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# 2SC535

Silicon NPN Epitaxial Planar

# HITACHI

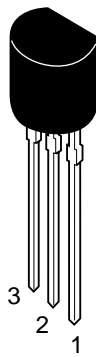
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## Application

VHF amplifier, mixer, local oscillator

## Outline

TO-92 (2)



1. Emitter
2. Collector
3. Base

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## 2SC535

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

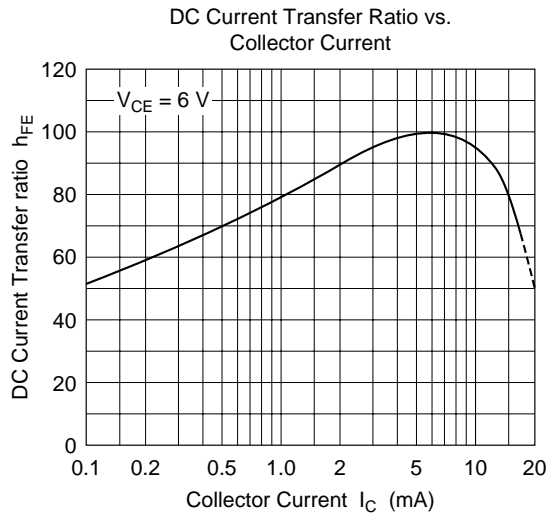
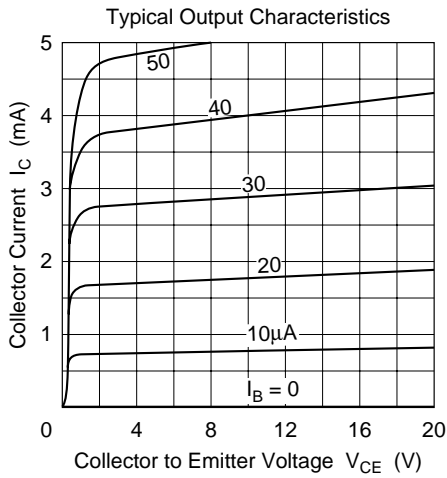
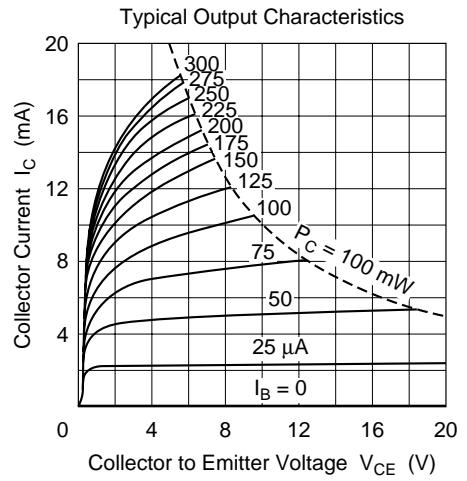
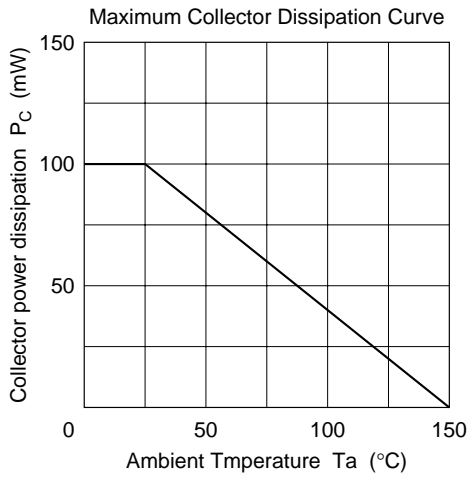
Item	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	30	V
Collector to emitter voltage	$V_{CEO}$	20	V
Emitter to base voltage	$V_{EBO}$	4	V
Collector current	$I_C$	20	mA
Collector power dissipation	$P_C$	100	mW
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

