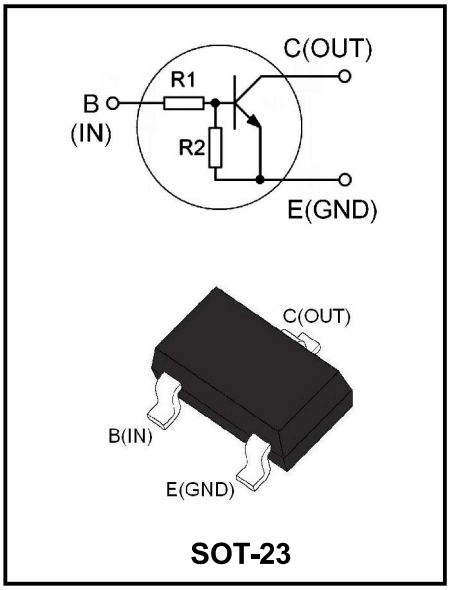
100mA NPN Digital Transistor



Features

- Built-In Biasing Resistors, R_1 =10kΩ, R_2 = 10kΩ
- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.
- Only the on/off conditions need to be set for operation, making the circuit design easy.

Product Specification Classification

Part Number	Package	Marking	Pack
BCR533	SOT-23	XC	3000PCS/Tape

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Value	Unit
Supply voltage	V_{CBO}	50	V
Input voltage	V_{CEO}	50	V
Input forward voltage	V_{IF}	40	V
Input reverse voltage	V_{IR}	10	V
Output current	I_C	500	mA
Total power dissipation	P_{tot}	330	mA
Junction temperature	T_j	150	℃
Storage temperature	T_{stg}	-65~150	℃

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point	R_{thJS}	215	K/W

Note: Pb-containing package may be available upon special request

For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics (Ta=25℃, unless otherwise specified)

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Collector-base breakdown voltage	BV_{CBO}	I_C=10μA, I_E=0	50			V
Collector-emitter breakdown voltage	BV_{CEO}	I_C=100μA, I_B=0	50			V
Collector-base cutoff current	I_{CBO}	V_{CB}=50V			100	nA
Emitter-base cutoff current	I_{EBO}	V_{EB}=10V			0.75	mA
DC current gain	h_{FE}	V_{CE}=5V, I_O=50mA	70			
Collector-emitter saturation voltage*	$V_{CE(sat)}$	I_C=50mA, I_B=2.5mA			0.3	V
Input voltage	$V_{I(off)}$	V_{CE}=5V, I_O=100μA	0.6		1.5	V
	$V_{I(on)}$	V_{CE}=0.3V, I_O=2 mA	1.0		2.5	V
Input resistor	R_1		7	10	13	KΩ
Resistor ratio	R_1/R_2		0.9	1	1.1	
Transition frequency	f_T	V_{CE}=5V, I_E=50mA, f=100MHz		100		MHz

