

NPN Bias Resistor Transistors

NPN Silicon Surface Mount Transistors with Monolithic Bias Resistor Network

FEATURES

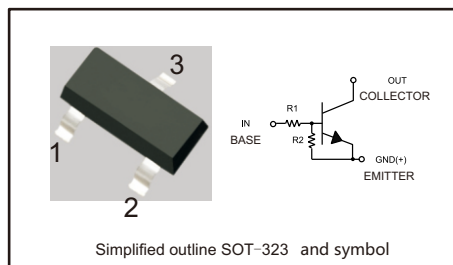
- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Simplifies Circuit Design
- Reduces Board Space and Component Count

DEVICE RESISTOR VALUES

Type	Marking	R1(KΩ)	R2(KΩ)
JDTC114EWG	14E	10	10
JDTC124EWG	24E	22	22
JDTC144EWG	44E	47	47
JDTC114YWG	14Y	10	47
JDTC114TWG	14T	10	-
JDTC143TWG	43T	4.7	-
JDTC113EWG	13E	1	1
JDTC123EWG	23E	2.2	2.2
JDTC143EWG	43E	4.7	4.7
JDTC143ZWG	43Z	4.7	47
JDTC124XWG	24X	22	47
JDTC123JWG	23J	2.2	47
JDTC115EWG	15E	100	100
JDTC144WWG	44A	47	22

PINNING

PIN	DESCRIPTION
1	BASE
2	EMITTER
3	COLLECTOR



Absolute Maximum Ratings And Characteristics (Ta = 25°C)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	50	V
Collector-Emitter Voltage	V _{CE0}	50	V
Collector Current	I _c	100	mA
Total Power Dissipation @ T _A = 25°C Derate above 25°C	P _D	246 1.5	mW °C/W

THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal Resistance – Junction-to-Ambient	R _{θJA}	508	°C/W
Operating and Storage Temperature Range	T _J , T _{stg}	-55 to +150	°C
Maximum Temperature for Soldering Purposes, Time in Solder Bath	T _L	260 10	°C Sec



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
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}	$V_{EB}=6.0V, I_C=0$			0.5 0.2 0.1 0.2 0.9 1.9 4.3 2.3 1.5 0.18 0.13 0.2 0.05 0.13	mA
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10uA, I_E=0$	50			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=2.0mA, I_B=0$	50			V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=200uA, I_C=0$	6			V
ON CHARACTERISTICS						
DCCurrentGain	h_{FE}	$V_{CE}=10V, I_C=5mA$	35 60 80 80 160 160 3.0 8.0 15 80 80 80 80 80	60 100 140 140 350 350 5.0 15 30 200 150 140 150 140	- - - - - - - - - - - - - -	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=10mA, I_B=0.3mA$ $I_C=10mA, I_B=0.3mA$ $I_C=10mA, I_B=0.3mA$ $I_C=10mA, I_B=0.3mA$ $I_C=10mA, I_B=1mA$ $I_C=10mA, I_B=1mA$ $I_C=10mA, I_B=5mA$ $I_C=10mA, I_B=5mA$ $I_C=10mA, I_B=1mA$ $I_C=10mA, I_B=1mA$ $I_C=10mA, I_B=1mA$ $I_C=10mA, I_B=1mA$ $I_C=10mA, I_B=1mA$ $I_C=10mA, I_B=0.3mA$ $I_C=10mA, I_B=5mA$			0.25	V
Output Voltage(on)	V_{OL}	$V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=2.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=3.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=5.5V, R_L=1.0k$ $V_{CC}=5.0V, V_B=4.0V, R_L=1.0k$			0.2	V