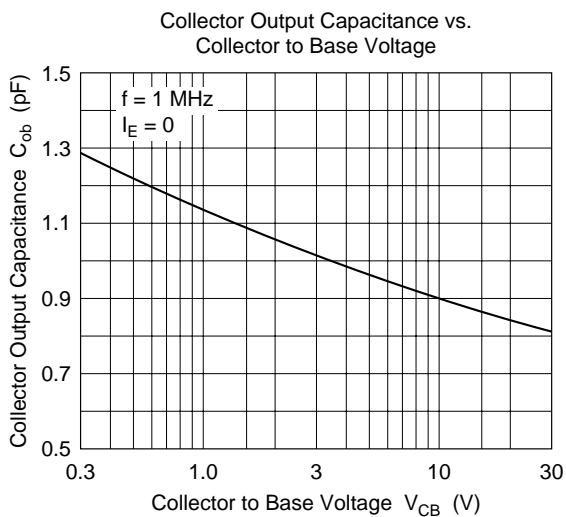
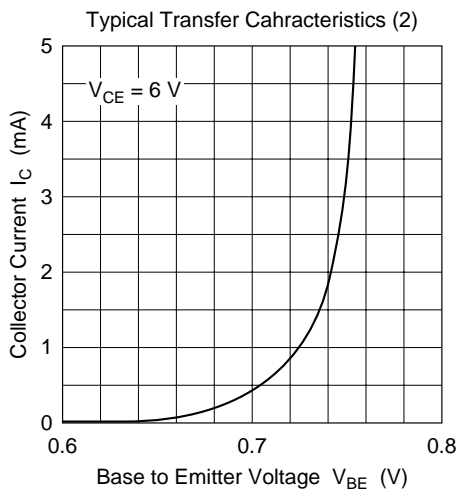
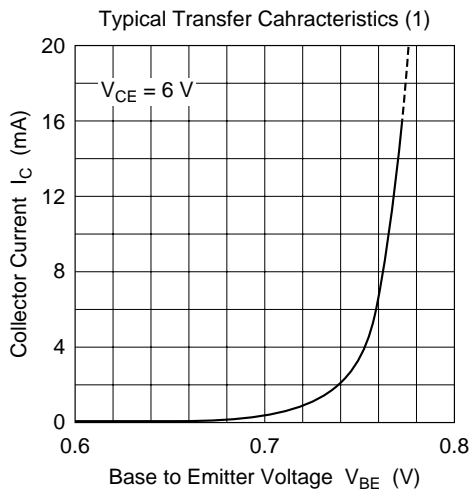
## Electrical Characteristics (Ta = 25°C)

