

**FOR HIGH FREQUENCY AMPLIFY, MEDIUM FREQUENCY AMPLIFY APPLICATION  
SILICON NPN EPITAXIAL TYPE**

**DESCRIPTION**

2SC3053 is a super mini silicon NPN epitaxial type transistor designed for high frequency amplify, oscillating, frequency exchange, medium frequency amplify application.

**FEATURE**

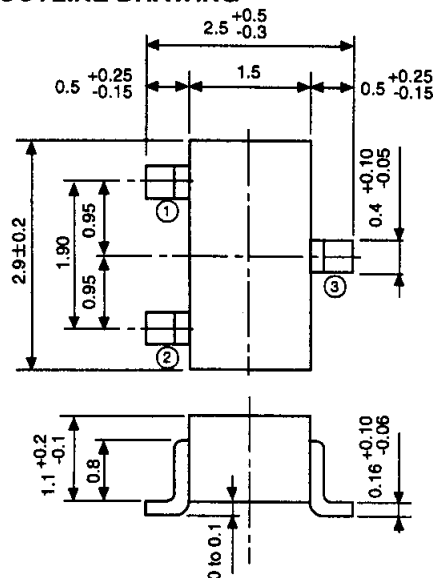
- High gain (@ 10.7MHz), MAG=45dB typ
- Low noise (@ 10.7MHz), NF=3.0dB typ
- Low  $y_{re}$  (@ 10.7MHz),  $y_{re} = -j0.11mS$  typ
- Super mini package for easy mounting

**APPLICATION**

High frequency amplify, oscillating, frequency exchange, medium frequency amplify for small communication machine, FM/AM radio.

**OUTLINE DRAWING**

Unit:mm



**TERMINAL CONNECTOR**

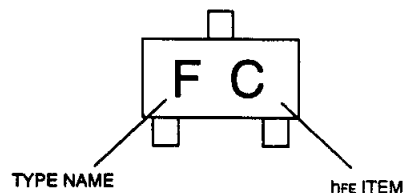
- ① : BASE
  - ② : EMITTER
  - ③ : COLLECTOR
- EIAJ : SC-59  
JEDEC : TO-236 resemblance

Note)  
The dimension without tolerance represent central value.

**MAXIMUM RATINGS (Ta=25°C)**

Symbol	Parameter	Ratings	Unit
V <sub>CB0</sub>	Collector to Base voltage	30	V
V <sub>EB0</sub>	Emitter to Base voltage	4	V
V <sub>CEO</sub>	Collector to Emitter voltage	25	V
I <sub>C</sub>	Collector current	30	mA
P <sub>C</sub>	Collector dissipation(Ta=25°C)	150	mW
T <sub>J</sub>	Junction temperature	+125	°C
T <sub>stg</sub>	Storage temperature	-55 to +125	°C

**MARKING**



**ELECTRICAL CHARACTERISTICS (Ta=25°C)**

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I <sub>CBO</sub>	Collector cut off current	V <sub>CB</sub> =25V, I <sub>E</sub> =0			1	μA
I <sub>EB0</sub>	Emitter cut off current	V <sub>EB</sub> =4V, I <sub>C</sub> =0			1	μA
h <sub>FE</sub> *	DC forward current gain	V <sub>CE</sub> =6V, I <sub>C</sub> =1mA	35		180	—
V <sub>CE(sat)</sub>	C to E saturation voltage	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA		0.1	0.3	V
f <sub>T</sub>	Gain band width product	V <sub>CE</sub> =6V, I <sub>E</sub> =-1mA	150	200		MHz
C <sub>ob</sub>	Collector output capacitance	V <sub>CB</sub> =6V, I <sub>E</sub> =0, f=1MHz		2.0	2.7	pF
C <sub>eF(b)</sub>	Base time constant	V <sub>CB</sub> =6V, I <sub>E</sub> =-1mA, f=31.8MHz		20	60	μS
NF	Noise figure	V <sub>CE</sub> =6V, I <sub>E</sub> =-1mA, f=10.7MHz, R <sub>G</sub> =500Ω		3.0		dB

