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# 2SC454

Silicon NPN Epitaxial

# HITACHI

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## Application

High frequency amplifier, mixer

## Outline

TO-92 (2)



1. Emitter
2. Collector
3. Base

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

Item	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	30	V
Collector to emitter voltage	$V_{CEO}$	30	V
Emitter to base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	100	mA
Collector power dissipation	$P_C$	200	mW
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

## Electrical Characteristics (Ta = 25°C)

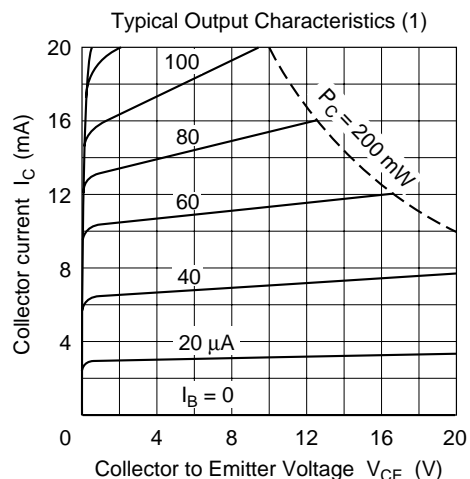
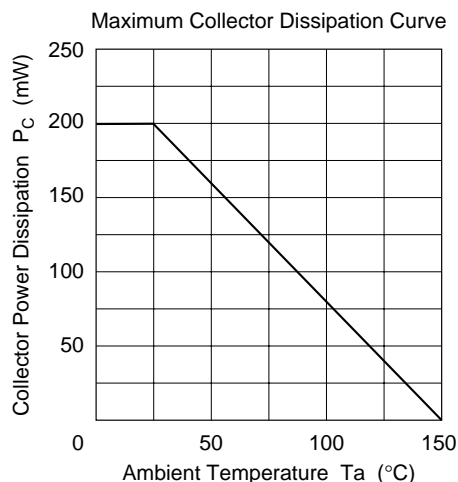
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	30	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.5	$\mu A$	$V_{CB} = 18 \text{ V}, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	0.5	$\mu A$	$V_{EB} = 2 \text{ V}, I_C = 0$
DC current transfer ratio	$h_{FE}^{*1}$	100	—	500		$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Base to emitter voltage	$V_{BE}$	—	0.63	0.75	V	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.2	V	$I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$
Gain bandwidth product	$f_T$	—	230	—	MHz	$V_{CE} = 12 \text{ V}, I_C = 2 \text{ mA}$
Collector output capacitance	$C_{ob}$	—	—	3.5	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$
Noise figure	NF	—	—	25	dB	$V_{CE} = 6 \text{ V}, I_C = 0.1 \text{ mA}, f = 1 \text{ kHz}, R_g = 500 \Omega$
IF power gain	IFG	—	35	—	dB	$V_{CE} = 12 \text{ V}, I_C = 1 \text{ mA}, f = 455 \text{ kHz}, R_g = 1.5 \text{ k}\Omega, R_L = 40 \text{ k}\Omega$

Note: 1. The 2SC454 is grouped by  $h_{FE}$  as follows.