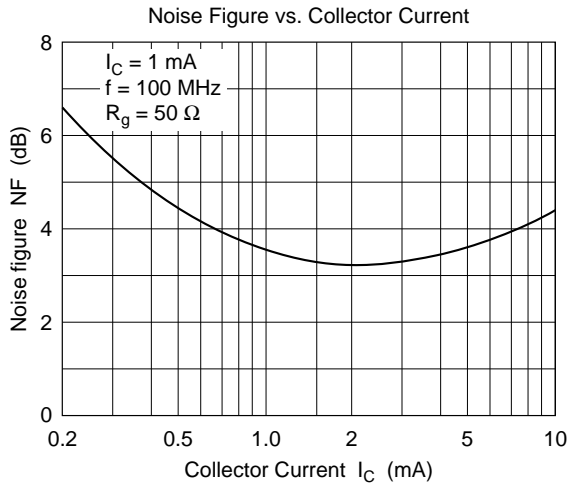
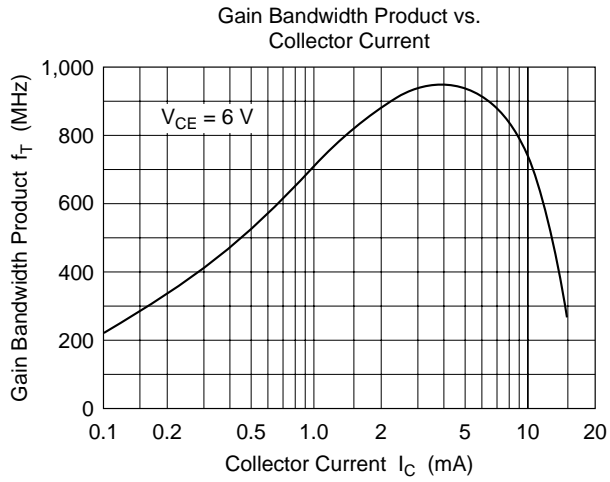
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	20	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	4	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.5	$\mu A$	$V_{CB} = 10 \text{ V}, I_E = 0$
DC current transfer ratio	$h_{FE}^{*1}$	60	—	200		$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}$
Base to emitter voltage	$V_{BE}$	—	0.72	—	V	$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	0.17	—	V	$I_C = 20 \text{ mA}, I_B = 4 \text{ mA}$
Gain bandwidth product	$f_T$	450	940	—	MHz	$V_{CE} = 6 \text{ V}, I_C = 5 \text{ mA}$
Collector output capacitance	$C_{ob}$	—	0.9	1.2	pF	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$
Power gain	PG	17	20	—	dB	$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}, f = 100 \text{ MHz}$
Noise figure	NF	—	3.5	5.5	dB	$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}, f = 100 \text{ MHz}, R_g = 50 \Omega$
Input admittance (typ)	$y_{ie}$	1.3 + j5.3			mS	$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}, f = 100 \text{ MHz}$
Reverse transfer admittance (typ)	$y_{re}$	-0.078 - j0.41			mS	
Foward transfer admittance (typ)	$y_{fe}$	32 - j10			mS	
Output admittance (typ)	$y_{oe}$	0.08 + j0.82			mS	

Note: 1. The 2SC535 is grouped by  $h_{FE}$  as follows.

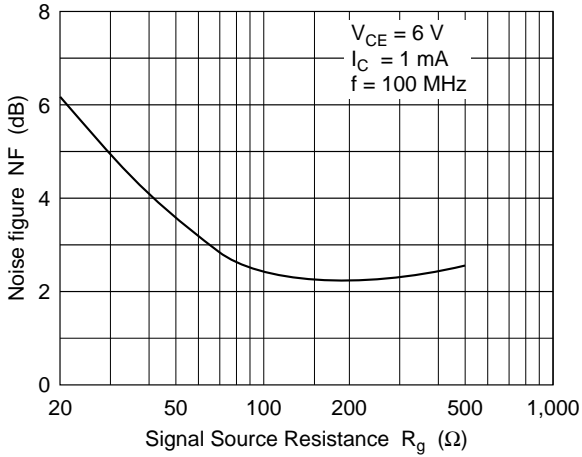
B	C
60 to 120	100 to 200



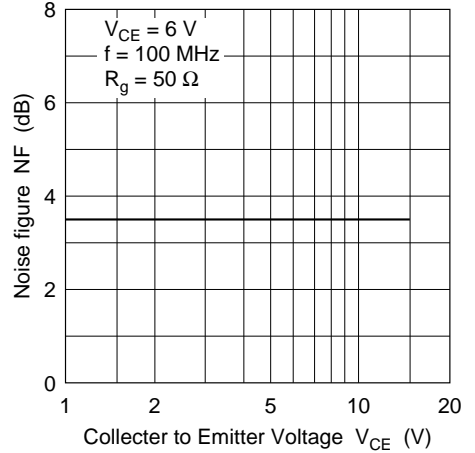




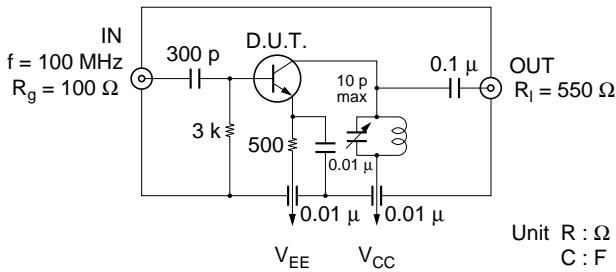
Noise Figure vs. Signal Source Resistance



