ZXTC4591AMC

COMPLEMENTARY DUAL 40V HIGH PERFORMANCE TRANSISTOR

Features

- NPN Transistor
  - V_{CEO} = 40
  - R_{SAT} = 195 mΩ
  - I_C = 2.5A
- PNP Transistor
  - V_{CEO} = -40V
  - R_{SAT} = 350 mΩ
  - I_C = -2A
- Low Saturation Voltage (500mV max @ 1A)
- I_C = 2.5A Continuous Collector Current
- h_{FE} characterized up to 2A

Mechanical Data

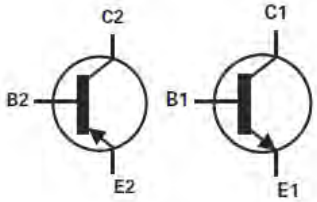
- Case: DFN3020B-8
- UL Flammability Rating 94V-0
- Terminals: Pre-Plated NiPdAu leadframe
- Nominal package height: 0.8mm
- Moisture Sensitivity: Level 1 per J-STD-020
- Solderable per MIL-STD-202, Method 208
- Weight: 0.013 grams (approximate)

Applications

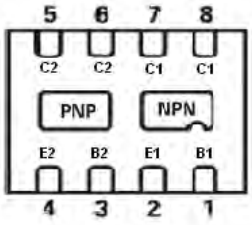
- DC – DC Converters
- Power switches
- Motor control
- LED Backlighting circuits

DFN3020B-8

TOP VIEW



Device Symbol



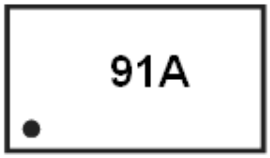
Pin Configuration

Ordering Information

Product	Status	Package	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTC4591AMCTA	Active	DFN3020B-8	91A	7	8	3000

Notes: 1. No purposefully added lead. Halogen and Antimony Free.
2. Diodes Inc's "Green" Policy can be found on our website at http://www.diodes.com

