NEC

SILICON TRANSISTOR
2SC3841

UHF OSCILLATOR AND UHF MIXER
NPN SILICON EPITAXIAL TRANSISTOR
MINI MOLD

DESCRIPTION

The 2SC3841 is an NPN silicon epitaxial transistor intended for use as UHF oscillators and a UHF mixer in a tuner of a TV receiver.

The device features stable oscillation and small frequency drift against any change of the supply voltage and the ambient temperature.

It is designed for use in small type equipments especially recommendd for Hybried Integrated Circuit and other applications.

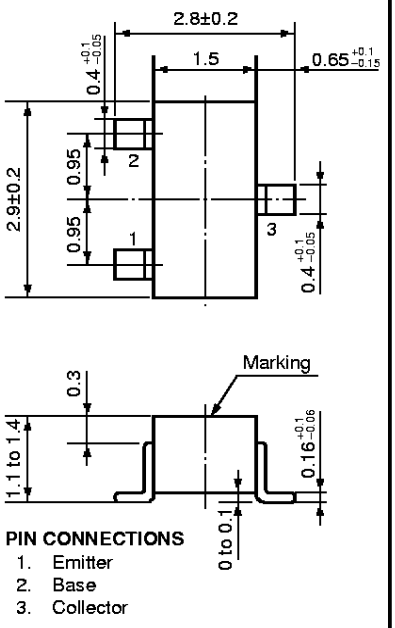
FEATURES

- High Gain Bandwidth Procuct; f_T = 4.0 GHz TYP.
- Low Collector to Base Time Constant; $C_C \cdot r_{b'b}$ = 4.0 ps TYP.
- Low Output Capacitance; C_{ob} = 1.5 pF MAX.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Maximum Voltages and Current			
Collector to Base Voltage	V_{CBO}	25	V
Collector to Emitter Voltage	V_{CEO}	12	V
Emitter to Base Voltage	V_{EBO}	3	V
Collector Current	I_C	30	mA
Maximum Power Dissipation			
Total Power Dissipation	P_T	200	mW
Maximum Power Temperutures			
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−55 to +150	°C

PACKAGE DIMENSIONS
(Units: mm)



PIN CONNECTIONS
1. Emitter
2. Base
3. Collector

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			0.1	μA	V_{CB} = 10 V, I_E = 0
DC Current Gain	h_{FE}	40	100	200		V_{CE} = 10 V, I_C = 5.0 mA
Collector Saturation Voltage	$V_{CE(sat)}$		0.09	0.5	V	I_C = 10 mA, I_B = 1.0 mA
Gain Bandwidth Product	f_T	2.5	4.0		GHz	V_{CE} = 10 V, I_E = −5.0 mA
Output Capacitance	C_{ob}		0.85	1.5	pF	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz
Collector to Base Time Constatnt	$C_C \cdot r_{b'b}$		4.0	10.0	ps	V_{CE} = 10 V, I_E = −5.0 mA, f = 31.9 MHz

h_{FE} Classification

Class	T62/P *	T63/Q *	T64/R *
Marking	T62	T63	T64
h_{FE}	40 to 80	60 to 120	100 to 200

* Old Specification / New Specification

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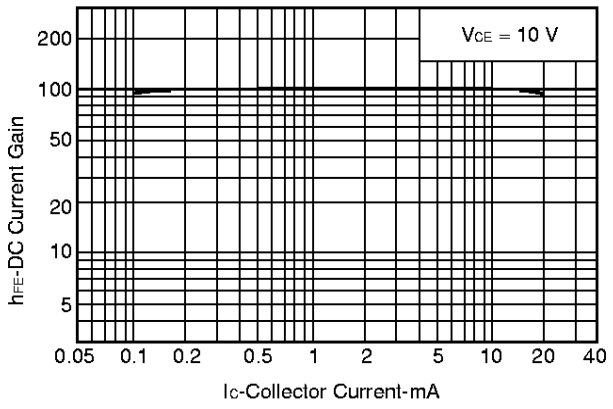
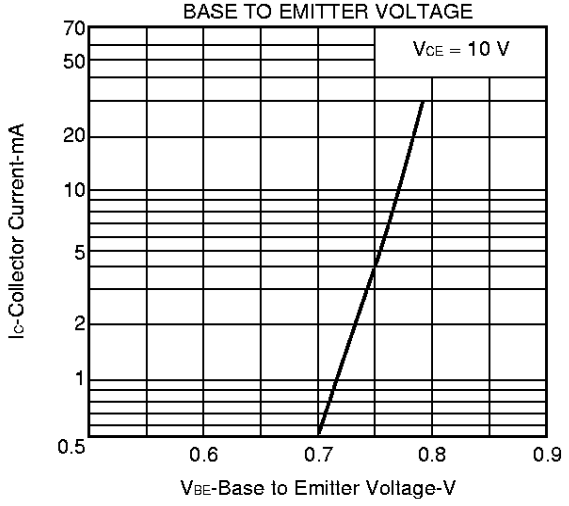
TYPICAL CHARACTERISTICS (T_A = 25 °C)

