

Features

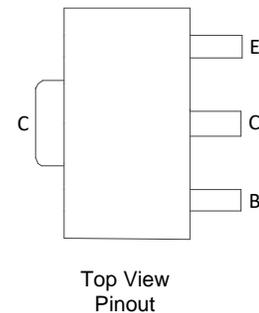
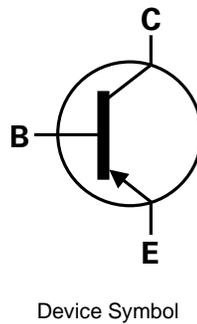
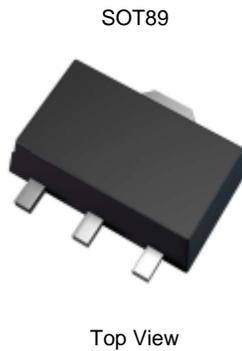
- $BV_{CEO} > -140V$
- $I_C = -3A$ High Continuous Current
- Low Saturation Voltage $V_{CE(sat)} < -75mV @ -0.5A$
- $R_{sat} = 85m\Omega$ for a Low Equivalent On-Resistance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet ([ZXTP2014ZQ](#))**

Application

- Motor driving
- Line switching
- High-side switches
- Subscriber line interference cards (SLIC)

Mechanical Data

- Package: SOT89
- Package 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: 0.05 grams (Approximate)

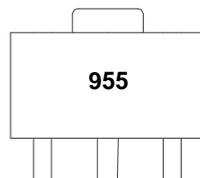


Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
ZXTP2014ZTA	SOT89	955	7	12	1,000	Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



955 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-180	V
Collector-Emitter Voltage	V_{CEO}	-140	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-10	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1.5	W
Linear Derating Factor		12	mW/ $^\circ\text{C}$
Power Dissipation (Note 6)	P_D	2.1	W
Linear Derating Factor		16.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	83	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 6)		60	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	18.5	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
5. For a device surface-mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single-sided 1oz copper, in still air conditions; device measured when operating in steady-state condition.
 6. Same as Note 5, except the device is mounted on 50mm x 50mm x 1.6mm single-sided 1oz weight copper.