* Pulse test: t < 300μs; Duty < 2%

Typical Characteristics

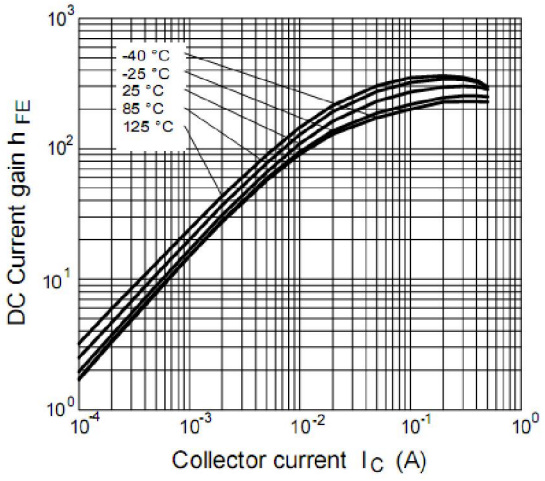


Figure 1. DC current gain

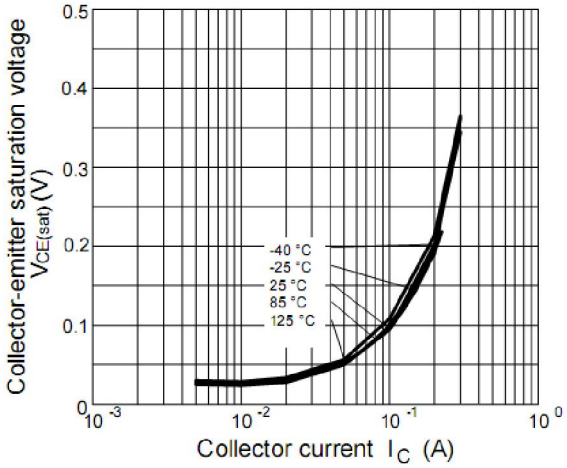


Figure2. Collector-emitter saturation voltage

Typical Characteristics

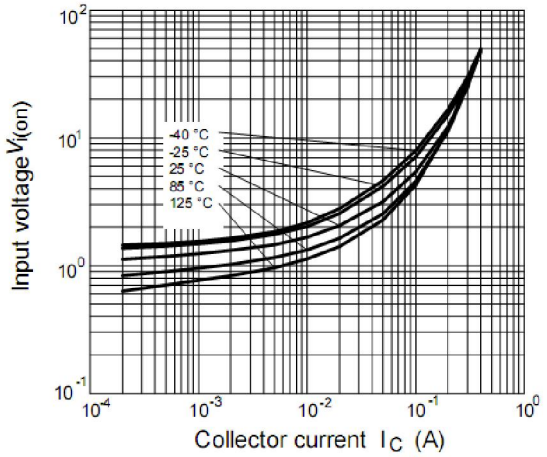


Figure 3. Input voltage vs. output current (ON characteristics)

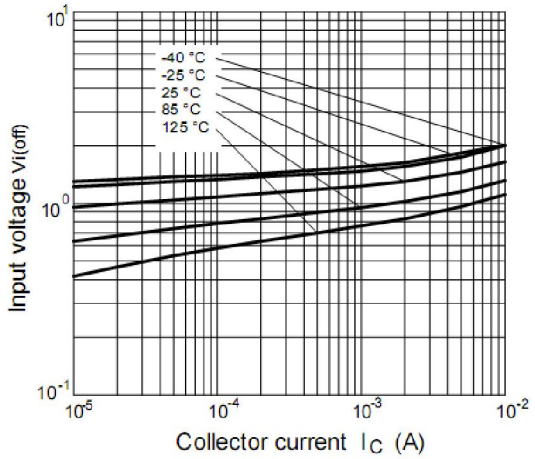


Figure 4. Output current vs. input voltage (OFF characteristics)

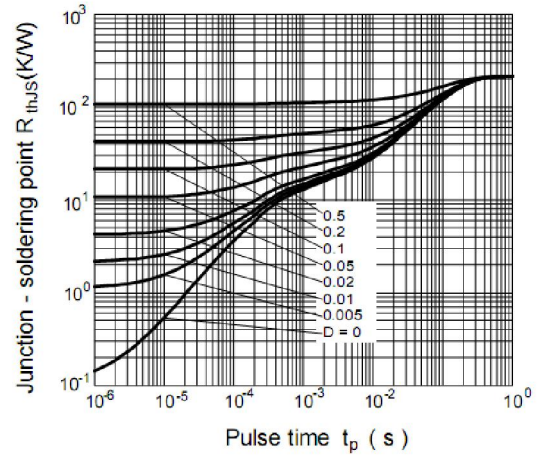


Figure 5. Permissible Pulse Load

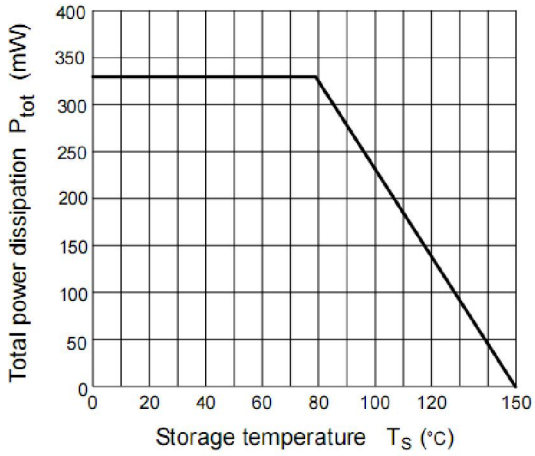
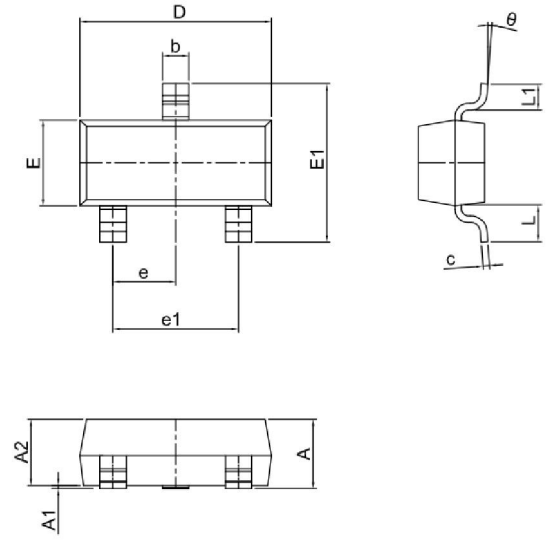


Figure 5. Total power dissipation

Package Dimensions



Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.90	1.00	0.035	0.039
e1	1.80	2.00	0.071	0.079
L	0.50	0.60	0.020	0.024
L1	0.30	0.50	0.012	0.020