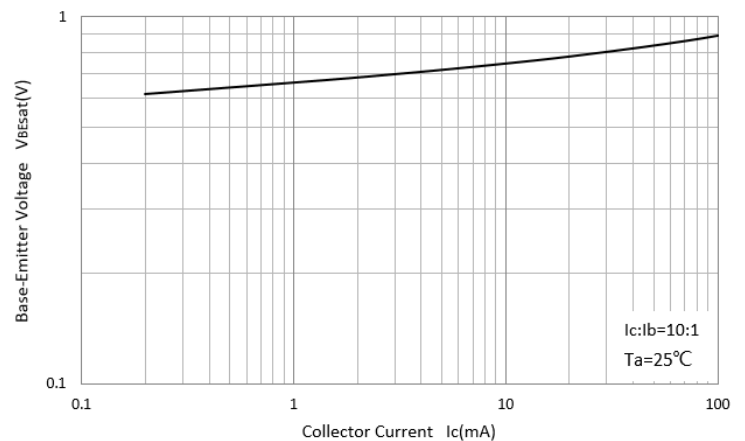
DC Current Gain



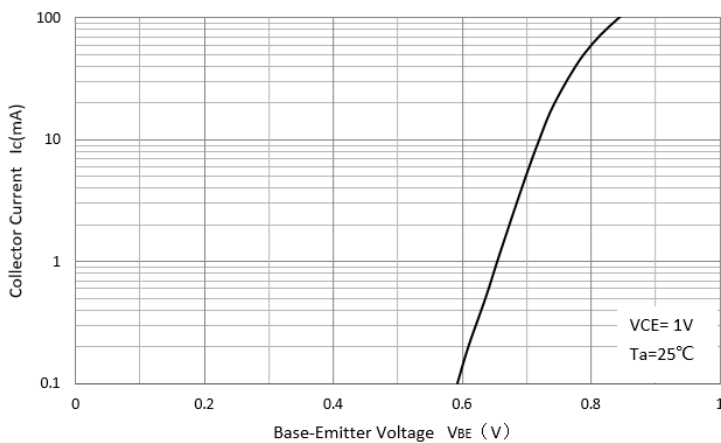
Collector-Emmitter Saturation Voltage



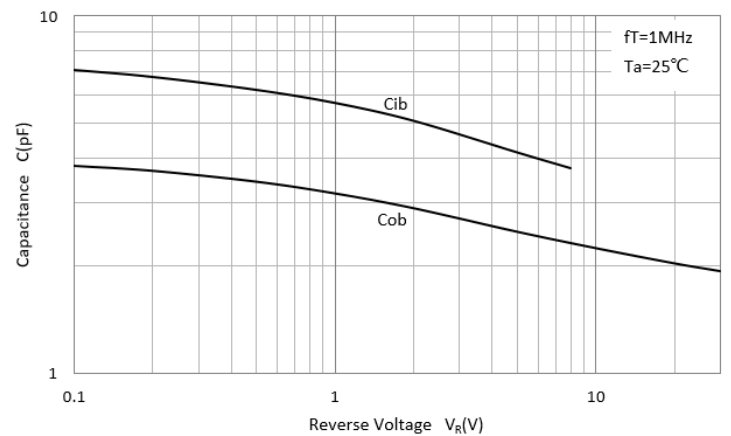
Base-Emmitter Saturation Voltage



Base-Emmitter On Voltage

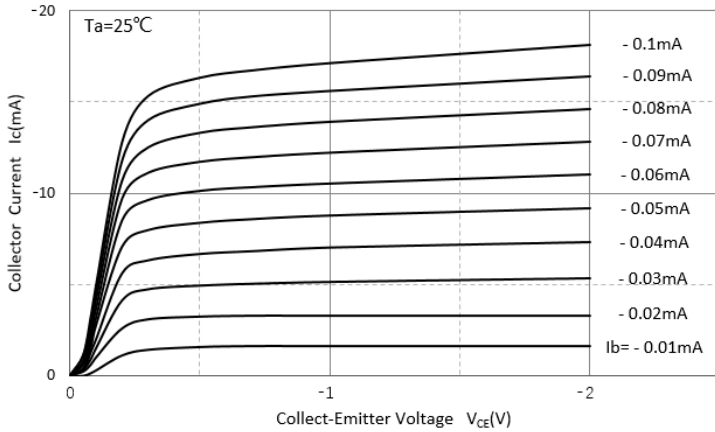


$C_{ob}/C_{ib}-V_{CB}/V_{EB}$

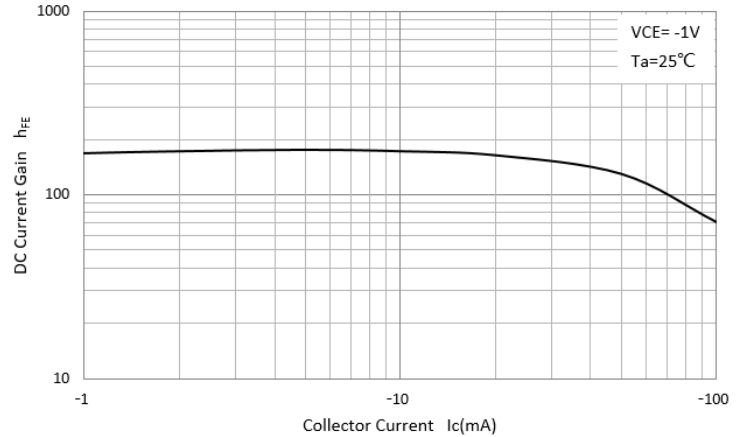


TR2 PNP Pin3、4、5 Characteristics (Typical)