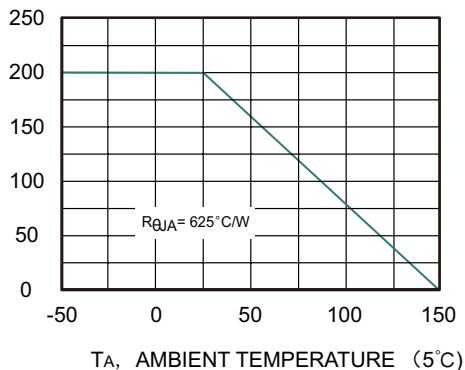


Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output Voltage(off)	V_{OH}	VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.5V RL=1.0k VCC=5.0V VB=0.05V VCC=5.0V VB=0.25V VCC=5.0V VB=0.25V VCC=5.0V VB=0.25V VCC=5.0V VB=0.25V VCC=5.0V VB=0.25V VCC=5.0V VB=0.25V	4.9			V
Input Resistor	R_i		7 15.4 32.9 7 7 3.3 0.7 1.5 3.3 3.3 15.4 1.54 70 32.9	10 22 47 10 10 4.7 1 2.2 4.7 4.7 22 2.2 100 47	13 28.6 61.1 13 13 6.1 1.3 2.9 6.1 6.1 28.6 2.86 130 61.1	k Ω
Resistor Ratio	R_1/R_2		0.8 0.8 0.8 0.17 - - 0.8 0.8 0.8 0.055 0.38 0.038 0.8 1.7	1 1 1 0.21 - - 1 1 1 0.1 0.47 0.047 1 2.1	1.2 1.2 1.2 0.25 - - 1.2 1.2 1.2 0.185 0.56 0.056 1.2 2.6	



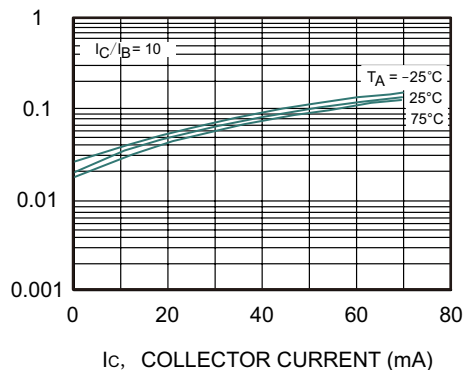
P_d POWER DISSIPATION (MILLIWATTS)

Figure 1. Derating Curve



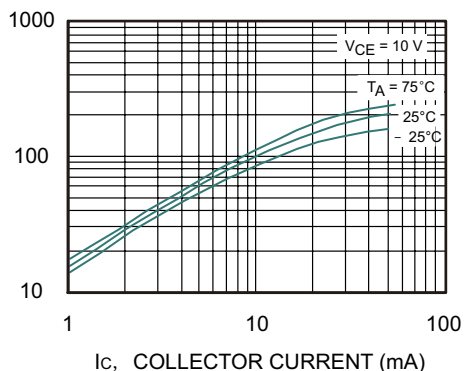
V_{CE(sat)}, MAXIMUM COLLECTOR VOLTAGE (VOLTS)

Figure 2. V_{CE(sat)} vs. I_C



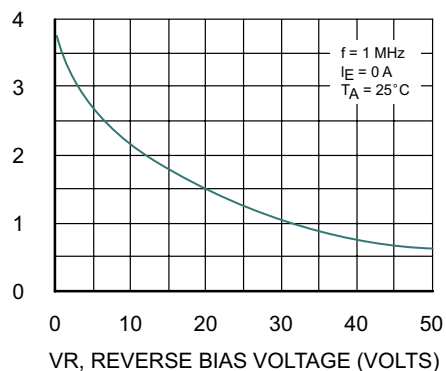
h_{FE}, DC CURRENT GAIN (NORMALIZED)

Figure 3. DC Current Gain



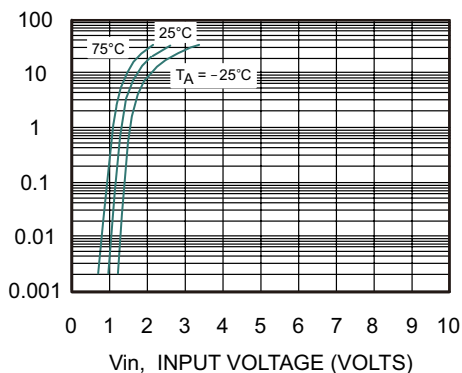
C_{ob}, CAPACITANCE (pF)

Figure 4. Output Capacitance



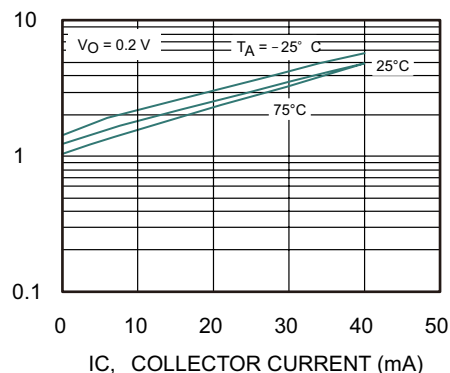
I_C, COLLECTOR CURRENT (mA)