Thermal Characteristics and Derating Information

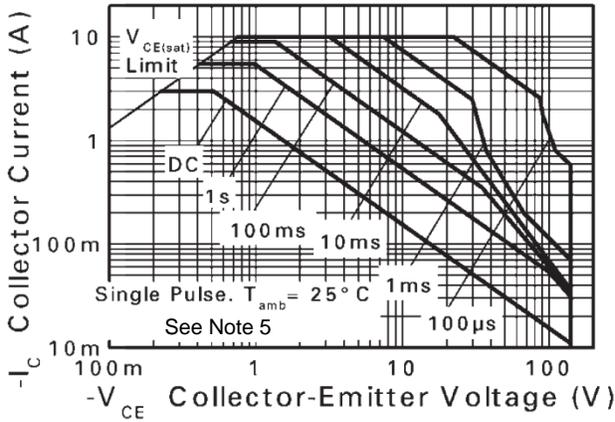


Figure 1. Safe Operating Area

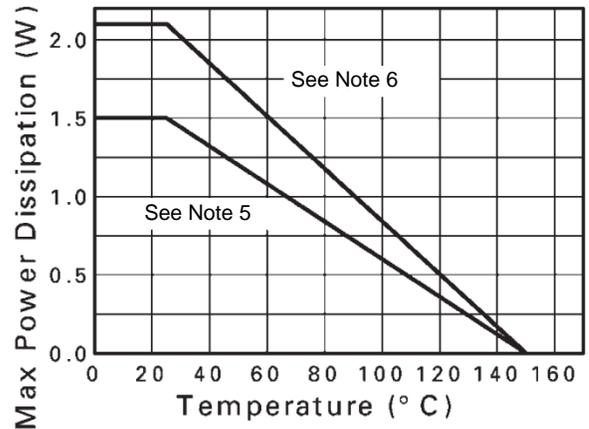


Figure 2. Derating Curve

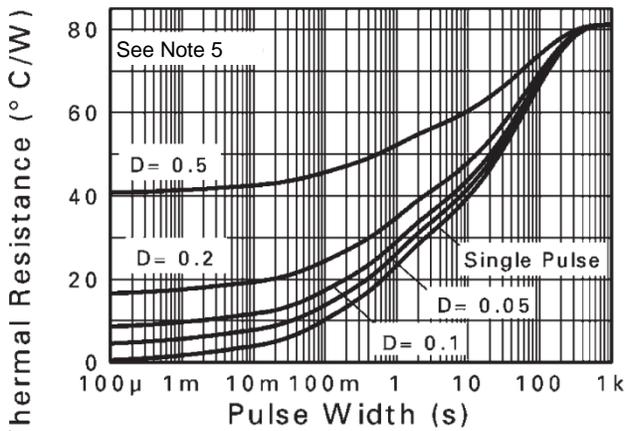


Figure 3. Transient Thermal Impedance

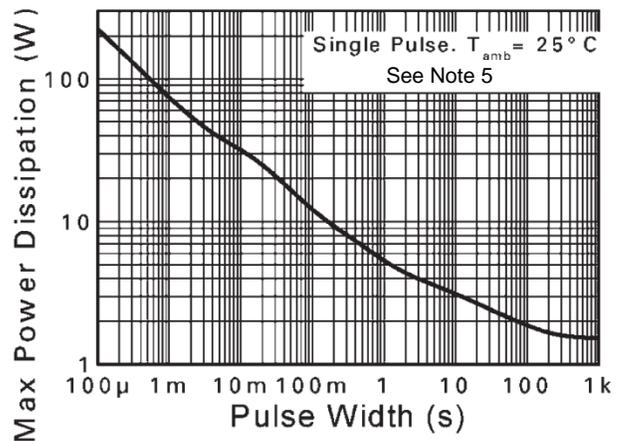


Figure 4. Pulse Power Dissipation

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}	-180	-200	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CER}	-180	-200	—	V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector- Emitter Breakdown Voltage (Note 7)	BV_{CEO}	-140	-160	—	V	$I_E = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7.0	-8.0	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	—	-1	-20	nA	$V_{CB} = -150\text{V}$
			—	-0.5	μA	$V_{CB} = -150\text{V}$, $T_A = +100^\circ\text{C}$
Collector-Emitter Cutoff Current	I_{CER}	—	-1	-20	nA	$V_{CB} = -150\text{V}$, $R \leq 1\text{k}\Omega$
			—	-0.5	μA	$V_{CB} = -150\text{V}$, $T_A = +100^\circ\text{C}$, $R \leq 1\text{k}\Omega$
Emitter Cutoff Current	I_{EBO}	—	-1	-10	nA	$V_{EB} = -6\text{V}$
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	-37	-60	mV	$I_C = -0.1\text{A}$, $I_B = -5\text{mA}$
			-50	-75		$I_C = -0.5\text{A}$, $I_B = -50\text{mA}$
			-80	-115		$I_C = -1\text{A}$, $I_B = -100\text{mA}$
			-255	-330		$I_C = -3\text{A}$, $I_B = -300\text{mA}$
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	-970	-1010	mV	$I_C = -3\text{A}$, $I_B = -300\text{mA}$
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	—	-800	-900	mV	$I_C = -3\text{A}$, $V_{CE} = -5\text{V}$
Static Forward Current Transfer Ratio (Note 7)	h_{FE}	100	255	—	—	$I_C = -10\text{mA}$, $V_{CE} = -5\text{V}$
		100	200	300		$I_C = -1\text{A}$, $V_{CE} = -5\text{V}$
		45	100	—		$I_C = -3\text{A}$, $V_{CE} = -5\text{V}$
		—	5	—		$I_C = -10\text{A}$, $V_{CE} = -5\text{V}$
Transitional Frequency	f_T	—	120	—	MHz	$I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$, $f = 50\text{MHz}$
Output Capacitance	C_{obo}	—	33	—	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Switching Time	t_{on}	—	42	—	ns	$I_C = -1\text{A}$, $V_{CC} = -50\text{V}$,
	t_{off}	—	636	—		$I_{B1} = -I_{B2} = -100\text{mA}$

