20V PNP HIGH GAIN TRANSISTOR IN SOT89

Features

- BV_{CEO} > -20V
- High current capability Max Continuous Current I_C = -6A
- Low saturation voltage $V_{CE(sat)}$ < -47mV @ I_C = -1A
- $R_{CE(sat)}$ = 28mΩ
- P_D = 2.4W
- Complementary part number ZXTN19020DZ
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free, "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

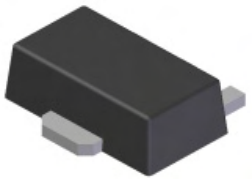
Mechanical Data

- Case: SOT89
- Moisture Sensitivity: Level 1 per J-STD-020
- UL Flammability Rating 94V-0
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (Approximate)

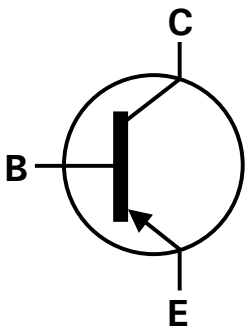
Application

- Power disconnect switch
- Battery chargers
- High side drivers
- Motor drive

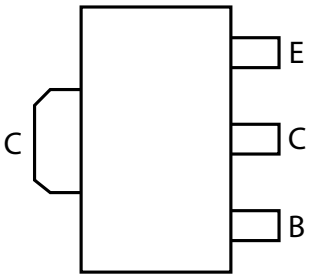
SOT89



Top View



Device symbol



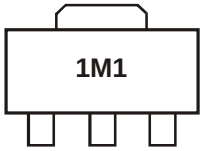
Pin-out Top

Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP19020DZTA	1M1	7	12	1,000

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

Marking Information



1M1 = Product Type Marking Code

Maximum Ratings @T_A = 25°C unless otherwise specified

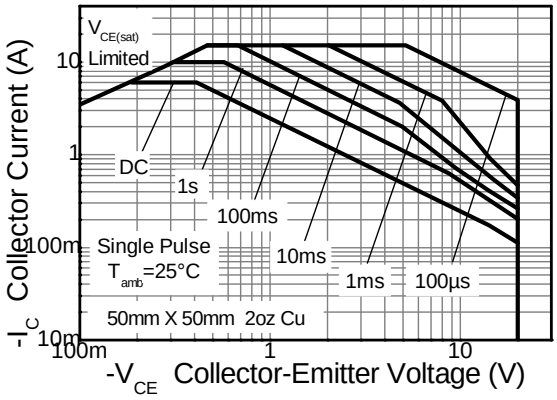
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{ECO}	-4	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current (Note 6)	I_C	-6	A
Base current	I_B	-1	A
Peak Pulse Current	I_{CM}	-15	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

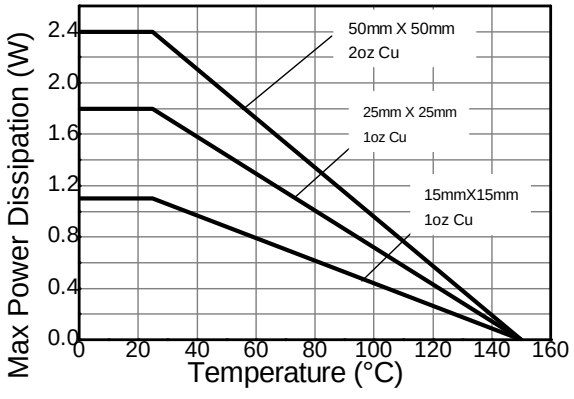
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) Linear derating factor	P_D	1.1 8.8	W mW/°C
Power Dissipation (Note 5) Linear derating factor	P_D	1.8 14.4	W mW/°C
Power Dissipation (Note 6) Linear derating factor	P_D	2.4 19.2	W mW/°C
Power Dissipation (Note 7) Linear derating factor	P_D	4.46 35.7	W mW/°C
Power Dissipation (Note 8) Linear derating factor	P_D	26.7 213	W mW/°C
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	117	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	68	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	51	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	117	°C/W
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	4.69	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
4. For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
5. Mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. Mounted on 50mm x 50mm x 0.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
7. As note 6 above measured at t<5 seconds.
8. Junction to case (collector tab). Typical

