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# 2SD1504

Silicon NPN Epitaxial

# HITACHI

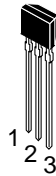
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## Application

Low frequency amplifier, Muting

## Outline

SPAK



1. Emitter
2. Collector
3. Base

# 2SD1504

## Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	30	V
Collector to emitter voltage	$V_{CEO}$	15	V
Emitter to base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	0.5	A
Collector peak current	$i_{c (peak)}$	1.0	A
Collector power dissipation	$P_C$	300	mW
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

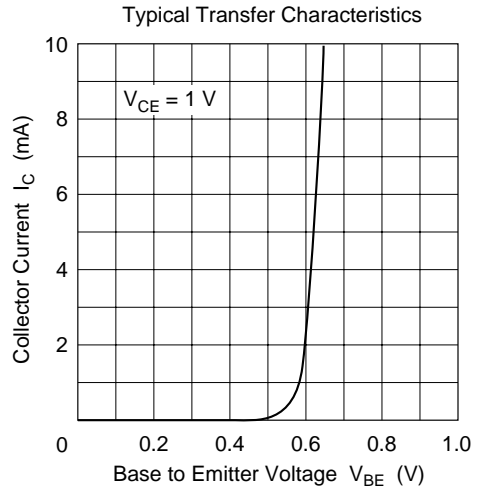
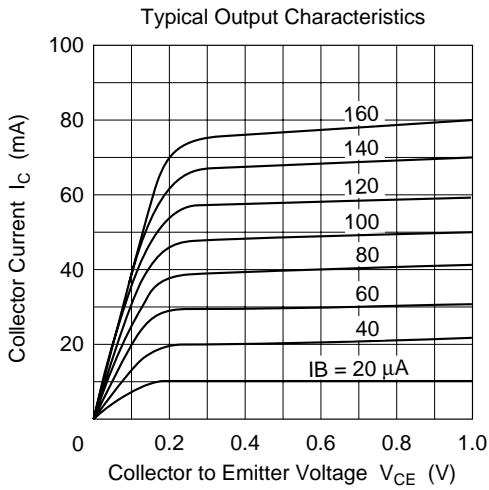
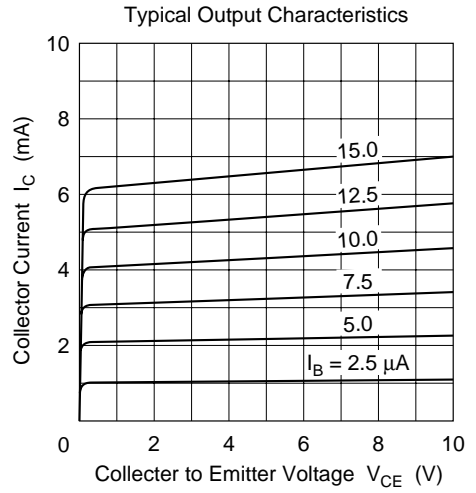
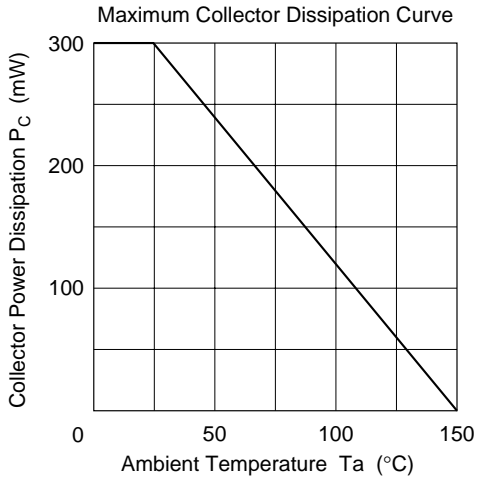
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	15	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	10	$\mu A$	$V_{CB} = 20 \text{ V}, I_E = 0$
DC current transfer ratio	$h_{FE}^{*1}$	250	—	1200		$V_{CE} = 1 \text{ V}, I_C = 150 \text{ mA}^{*2}$
Base to emitter voltage	$V_{BE}$	—	0.65	—	V	$V_{CE} = 1 \text{ V}, I_C = 150 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	0.15	0.5	V	$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}^{*2}$
	$V_{CE(sat)}$	—	0.018	—	V	$I_C = 30 \text{ mA}, I_B = 3 \text{ mA}$
Gain bandwidth product	$f_T$	—	300	—	MHz	$V_{CE} = 1 \text{ V}, I_C = 50 \text{ mA}$
On resistance	$r_{on}$	—	0.5	—	$\Omega$	$I_B = 2 \text{ mA}$

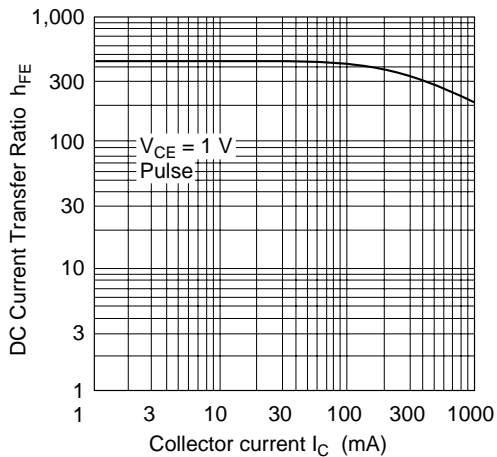
Notes: 1. The 2SD1504 is grouped by  $h_{FE}$  as follows.