Note: 7. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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

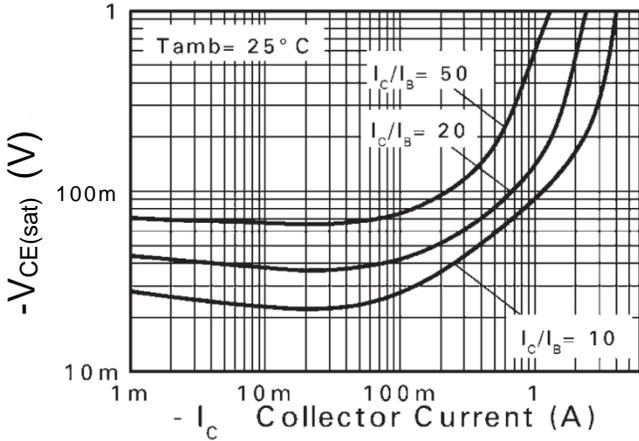


Figure 5. $V_{CE(sat)}$ vs. I_C

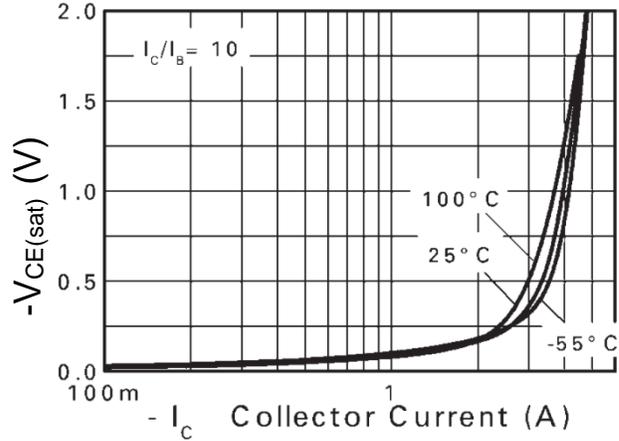


Figure 6. $V_{CE(sat)}$ vs. I_C

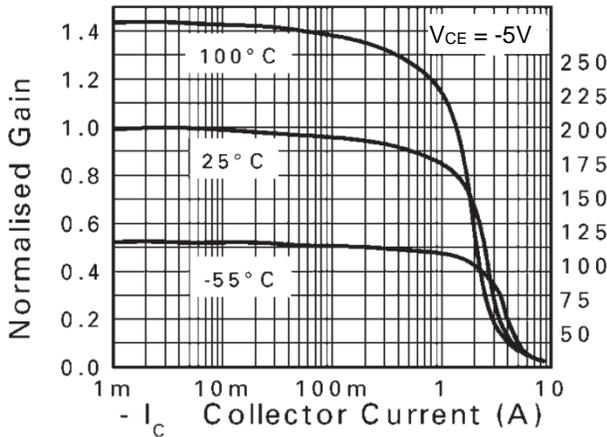


Figure 7. h_{FE} vs. I_C

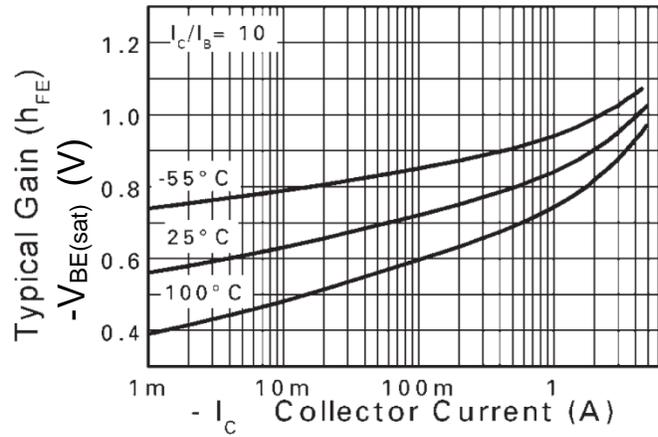


Figure 8. $V_{BE(sat)}$ vs. I_C