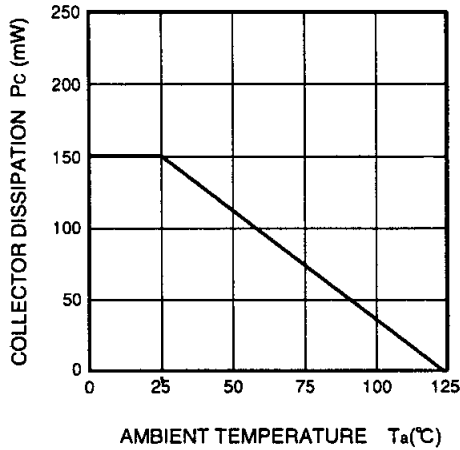
\* : It shows h<sub>FE</sub> classification in right table.

Item	B	C	D
h <sub>FE</sub>	35 to 70	55 to 110	90 to 180
Marking	FB	FC	FD

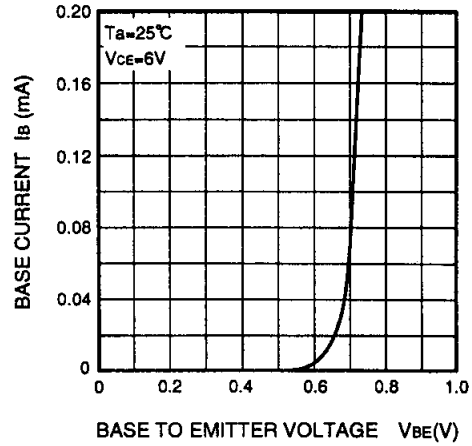
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TYPICAL CHARACTERISTICS

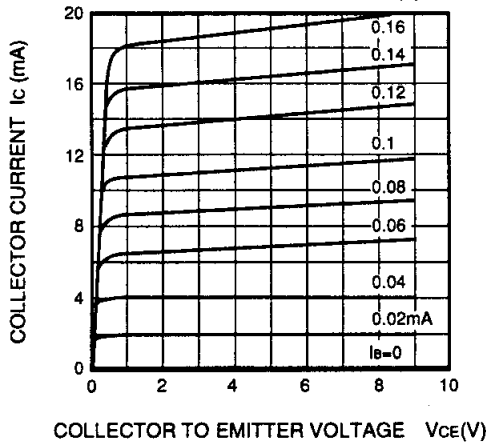
COLLECTOR DISSIPATION VS.  
AMBIENT TEMPERATURE



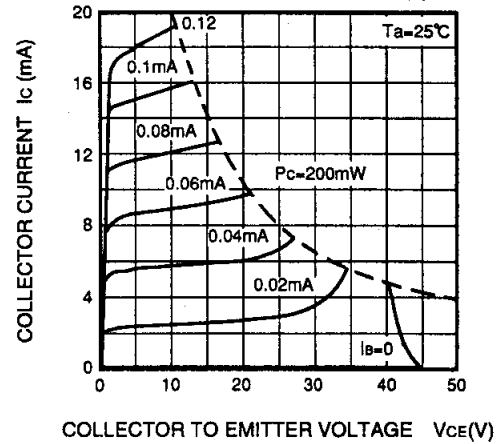
COMMON EMITTER INPUT



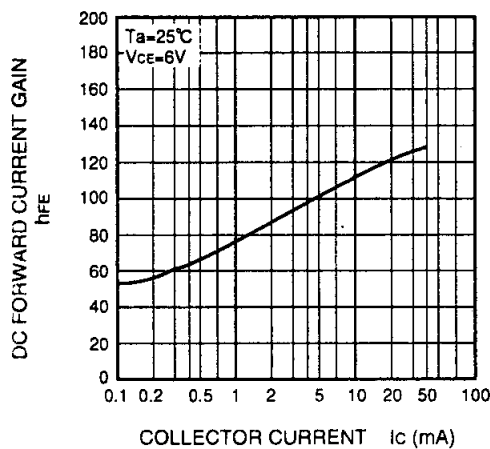
COMMON EMITTER OUTPUT (1)



