

ZXTC6720MC

DUAL 80V NPN & 70V PNP LOW SATURATION TRANSISTOR COMBINATION

Features

- NPN Transistor
 - $V_{CE0} = 80V$
 - $R_{SAT} = 68\ m\Omega$
 - $I_C = 3.5A$
- PNP Transistor
 - $V_{CE0} = -70V$
 - $R_{SAT} = 117\ m\Omega$
 - $I_C = -2.5A$
- $I_C = -3.5A$ Continuous Collector Current
- Low Saturation Voltage (-185mV max @ 1A -- NPN)
- h_{FE} characterized up to -5A
- **Lead, Halogen, and Antimony Free/RoHS Compliant (Note 1)**
- **"Green" Devices (Note 2)**

Mechanical Data

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

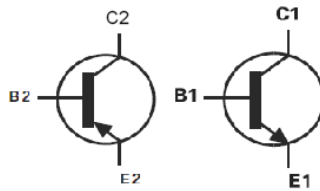
Applications

- DC – DC Converters
- Charging circuits
- Power switches
- Motor control

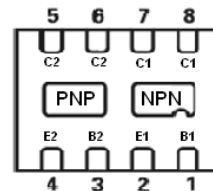
DFN3020B-8



Top View



Device Symbol



Pin Configuration

Ordering Information

Product	Status	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTC6720MCTA	Active	DE4	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

www.DataSheet4U.com



DE4 = Product type Marking Code
Dot denotes Pin 1

Maximum Ratings

