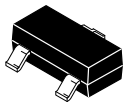
NPN General Purpose Amplifier

BCW71



SOT−23
CASE 318

Description

This device is designed for general purpose amplifier applications at collector currents to 300 mA. Sourced from Process 10.

ABSOLUTE MAXIMUM RATINGS

(T_A = 25°C unless otherwise noted.) (Notes 1, 2)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector−Emitter Voltage	45	V
V_{CBO}	Collector−Base Voltage	50	V
V_{EBO}	Emitter−Base Voltage	5.0	V
I_C	Collector Current − Continuous	500	mA
T_J, T_{STG}	Operating and Storage Junction Temperature Range	−55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady−state limits. **onsemi** should be consulted on applications involving pulsed or low−duty−cycle operations.

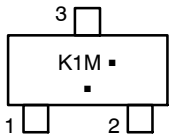
THERMAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted.) (Note 3)

Symbol	Parameter	Max	Unit
P_D	Total Device Dissipation	350	mW
	Derate Above 25°C	2.8	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction−to−Ambient	357	°C/W

3. Device mounted on FR−4 PCB 40 mm x 40 mm x 1.5 mm.

MARKING DIAGRAM



1. Base
2. Emitter
3. Collector

K1 = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping
BCW71	SOT−23 (Pb−Free, Halide Free)	3,000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
$V_{(BR)CEO}$	Collector−Emitter Breakdown Voltage	I_C = 1.0 mA, I_B = 0	45	–	–	V
$V_{(BR)CBO}$	Collector−Base Breakdown Voltage	I_C = 10 μA, I_E = 0	50	–	–	V
$V_{(BR)EBO}$	Emitter−Base Breakdown Voltage	I_E = 10 μA, I_C = 0	5.0	–	–	V
I_{CBO}	Collector Cut−Off Current	V_{CB} = 20 V, I_E = 0 V_{CB} = 20 V, I_E = 0, T_A = 100°C	– –	– –	100 10	μA
ON CHARACTERISTICS						
h_{FE}	DC Current Gain	I_C = 2.0 mA, V_{CE} = 5.0 V	110	–	220	
$V_{CE(sat)}$	Collector−Emitter Saturation Voltage	I_C = 10 mA, I_B = 0.5 mA	–	–	0.25	V
$V_{BE(sat)}$	Base−Emitter Saturation Voltage	I_C = 50 mA, I_B = 2.5 mA	–	0.85	–	V
$V_{BE(on)}$	Base−Emitter On Voltage	I_C = 2.0 mA, V_{CE} = 5.0 V	0.6	–	0.75	V
SMALL SIGNAL CHARACTERISTICS						
f_T	Current Gain − Bandwidth Product	I_C = 10 mA, V_{CE} = 5.0 V, f = 35 MHz	–	330	–	MHz
C_{obo}	Output Capacitance	V_{CE} = 10 V, I_E = 0, f = 1.0 MHz	–	–	4.0	pF
C_{ibo}	Input Capacitance	V_{EB} = 0.5 V, I_C = 0, f = 1.0 MHz	–	9.0	–	pF
NF	Noise Figure	I_C = 0.2 mA, V_{CE} = 5.0 V, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz	–	–	10	dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL CHARACTERISTICS

