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[Diodes Incorporated](#)
[ZXT6717MCTA](#)

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COMPLEMENTARY 15V NPN & 12V PNP LOW SATURATION TRANSISTOR

Features

NPN Transistor

- $BV_{CEO} > 15V$
- $I_C = 4.5A$ Continuous Collector Current
- Low Saturation Voltage (100mV max @ 1A)
- $R_{SAT} = 45m\Omega$ for a low equivalent On-Resistance

PNP Transistor

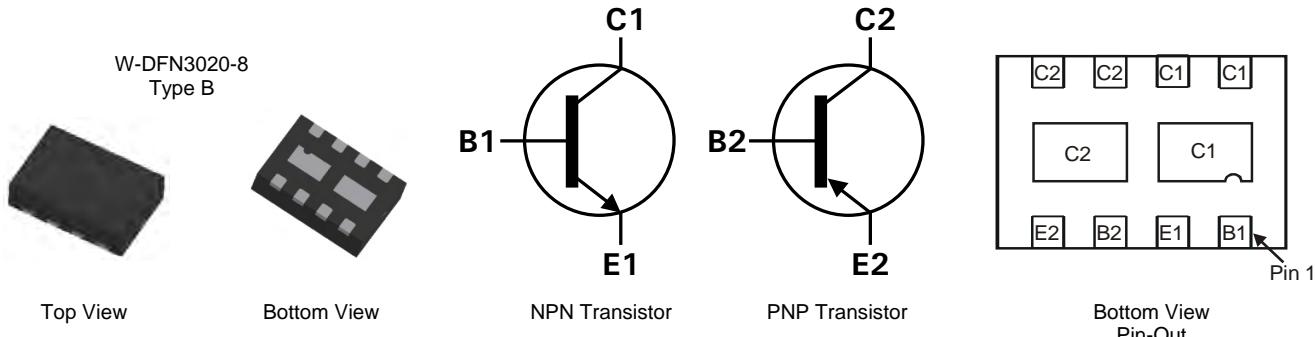
- $BV_{CEO} > -12V$
- $I_C = -4A$ Continuous Collector Current
- Low Saturation Voltage (-140mV max @ -1A)
- $R_{SAT} = 60m\Omega$ for a low equivalent On-Resistance
- h_{FE} characterized up to 12A for high current gain hold up
- Low profile 0.8mm high package for thin applications
- $R_{\theta JA}$ efficient, 40% lower than SOT26
- 6mm² footprint, 50% smaller than TSOP6 and SOT26
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free, "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP capable (Note 4)

Mechanical Data

- Case: W-DFN3020-8 Type B
- Nominal package height: 0.8mm
- Case material: molded plastic, "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - NiPdAu, Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.013 grams (approximate)

Applications

- DC – DC Converters
- Charging circuits
- Power switches
- Motor control
- LED Backlighting circuits
- Portable applications



Ordering Information (Note 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTC6717MCTA	AEC-Q101	DA1	7	8	3,000
ZXTC6717MCQTA	Automotive	DA1	7	8	3,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
 5. For packaging details, go to our website at <http://www.diodes.com>

