SILICON NPN EPITAXIAL PLANAR TYPE

2SC3172

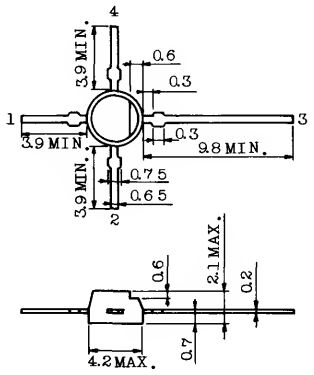
TV VHF MIXER APPLICATIONS.

FEATURES:

. High Conversion Gain : G_{ce}=26dB (Typ.)

. Low Reverse Transfer Capacitance : C_{re}=0.4pF (Typ.)

Unit in mm



1. BASE
2. EMITTER
3. COLLECTOR
4. EMITTER

JEDEC	—
EIAJ	—
TOSHIBA	2-4F1D

Weight : 0.08g

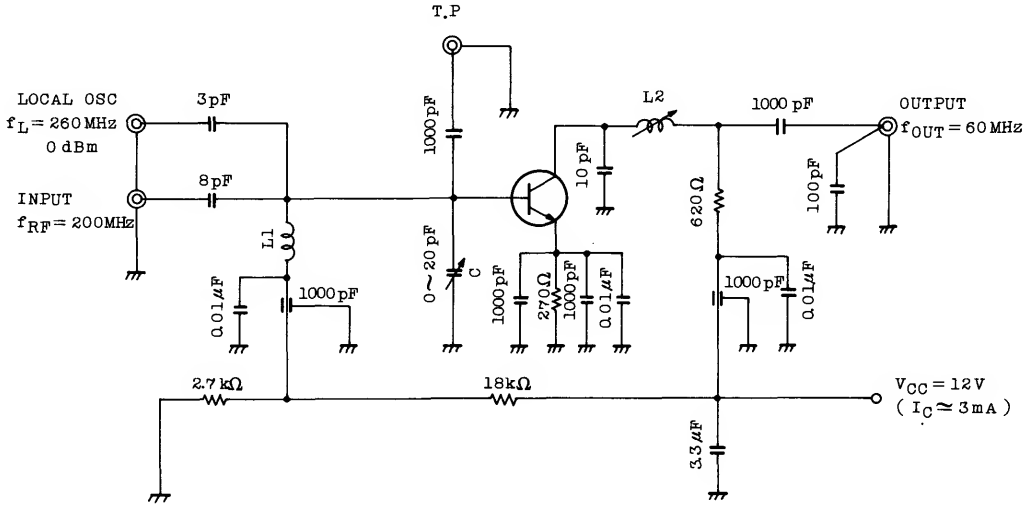
MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	30	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	3	V
Collector Current	I_C	50	mA
Base Current	I_B	25	mA
Collector Power Dissipation	P_C	200	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	-55 ~ 125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB}=25V, I_E=0	-	-	100	nA
Emitter Cut-off Current	I_{EBO}	V_{EB}=3V, I_C=0	-	-	1000	nA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, I_B=0	20	-	-	V
DC Current Gain	h_{FE}	V_{CE}=10V, I_C=5mA	40	150	300	
Reverse Transfer Capacitance	C_{re}	V_{CB}=10V, I_E=0, f=1MHz	-	0.4	0.5	pF
Transition Frequency	f_T	V_{CE}=10V, I_C=5mA	900	1400	-	MHz
Conversion Gain	G_{ce}	V_{CC}=12V, f=200MHz	23	26	-	dB
Noise Figure	NF	f_L=260MHz	-	3.8	5.5	dB