Marking Information



91A = Product type Marking Code
Dot denotes Pin 1

Maximum Ratings

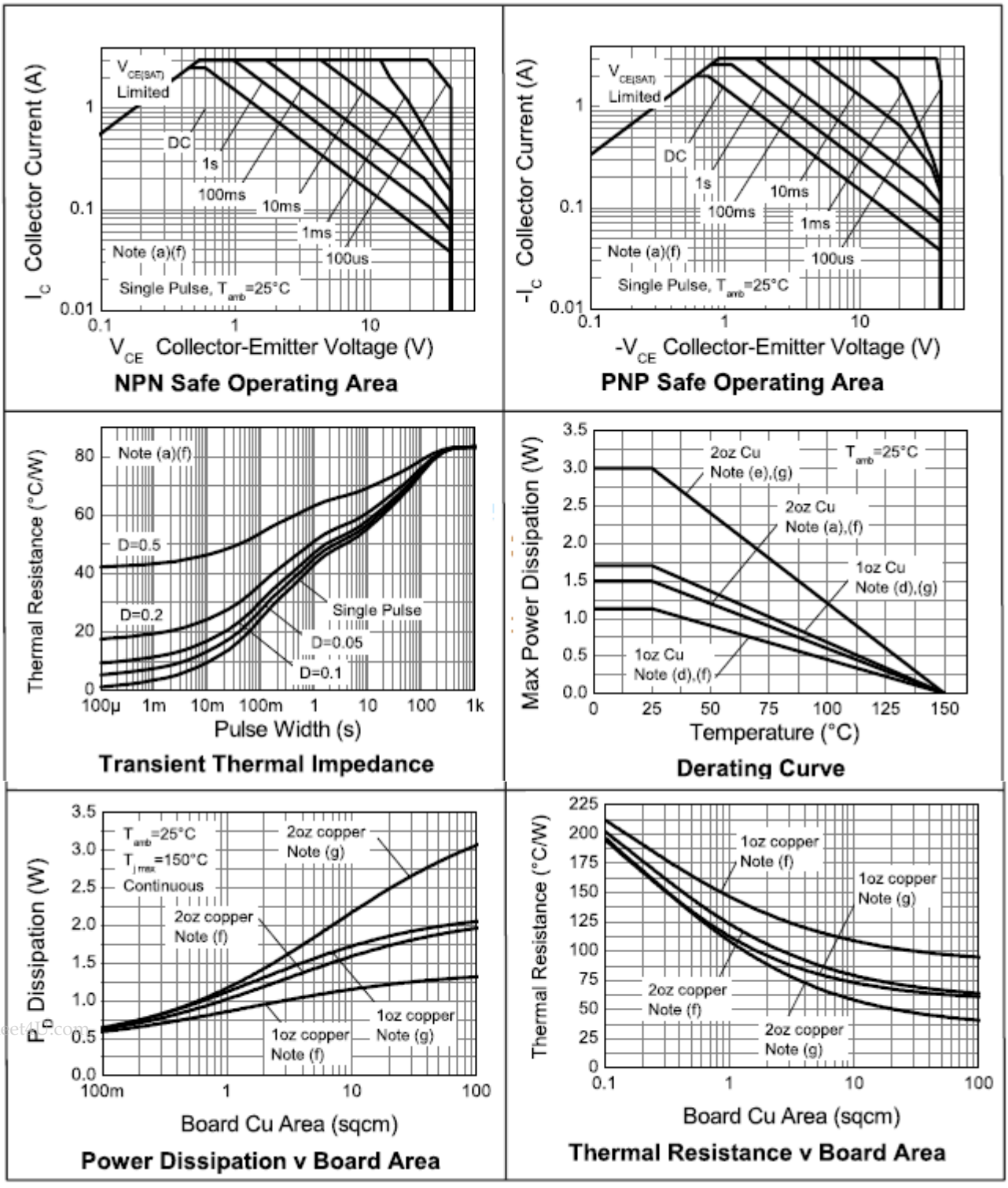
Parameter	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V_{CBO}	40	-40	V
Collector-Emitter Voltage	V_{CEO}	40	-40	V
Emitter-Base Voltage	V_{EBO}	5	-5	V
Peak Pulse Current	I_{CM}	3	-3	A
Continuous Collector Current(a)(f)	I_C	2	-1.5	A
Continuous Collector Current(b)(f)	I_C	2.5	-2.0	A
Base Current	I_B	300		mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation at T_A = 25°C (a) (f) Linear Derating Factor	P_D	1.5 12	W mW/°C
Power Dissipation at T_A = 25°C (b) (f) Linear Derating Factor	P_D	2.45 19.6	W mW/°C
Power Dissipation at T_A = 25°C (c) (f) Linear Derating Factor	P_D	1 8	W mW/°C
Power Dissipation at T_A = 25°C (d) (f) Linear Derating Factor	P_D	1.13 9	W mW/°C
Power Dissipation at T_A = 25°C (d) (g) Linear Derating Factor	P_D	1.7 13.6	W mW/°C
Power Dissipation at T_A = 25°C (e) (g) Linear Derating Factor	P_D	3 24	W mW/°C
Junction to Ambient (a) (f)	$R_{\theta JA}$	83.3	°C/W
Junction to Ambient (b) (f)	$R_{\theta JA}$	51	°C/W
Junction to Ambient (c) (f)	$R_{\theta JA}$	125	°C/W
Junction to Ambient (d) (f)	$R_{\theta JA}$	111	°C/W
Junction to Ambient (d) (g)	$R_{\theta JA}$	73.5	°C/W
Junction to Ambient (e) (g)	$R_{\theta JA}$	41.7	°C/W
Junction Temerature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Notes:
a. For a dual device surface mounted on 8 sq cm single sided 2 oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.
b. Measured at t <5 secs for a dual device surface mounted on 8 sq cm single sided 2 oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.
c. For a dual device surface mounted on 8 sq cm single sided 2 oz copper on FR4 PCB, in still air conditions **with minimal lead connections only.**
d. For a dual device surface mounted on 10 sq cm single sided 1 oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.
e. For a dual device surface mounted on 85 sq cm single sided 2 oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.
f. For a dual device with one active die.
g. For dual device with 2 active die running at equal power.