Marking Information



DA1 = Product type Marking Code
Dot denotes Pin 1

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

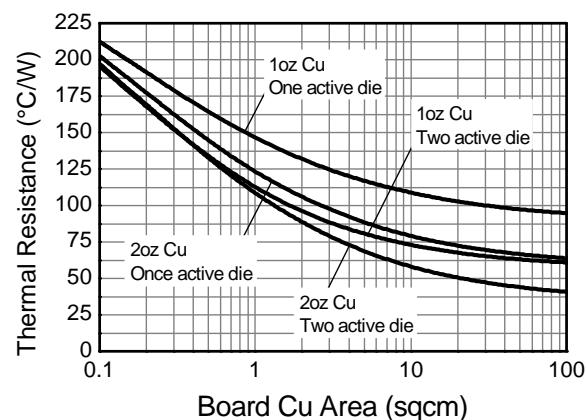
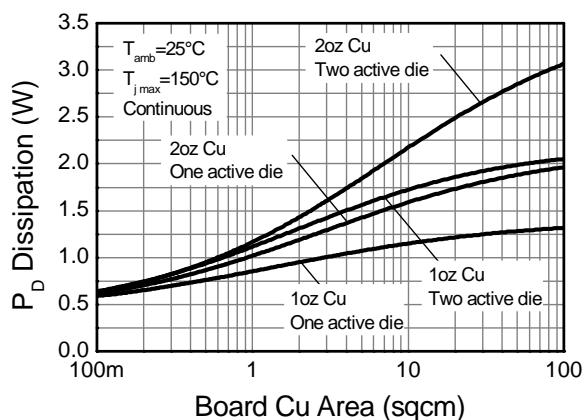
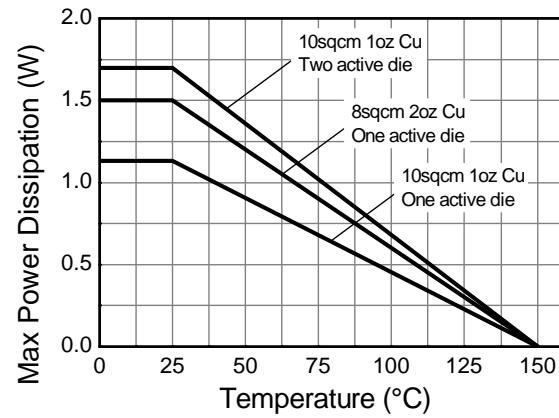
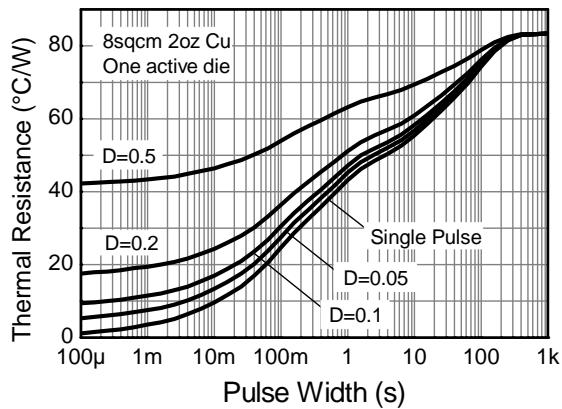
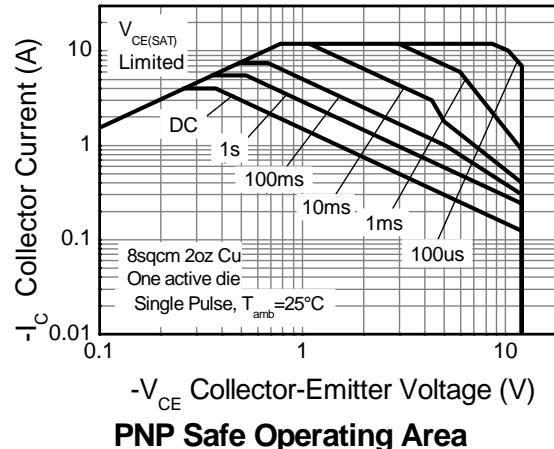
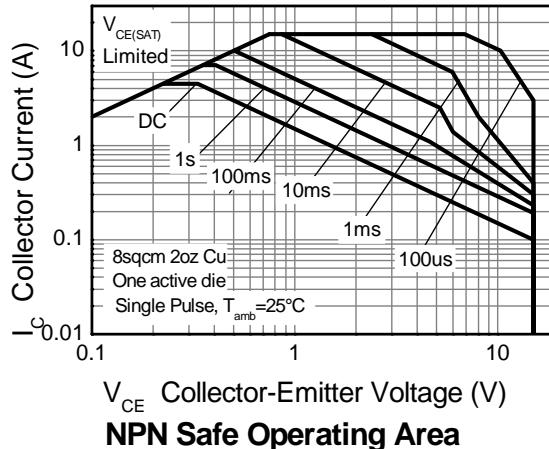
Characteristic	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V_{CBO}	40	-20	V
Collector-Emitter Voltage	V_{CEO}	15	-12	V
Emitter-Base Voltage	V_{EBO}	7	-7	V
Peak Pulse Current	I_{CM}	15	-12	A
Continuous Collector Current	I_C	4.5	-4	A
(Notes 6 & 9)		5	-4.45	
Base Current	I_B	1		A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	NPN	PNP	Unit
Power Dissipation Linear Derating Factor	P_D	1.5		W mW/°C
		12		
		2.45		
		19.6		
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.13		°C/W
		8		
		1.7		
		13.6		
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	83.3		°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	51.0		
		111		
		73.5		
		17.1		
		-55 to +150		°C

