40V NPN SMALL SIGNAL TRANSISTOR IN SOT89

Features

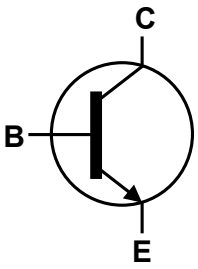
- BV_{CEO} > 40V
- I_C = 600mA High Collector Current
- Complementary PNP Type: DXT2907A
- Ideal for Medium-Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

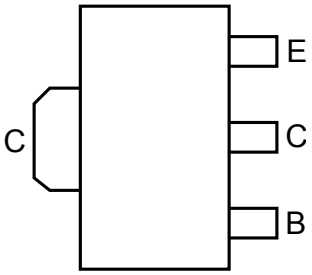
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.072 grams (Approximate)

SOT89

Top View



Device Symbol



Top View
Pin-Out

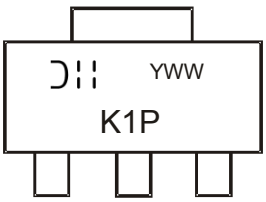
Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DXT2222A-13	Standard	K1P	13	12	2,500

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

(Top View)



= Manufacturer's Code Marking
K1P = Product Type Marking Code:
YWW = Date Code Marking
Y = Last Digit of Year ex: 5 = 2015
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}	75	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Peak Pulse Current	I_{CM}	800	mA
Continuous Collector Current	I_C	600	mA

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	0.75	W
	(Note 6)		1.2	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	166	°C/W
	(Note 6)		104	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 7)

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	C

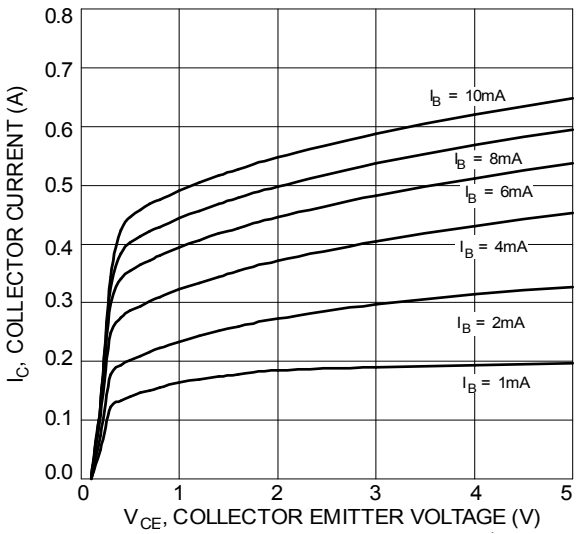
Notes:
5. For a device mounted with the exposed collector pad on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted with the exposed collector pad on 25mm x 25mm 1oz copper.
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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

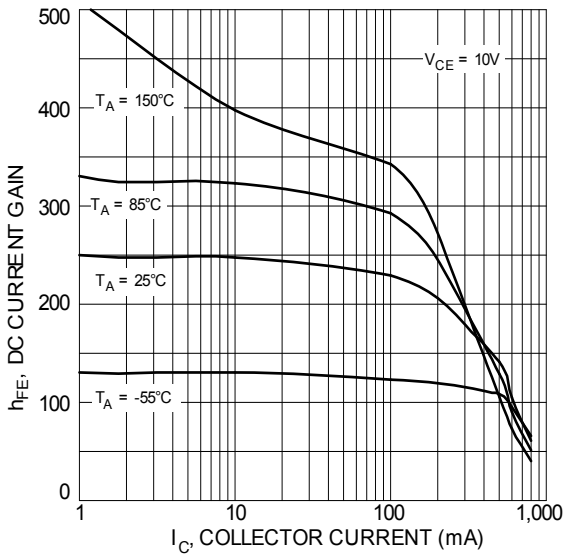
Characteristic	Symbol	Min	Max	Unit	Test Conditions
OFF CHARACTERISTICS (Note 8)					
Collector-Base Breakdown Voltage	BV_{CBO}	75	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	BV_{CEO}	40	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0	—	V	I_E = 100µA
Collector Cut-Off Current	I_{CBO}	—	10	nA µA	V_{CB} = 60V V_{CB} = 60V, T_A = +150°C
Collector Cut-Off Current	I_{CEX}	—	10	nA	V_{CE} = 60V, $V_{EB(off)}$ = 3.0V
Emitter Cut-Off Current	I_{EBO}	—	10	nA	V_{EB} = 3.0V
Base Cut-Off Current	I_{BL}	—	20	nA	V_{CE} = 60V, $V_{EB(off)}$ = 3.0V
ON CHARACTERISTICS (Note 8)					
DC Current Gain	h_{FE}	35 50 75 100 40 35 50	— — — 300 — — —	—	I_C = 100µA, V_{CE} = 10V I_C = 1.0mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V I_C = 150mA, V_{CE} = 10V I_C = 500mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V, T_A = -55°C I_C = 150mA, V_{CE} = 1.0V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— —	0.3 1.0	V	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	0.6 —	1.2 2.0	V	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	8	pF	V_{CB} = 10V, f = 1.0MHz
Input Capacitance	C_{ibo}	—	25	pF	V_{EB} = 0.5V, f = 1.0MHz
Transition frequency	f_T	300	—	MHz	V_{CE} = 20V, I_C = 20mA, f = 100MHz
Noise Figure	NF	—	4.0	dB	V_{CE} = 10V, I_C = 150µA, R_S = 1.0kΩ, f = 1.0kHz
SWITCHING CHARACTERISTICS					
Delay Time	t_d	—	10	ns	V_{CC} = 30V, I_C = 150mA,
Rise Time	t_r	—	25	ns	$V_{EB(off)}$ = 0.5V, I_{B1} = 15mA
Storage Time	t_s	—	225	ns	V_{CC} = 30V, I_C = 150mA,
Fall Time	t_f	—	60	ns	I_{B1} = I_{B2} = 15mA