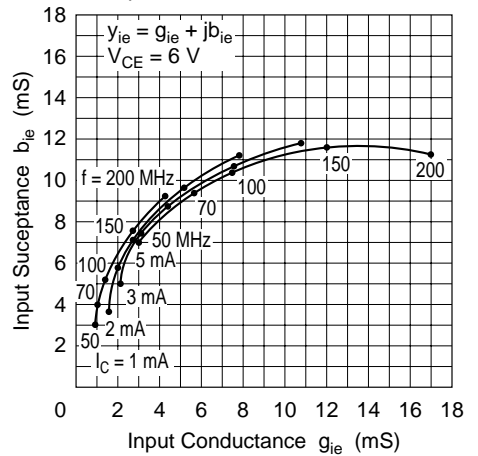
Noise Figure vs. Collector to Emitter Voltage



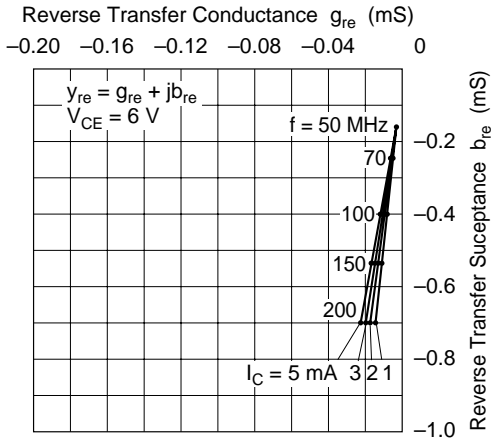
100 MHz Power Gain Test Circuit



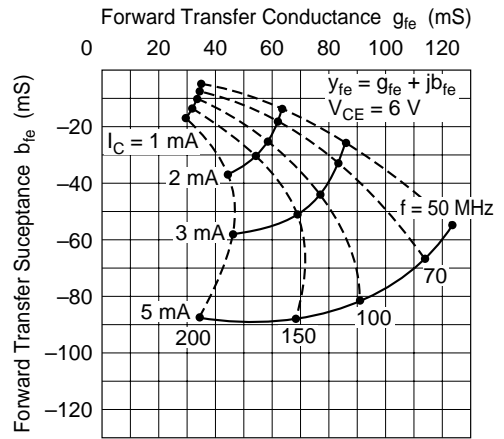
Input Admittance Characteristics



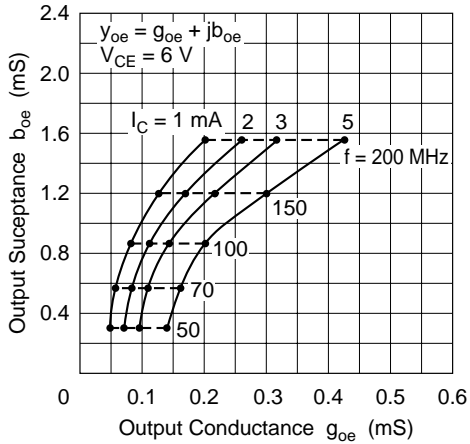
Reverse Transfer Admittance Characteristics



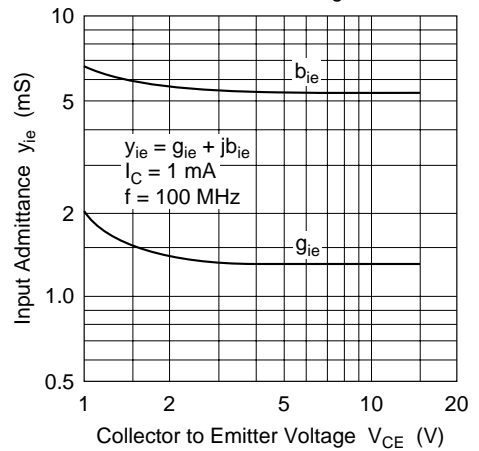
Forward Transfer Admittance Characteristics