- Notes:
- 6. For a dual device surface mounted on 28mm x 28mm (8cm²) FR4 PCB with high coverage of single sided 2 oz copper, in still air conditions; the device is measured when operating in a steady-state condition. The heatsink is split in half with the exposed collector pads connected to each half.
 - 7. Same as note (6), except the device is measured at $t < 5$ sec.
 - 8. Same as note (6), except the device is surface mounted on 31mm x 31mm (10cm²) FR4 PCB with high coverage of single sided 1oz copper.
 - 9. For a dual device with one active die.
 - 10. For dual device with 2 active die running at equal power.
 - 11. Thermal resistance from junction to solder-point (on the exposed collector pads).

Thermal Characteristics and Derating Information

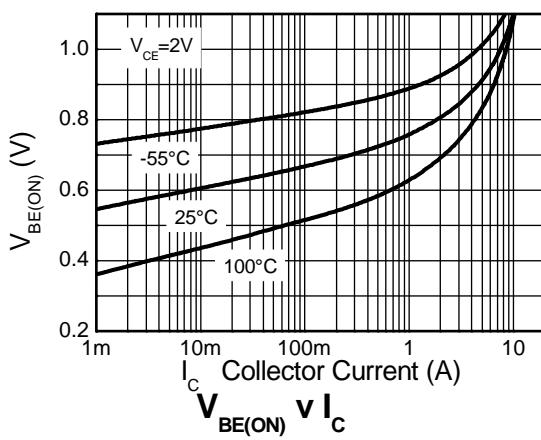
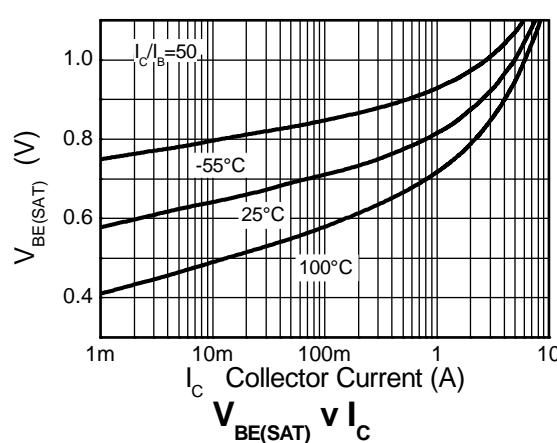
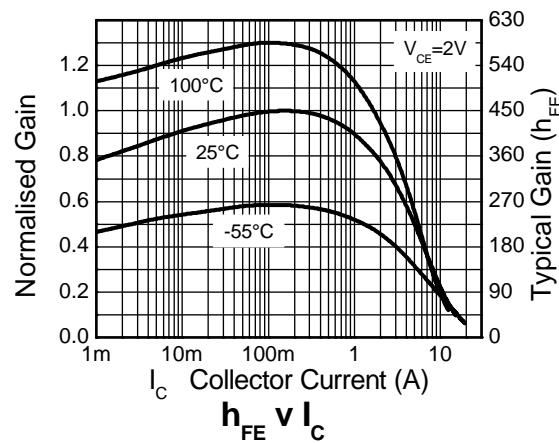
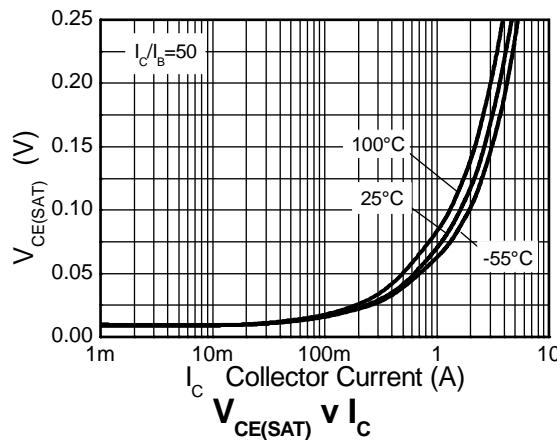
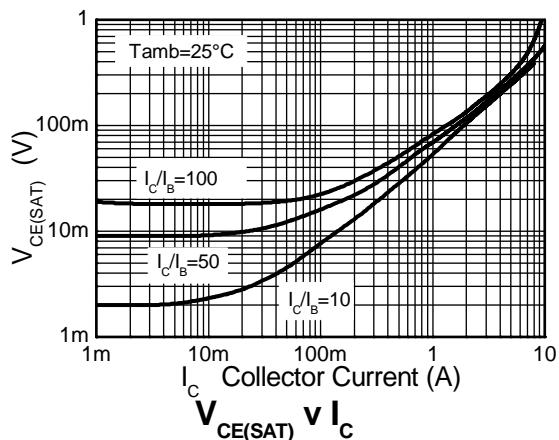