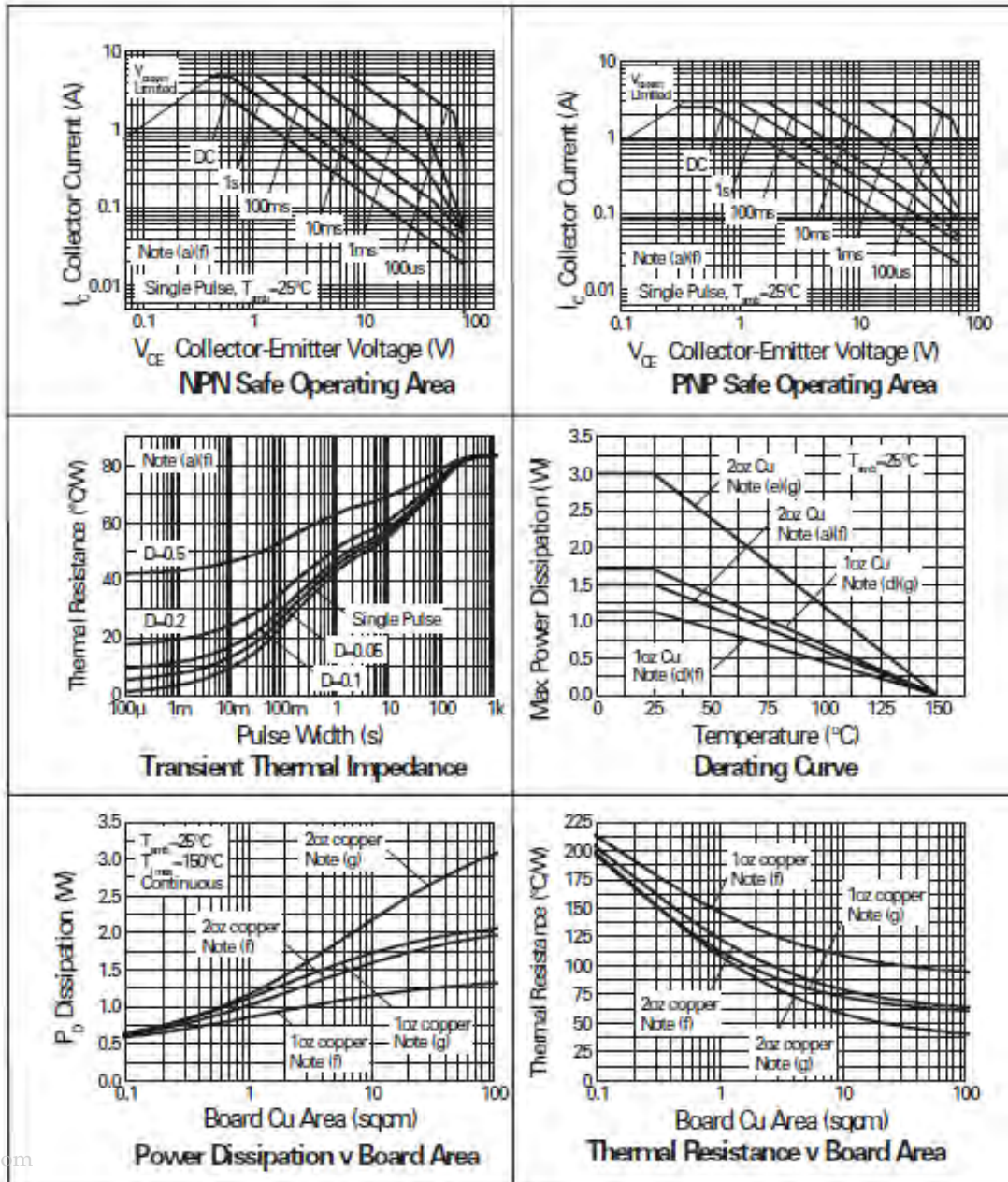
Parameter	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V_{CBO}	100	-70	V
Collector-Emitter Voltage	V_{CEO}	80	-70	V
Emitter-Base Voltage	V_{EBO}	7.5	-7.5	V
Peak Pulse Current	I_{CM}	5	-3	A
Continuous Collector Current (a) (f)	I_C	3.5	-2.5	A
Base Current	I_B		1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation at $T_A = 25^\circ\text{C}$ (a) (f) Linear Derating Factor	P_D	1.5 12	W mW/°C
Power Dissipation at $T_A = 25^\circ\text{C}$ (b) (f) Linear Derating Factor	P_D	2.45 19.6	W mW/°C
Power Dissipation at $T_A = 25^\circ\text{C}$ (c) (f) Linear Derating Factor	P_D	1 8	W mW/°C
Power Dissipation at $T_A = 25^\circ\text{C}$ (d) (f) Linear Derating Factor	P_D	1.13 9	W mW/°C
Power Dissipation at $T_A = 25^\circ\text{C}$ (d) (g) Linear Derating Factor	P_D	1.7 13.6	W mW/°C
Power Dissipation at $T_A = 25^\circ\text{C}$ (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 Temperature	T_J	150	°C
Operating and Storage Temperature Range	T_{STG}	-55 to +150	°C

