Bipolar Transistors Silicon PNP Triple-Diffused Type

2SA1943N

1. Applications

- Power Amplifiers

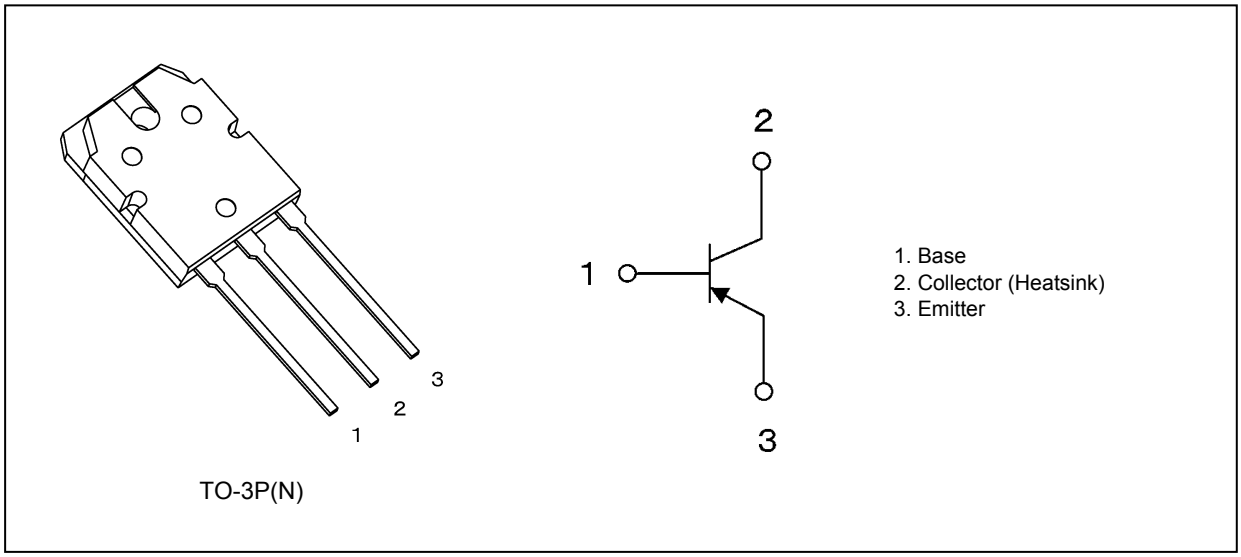
2. Features

(1) High collector voltage: V_{CEO} = -230 V (min)

(2) Complementary to 2SC5200N

(3) Recommended for 100-W high-fidelity audio frequency amplifier output stage

3. Packaging and Internal Circuit



4. Absolute Maximum Ratings (Note) (Unless otherwise specified, T_c = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	-230	V
Collector-emitter voltage		V_{CEO}	-230	
Emitter-base voltage		V_{EBO}	-5	
Collector current (DC)	(Note 1)	I_C	-15	A
Base current		I_B	-1.5	
Collector power dissipation		P_C	150	W
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	-55 to 150	

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Ensure that the junction temperature does not exceed 150°C.

5. Thermal Characteristics

Characteristics	Symbol	Max	Unit
Junction-to-case thermal resistance	$R_{th(j-c)}$	0.83	°C/W

6. Electrical Characteristics

6.1. Static Characteristics (Unless otherwise specified, T_C = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = -230 V, I_E = 0 A	—	—	-5.0	μA
Emitter cut-off current	I_{EBO}	V_{EB} = -5 V, I_C = 0 A	—	—	-5.0	
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C = -50 mA, I_B = 0 A	-230	—	—	V
DC current gain	$h_{FE(1)}$	V_{CE} = -5 V, I_C = -1 A	80	—	160	—
	$h_{FE(2)}$	V_{CE} = -5 V, I_C = -7 A	35	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = -8 A, I_B = -0.8 A	—	-1.1	-3.0	V
Base-emitter voltage	V_{BE}	V_{CE} = -5 V, I_C = -7 A	—	-0.97	-1.5	

6.2. Dynamic Characteristics (Unless otherwise specified, T_C = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Transition frequency	f_T	V_{CE} = -5 V, I_C = -1 A	—	30	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = -10 V, I_E = 0 A, f = 1 MHz	—	360	—	pF

7. Marking (Note)

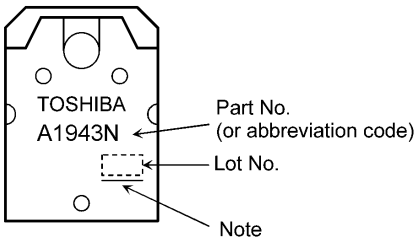


Fig. 7.1 Marking

Note: A line under a Lot No. identifies the indication of product Labels.
[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]
Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.
The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