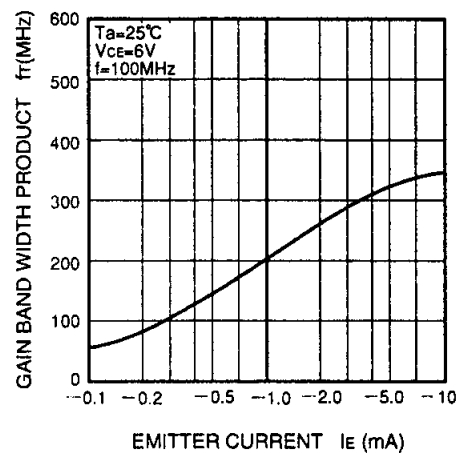
COMMON EMITTER OUTPUT (2)



DC FORWARD CURRENT GAIN  
VS. COLLECTOR CURRENT



GAIN BAND WIDTH PRODUCT  
VS. EMITTER CURRENT



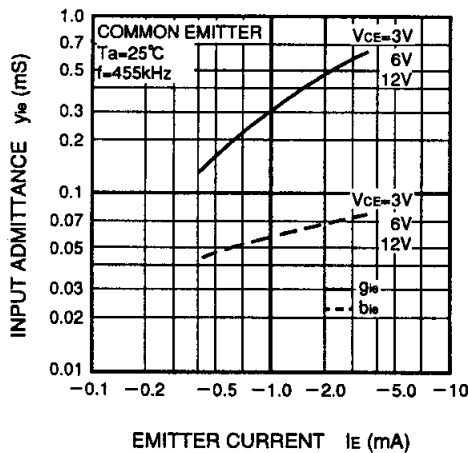
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COMMON EMITTER, y PARAMETER (TYPICAL VALUE)

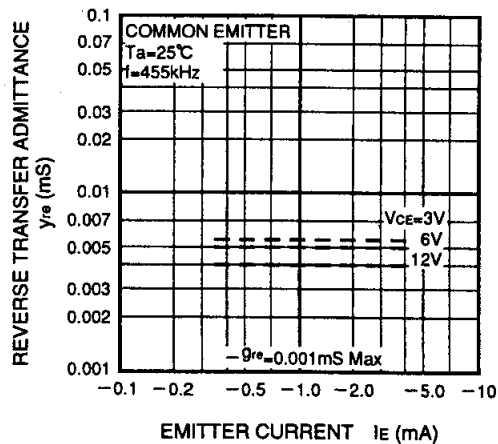
Test conditions		f=455kHz VCE=6V IE=-1mA	f=1MHz VCE=6V IE=-1mA	f=10.7MHz VCE=6V IE=-1mA	f=100MHz VCE=6V IE=-1mA
y <sub>ie</sub> (mS)	g <sub>ie</sub>	0.30	0.30	0.38	4.4
	b <sub>ie</sub>	0.06	0.12	1.40	11.0
y <sub>re</sub> (mS)	-g <sub>re</sub>	0.001Max	0.001Max	0.005Max	0.05Max
	-b <sub>re</sub>	0.005	0.010	0.11	1.0
y <sub>fe</sub> (mS)	g <sub>fe</sub>	50	46	37	25
	-b <sub>fe</sub>	1.0Max	1.0Max	2.8	16
y <sub>oe</sub> (mS)	g <sub>oe</sub>	0.010	0.012	0.03	0.32
	b <sub>oe</sub>	0.011	0.022	0.18	1.3