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

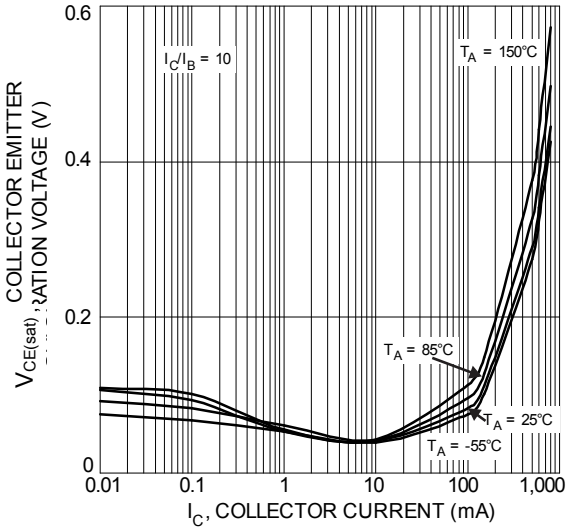
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



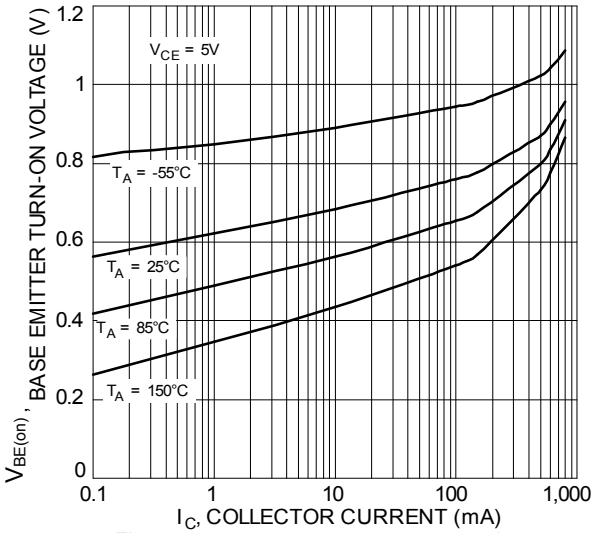
I_C v V_{CE}



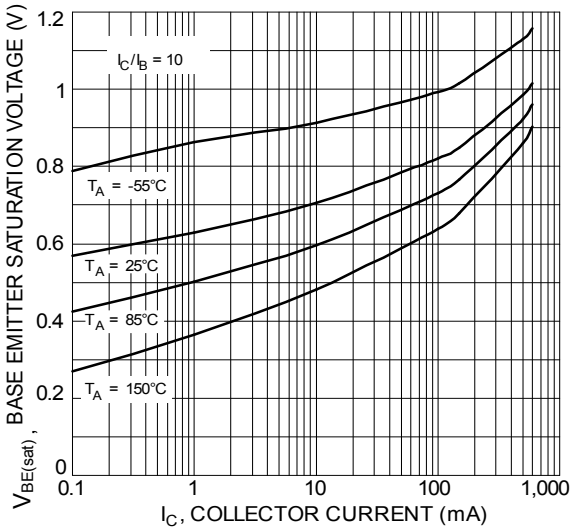
h_{FE} v I_C



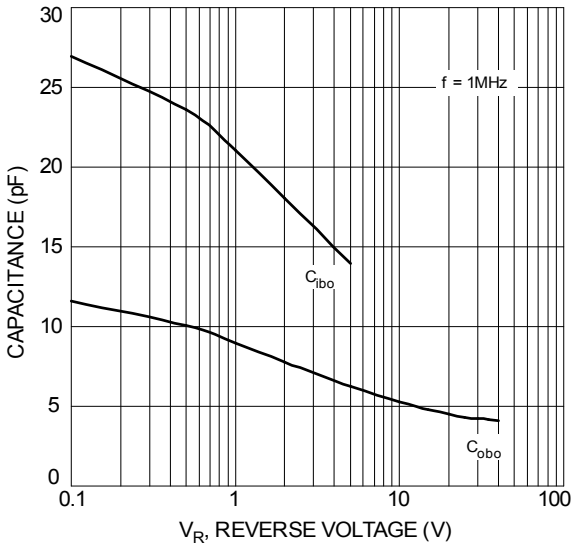
$V_{CE(sat)}$ v I_C



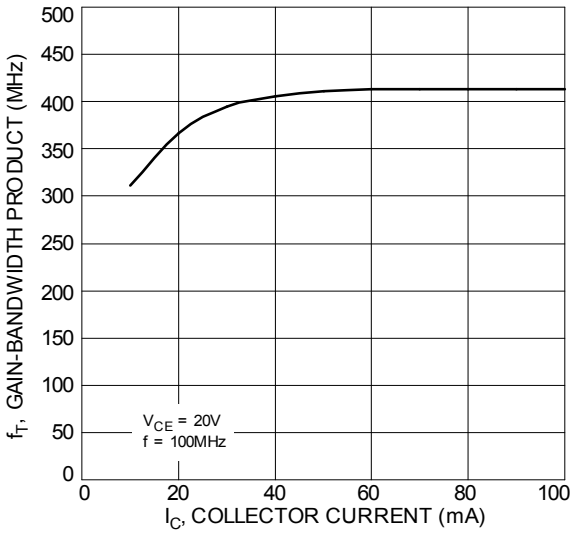
