Bias Resistor Transistors

NPN Silicon Surface Mount Transistors with Monolithic Bias Resistor Network

FEATURES

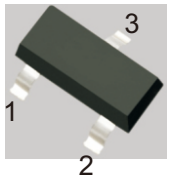
- Reduces board space
- Simplifies Circuit Design
- Reduces Board Space and Component Count
- Qualified to AEC-Q101 Standards for High Reliability

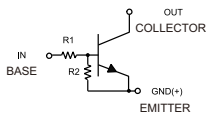
Mechanical Data

- Case: SOT-23
- R_1 =22KΩ (Typ) , R_2 = 22KΩ (Typ)

PINNING

PIN	DESCRIPTION
1	BASE
2	EMITTER
3	COLLECTOR





Simplified outline SOT-23 and symbol

Automotive Grade

MAXIMUM RATINGS (Ta =25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	50	V
Output current	I_C	100	mA
Power dissipation	P_D	200	mW
Thermal Resistance – Junction-to-Ambient	$R_{\theta JA}$	625	°C/W
Junction temperature	T_J	150	°C
Range of storage temperature	T_{stg}	-55~ +150	°C

ELECTRICAL CHARACTERISTICS(TA = 25°C unless otherwise noted.)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10uA , I_E = 0	50			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 2mA , I_B = 0	50			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E = 1mA , I_C = 0	10			V
Collector-Base Cut off Current	I_{CBO}	V_{CB} = 50V , I_E = 0			100	nA
Collector-Emitter Cut off Current	I_{CEO}	V_{CE} = 50V , I_B =0			0.5	uA
Emitter-Base Cut off Current	I_{EBO}	V_{EB} = 6V , I_C =0			0.2	mA
DC Current Gain	h_{FE}	V_{CE} = 10V , I_C =5mA	60			
Output Voltage (on)	V_{OL}	V_{CE} = 5.0V , V_{BE} = 2.5V , R_L = 1.0KΩ			0.2	V
OutputVoltage (off)	V_{OH}	V_{CE} = 5.0V , V_{BE} = 0.5V , R_L = 1.0KΩ	4.9			V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10mA , I_B = 0.3mA			0.25	V
Input Voltage(off)	$V_{I(off)}$	V_{CE} = 5V , I_C =100μA	0.5			V
Input Voltage(on)	$V_{I(on)}$	V_{CE} = 0.2V , I_C =5mA			1.9	V
Input resistance	R_1		15.4	22.0	28.6	KΩ
Input resistance	R_2		15.4	22.0	28.6	KΩ
Resistance ratio	R_2 / R_1		0.8	1.0	1.2	