Thermal Characteristics and Derating information

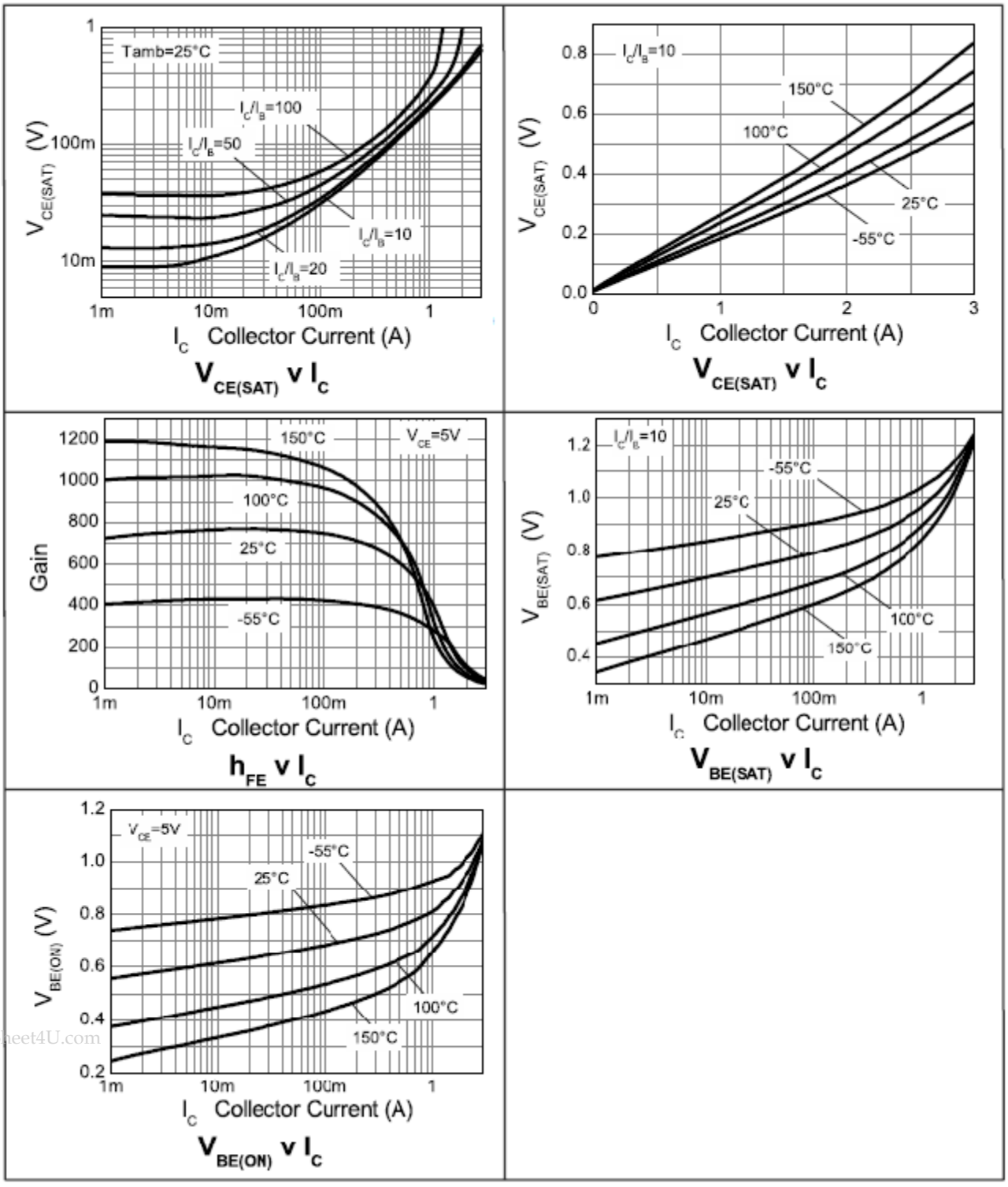


Electrical Characteristics, NPN Transistor (at T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	40	-	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 3)	$V_{(BR)CEO}$	40	-	-	V	I_C = 10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	-	-	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	-	-	100	nA	V_{CB} = 30V
Emitter Cutoff Current	I_{EBO}	-	-	100	nA	V_{EB} = 4V
Collector Emitter Cutoff Current	I_{CES}	-	-	100	nA	V_{CE} = 30V
Static Forward Current Transfer Ratio (Note 3)	h_{FE}	300 300 200 35	- - - -	- 900 - -	-	I_C = 1mA, V_{CE} = 5V I_C = 500mA, V_{CE} = 5V I_C = 1A, V_{CE} = 5V I_C = 2A, V_{CE} = 5V
Collector-Emitter Saturation Voltage (Note 3)	$V_{CE(sat)}$	- -	- -	300 500	mV	I_C = 0.5A, I_B = 50mA I_C = 1A, I_B = 100mA
Base-Emitter Turn-On Voltage (Note 3)	$V_{BE(on)}$	-	-	1.0	V	I_C = 1A, V_{CE} = 5V
Base-Emitter Saturation Voltage (Note 3)	$V_{BE(sat)}$	-	-	1.1	V	I_C = 1A, I_B = 100mA
Output Capacitance	C_{obo}	-	-	10	pF	V_{CB} = -10V. f = 1MHz
Transition Frequency	f_T	150	-	-	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz

Notes: 3. Measured under pulsed conditions.

