

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 Hybrided Integrated Circuit and other applications.

FEATURES

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

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

Maximum Voltages and Current

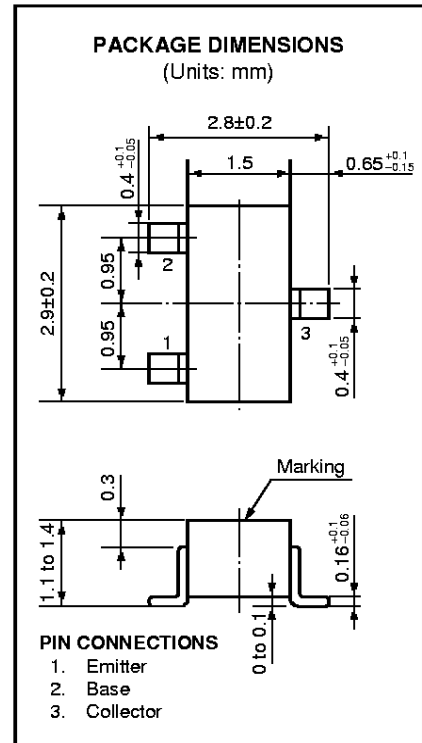
Collector to Base Voltage	$V_{CBO}$	25	V
Collector to Emitter Voltage	$V_{CEO}$	12	V
Emitter to Base Voltage	$V_{EBO}$	3	V
Collector Current	$I_C$	30	mA

Maximum Power Dissipation

Total Power Dissipation	$P_T$	200	mW
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Maximum Power Temperatures

Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$



ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

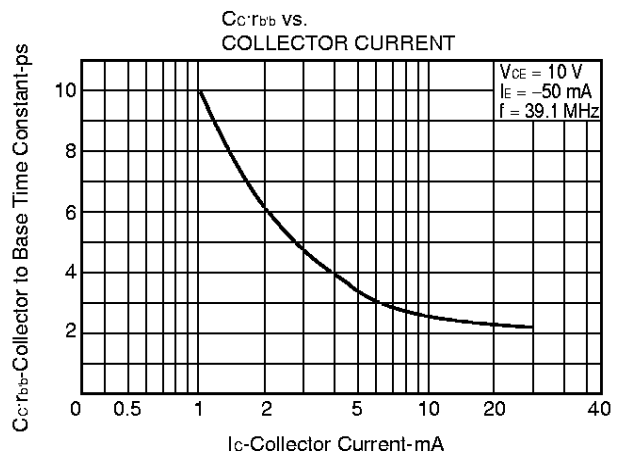
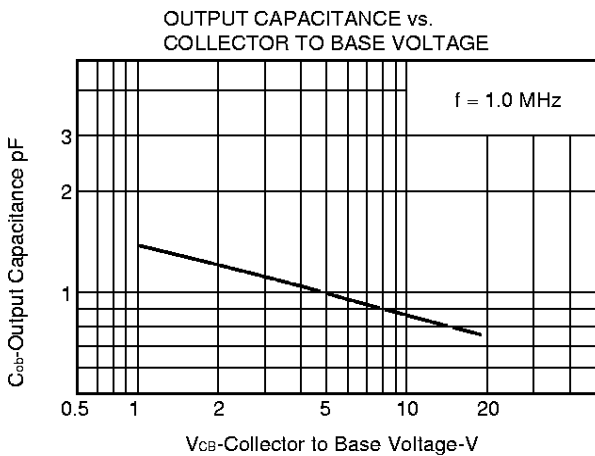
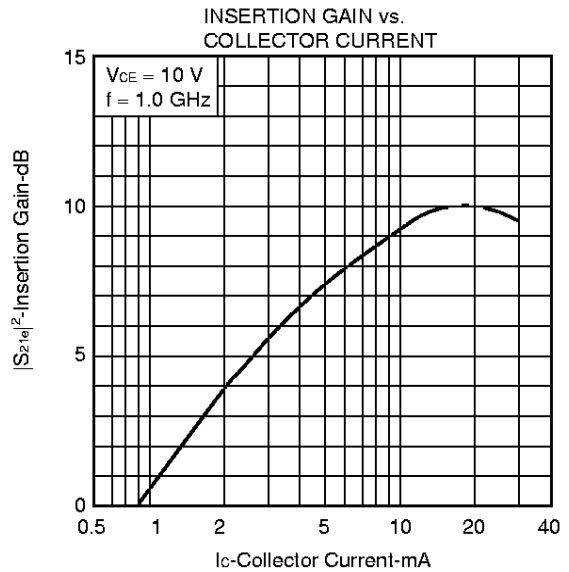
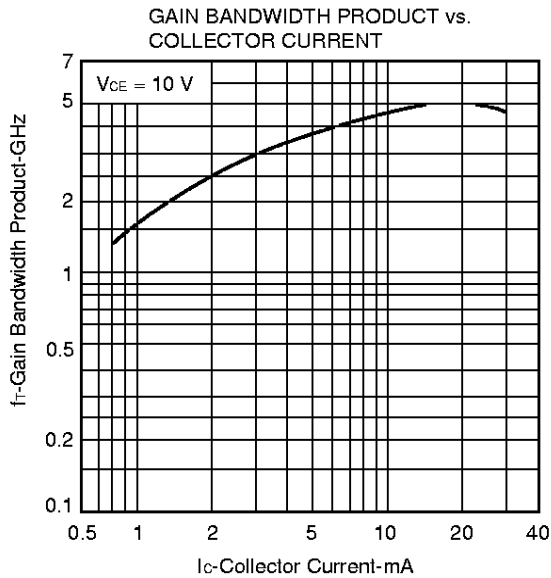
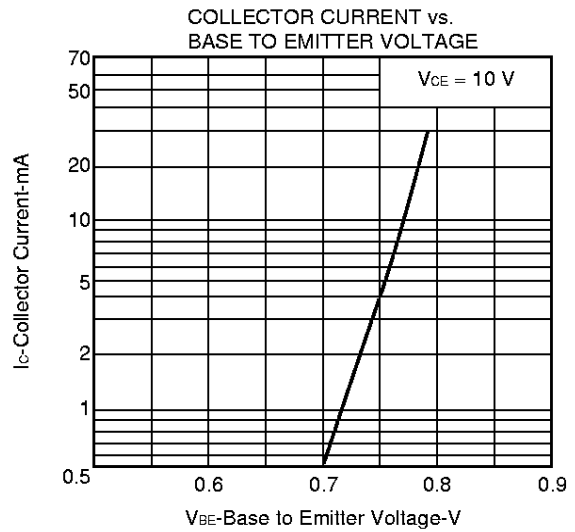
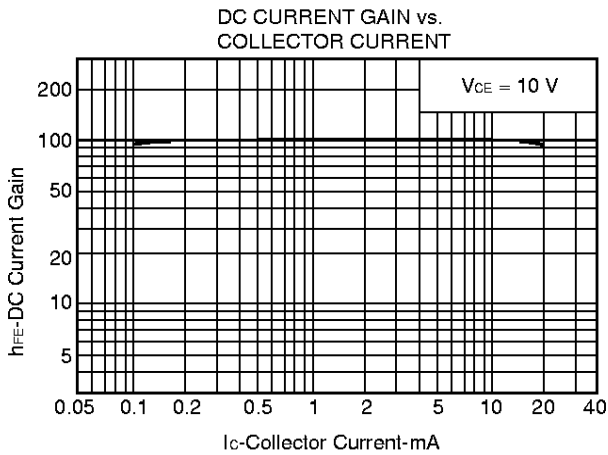
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			0.1	$\mu\text{A}$	$V_{CB} = 10$ V, $I_E = 0$
DC Current Gain	$h_{FE}$	40	100	200		$V_{CE} = 10$ V, $I_C = 5.0$ mA
Collector Saturation Voltage	$V_{CE(sat)}$		0.09	0.5	V	$I_C = 10$ mA, $I_B = 1.0$ mA
Gain Bandwidth 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 Constannt	$C_C \cdot \tau_{b'b}$		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

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)



