

TOSHIBA Transistor Silicon NPN Diffused Type (PCT Process)

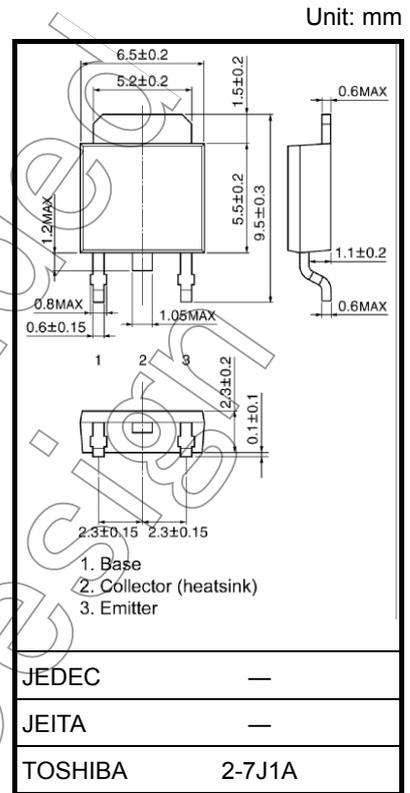
2SD1221

Audio Frequency Power Amplifier Application

- Low collector saturation voltage
: $V_{CE(sat)} = 0.4\text{ V (typ.)}$ ($I_C = 3\text{ A}$, $I_B = 0.3\text{ A}$)
- High power dissipation: $P_C = 20\text{ W}$ ($T_c = 25^\circ\text{C}$)
- Complementary to 2SB906

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	60	V
Collector-emitter voltage		V_{CEO}	60	V
Emitter-base voltage		V_{EBO}	7	V
Collector current		I_C	3	A
Base current		I_B	0.5	A
Collector power dissipation	$T_a = 25^\circ\text{C}$	P_C	1.0	W
	$T_c = 25^\circ\text{C}$		20	
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$



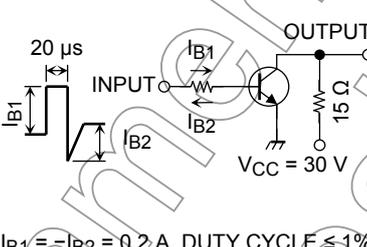
Weight: 0.36 g (typ.)

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).

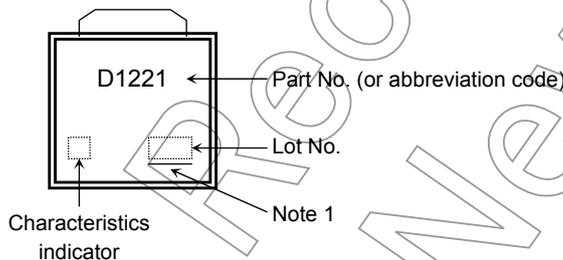
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Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 60\text{ V}, I_E = 0$	—	—	100	μA
Emitter cut-off current		I_{EBO}	$V_{EB} = 7\text{ V}, I_C = 0$	—	—	100	μA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = 50\text{ mA}, I_B = 0$	60	—	—	V
DC current gain		$h_{FE(1)}$ (Note)	$V_{CE} = 5\text{ V}, I_C = 0.5\text{ A}$	60	—	300	—
		$h_{FE(2)}$	$V_{CE} = 5\text{ V}, I_C = 3\text{ A}$	20	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 3\text{ A}, I_B = 0.3\text{ A}$	—	0.4	1.0	V
Base-emitter voltage		V_{BE}	$V_{CE} = 5\text{ V}, I_C = 0.5\text{ A}$	—	0.7	1.0	V
Transition frequency		f_T	$V_{CE} = 5\text{ V}, I_C = 0.5\text{ A}$	—	3.0	—	MHz
Collector output capacitance		C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	70	—	pF
Switching time	Turn-on time	t_{on}	 <p>$I_{B1} = -I_{B2} = 0.2\text{ A}, \text{DUTY CYCLE} \leq 1\%$</p>	—	0.8	—	μs
	Storage time	t_{stg}		—	1.5	—	
	Fall time	t_f		—	0.8	—	