Thermal Characteristics

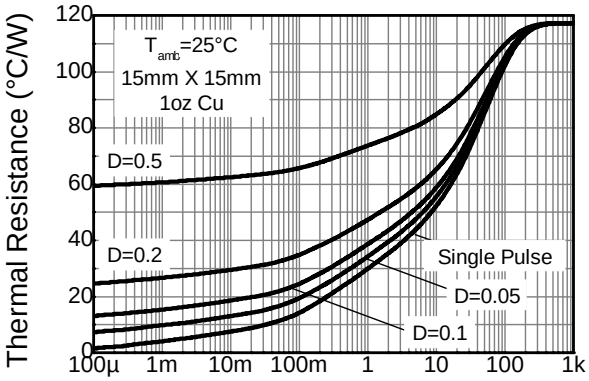


Safe Operating Area

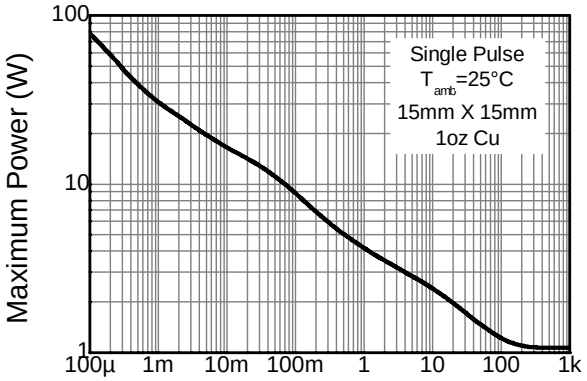


Derating Curve

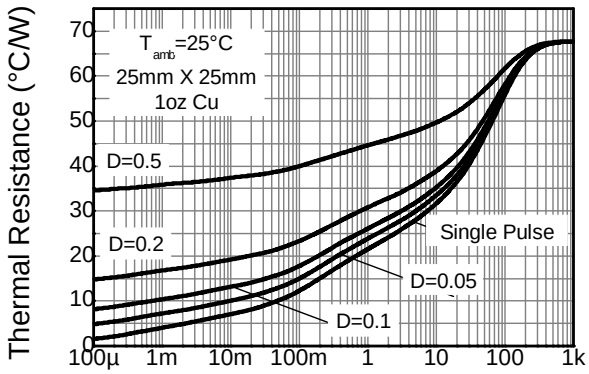
Thermal Characteristics (- Continued)



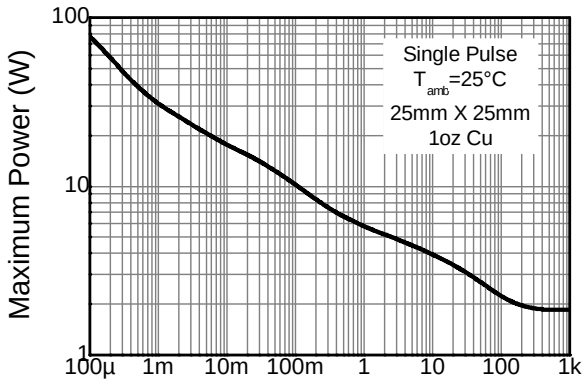
Transient Thermal Impedance



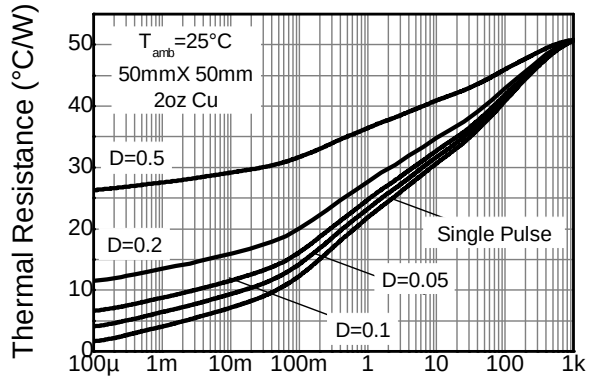
Pulse Power Dissipation



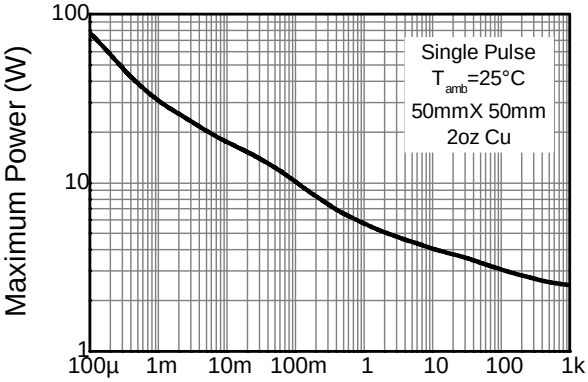
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