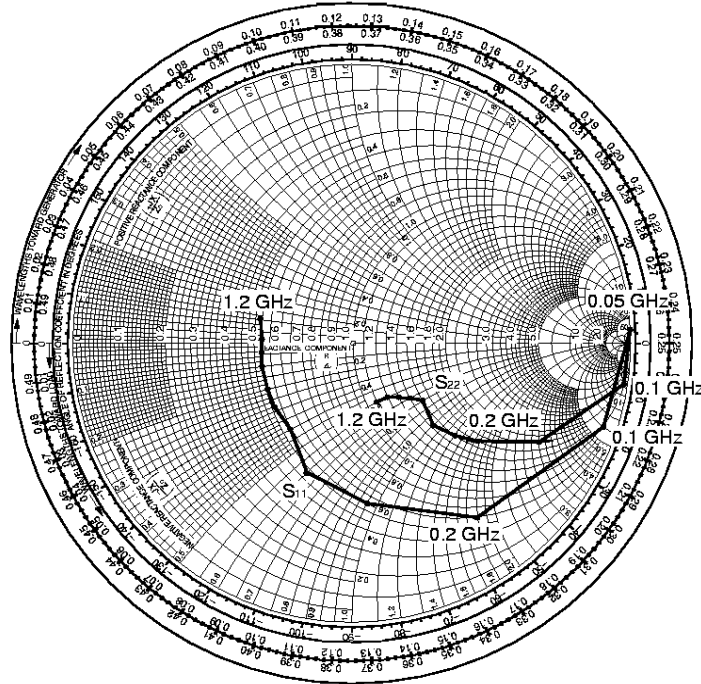
**S-PARAMETER**

$V_{CE} = 10 \text{ V}$ ,  $I_c = 5 \text{ mA}$ ,  $Z_o = 50 \Omega$

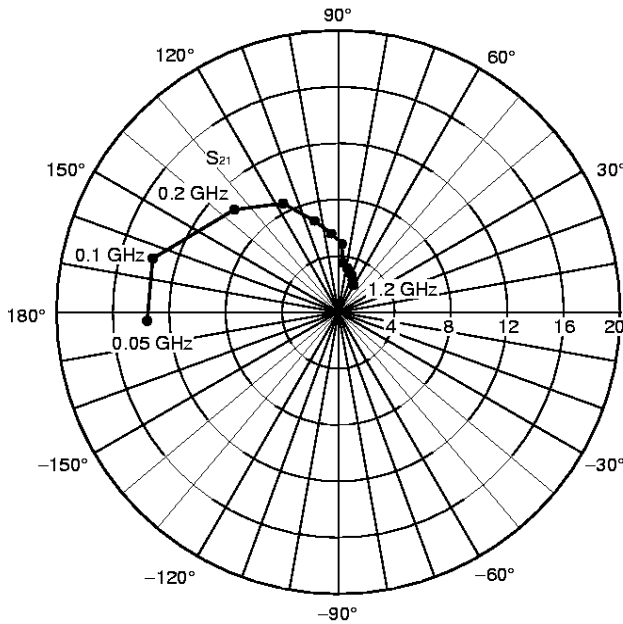
f (MHz)	S <sub>11</sub>	∠ S <sub>11</sub>	S <sub>21</sub>	∠ S <sub>21</sub>	S <sub>12</sub>	∠ S <sub>12</sub>	S <sub>22</sub>	∠ S <sub>22</sub>
50	1.047	3	14.240	-178	0.003	42	1.012	3
100	0.944	-18	13.693	164	0.026	81	0.989	-10
200	0.750	-56	10.802	137	0.058	66	0.759	-30
300	0.562	-84	8.270	118	0.078	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

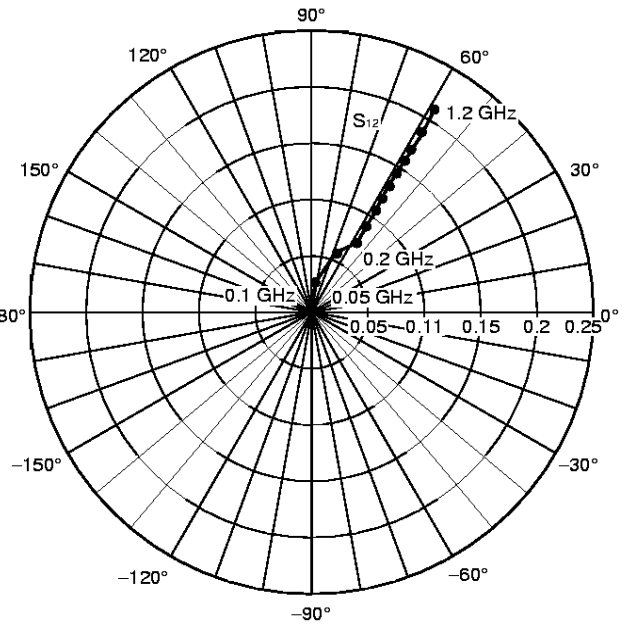
$S_{11e}$ ,  $S_{22e}$ -FREQUENCY CONDITION  $V_{CE} = 10\text{ V}$ ,  $I_c = 5\text{ mA}$ ,  $Z_O = 50\ \Omega$



$S_{21e}$ -FREQUENCY CONDITION  $V_{CE} = 10\text{ V}$ ,  $I_c = 5\text{ mA}$



$S_{12e}$ -FREQUENCY CONDITION  $V_{CE} = 10\text{ V}$ ,  $I_c = 5\text{ mA}$



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Anti-radioactive design is not implemented in this product.