2. Pulse test

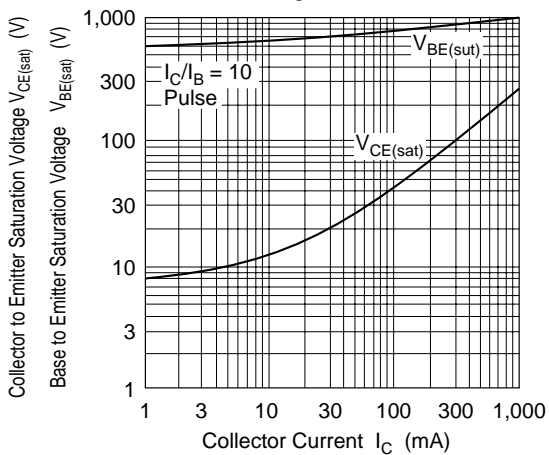
D	E	F
250 to 500	400 to 800	600 to 1200



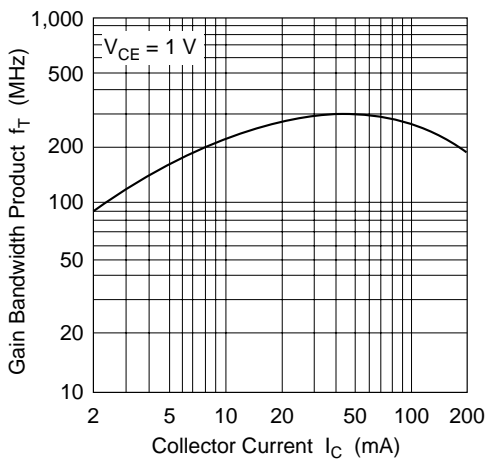
DC Current Transfer Ratio vs. Collector Current



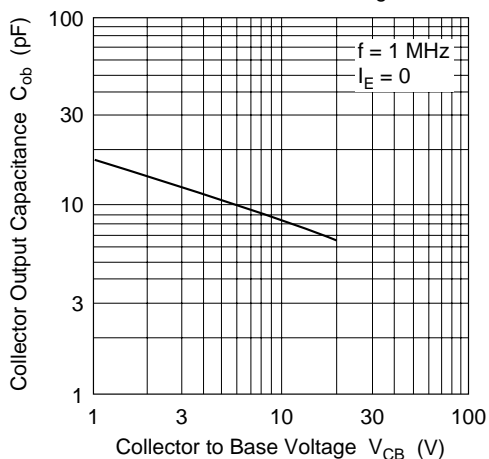
Saturation Voltage vs. Collector Current

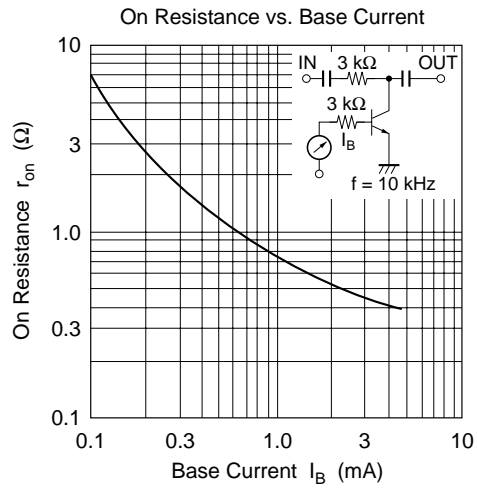


Gain Bandwidth Product vs. Collector Current

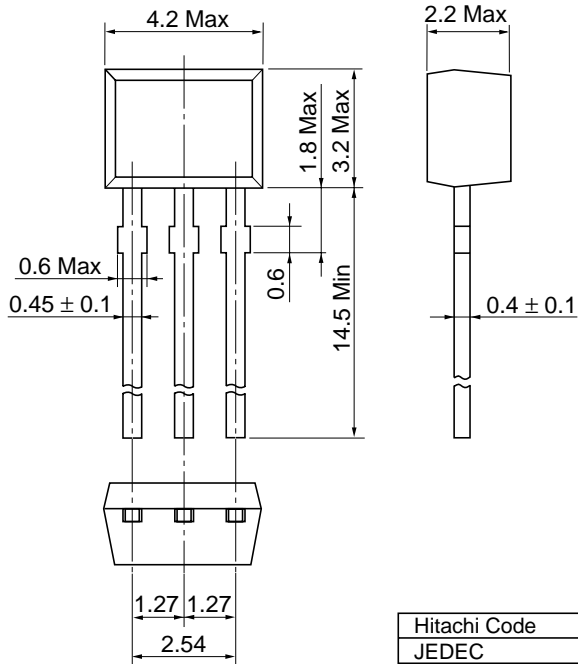


Collector Output Capacitance vs. Collector to Base Voltage





Unit: mm



Hitachi Code	SPAK
JEDEC	—
EIAJ	—
Weight (reference value)	0.10 g

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