

Transistors

# High-Frequency Amplifier Transistor (20V, 50mA, 1.5GHz)

## 2SC5661 / 2SC4725 / 2SC4082 / 2SC3837K

●Features

- 1) High transition frequency. (Typ.  $f_T = 1.5\text{GHz}$ )
- 2) Small  $r_{bb'}$ -Cc and high gain. (Typ. 6ps)
- 3) Small NF.

●Packaging specifications and  $h_{FE}$

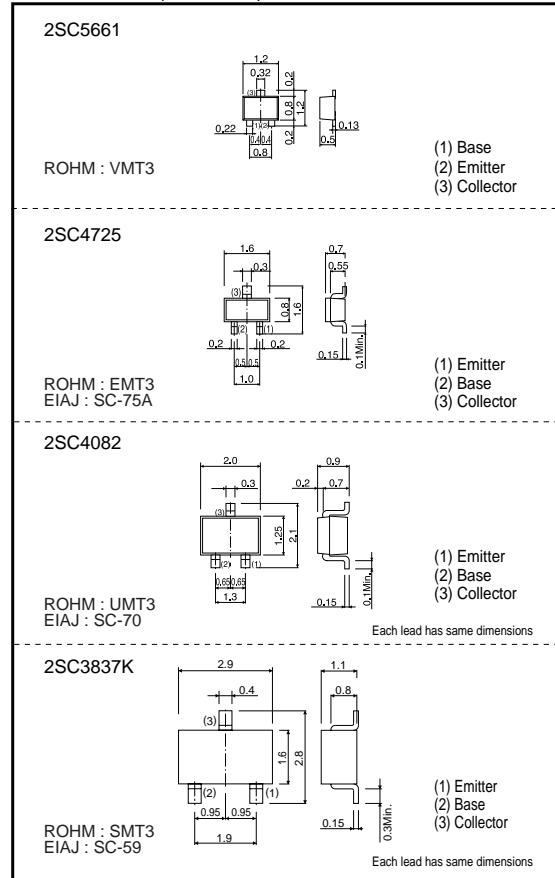
Type	2SC5661	2SC4725	2SC4082	2SC3837K
Package	VMT3	EMT3	UMT3	SMT3
$h_{FE}$	NP	NP	NP	NP
Marking	AC*	AC*	1C*	AC*
Code	T2L	TL	T106	T146
Basic ordering unit (pieces)	8000	3000	3000	3000

\* Denotes  $h_{FE}$

● Absolute maximum ratings ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CB0}$	30	V
Collector-emitter voltage	$V_{CE0}$	20	V
Emitter-base voltage	$V_{EB0}$	3	V
Collector current	$I_C$	50	mA
Collector power dissipation	2SC5661, 2SC4725	0.15	W
	2SC4082, 2SC3837K	0.2	
Junction temperature	$T_J$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

●Dimensions (Unit : mm)



●Electrical characteristics ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CB0}$	30	-	-	V	$I_C = 10\mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CE0}$	18	-	-	V	$I_C = 1\text{mA}$
Emitter-base breakdown voltage	$BV_{EB0}$	3	-	-	V	$I_E = 10\mu\text{A}$
Collector cutoff current	$I_{CBO}$	-	-	0.5	$\mu\text{A}$	$V_{CB} = 15\text{V}$
Emitter cutoff current	$I_{EBO}$	-	-	0.5	$\mu\text{A}$	$V_{EB} = 2\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.5	V	$I_C/I_E = 20\text{mA}/4\text{mA}$
DC current transfer ratio	$h_{FE}$	56	-	180	-	$V_{CE}/I_C = 10\text{V}/10\text{mA}$
Transition frequency	$f_T$	600	1500	-	MHz	$V_{CE} = 10\text{V}$ , $I_E = -10\text{mA}$ , $f = 200\text{MHz}$
Output capacitance	$C_{ob}$	-	0.9	1.5	pF	$V_{CB} = 10\text{V}$ , $I_E = 0\text{A}$ , $f = 1\text{MHz}$
Collector-base time constant	$r_{bb'}$ -Cc	-	6	13	ps	$V_{CB} = 10\text{V}$ , $I_C = 10\text{mA}$ , $f = 31.8\text{MHz}$
Noise factor	NF	-	4.5	-	dB	$V_{CE} = 12\text{V}$ , $I_C = 2\text{mA}$ , $f = 200\text{MHz}$ , $R_g = 50\Omega$

This product might cause chip aging and breakdown under the large electrified environment.  
Please consider to design ESD protection circuit.