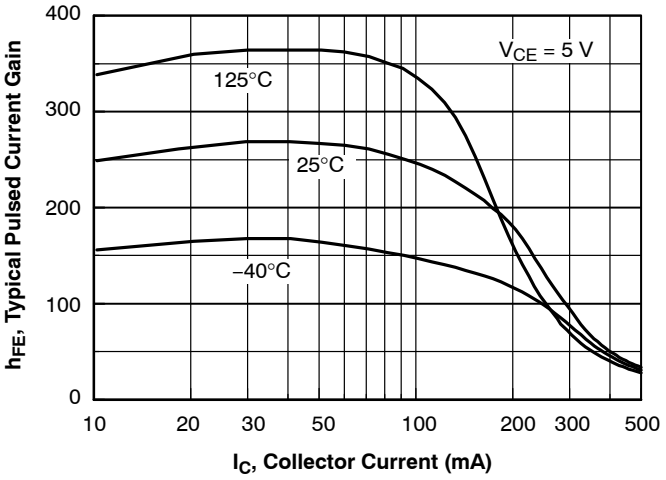


Figure 1. Typical Pulsed Current Gain vs. Collector Current

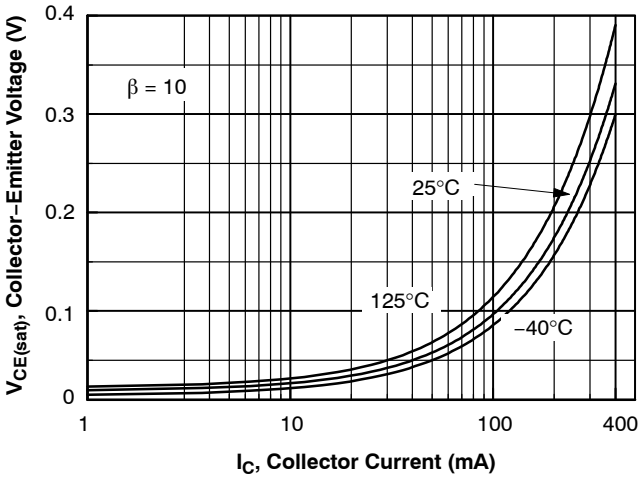


Figure 2. Collector−Emitter Saturation Voltage vs. Collector Current

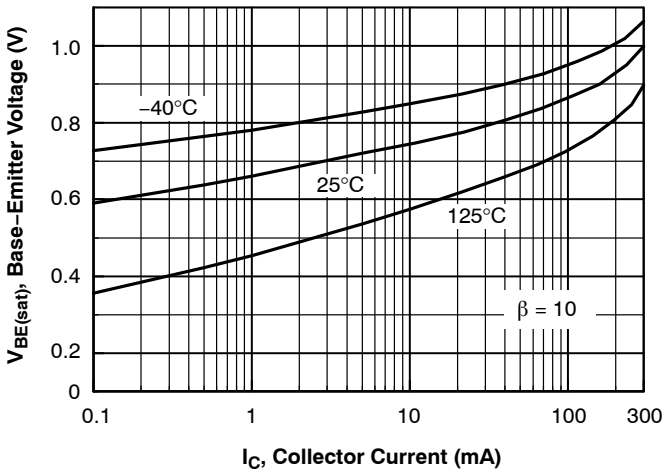


Figure 3. Base−Emitter Saturation Voltage vs. Collector Current

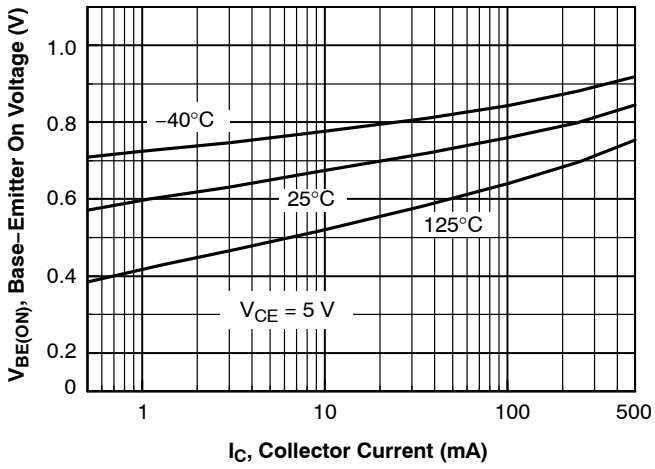


Figure 4. Base Emitter On Voltage vs. Collector Current

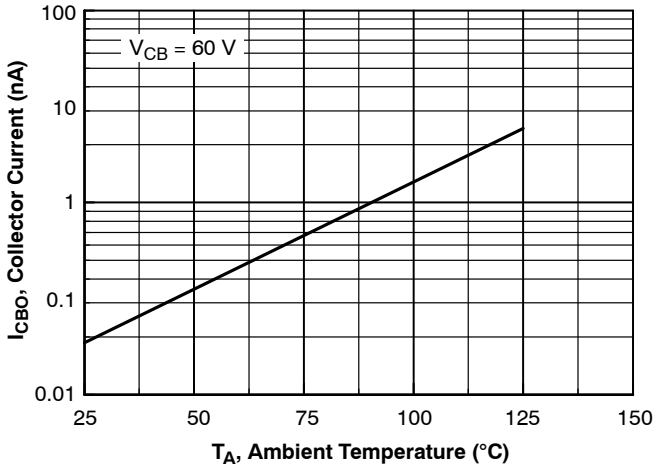