NPN - Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	40	70	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	15	18	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.2	-	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	-	100	nA	$V_{\text{CB}} = 30\text{V}$
Emitter Cutoff Current	I_{EBO}	-	-	100	nA	$V_{\text{EB}} = 6\text{V}$
Collector Emitter Cutoff Current	I_{CES}	-	-	100	nA	$V_{\text{CE}} = 12\text{V}$
Static Forward Current Transfer Ratio (Note 12)	h_{FE}	200 300 200 150 -	415 450 320 240 80	- - - - -	-	$I_C = 10\text{mA}, V_{\text{CE}} = 2\text{V}$ $I_C = 200\text{mA}, V_{\text{CE}} = 2\text{V}$ $I_C = 3\text{A}, V_{\text{CE}} = 2\text{V}$ $I_C = 5\text{A}, V_{\text{CE}} = 2\text{V}$ $I_C = 12\text{A}, V_{\text{CE}} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 12)	$V_{\text{CE}(\text{sat})}$	-	8 70 165 240 200	14 100 200 310 -	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$ $I_C = 1\text{A}, I_B = 10\text{mA}$ $I_C = 3\text{A}, I_B = 50\text{mA}$ $I_C = 4.5\text{A}, I_B = 50\text{mA}$ $I_C = 4.5\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-On Voltage (Note 12)	$V_{\text{BE}(\text{on})}$	-	0.88	0.96	V	$I_C = 4.5\text{A}, V_{\text{CE}} = 2\text{V}$
Base-Emitter Saturation Voltage (Note 12)	$V_{\text{BE}(\text{sat})}$	-	0.94	1.05	V	$I_C = 4.5\text{A}, I_B = 50\text{mA}$
Output Capacitance	C_{obo}	-	30	40	pF	$V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	80	120	-	MHz	$V_{\text{CE}} = 10\text{V}, I_C = 50\text{mA}, f = 100\text{MHz}$
Turn-on Time	t_{on}	-	120	-	ns	$V_{\text{CC}} = 10\text{V}, I_C = 1\text{A}$
Turn-off Time	t_{off}	-	160	-	ns	$I_{B1} = I_{B2} = 10\text{mA}$