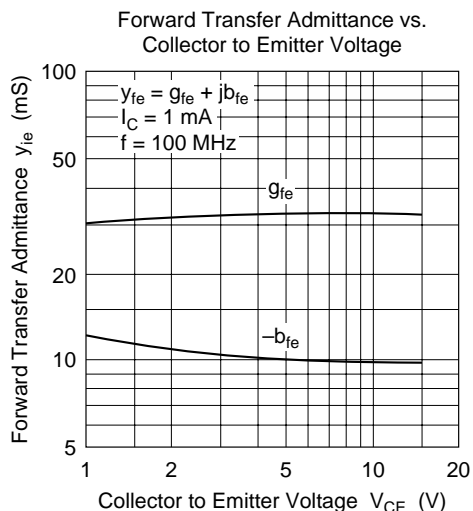
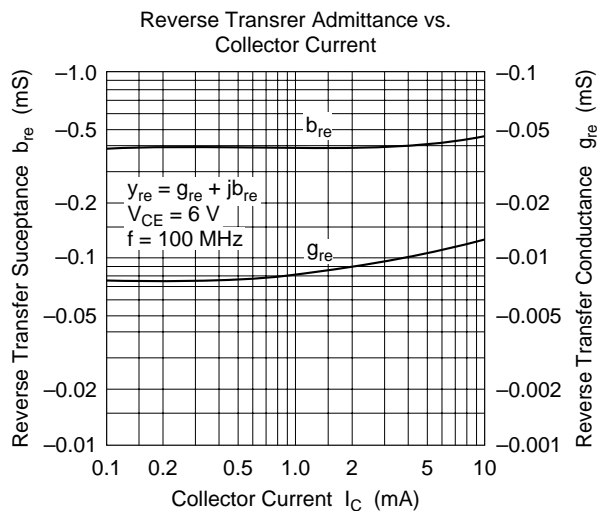
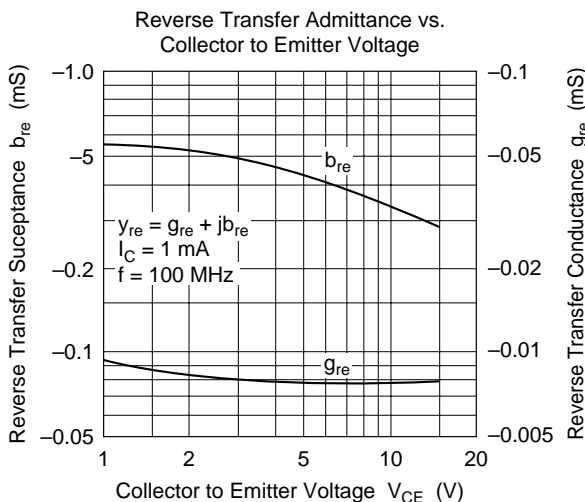
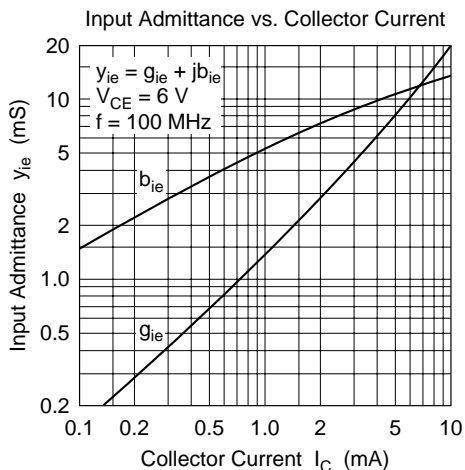
Output Admittance Characteristics