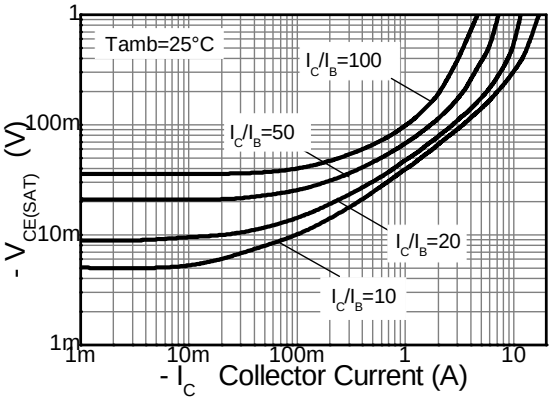
Pulse Power Dissipation

Electrical Characteristics @T_A = 25°C unless otherwise specified

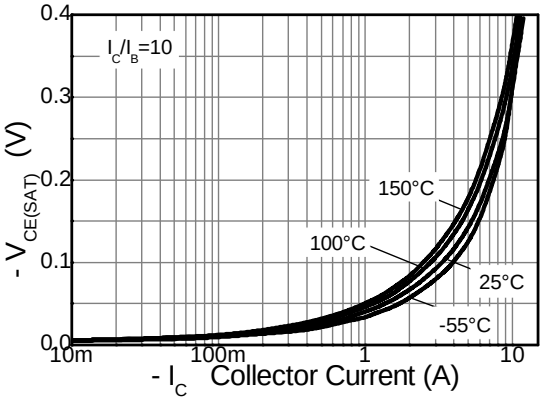
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-25	-55	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Notes 9)	BV_{CEO}	-20	-50	-	V	I_C = -10mA
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECX}	-4	-8.6	-	V	I_E = -100µA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECO}	-4	-8.6	-	V	I_E = -100µA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.2	-	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	-	< -1	-50	nA	V_{CB} = -25V
		-	-	-500		V_{CB} = -25V, T_A = 100°C
Emitter Cutoff Current	I_{EBO}	-	< -1	-50	nA	V_{EB} = -5.6V
DC current transfer Static ratio (Notes 9)	h_{FE}	300	450	900	-	I_C = -100mA, V_{CE} = -2V
		200	290	-		I_C = -2A, V_{CE} = -2V
		65	110	-		I_C = -6A, V_{CE} = -2V
		-	25	-		I_C = -15A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Notes 9)	$V_{CE(sat)}$	-	-40	-47	mV	I_C = -1A, I_B = -100mA
		-	-100	-130		I_C = -1A, I_B = -10mA
		-	-115	-145		I_C = -2A, I_B = -40mA
		-	-225	-275		I_C = -6A, I_B = -300mA
Base-Emitter Saturation Voltage (Notes 9)	$V_{BE(sat)}$	-	-1000	-1100	mV	I_C = -6A, I_B = -300mA
Base-Emitter Turn-on Voltage (Notes 9)	$V_{BE(on)}$	-	-865	-1000	mV	I_C = -6A, V_{CE} = -2V
Transitional Frequency (Notes 9)	f_T	-	176	-	MHz	I_C = -50mA, V_{CE} = -10V, f = 50MHz
Input Capacitance	C_{ibo}	-	-	400	pF	V_{EB} = -0.5V, f = 1MHz
Output capacitance	C_{obo}	-	36	45	pF	V_{CB} = -10V, f = 1MHz
Delay time	t_d	-	23	-	ns	V_{CC} = -10V, I_C = -1A, I_{B1} = -I_{B2} =-50mA
Rise time	t_r	-	18.4	-	ns	
Storage time	t_s	-	266	-	ns	
Fall time	t_f	-	49.6	-	ns	

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤2%.

