

Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirement of automotive applications.

Features

- $BV_{CEO} > -140V$
- $I_C = -3A$ Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Very Low Saturation Voltage
- $R_{SAT} = 85m\Omega @ I_C -3A$ for Low Equivalent On-Resistance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXTP2014ZQ is suitable for automotive applications requiring specific change control and is AEC-Q101 qualified, is PPAP capable, and is manufactured in IATF16949:2016 certified facilities.**

Mechanical Data

- Case: SOT89
- 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 (E3)
- Weight: 0.05 grams (Approximate)

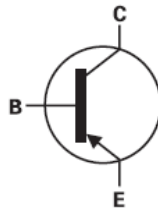
Applications

- Motor Driving
- Line Switching
- High Side Switches
- Subscriber Line Interface Cards (SLIC)

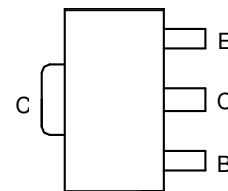
SOT89



Top View



Device Schematic



Pin-Out Top View

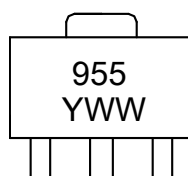
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTP2014ZQTA	Automotive	955	7	12	1000

- 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

SOT89



955 = Product Type Marking Code
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 9 = 2019)
 WW = Week Code (01 to 53)

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

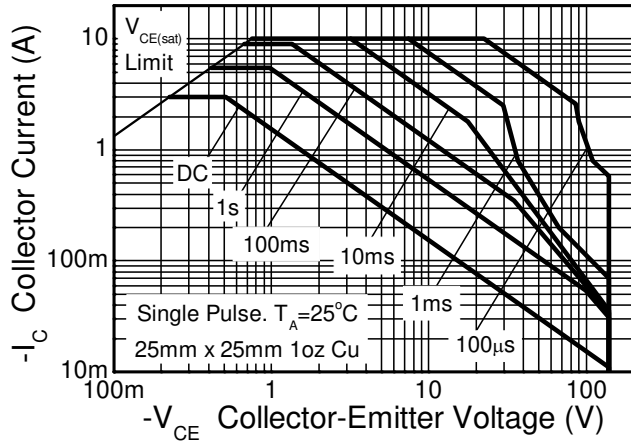
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P _D	1.5	W
		12	
		2.1	
Thermal Resistance, Junction to Ambient	R _{θJA}	16.8	°C/W
		83	
Operating and Storage Temperature Range	T _J , T _{STG}	60	°C
		-55 to +150	

ESD Ratings (Note 7)

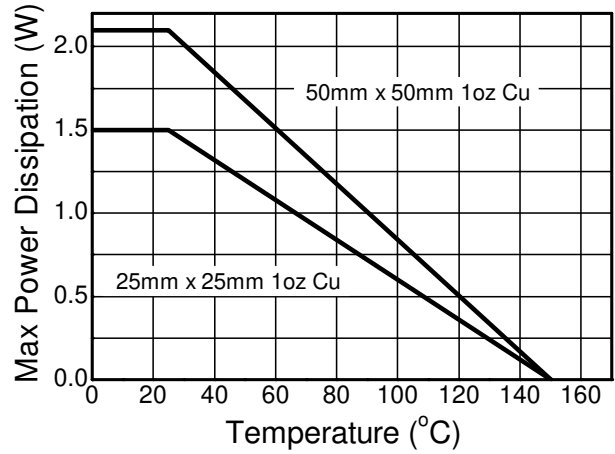
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge — Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge — Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 25mm × 25mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
 6. Same as Note 5, except the device is mounted on 50mm × 50mm 1oz copper.
 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