Notes: 12. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

NPN – Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

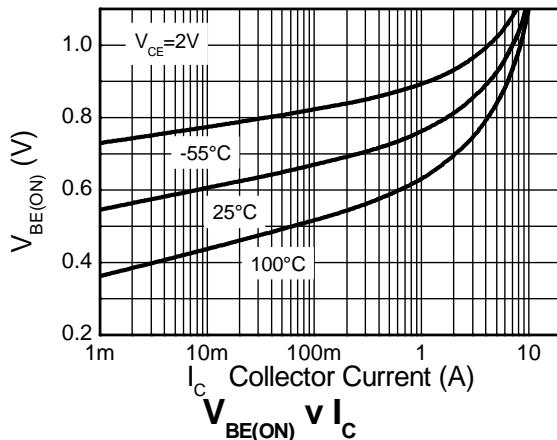
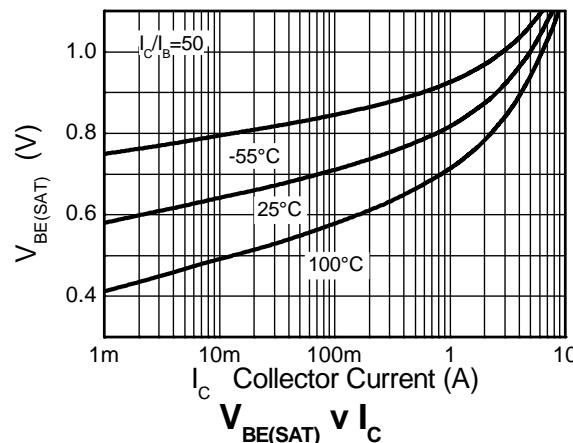
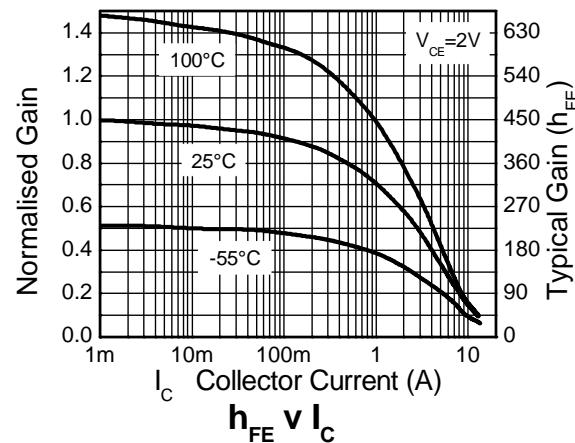
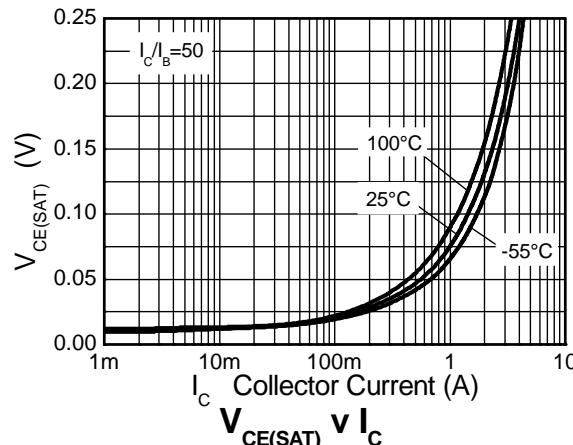
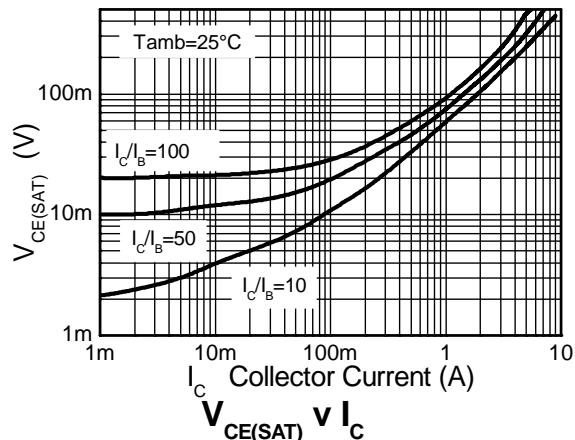


