

ZXTP25020DG

20V PNP MEDIUM POWER HIGH GAIN TRANSISTOR IN SOT223

Features

- BV_{CEO} > -20V
- BV_{CBO} > -25V
- I_C = -6A High Continuous Current
- h_{FE} > 200 @ -1A and Low Saturation Voltage
- Extremely Low Equivalent On-Resistance R_{CE(sat)} 42mΩ
- Complementary NPN Type: ZXTN25020DG
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

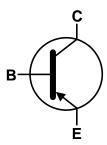
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads.
 Solderable per MIL-STD-202, Method 208 (€3)
- Weight: 0.112 grams (Approximate)

Applications

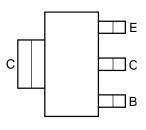
- Load Switch
- Motor Drive
- Regulator Circuit







Device Symbol



Top View Pin-Out

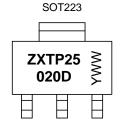
Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25020DGTA	AEC-Q101	ZXTP25020DG	7	12	1,000

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/quality/lead_free.html 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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



ZXTP25 020D= Product Type Marking Code YWW = Date Code Marking Y or \overline{Y} = Last Digit of Year (ex: 5= 2015) WW or $\overline{W}W$ = Week Code (01~53)



Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	$V_{\sf CEO}$	-20	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	Ic	-6	Α
Peak Pulse Current	I _{CM}	-10	Α

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit		
	(Note 5)		3		
Power Dissipation	(Note 6)	D	2	W	
Power Dissipation	(Note 7)	P_D	1.6		
	(Note 8)		1.2	1	
	(Note 5)		41.7		
Thermal Resistance, Junction to Ambient	(Note 6)	Ъ	62.5		
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{ heta JA}$	78.1	°C/W	
	(Note 8)		104	1	
Thermal Resistance Junction to Lead (Note 9)		$R_{ hetaJL}$	12.9		
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C		

ESD Ratings (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	С

Notes:

- 5. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.

- 6. Same as Note 6, except the device is mounted on 25mm x 25mm 2oz copper.

 7. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.

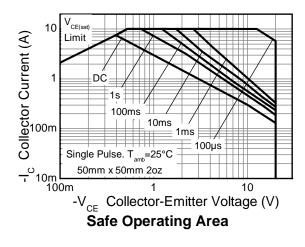
 8. Same as Note 6, except the device is mounted on minimum recommended pad layout.

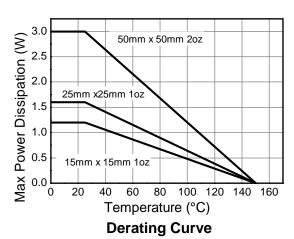
 9. Thermal resistance from junction to solder-point (at the end of the collector lead).

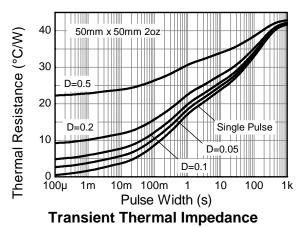
 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