- Notes:
- 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.
 - 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.
 - 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**.
 - 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.
 - 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.
 - For a dual device with one active die.
 - For dual device with 2 active die running at equal power.

Thermal Characteristics and Derating information



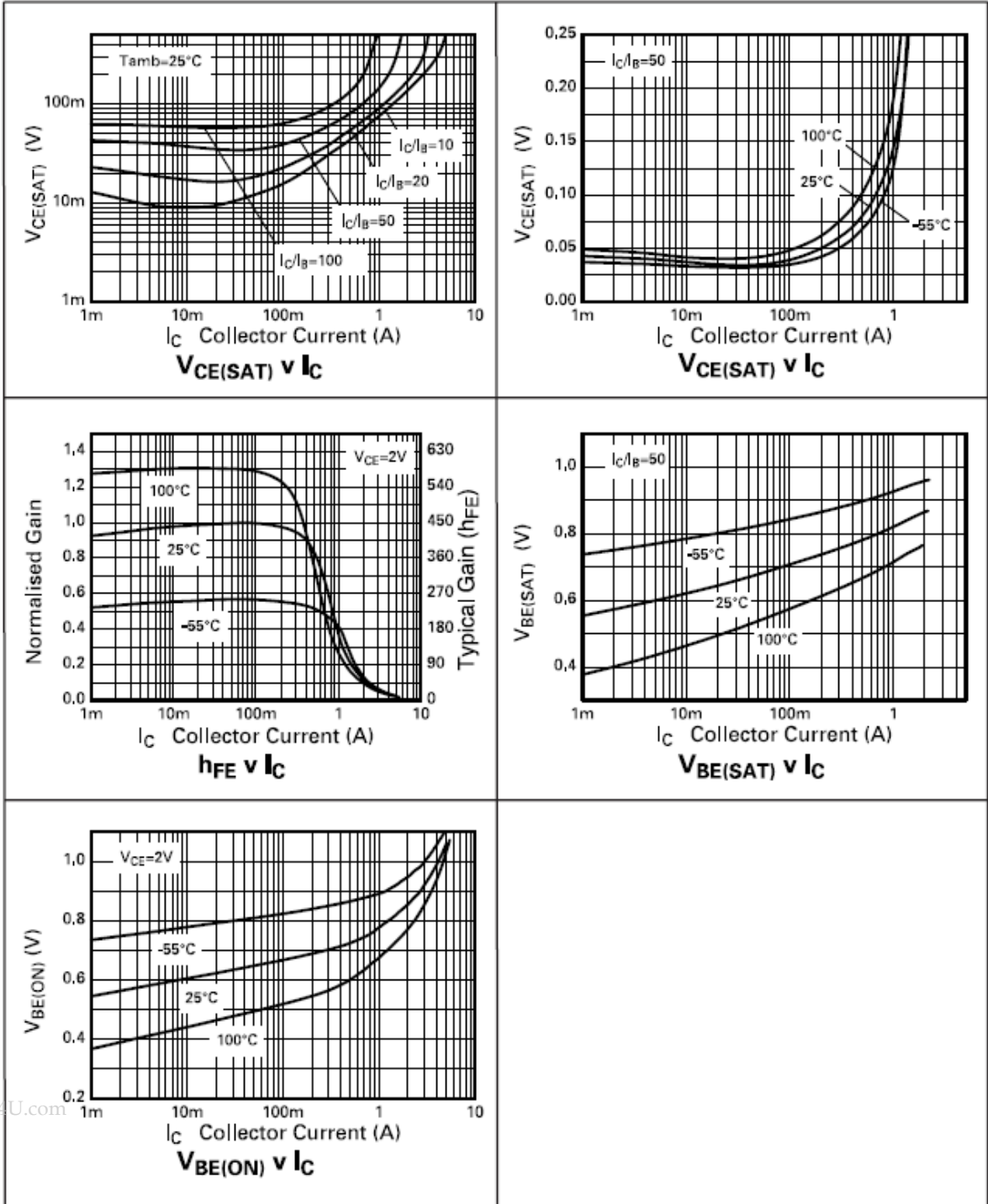
www.DataSheet4U.com

Electrical Characteristics, NPN Transistor (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	100	180	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 3)	$V_{(BR)CEO}$	80	110	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7.5	8.2	-	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	-	25	nA	$V_{CB} = 80\text{V}$
Emitter Cutoff Current	I_{EBO}	-	-	25	nA	$V_{EB} = 6\text{V}$
Collector Emitter Cutoff Current	I_{CES}	-	-	25	nA	$V_{CE} = 65\text{V}$
Static Forward Current Transfer Ratio (Note 3)	h_{FE}	200 300 110 60 20 -	450 450 170 90 30 10	- 900 - - - -	-	$I_C = 10\text{mA}, V_{CE} = 2\text{V}$ $I_C = 200\text{mA}, V_{CE} = 2\text{V}$ $I_C = 1\text{A}, V_{CE} = 2\text{V}$ $I_C = 1.5\text{A}, V_{CE} = 2\text{V}$ $I_C = 3\text{A}, V_{CE} = 2\text{V}$ $I_C = 5\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 3)	$V_{CE(sat)}$	- - - - -	15 45 145 160 240	20 60 185 200 325	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$ $I_C = 0.5\text{A}, I_B = 50\text{mA}$ $I_C = 1\text{A}, I_B = 20\text{mA}$ $I_C = 1.5\text{A}, I_B = 50\text{mA}$ $I_C = 3.5\text{A}, I_B = 300\text{mA}$
Base-Emitter Turn-On Voltage (Note 3)	$V_{BE(on)}$	-	0.96	1.05	V	$I_C = 3.5\text{A}, V_{CE} = 2\text{V}$
Base-Emitter Saturation Voltage (Note 3)	$V_{BE(sat)}$	-	1.09	1.175	V	$I_C = 3.5\text{A}, I_B = 300\text{mA}$
Output Capacitance	C_{obo}	-	11.5	18	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	100	160	-	MHz	$V_{CE} = 10\text{V}, I_C = 50\text{mA}, f = 100\text{MHz}$
Turn-on Time	t_{on}	-	86	-	ns	$V_{CC} = 10\text{V}, I_C = 1\text{A}$
Turn-off Time	t_{off}	-	1128	-	ns	$I_{B1} = I_{B2} = 25\text{mA}$