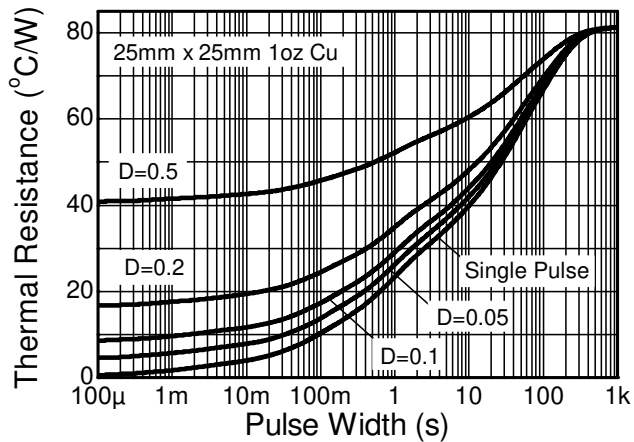
Thermal Characteristics and Derating Information



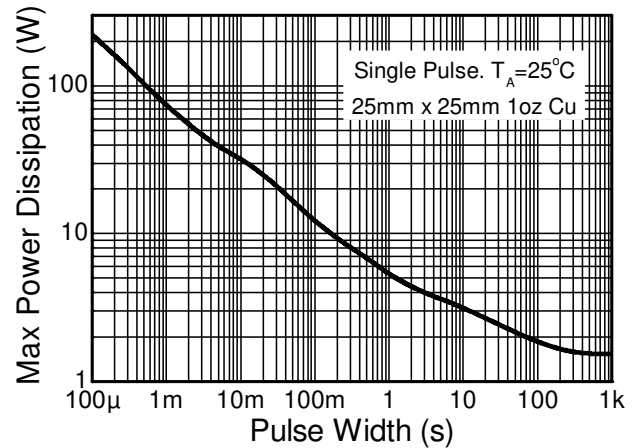
Safe Operating Area



Derating Curve



Transient Thermal Impedance



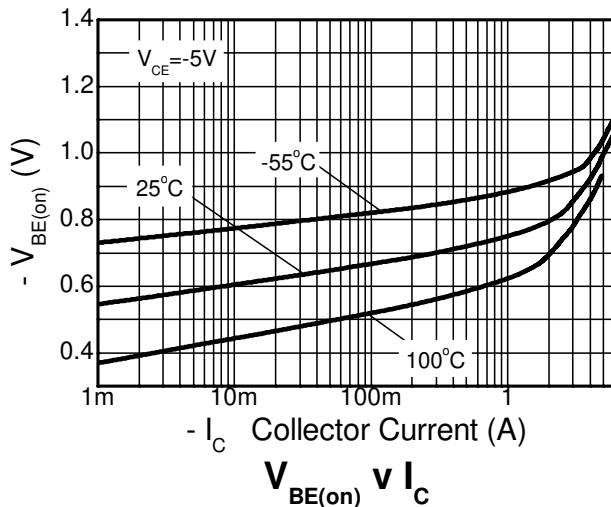
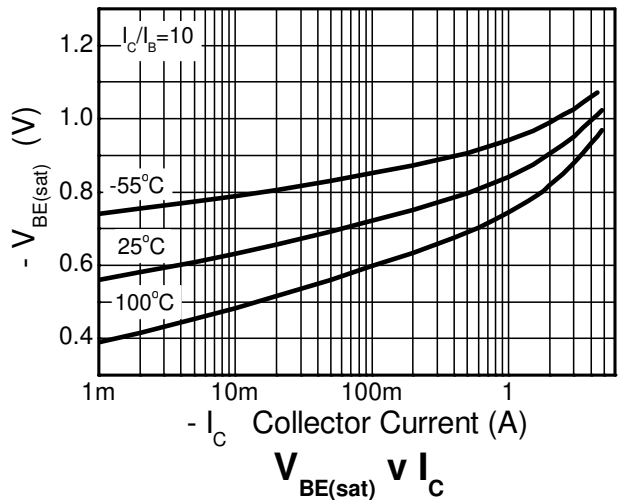
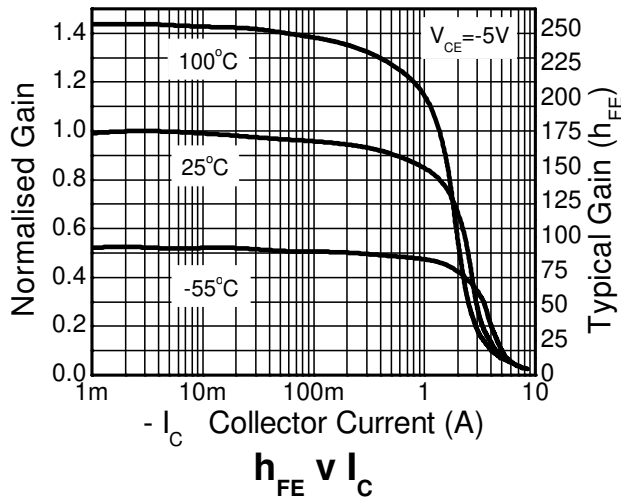
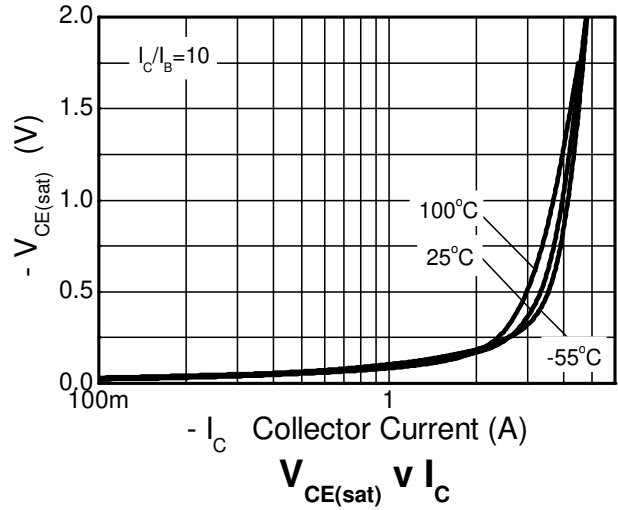
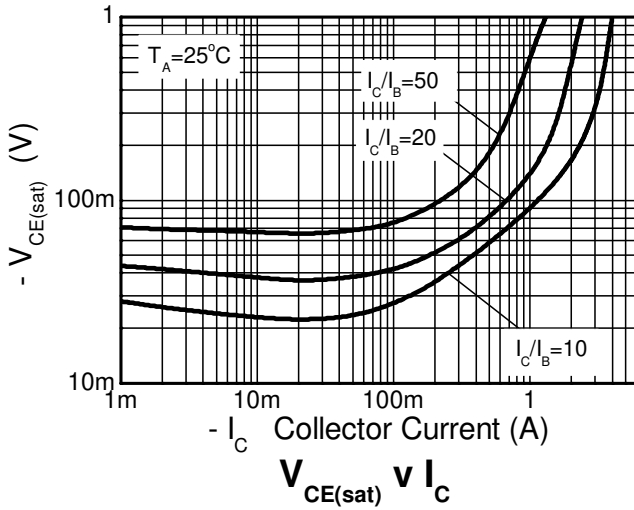
Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-180	-200	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage	BV _{CER}	-180	-200	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 8)	BV _{CEO}	-140	-160	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7.0	-8.0	—	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	—	< -1	-20	nA	V _{CB} = -150V
			—	-0.5	μA	V _{CB} = -150V, T _A = +100°C
Collector Cutoff Current	I _{CER}	—	< -1	-20	nA	V _{CB} = -150V
	R ≤ 1kΩ		—	-0.5	μA	V _{CB} = -150V, T _A = +100°C