PNP - Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-20	-35	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	-12	-25	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	-	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	-	-100	nA	$V_{\text{CB}} = -16\text{V}$
Emitter Cutoff Current	I_{EBO}	-	-	-100	nA	$V_{\text{EB}} = -6\text{V}$
Collector Emitter Cutoff Current	I_{CES}	-	-	-100	nA	$V_{\text{CE}} = -10\text{V}$
Static Forward Current Transfer Ratio (Note 12)	h_{FE}	300 300 180 60 45	475 450 275 100 70	- - - - -	-	$I_C = -10\text{mA}, V_{\text{CE}} = -2\text{V}$ $I_C = -100\text{mA}, V_{\text{CE}} = -2\text{V}$ $I_C = -2.5\text{A}, V_{\text{CE}} = -2\text{V}$ $I_C = -8\text{A}, V_{\text{CE}} = -2\text{V}$ $I_C = -10\text{A}, V_{\text{CE}} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 12)	$V_{\text{CE}(\text{sat})}$	- - - - -	-10 -100 -100 -195 -240	-17 -140 -150 -300 -310	mV	$I_C = -0.1\text{A}, I_B = -10\text{mA}$ $I_C = -1\text{A}, I_B = -10\text{mA}$ $I_C = -1.5\text{A}, I_B = -50\text{mA}$ $I_C = -3\text{A}, I_B = -50\text{mA}$ $I_C = -4\text{A}, I_B = -150\text{mA}$
Base-Emitter Turn-On Voltage (Note 12)	$V_{\text{BE}(\text{on})}$	-	-0.87	-0.96	V	$I_C = -4\text{A}, V_{\text{CE}} = -2\text{V}$
Base-Emitter Saturation Voltage (Note 12)	$V_{\text{BE}(\text{sat})}$	-	-0.97	-1.07	V	$I_C = -4\text{A}, I_B = -150\text{mA}$
Output Capacitance	C_{obo}	-	21	30	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	100	110	-	MHz	$V_{\text{CE}} = -10\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$
Turn-on Time	t_{on}	-	70	-	ns	$V_{\text{CC}} = -6\text{V}, I_C = -2\text{A}$
Turn-off Time	t_{off}	-	130	-	ns	$I_{B1} = I_{B2} = -50\text{mA}$

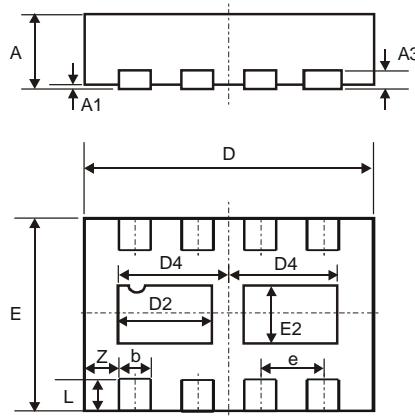
Notes: 12. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

PNP – Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

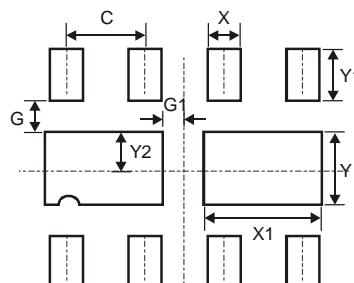


W-DFN3020-8 Type B			
Dim	Min	Max	Typ
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	-	-	0.15
b	0.25	0.35	0.30
D	2.95	3.075	3.00
D2	0.82	1.02	0.92
D4	1.01	1.21	1.11
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.43	0.63	0.53
L	0.25	0.35	0.30
Z	-	-	0.375

All Dimensions in mm

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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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