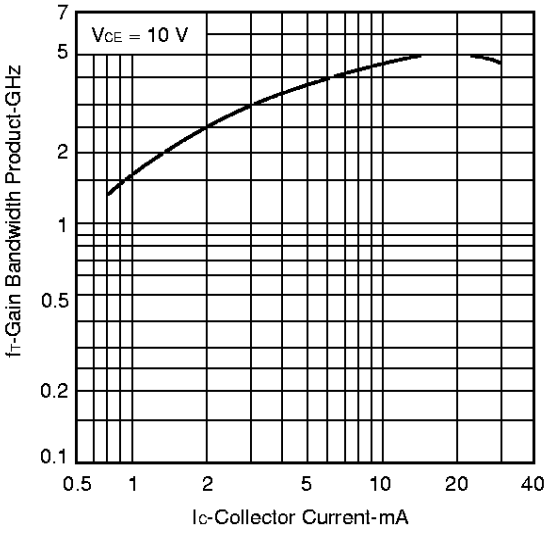
DC CURRENT GAIN vs.
COLLECTOR CURRENT



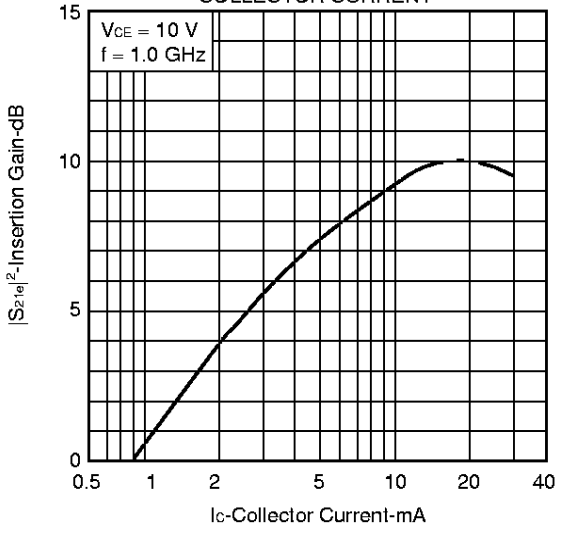
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



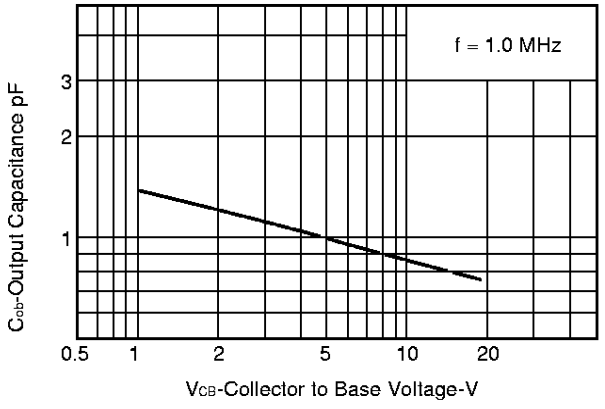
GAIN BANDWIDTH PRODUCT vs.
COLLECTOR CURRENT