Notes: 3. Measured under pulsed conditions.

NPN Characteristics



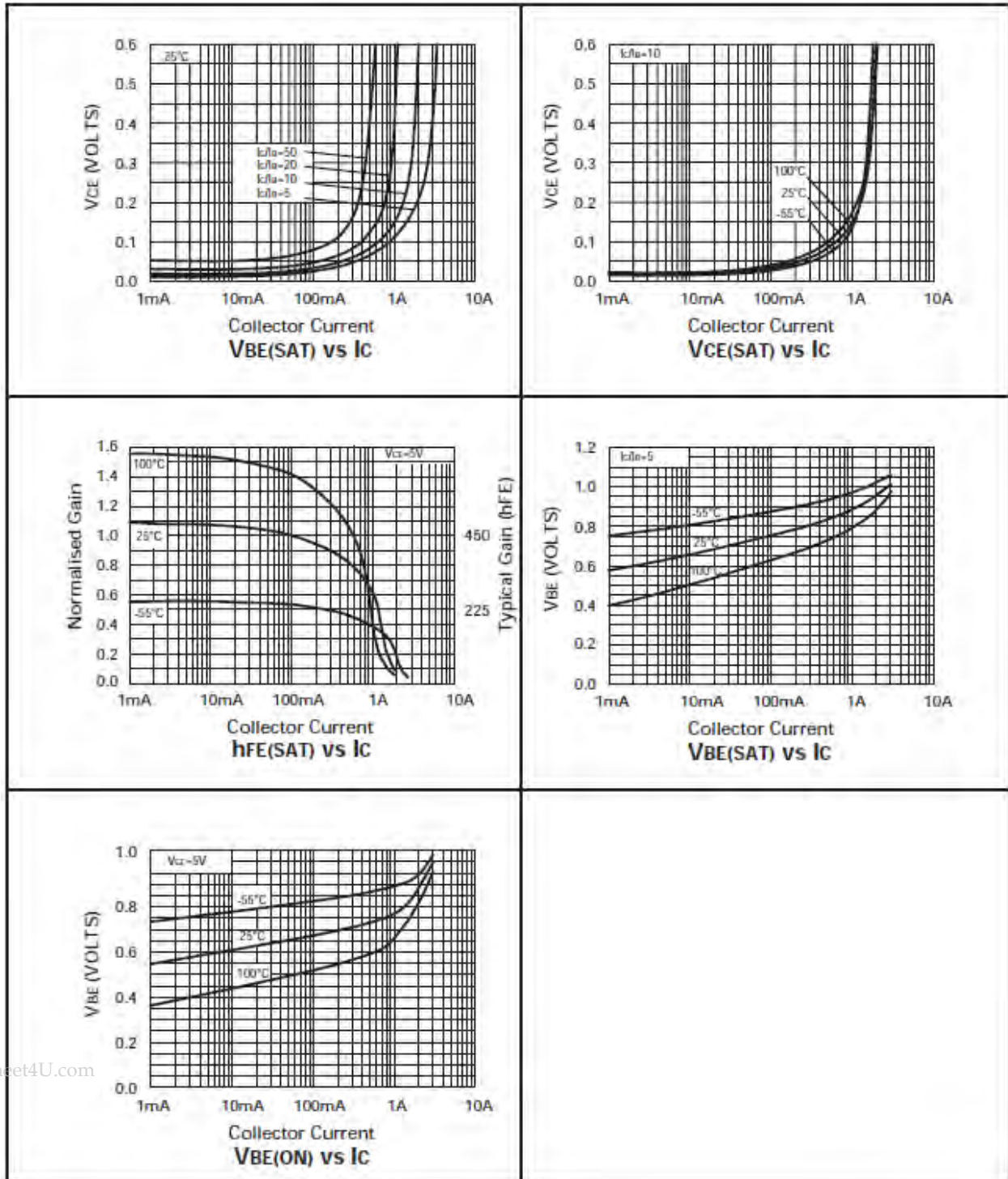
www.DataSheet4U.com

Electrical Characteristics, PNP Transistor @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-70	-150	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 4)	$V_{(BR)CEO}$	-70	-125	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-7.5	-8.5	-	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	-	-25	nA	$V_{CB} = -55\text{V}$
Emitter Cutoff Current	I_{EBO}	-	-	-25	nA	$V_{EB} = -6\text{V}$
Collector Emitter Cutoff Current	I_{CES}	-	-	-25	nA	$V_{CE} = -55\text{V}$
Static Forward Current Transfer Ratio (Note 4)	h_{FE}	300	470	-	-	$I_C = -10\text{mA}, V_{CE} = -5\text{V}$
		300	450	-		$I_C = -100\text{mA}, V_{CE} = -5\text{V}$
		175	275	-		$I_C = -1\text{A}, V_{CE} = -5\text{V}$
		40	60	-		$I_C = -1.5\text{A}, V_{CE} = -5\text{V}$
		-	10	-		$I_C = -3\text{A}, V_{CE} = -5\text{V}$
Collector-Emitter Saturation Voltage (Note 4)	$V_{CE(sat)}$	-	-35	-50	mV	$I_C = -0.1\text{A}, I_B = -10\text{mA}$
		-	-135	-200		$I_C = -0.5\text{A}, I_B = -20\text{mA}$