Figure 5. Output Current vs. Input Voltage



V_{in}, INPUT VOLTAGE (VOLTS)

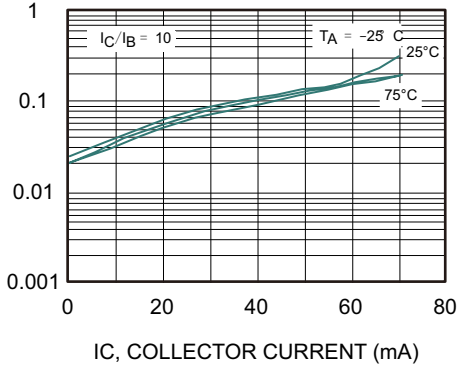
Figure 6. Input Voltage vs. Output Current





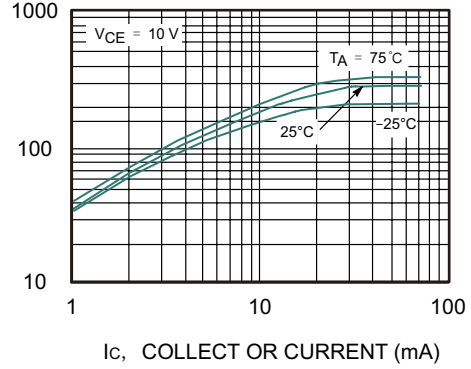
VCE(sat), MAXIMUM COLLECTOR VOLTAGE (VOLTS)

Figure 7. VCE(sat) vs. IC



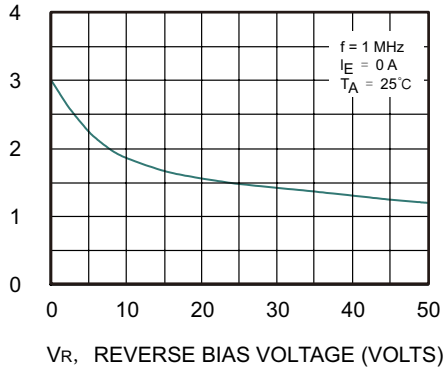
hFE DC CURRENT GAIN (NORMALIZED)

Figure 8. DC Current Gain



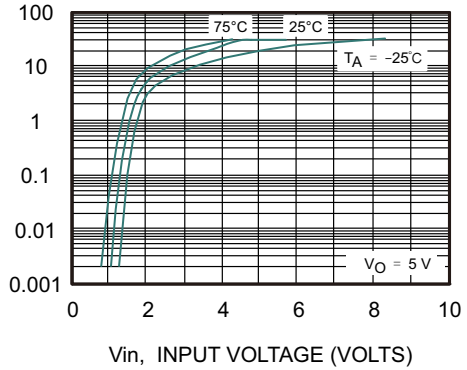
Cob, CAPACITANCE (pF)

Figure 9. Output Capacitance



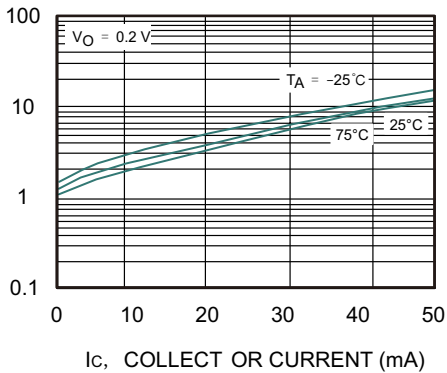
IC COLLECTOR CURRENT (mA)