8. Characteristics Curves (Note)

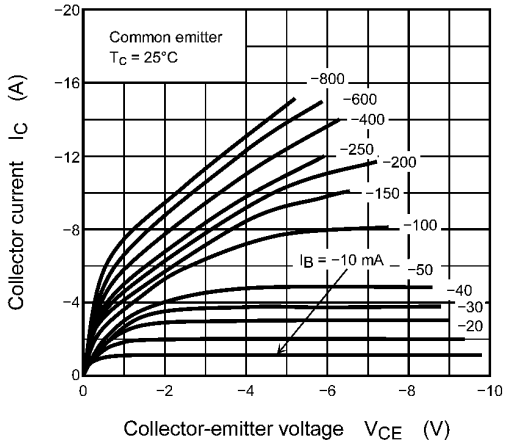


Fig. 8.1 I_C - V_{CE}

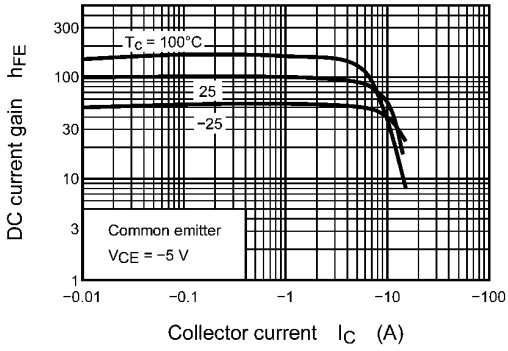


Fig. 8.2 h_{FE} - I_C

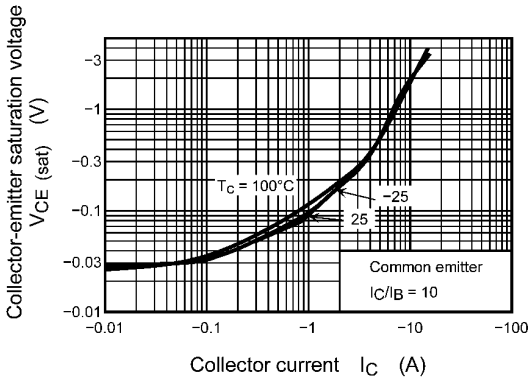


Fig. 8.3 $V_{CE(sat)}$ - I_C

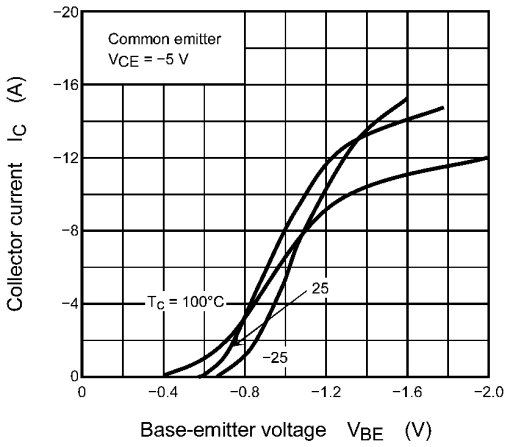


Fig. 8.4 I_C - V_{BE}

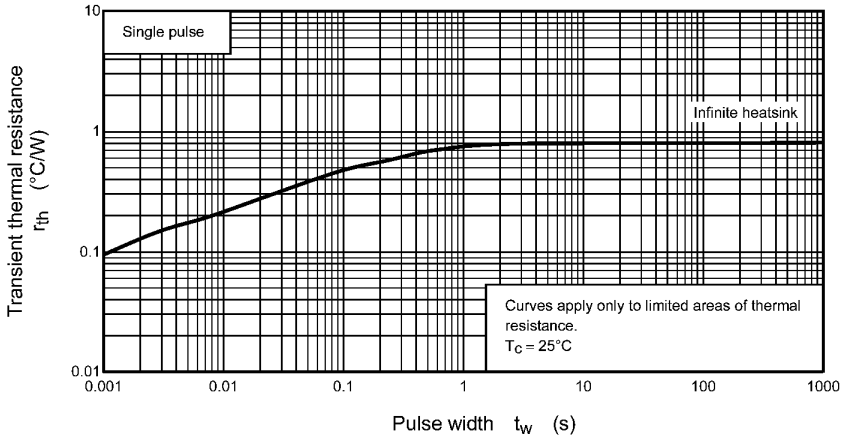


Fig. 8.5 $r_{th(j-c)}$ - t_W
(Guaranteed Maximum)