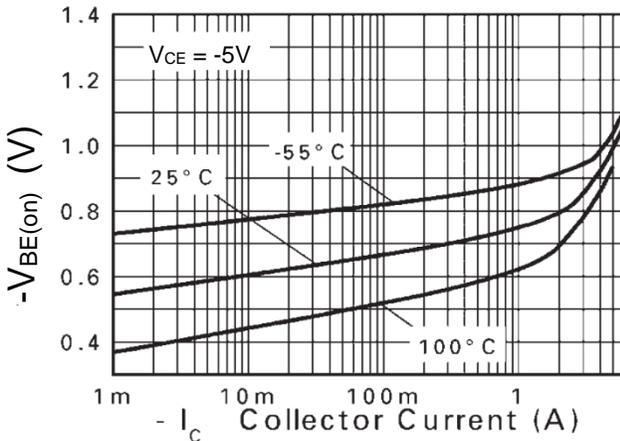
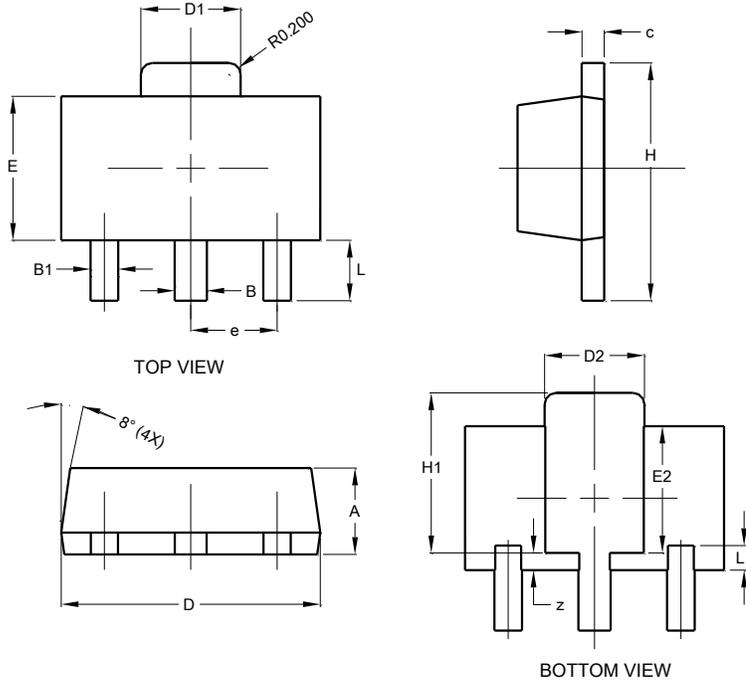


Figure 9. $V_{BE(on)}$ vs. I_C

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT89

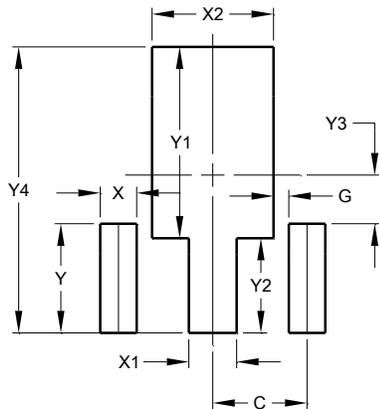


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT89



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

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