Figure 10. Output Current vs. Input Voltage



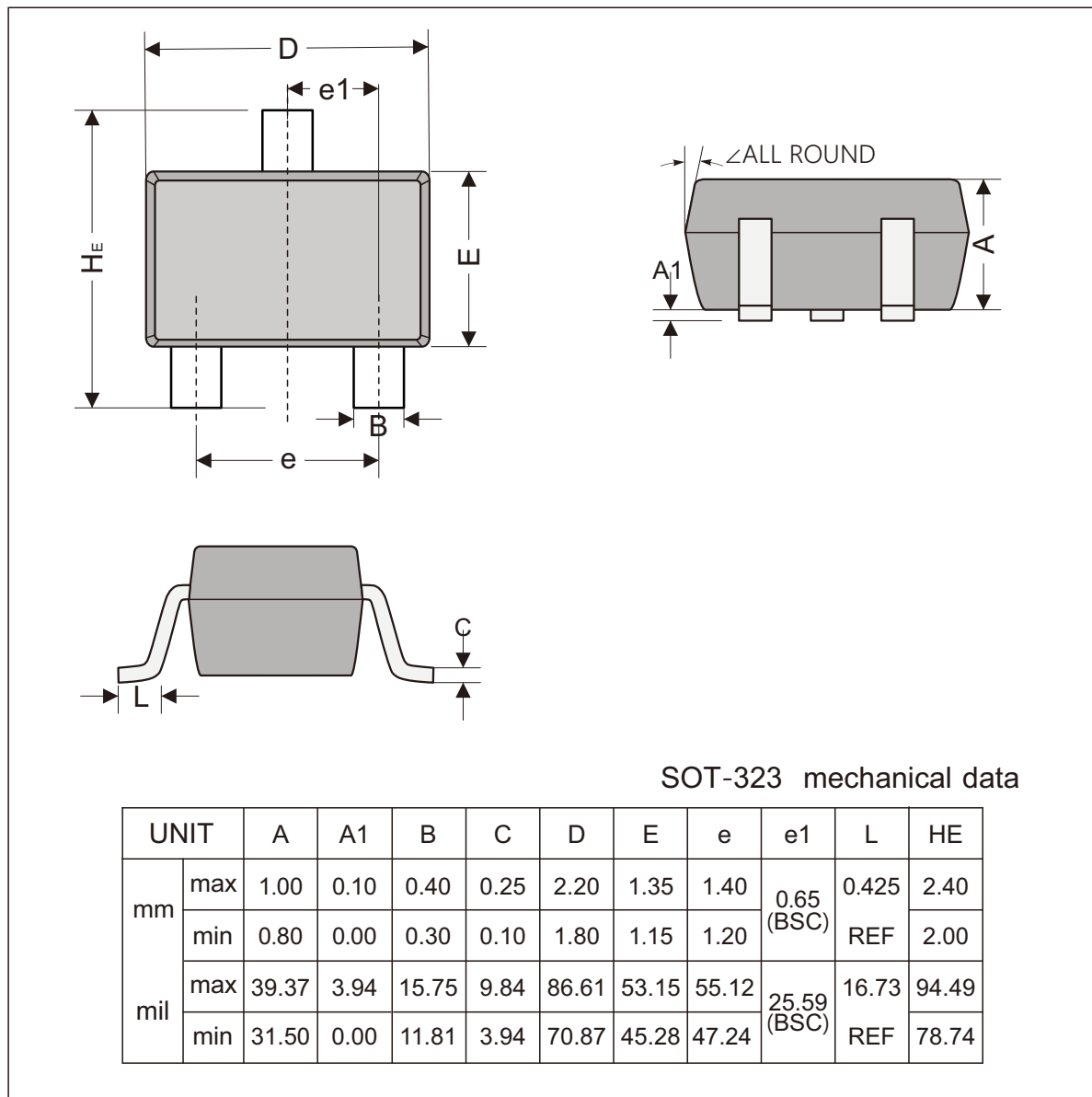
Vin, INPUT VOLTAGE (VOLTS)

Figure 11. Input Voltage vs. Output Current

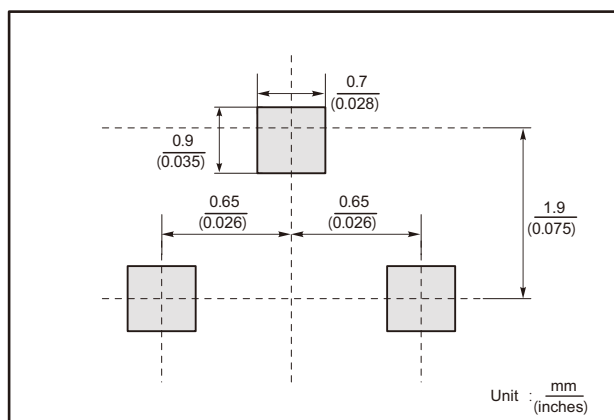




SOT-323 Package Outline Dimensions



The recommended mounting pad size





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