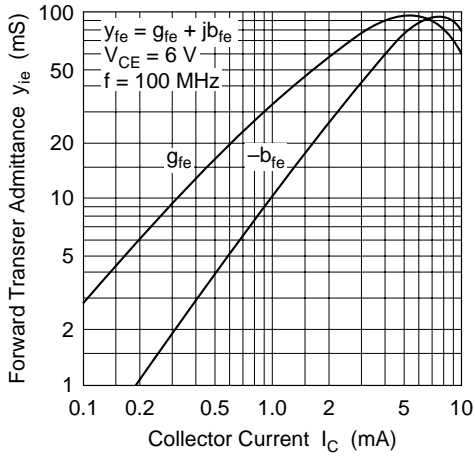
Input Admittance vs. Collector to Emitter Voltage



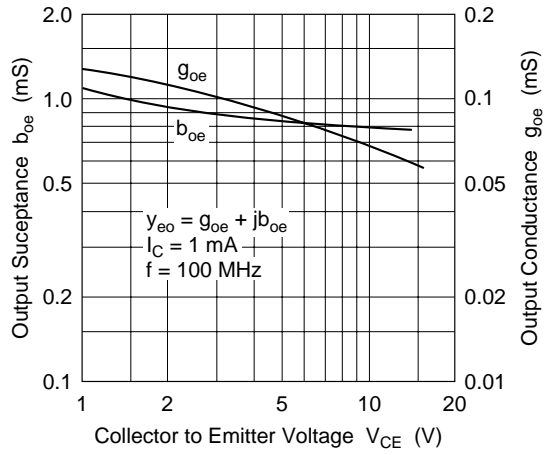




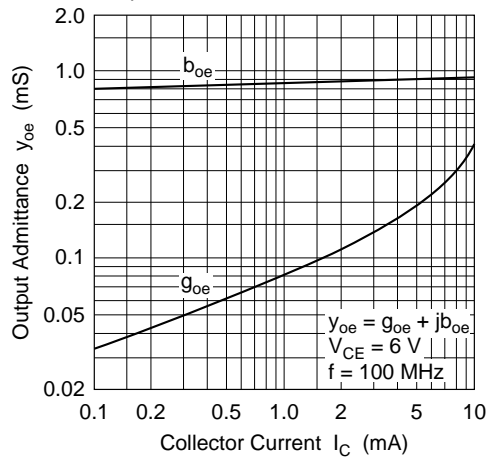
Forward Transfer Admittance vs. Collector Current

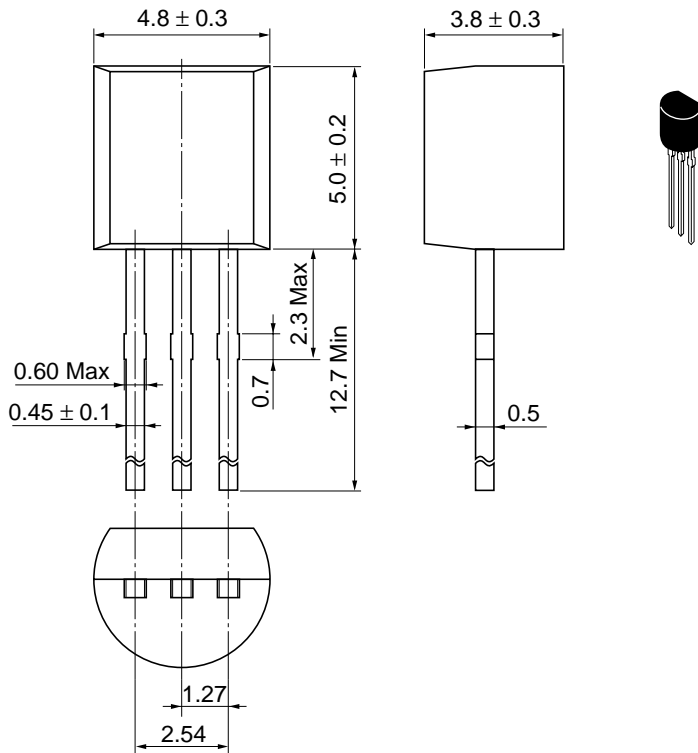


Output Admittance vs. Collector to Emitter Voltage



Output Admittance vs. Collector Current





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

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