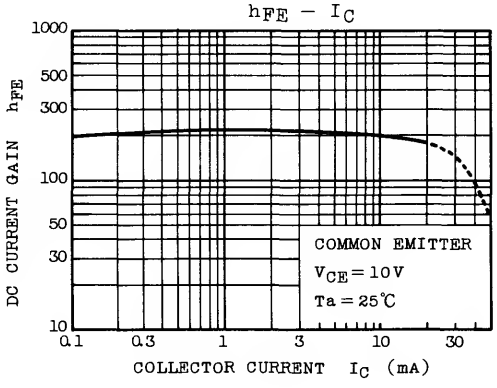
Fig. 1 200MHz G_{ce}, NF TEST CIRCUIT

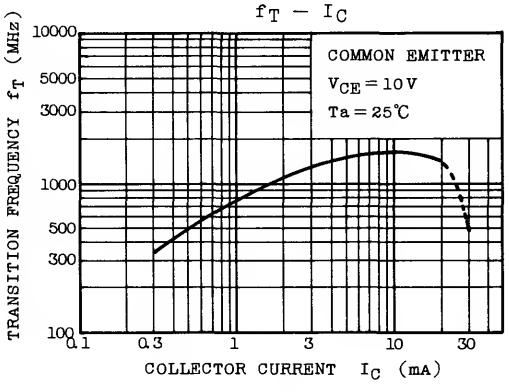


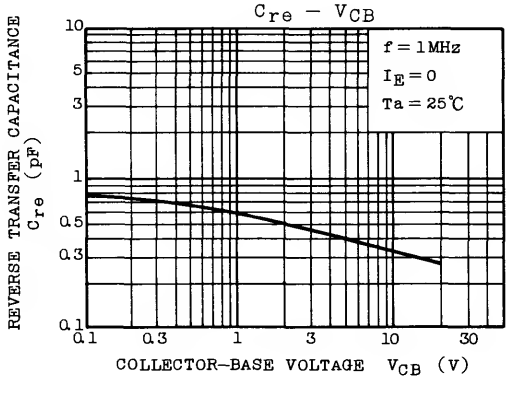
L1 : 0.8mmϕ SILVER PLATED COPPER WIRE, 1.5T, 5mm ID

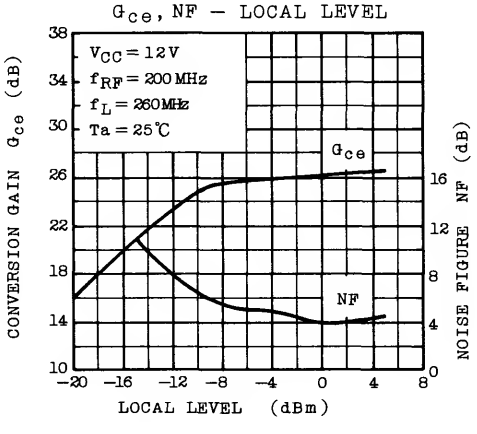
L2 : COIL WITH CORE SCN-5962A ① - ③ (TOKO INC.) OR EQUIVALENT

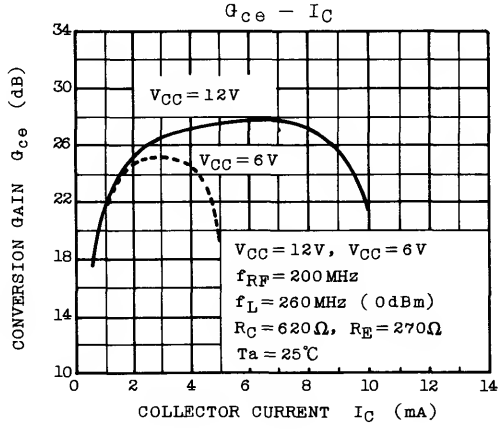
C : AIR TRIMMER TTA25A200A(MURATA MFG. Co., LTD.) OR EQUIVALENT


h_{FE} – I_C
DC CURRENT GAIN h_{FE}
1000
500
300
100
50
30
10
0.1
0.3
1
3
10
30
COMMON EMITTER
V_{CE} = 10V
Ta = 25℃
COLLECTOR CURRENT I_C (mA)