		-	-140	-220		$I_C = -1.0\text{A}, I_B = -100\text{mA}$
		-	-175	-260		$I_C = -1.5\text{A}, I_B = -200\text{mA}$
Base-Emitter Turn-On Voltage (Note 4)	$V_{BE(on)}$	-	0.78	1.00	V	$I_C = -1.5\text{A}, V_{CE} = -5\text{V}$
Base-Emitter Saturation Voltage (Note 4)	$V_{BE(sat)}$	-	0.94	1.05	V	$I_C = -1.5\text{A}, I_B = -200\text{mA}$
Output Capacitance	C_{obo}	-	14	20	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	150	180	-	MHz	$V_{CE} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$
Turn-on Time	t_{on}	-	40	-	ns	$V_{CC} = -50\text{V}, I_C = -1\text{A}$
Turn-off Time	t_{off}	-	700	-	ns	$I_{B1} = I_{B2} = -50\text{mA}$

Notes: 4. Measured under pulsed conditions.

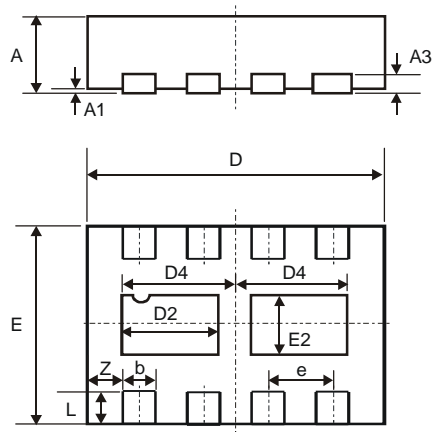
PNP Characteristics



www.DataSheet4U.com

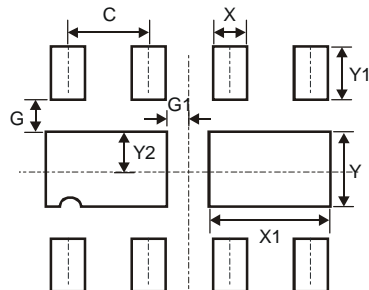
ZXTC6720MC

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

IMPORTANT NOTICE

DIODE INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
 - 1. are intended to implant into the body, or
 - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2009, Diodes Incorporated

www.diodes.com