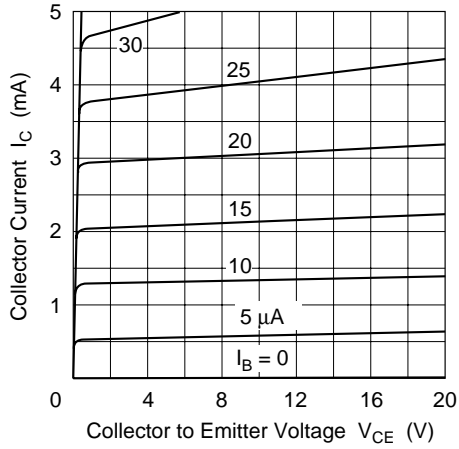
B	C	D
100 to 200	160 to 320	250 to 500

**Small Signal y Parameters** ( $V_{CE} = 12\text{ V}$ ,  $I_C = 2\text{ mA}$ , Emitter Common)

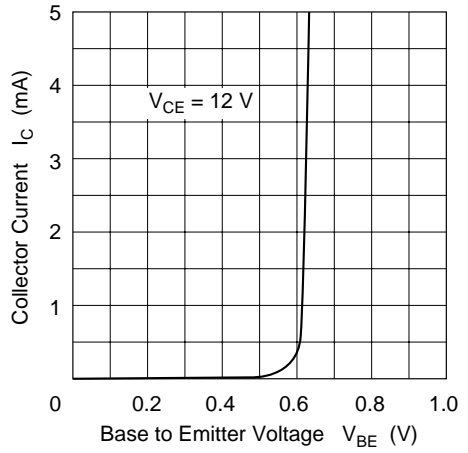
Item	Symbol	f	2SC454B	2SC454C	Unit
Input admittance	yie	455 kHz	$0.35 + j0.074$	$0.28 + j0.070$	mS
		1MHz	$0.35 + j0.130$	$0.28 + j0.125$	
Reverse transfer admittance	yre	455 kHz	$-j0.005$	$-j0.005$	mS
		1MHz	$-j0.013$	$-j0.013$	
Forward transfer admittance	yfe	455 kHz	$66 - j2.43$	$64 - j2.60$	mS
		1MHz	$66 - j4.27$	$66 - j5.7$	
Output admittance	yoe	455 kHz	$0.006 + j0.02$	$0.007 + j0.022$	mS
		1MHz	$0.006 + j0.047$	$0.007 + j0.049$	



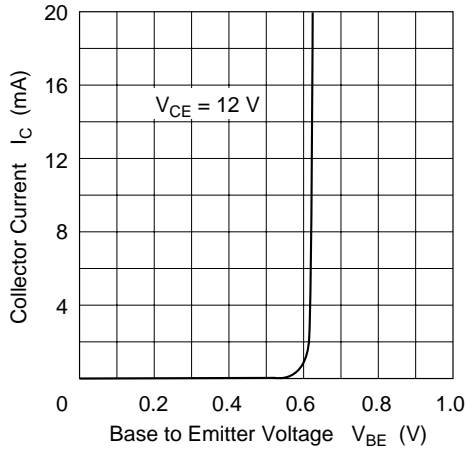
Typical Output Characteristics (2)



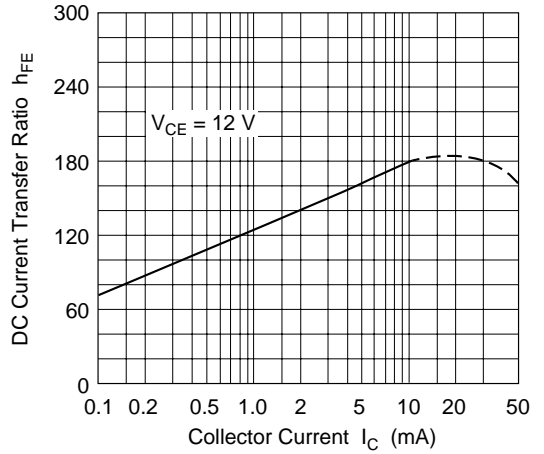
Typical Transfer Characteristics (1)



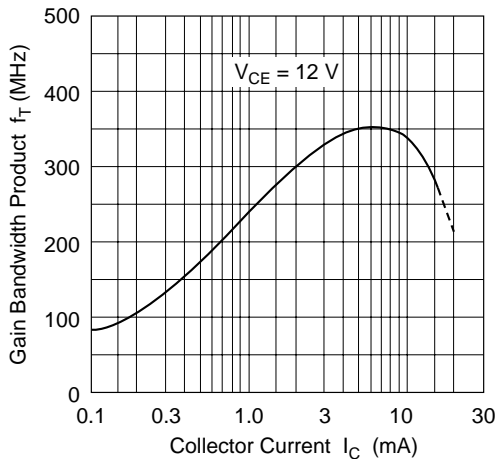
Typical Transfer Characteristics (2)



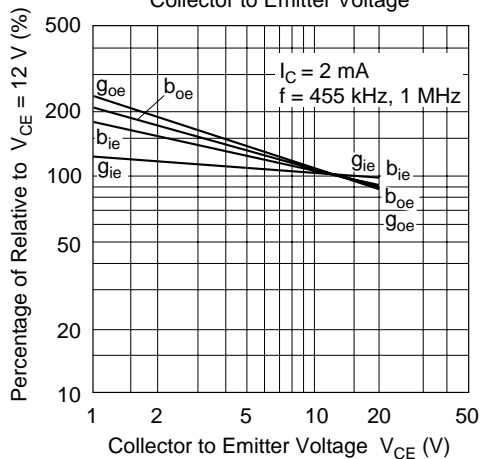
DC Current Transfer Ratio vs. Collector Current



