

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 2SC4082, 2SC3837K	0.15	W
		0.2	
Junction temperature	T_J	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

●Dimensions (Unit : mm)

<p>2SC5661</p> <p>ROHM : VMT3</p> <p>(1) Base (2) Emitter (3) Collector</p>	<p>2SC4725</p> <p>ROHM : EMT3 EIAJ : SC-75A SOT-416</p> <p>(1) Emitter (2) Base (3) Collector</p>
<p>2SC4082</p> <p>ROHM : UMT3 EIAJ : SC-70</p> <p>(1) Emitter (2) Base (3) Collector</p> <p>Each lead has same dimensions</p>	<p>2SC3837K</p> <p>ROHM : SMT3 EIAJ : SC-59</p> <p>(1) Emitter (2) Base (3) Collector</p> <p>Each lead has same dimensions</p>

●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}	20	—	—	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	μA	$V_{CB} = 15\text{V}$
Emitter cutoff current	I_{EBO}	—	—	0.5	μA	$V_{EB} = 2\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	0.5	V	$I_C/I_B = 20\text{mA}/4\text{mA}$
DC current transfer ratio	h_{FE}	82	—	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.

●Electrical characteristic curves

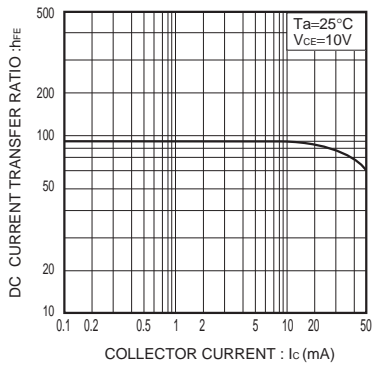


Fig.1 DC current gain vs. collector current

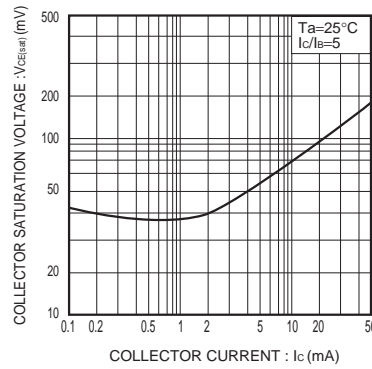


Fig.2 Collector-emitter saturation voltage vs. collector current

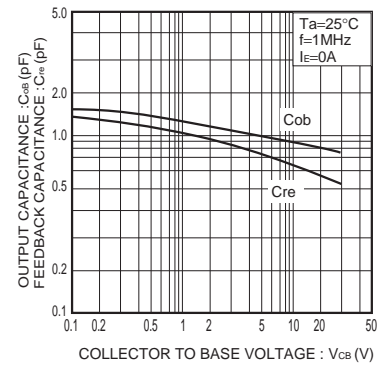


Fig.3 Capacitance vs. reverse bias voltage

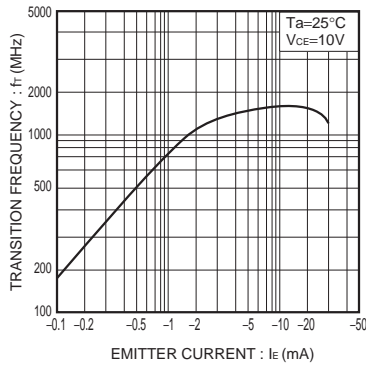


Fig.4 Gain bandwidth product vs. emitter current

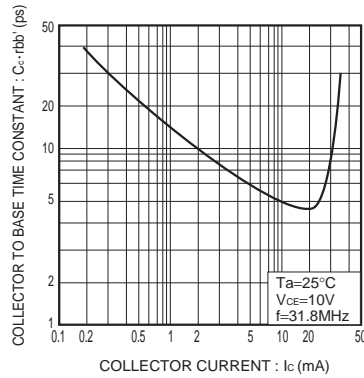


Fig.5 Collector to base time constant vs. collector current

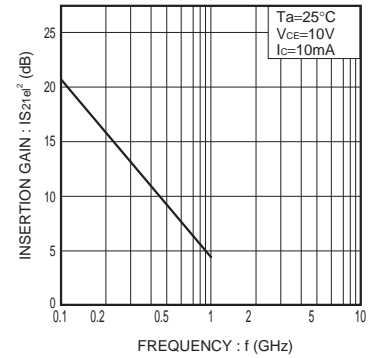


Fig.6 Insertion gain vs. frequency

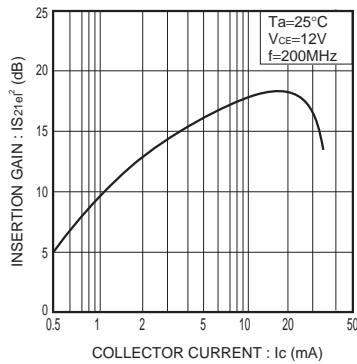


Fig.7 Insertion gain vs. collector current

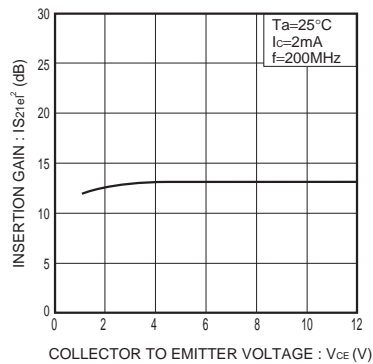


Fig.8 Insertion gain vs. collector voltage

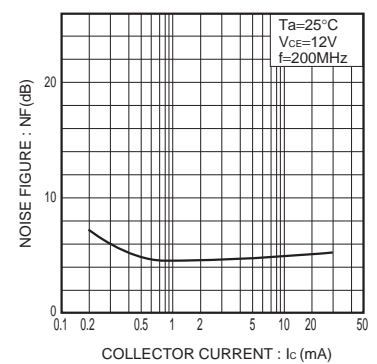


Fig.9 Noise factor vs. collector current

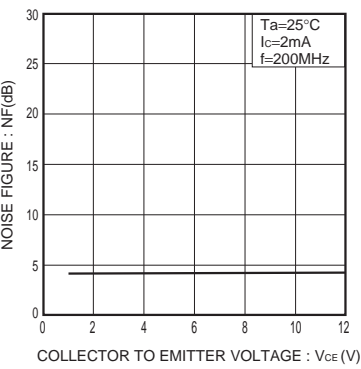


Fig.10 Noise factor vs. collector voltage

Notes

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