COMMON EMITTER, 455kHz y PARAMETER

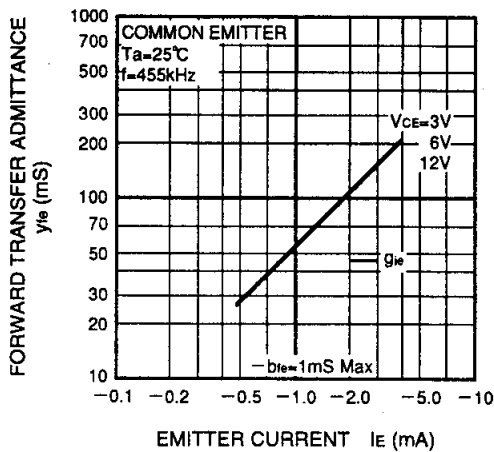
INPUT ADMITTANCE VS. EMITTER CURRENT



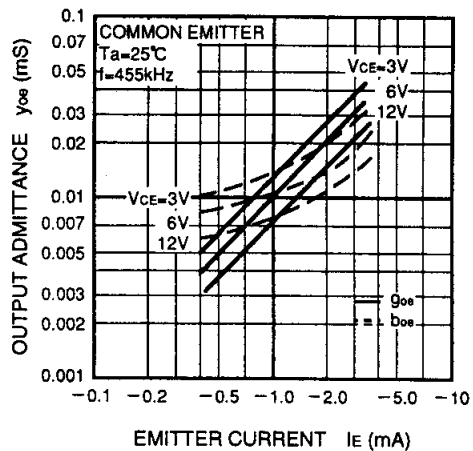
REVERSE TRANSFER ADMITTANCE VS. EMITTER CURRENT



FORWARD TRANSFER ADMITTANCE VS. EMITTER CURRENT

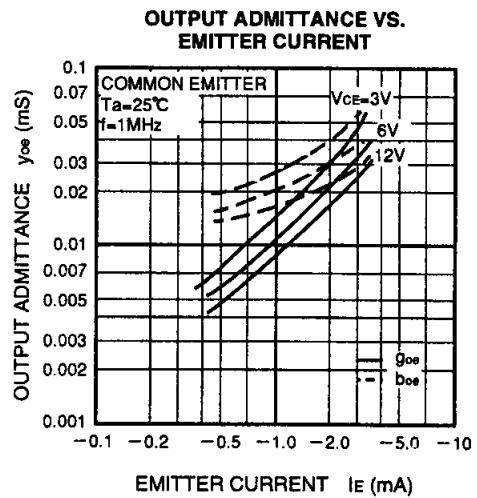
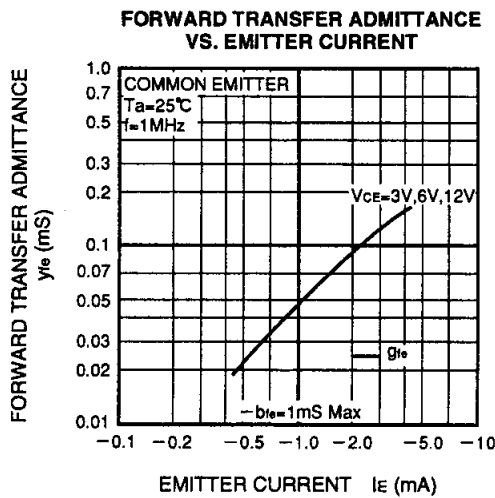
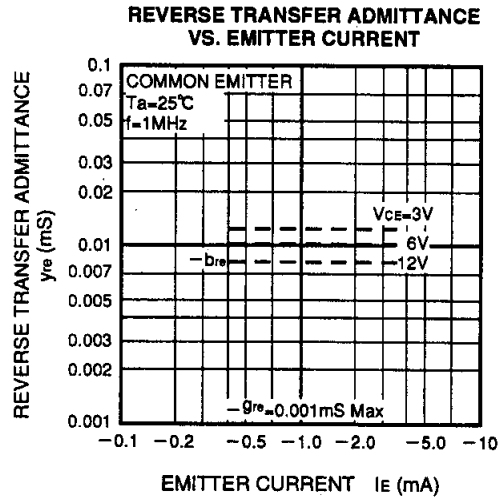
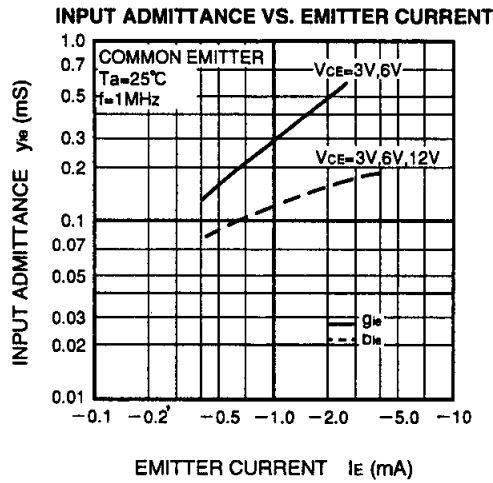