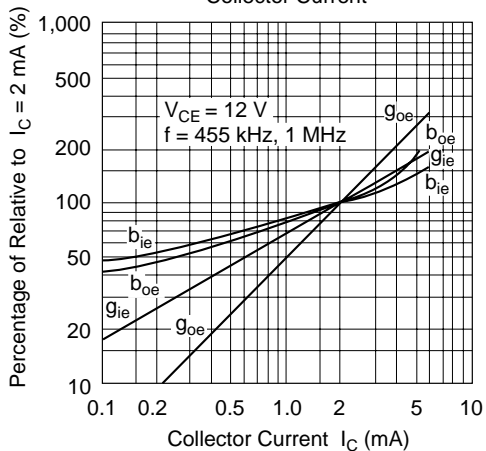
Gain Band width Product vs. Collector Current



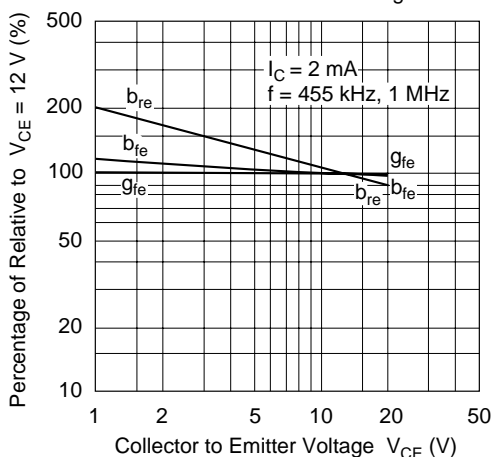
Input/Output Admittance vs. Collector to Emitter Voltage

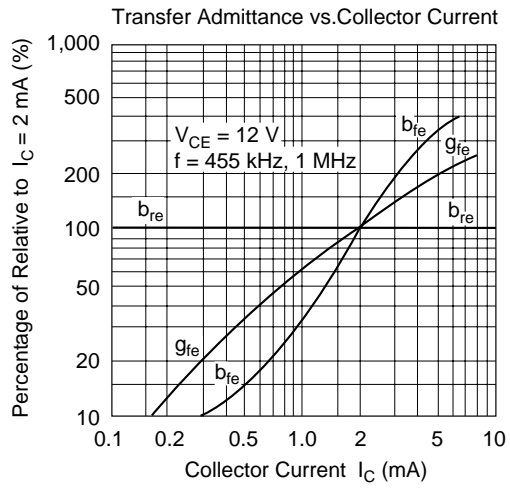


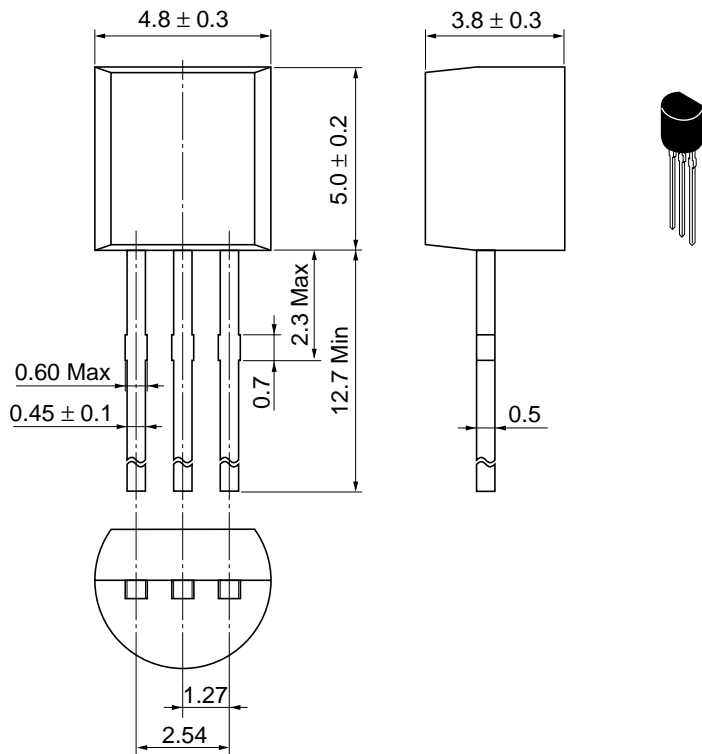
Input/Output Admittance vs. Collector Current



Transfer Admittance vs. Collector to Emitter Voltage







Hitachi Code	TO-92 (2)
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.25 g

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