Emitter Cutoff Current	I _{EBO}	—	< -1	-10	nA	V _{EB} = -6V
Collector-Emitter Saturation Voltage (Note 8)	V _{CE(sat)}	—	-37	-60	mV	I _C = -0.1A, I _B = -5mA
			-50	-75		I _C = -0.5A, I _B = -50mA
			-80	-115		I _C = -1A, I _B = -100mA
			-255	-330		I _C = -3A, I _B = -300mA
Base-Emitter Saturation Voltage (Note 8)	V _{BE(sat)}	—	-910	-1010	mV	I _C = -3A, I _B = -300mA
Base-Emitter Turn-On Voltage (Note 8)	V _{BE(on)}	—	-800	-900	mV	I _C = -3A, V _{CE} = -5V
DC Current Gain (Note 8)	h _{FE}	100	225	—	—	I _C = -10mA, V _{CE} = -5V
		100	200	300		I _C = -1A, V _{CE} = -5V
		45	100	—		I _C = -3A, V _{CE} = -5V
		—	5	—		I _C = -10A, V _{CE} = -5V
Transition Frequency	f _T	—	120	—	MHz	V _{CE} = -10V, I _C = -100mA, f = 50MHz
Output Capacitance	C _{OBO}	—	33	—	pF	V _{CB} = -10V, f = 1MHz
Switching Time	t _{ON}	—	42	—	ns	V _{CC} = -50V, I _C = -1A,
	t _{OFF}	—	636	—		I _{B1} = -I _{B2} = -100mA