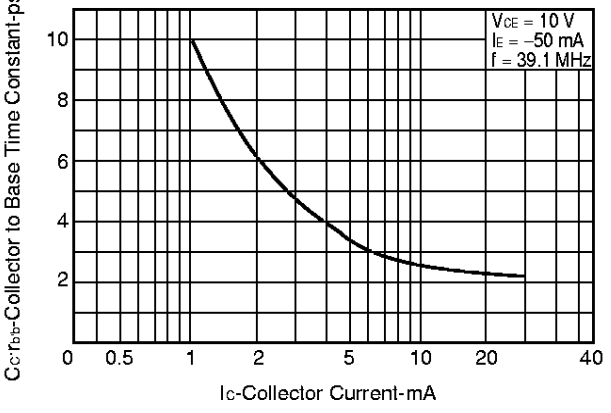
INSERTION GAIN vs.
COLLECTOR CURRENT



OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE



CC·rb'b vs.
COLLECTOR CURRENT



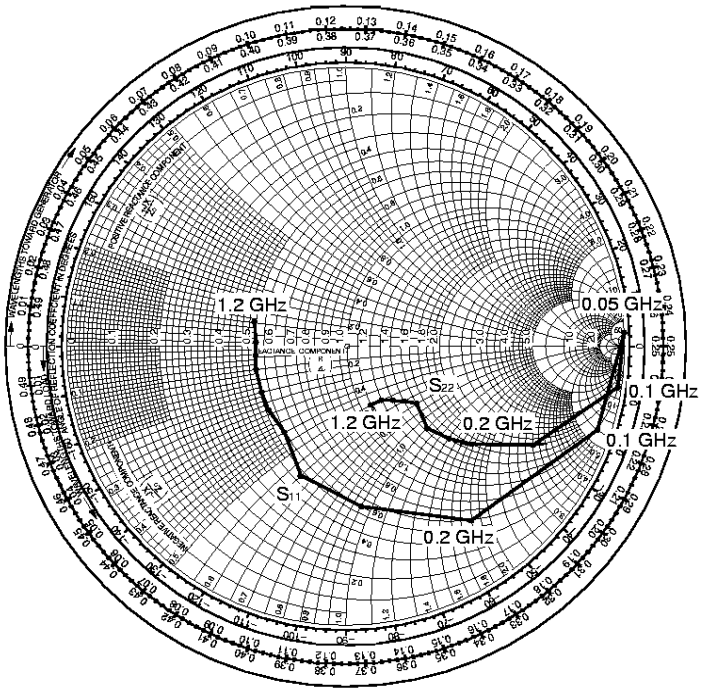
S-PARAMETER

V_{CE} = 10 V, I_C = 5 mA, Z_O = 50 Ω

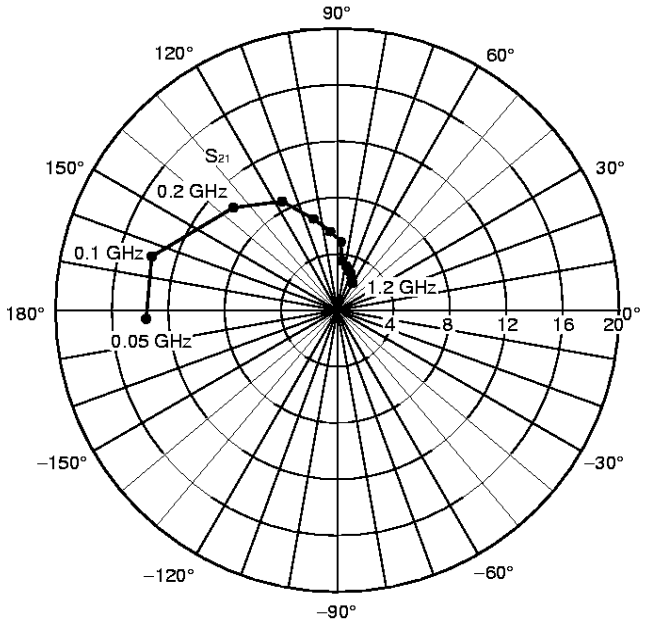
f (MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
50	1.047	3	14.240	−178	0.003	42	1.012	3
100	0.944	−18	13.693	164	0.026	81	0.989	−10
200	0.750	−56	10.802	137	0.058	66	0.759	−30
300	0.562	−84	8.270	118	0.078	59	0.582	−39
400	0.468	−106	6.449	105	0.091	58	0.484	−40
500	0.394	−123	5.399	97	0.106	58	0.417	−45
600	0.372	−138	4.421	89	0.120	59	0.343	−44
700	0.359	−150	3.824	83	0.133	59	0.309	−48
800	0.343	−164	3.388	77	0.146	58	0.288	−53
900	0.339	−172	3.020	73	0.158	59	0.292	−54
1000	0.320	178	2.692	67	0.172	59	0.279	−61
1100	0.339	170	2.483	64	0.188	59	0.279	−57
1200	0.351	168	2.291	61	0.204	59	0.279	−61

S-PARAMETER

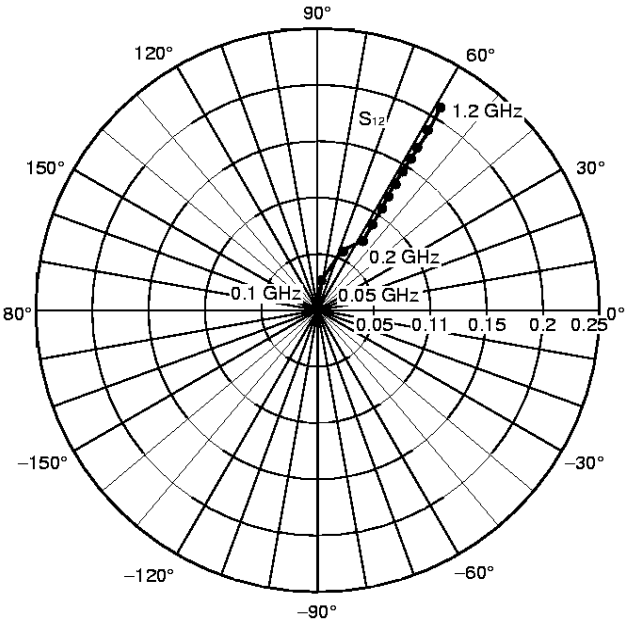
S_{11e}, S_{22e}-FREQUENCY CONDITION V_{CE} = 10 V, I_C = 5 mA, Z_O = 50 Ω



S_{21e}-FREQUENCY CONDITION V_{CE} = 10 V, I_C = 5 mA



S_{12e}-FREQUENCY CONDITION V_{CE} = 10 V, I_C = 5 mA



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