$V_{BE(on)}$ v I_C



$V_{BE(sat)}$ v I_C



C v V_R

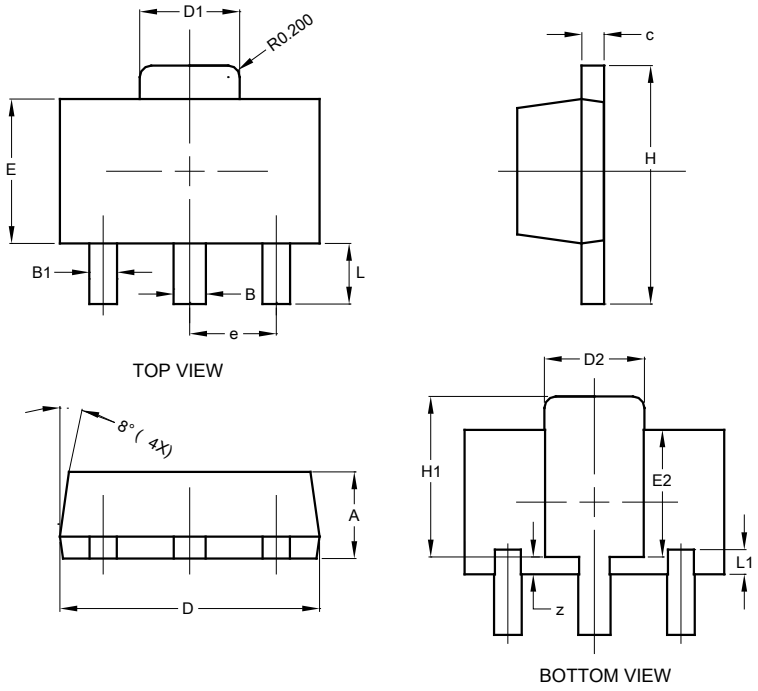


f_T v I_C

Package Outline Dimensions

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

SOT89

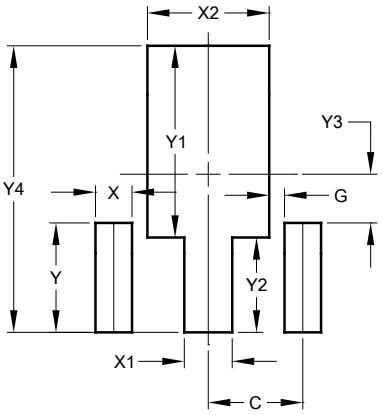


SOT89			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions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