NPN Characteristics

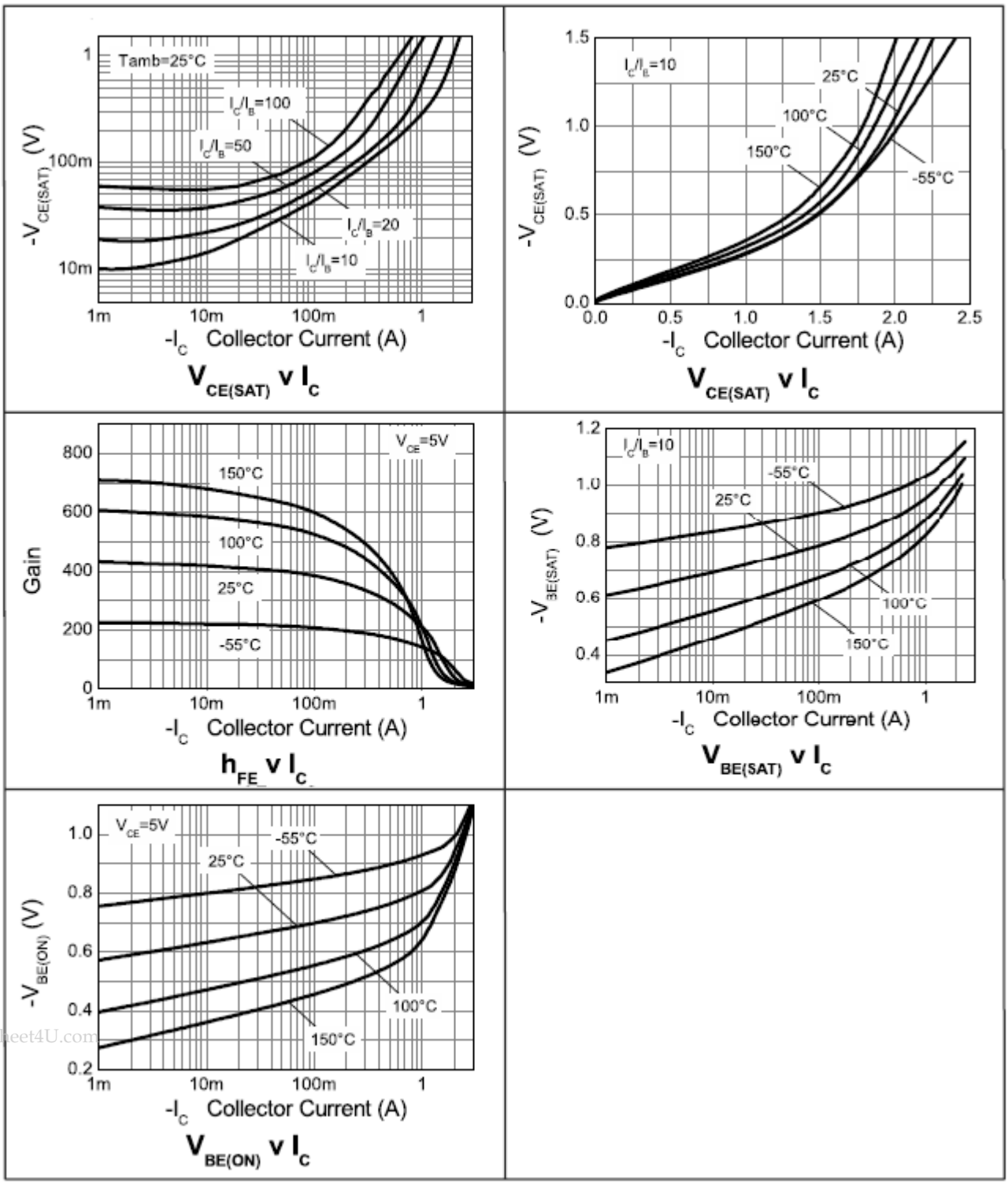


Electrical Characteristics, PNP Transistor @T_A = 25°C unless otherwise specified

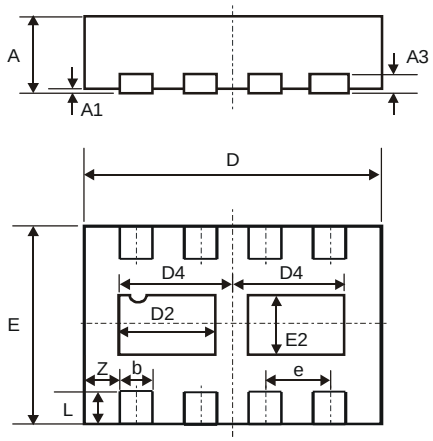
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40	-	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 4)	$V_{(BR)CEO}$	-40	-	-	V	I_C = -10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	-	-	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	-	-	-100	nA	V_{CB} = -30V
Emitter Cutoff Current	I_{EBO}	-	-	-100	nA	V_{EB} = -4V
Collector Emitter Cutoff Current	I_{CES}	-	-	-100	nA	V_{CE} = -30V
Static Forward Current Transfer Ratio (Note 4)	h_{FE}	300 300 250 160 30	- - - - -	- 800 - - -	-	I_C = -1mA, V_{CE} = -5V I_C = -100mA, V_{CE} = -5V I_C = -500mA, V_{CE} = -5V I_C = -1A, V_{CE} = -5V I_C = -2A, V_{CE} = -5V
Collector-Emitter Saturation Voltage (Note 4)	$V_{CE(sat)}$	- - -	- - -	-200 -350 -500	mV	I_C = -0.1A, I_B = -1mA I_C = -0.5A, I_B = -20mA I_C = -1A, I_B = -100mA