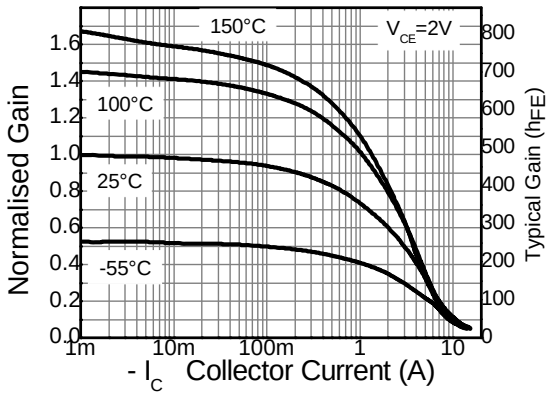
Typical Electrical Characteristics



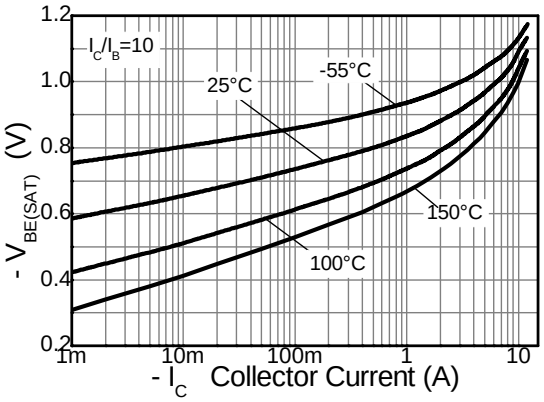
$V_{CE(SAT)}$ v I_C



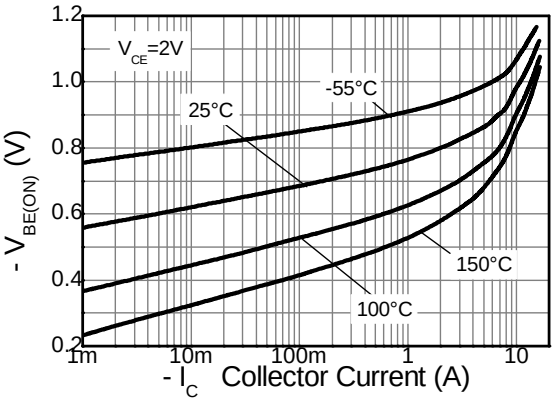
$V_{CE(SAT)}$ v I_C



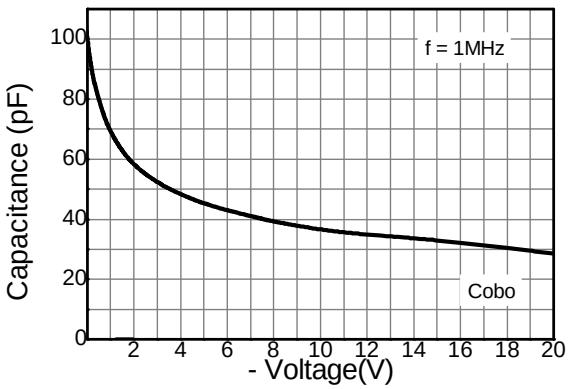
h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

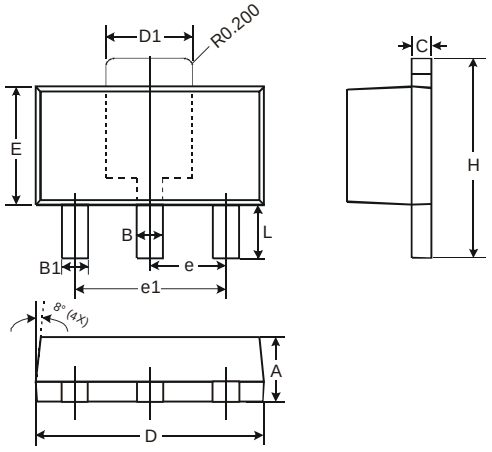


$V_{BE(ON)}$ v I_C



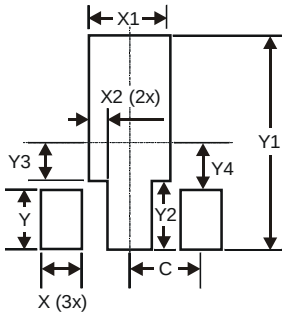
Capacitance v Voltage

Package Outline Dimensions



SOT89		
Dim	**Min**	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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