Typical Performance Characteristics

Fig 1. VCE(sat) vs.IC

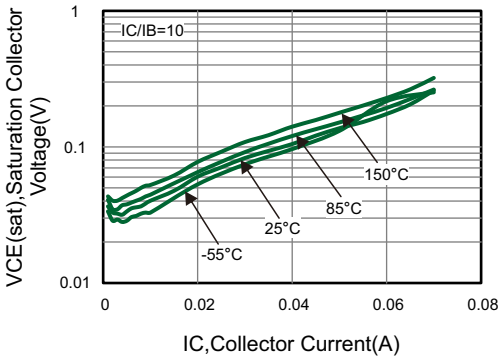


Fig 2. DC Current Gain

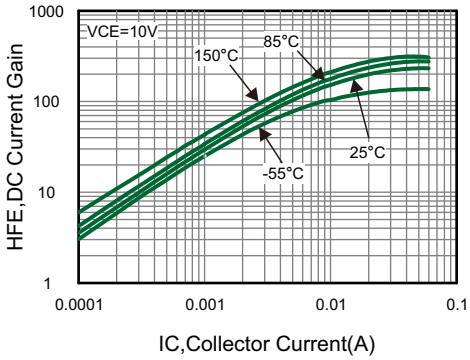


Fig 3. Vin vs. IC

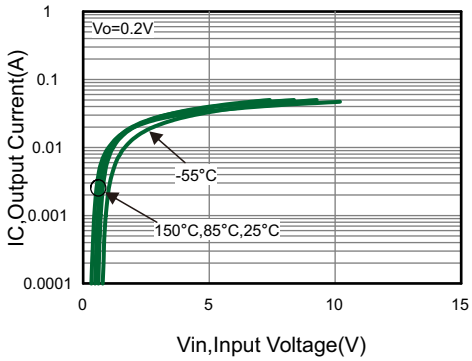


Fig 4. Capacitance vs. VCB

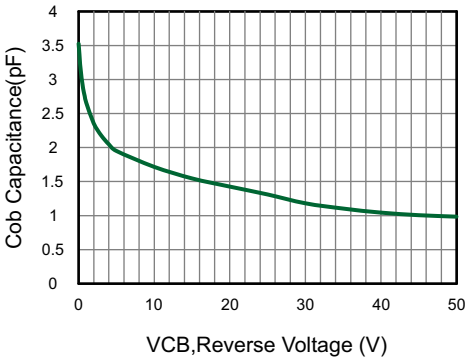
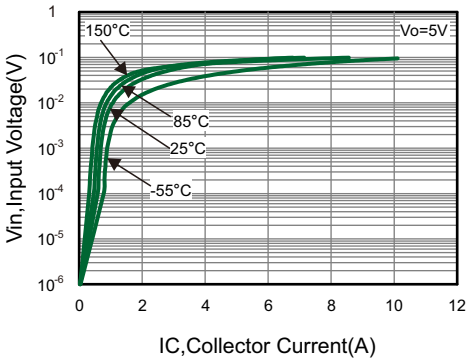
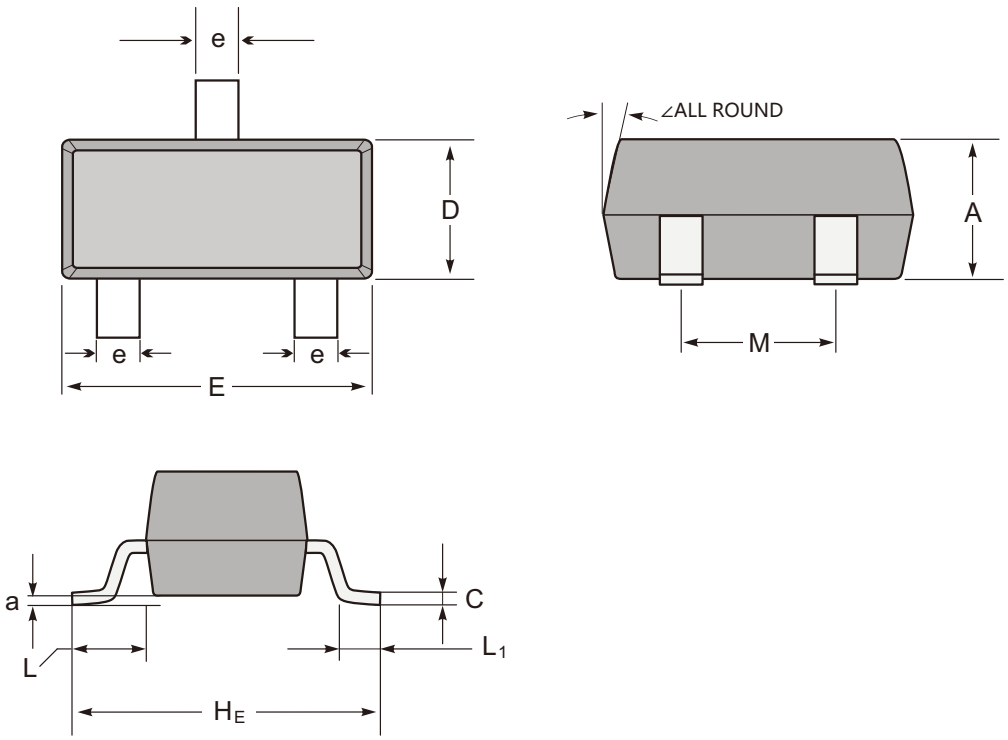


Fig 5. Vin vs. IC



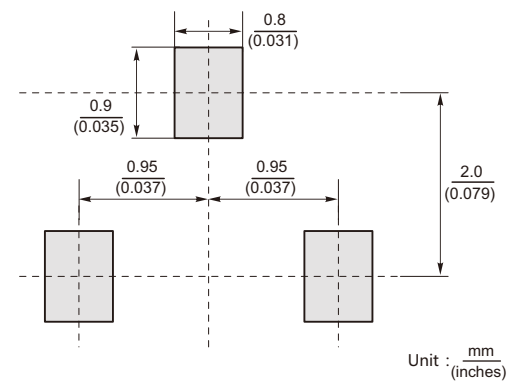
SOT-23 Package Outline Dimensions



SOT-23 mechanical data

UNIT		A	C	D	E	H_E	e	M	L	L_1	a	∠
mm	max	1.1	0.20	1.4	3.0	2.6	0.6	1.95	0.55 (ref)	0.36 (ref)	0.15	12°
	min	0.9	0.08	1.2	2.8	2.2	0.35	1.7			0.0	
mil	max	43	7.9	55	118	102	24	77	22 (ref)	14 (ref)	6	
	min	35	3.1	47	110	87	13	67			0.0	

The recommended mounting pad size



Marking

Type number	Marking code
JDTC124EWD	24E

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