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

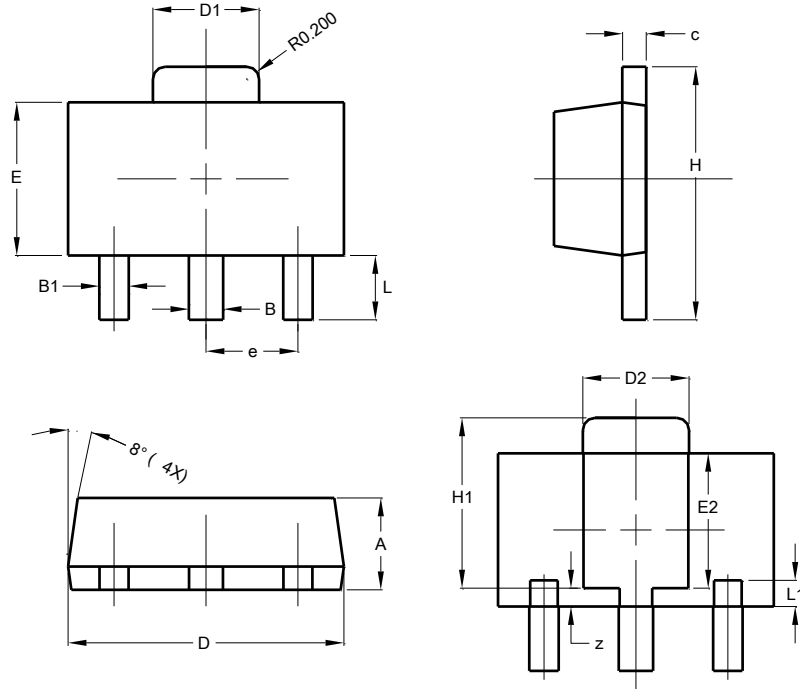
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT89

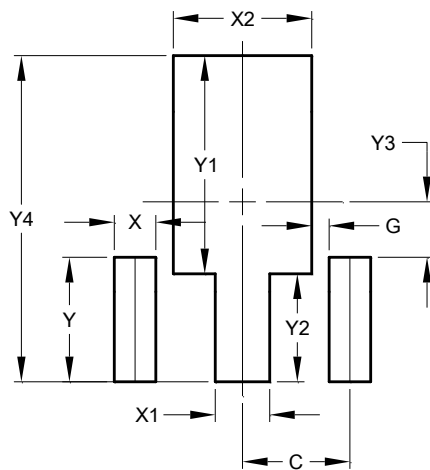


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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