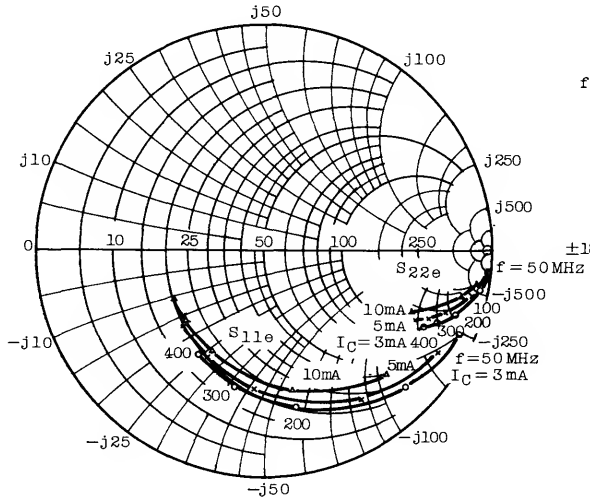

f_T – I_C
TRANSITION FREQUENCY f_T (MHz)
10000
5000
3000
1000
500
300
100
0.1
0.3
1
3
10
30
COMMON EMITTER
V_{CE} = 10V
Ta = 25℃
COLLECTOR CURRENT I_C (mA)


C_{re} – V_{CB}
REVERSE TRANSFER CAPACITANCE C_{re} (pF)
10
5
3
1
0.5
0.3
0.1
0.1
0.3
1
3
10
30
f = 1MHz
I_E = 0
Ta = 25℃
COLLECTOR-BASE VOLTAGE V_{CB} (V)

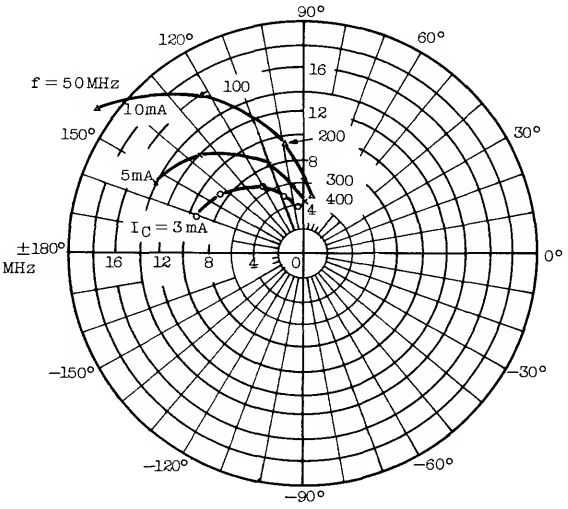

G_{ce}, NF – LOCAL LEVEL
CONVERSION GAIN G_{ce} (dB)
NOISE FIGURE NF (dB)
38
34
30
26
22
18
14
10
16
12
8
4
0
−20
−16
−12
−8
−4
0
4
8
V_{CC} = 12V
f_{RF} = 200MHz
f_L = 260MHz
Ta = 25℃
G_{ce}
NF
LOCAL LEVEL (dBm)


G_{ce} – I_C
CONVERSION GAIN G_{ce} (dB)
34
30
26
22
18
14
10
0
2
4
6
8
10
12
14
V_{CC} = 12V
V_{CC} = 6V
V_{CC} = 12V, V_{CC} = 6V
f_{RF} = 200MHz
f_L = 260MHz (0dBm)
R_C = 620Ω, R_E = 270Ω
Ta = 25℃
COLLECTOR CURRENT I_C (mA)

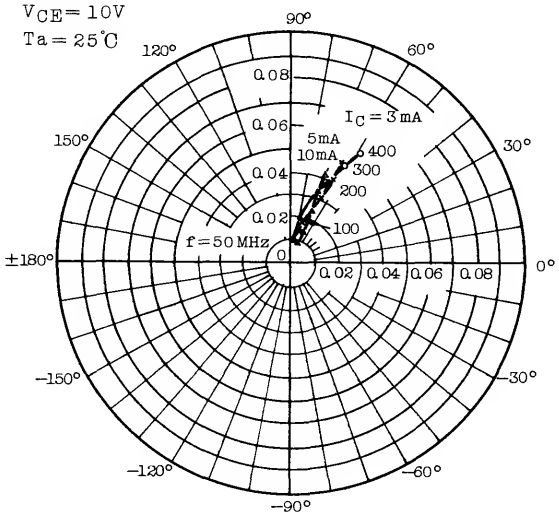
S_{11e}, S_{22e}
V_{CE} = 10V
Ta = 25°C
(UNIT : Ω)



S_{21e}
V_{CE} = 10V
Ta = 25°C



S_{12e}
V_{CE} = 10V
Ta = 25°C



P_C − Ta