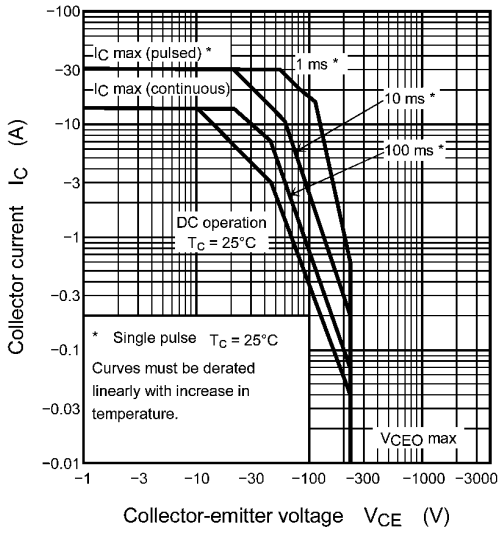
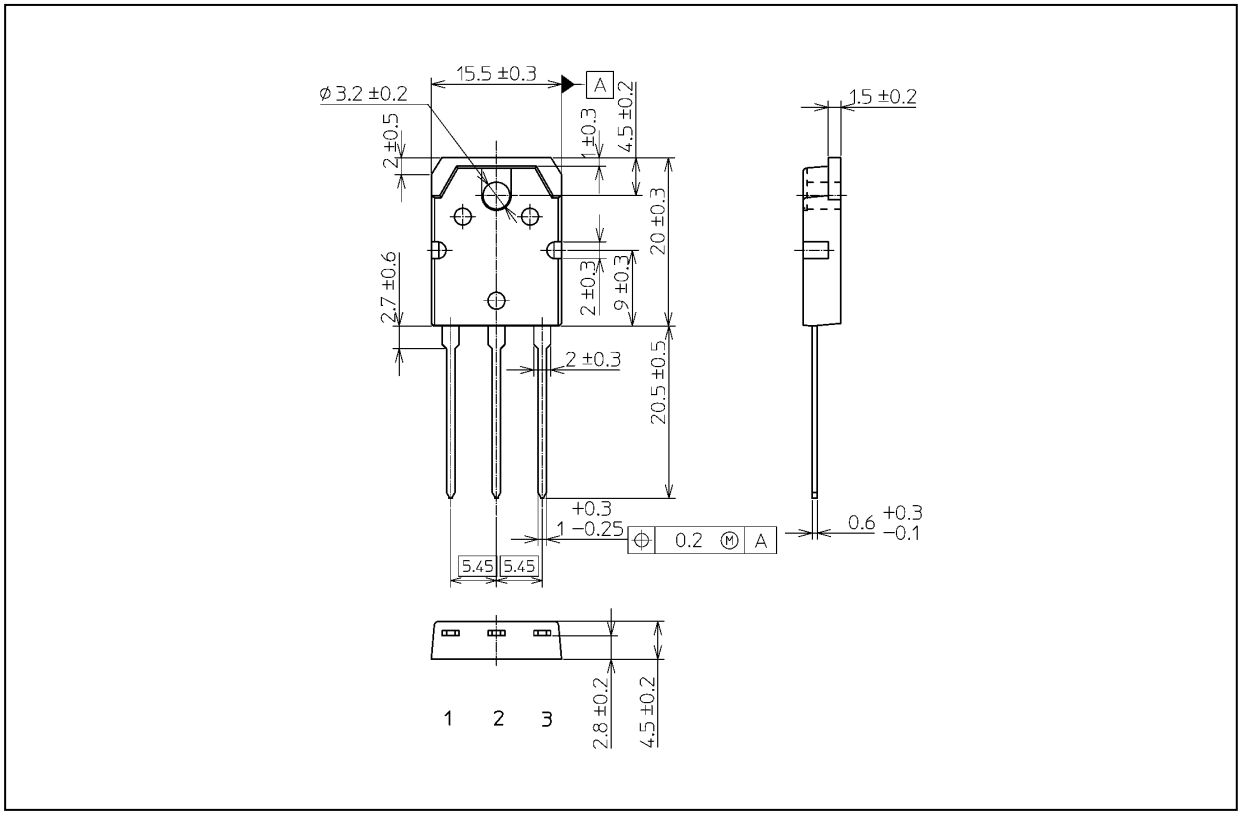


Fig. 8.6 Safe Operating Area (Guaranteed Maximum)

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 4.6 g (typ.)

Package Name(s)
TOSHIBA: 2-16C1S
Nickname: TO-3P(N)

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