Base-Emitter Turn-On Voltage(Note 4)	$V_{BE(on)}$	-	-	-1.0	V	I_C = -1A, V_{CE} = -5V
Base-Emitter Saturation Voltage(Note 4)	$V_{BE(sat)}$	-	-	-1.1	V	I_C = -1A, I_B = -50mA
Output Capacitance	C_{obo}	-	-	10	pF	V_{CB} = -10V. f = 1MHz
Transition Frequency	f_T	150	-	-	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz

Notes: 4. Measured under pulsed conditions.

PNP Characteristics

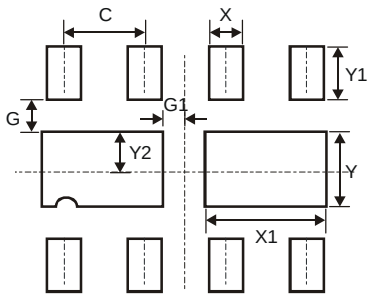


Package Outline Dimensions



DFN3020B-8			
Dim	**Min**	**Max**	**Typ**
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	-	-	0.15
b	0.25	0.35	0.30
D	2.95	3.075	3.00
D2	0.82	1.02	0.92
D4	1.01	1.21	1.11
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.43	0.63	0.53
L	0.25	0.35	0.30
Z	-	-	0.375
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.650
G	0.285
G1	0.090
X	0.400
X1	1.120
Y	0.730
Y1	0.500
Y2	0.365

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