OUTPUT ADMITTANCE VS. EMITTER CURRENT

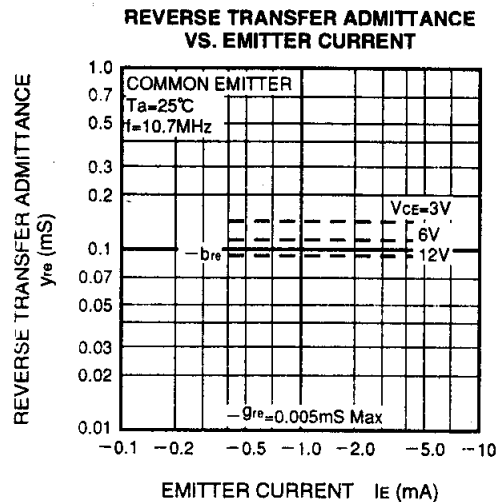
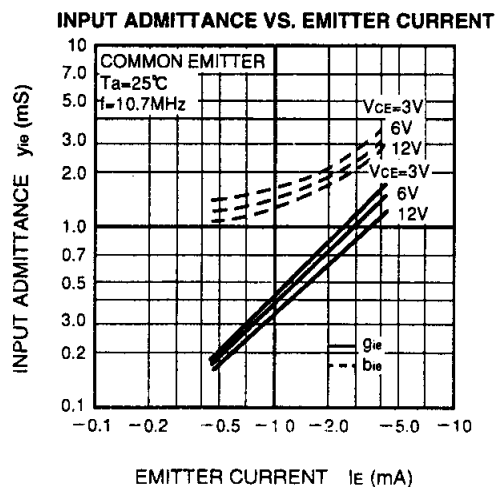


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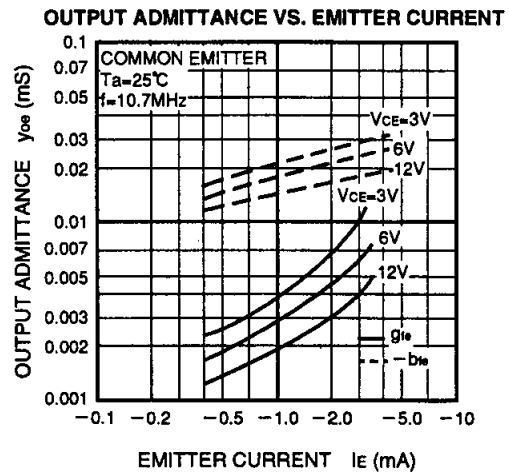
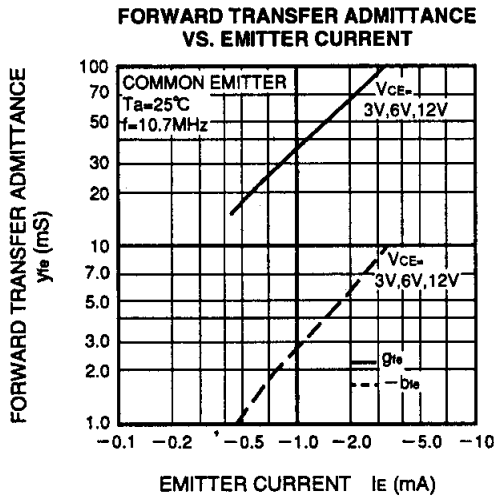
**COMMON EMITTER, 1MHz y PARAMETER**



**COMMON EMITTER, 10.7MHz y PARAMETER**



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**COMMON EMITTER, 100MHz y PARAMETER**