Figure 5. Collector Cut−Off Current vs. Ambient Temperature

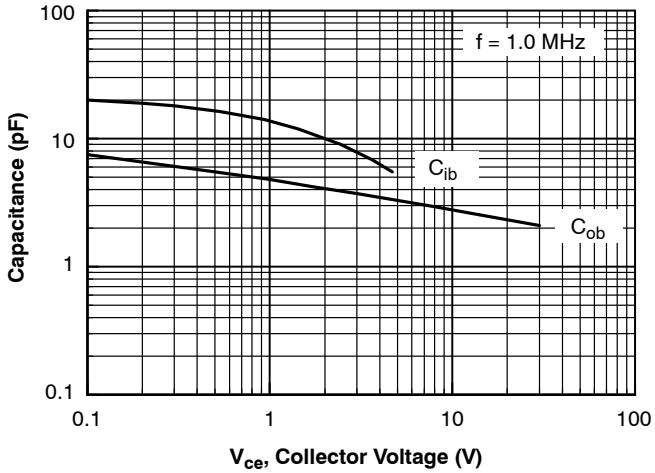


Figure 6. Input and Output Capacitance vs. Reverse Voltage

TYPICAL CHARACTERISTICS (Continued)

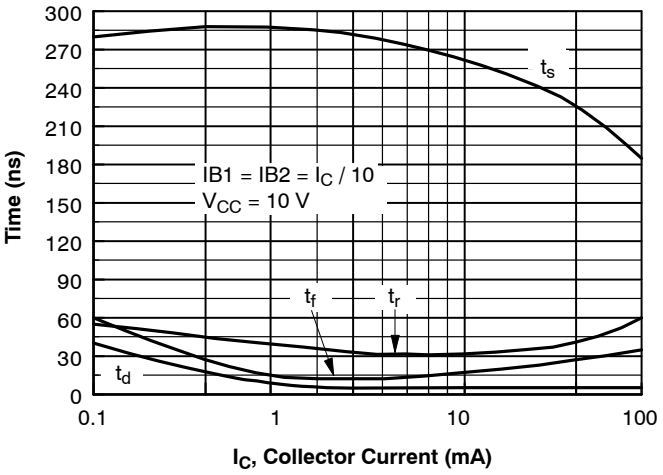


Figure 7. Switching Times vs. Collector Current

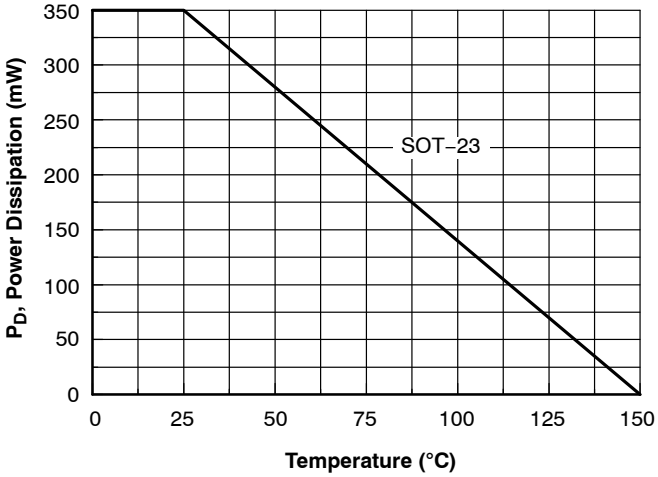


Figure 8. Power Dissipation vs. Ambient Temperature

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
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