Note: h_{FE} classification O: 60 to 120, Y: 100 to 200, GR: 150 to 300

Marking

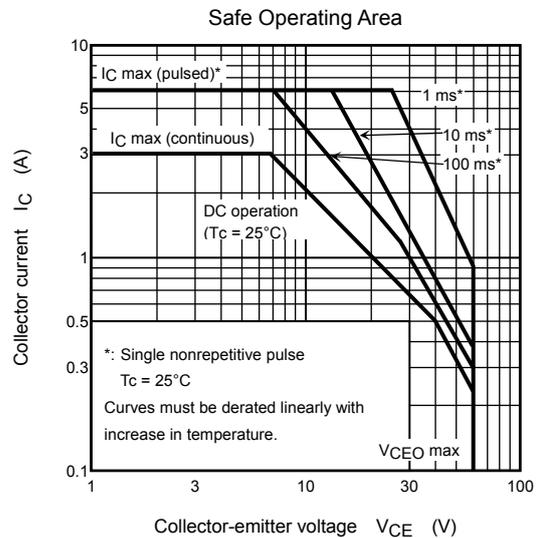
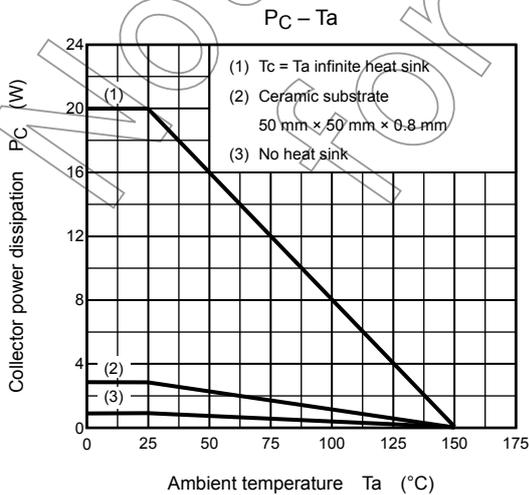
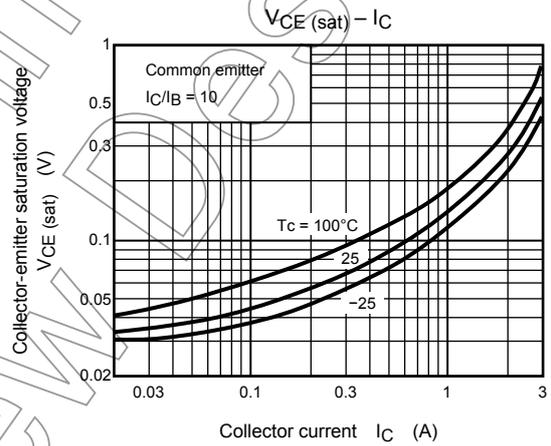
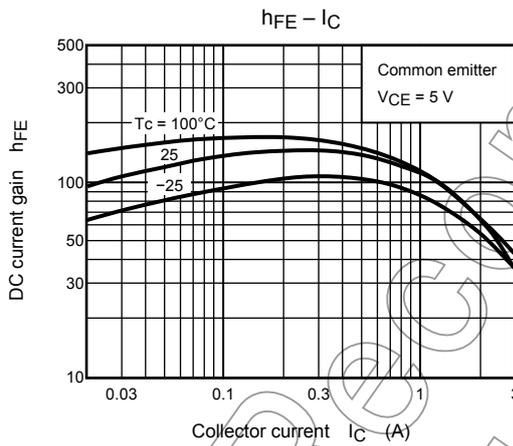
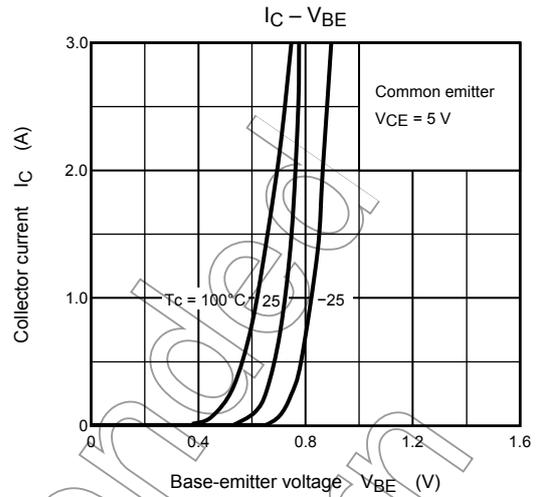
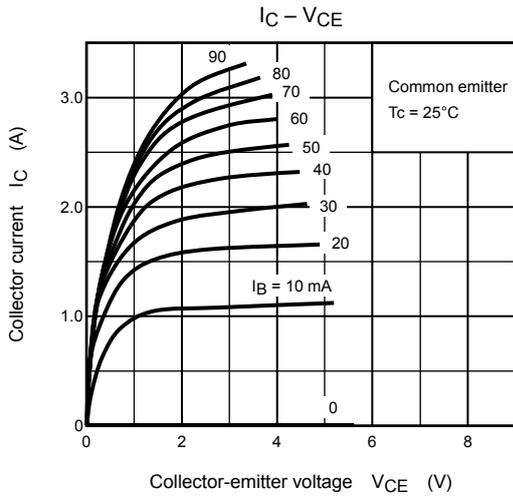


Note 1: A line under a Lot No. identifies the indication of product Labels.

Not underlined: $[[Pb]]/INCLUDES > MCV$

Underlined: $[[G]]/RoHS COMPATIBLE$ 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.



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