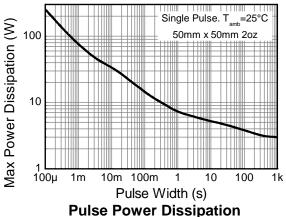


Thermal Characteristics and Derating Information











Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

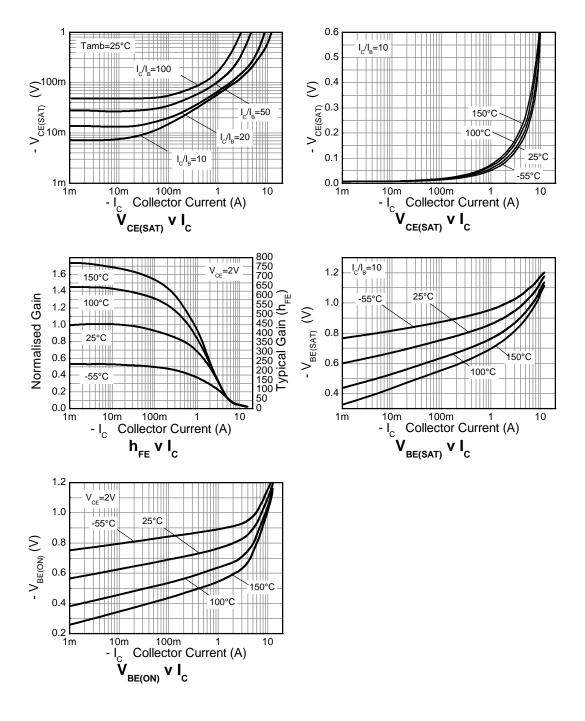
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-25	-55	_	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	-20	-45	_	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.3	_	V	I _E = -100μA
Emitter-Base Breakdown Voltage	BV _{ECO}	-4	-8.5	_	V	I _E = -100μA
Collector-Base Cut-Off Current	I _{CBO}	_	<1	50	nA	V _{CB} = -25V
Emitter Cut-Off Current	I _{EBO}	_	<1	100	nA	V _{EB} = -5.6V
DC Current Gain (Note 11)	h _{FE}	300 200 25 —	450 310 50 20	900 — — —	_	I _C = -10mA, V _{CE} = -2V I _C = -1A, V _{CE} = -2V I _C = -6A, V _{CE} = -2V I _C = -10A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	1111	-50 -150 -190 -250	-65 -215 -245 -355	mV	$I_{C} = -1A$, $I_{B} = -100mA$ $I_{C} = -1A$, $I_{B} = -10mA$ $I_{C} = -2A$, $I_{B} = -40mA$ $I_{C} = -6A$, $I_{B} = -600mA$
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	_	-1.05	-1.15	V	I _C = -6A, I _B = -600mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	_	-0.91	-1	V	I _C = -6A, V _{CE} = -2V
Input Capacitance	C _{ibo}	_	157	400	pF	V _{EB} = -0.5V, f = 1MHz
Output Capacitance	C _{obo}	_	21	30	pF	V _{CB} = -10V, f = 1MHz
Current Gain-Bandwidth Product	f _T	_	290	_	MHz	$V_{CE} = -10V, I_{C} = -50mA,$ f=50MHz
Delay Time	t _d	_	14.2	_	ns	
Rise Time	t _r		16.3		ns	$V_{CC} = -10V, I_{C} = -1A$
Turn-On Time	ts	_	186	_	ns	$I_{B1} = -I_{B2} = -50 \text{mA}$
Turn-Off Time	t _f		32.7	_	ns	

Note:

11. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.



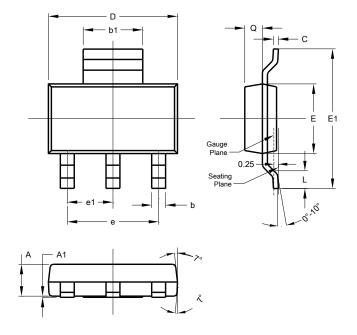
Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)





Package Outline Dimensions

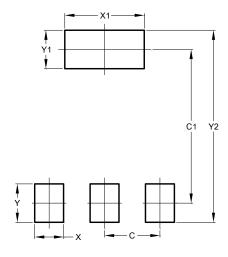
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT223					
Dim	Min	Max	Тур		
Α	1.55	1.65	1.60		
A1	0.010	0.15	0.05		
b	0.60	0.80	0.70		
b1	2.90	3.10	3.00		
С	0.20	0.30	0.25		
D	6.45	6.55	6.50		
Е	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	-	-	4.60		
e1	-	-	2.30		
L	0.85	1.05	0.95		
Q	0.84	0.94	0.89		
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)
С	2.30
C1	6.40
Х	1.20
X1	3.30
Υ	1.60
Y1	1.60
Y2	8.00



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