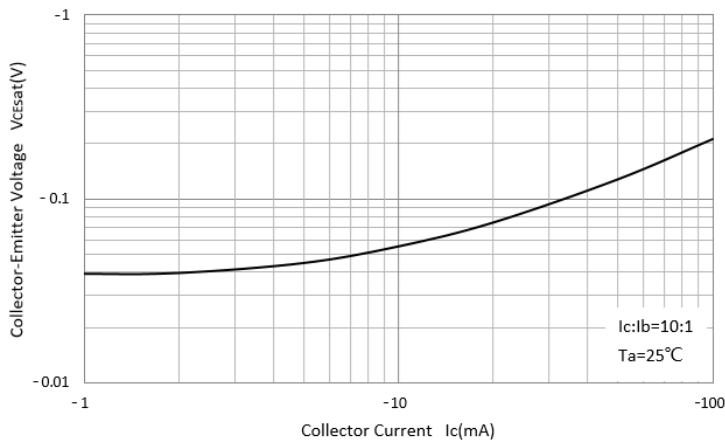
Static Characteristic



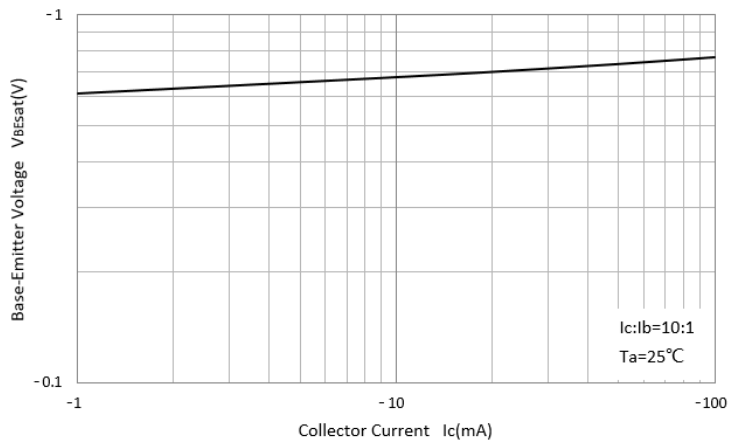
DC Current Gain



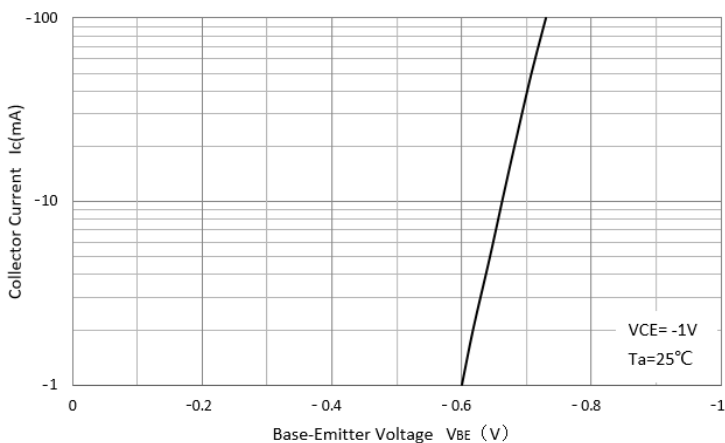
Collector-Emmitter Saturation Voltage



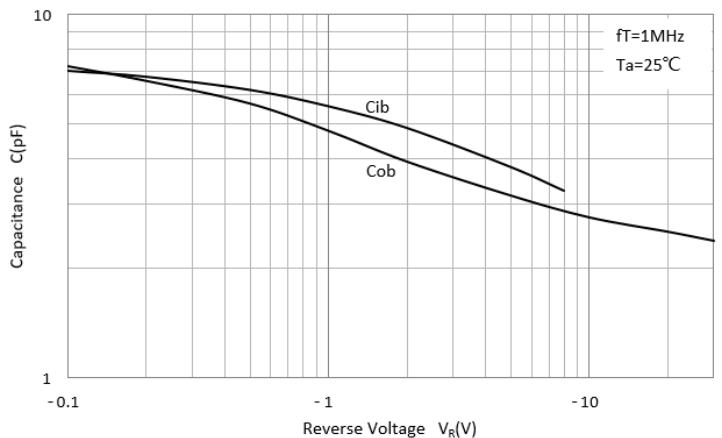
Base-Emmitter Saturation Voltage



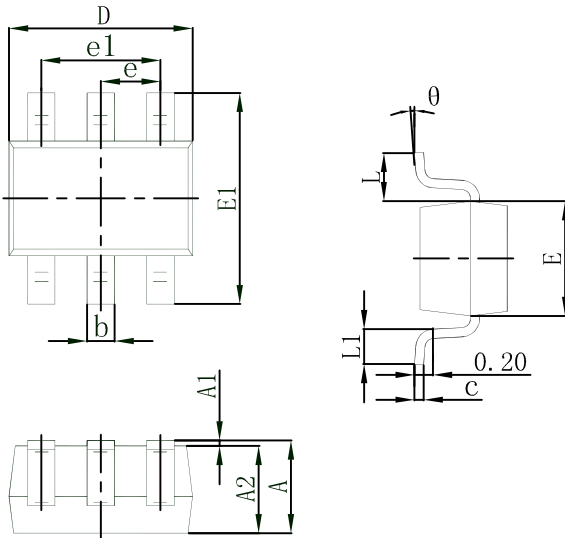
Base-Emmitter On Voltage



$C_{ob}/C_{ib}-V_{CB}/V_{EB}$

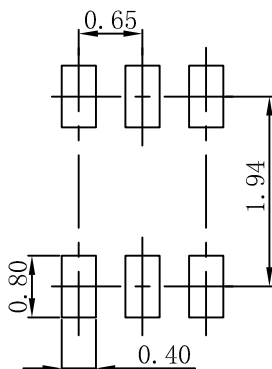


Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.050	0.250	0.002	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 TYP		0.021 TYP	
L1	0.260	0.460	0.010	0.018
theta	0°	8°	0°	8°

Soldering Footprint



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.