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● Electrical characteristic curves

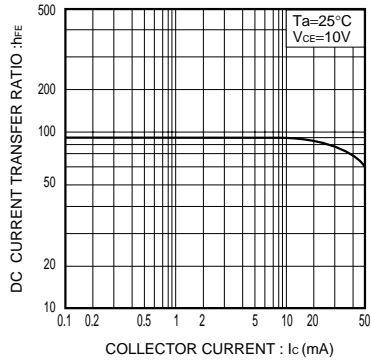


Fig.1 DC current gain vs. collector current

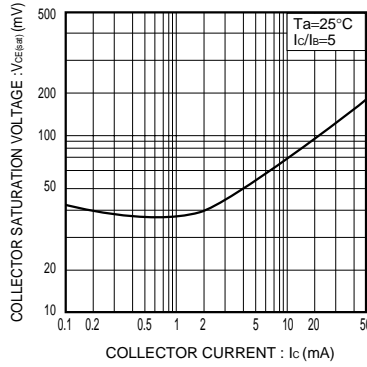


Fig.2 Collector-emitter saturation voltage vs. collector current

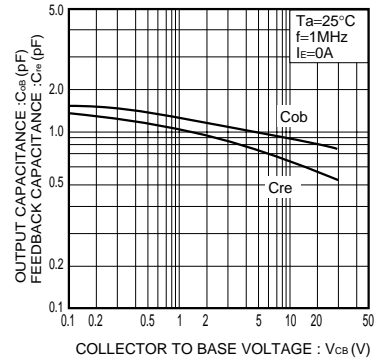


Fig.3 Capacitance vs. reverse bias voltage

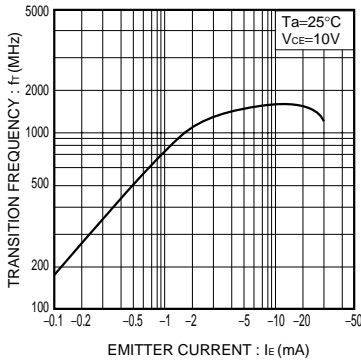


Fig.4 Gain bandwidth product vs. emitter current

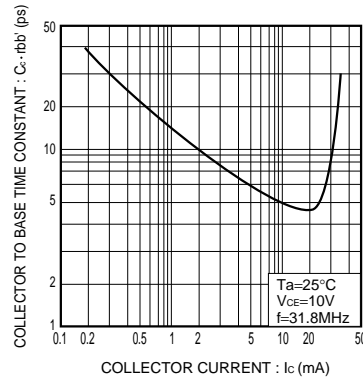


Fig.5 Collector to base time constant vs. collector current

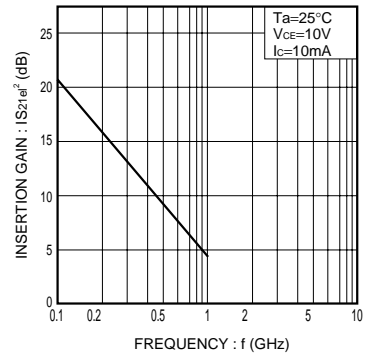


Fig.6 Insertion gain vs. frequency

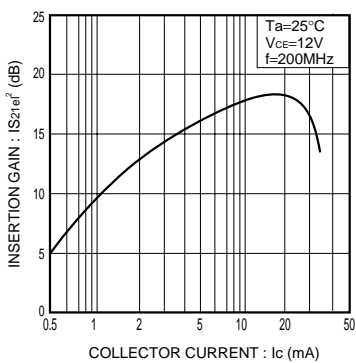


Fig.7 Insertion gain vs. collector current

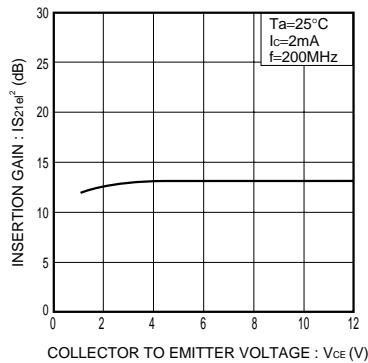


Fig.8 Insertion gain vs. collector voltage

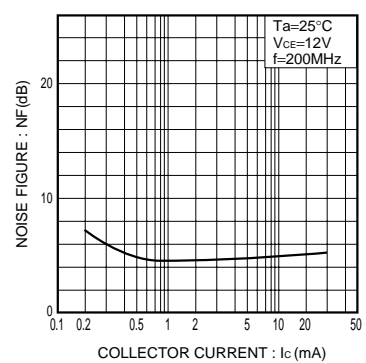


Fig.9 Noise factor vs. collector current

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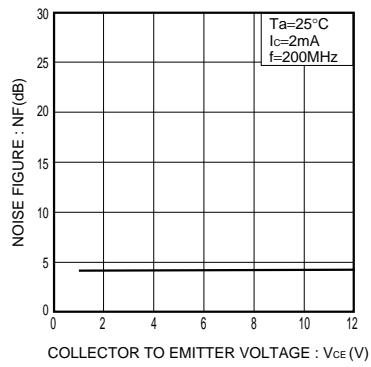


Fig.10 Noise factor vs. collector voltage

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