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

2SC5661 / 2SC4725 / 2SC4082 / 2SC3837K

●**Features**
1) High transition frequency. (Typ. f$_T$ = 1.5GHz)
2) Small rbb'·Cc and high gain. (Typ. 6ps)
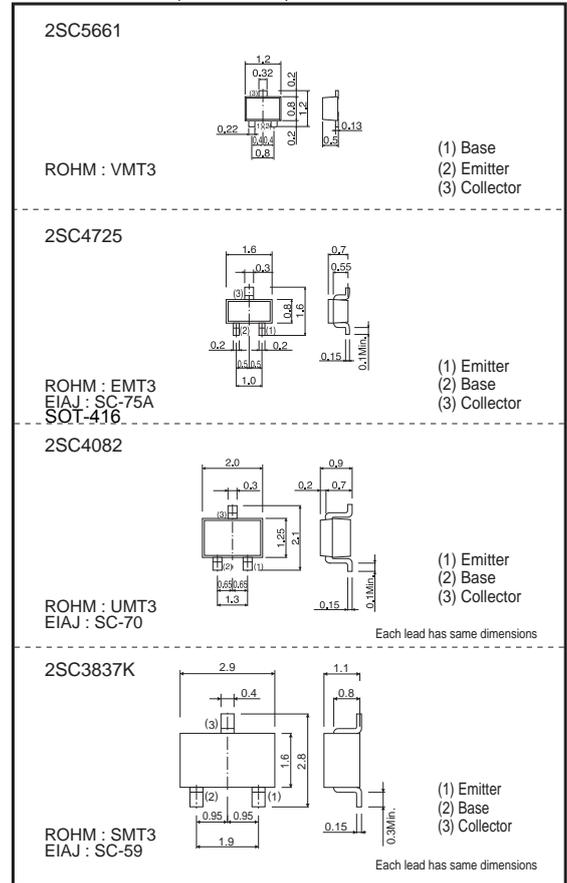3) Small NF.

●**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** (Ta=25°C)

Parameter		Symbol	Limits	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
Collector power dissipation	2SC5661, 2SC4725	P$_C$	0.15	W
	2SC4082, 2SC3837K		0.2	
Junction temperature		Tj	150	°C
Storage temperature		Tstg	−55 to +150	°C

●**Dimensions** (Unit : mm)

2SC5661
ROHM : VMT3
(1) Base
(2) Emitter
(3) Collector

2SC4725
ROHM : EMT3
EIAJ : SC-75A
SOT-416
(1) Emitter
(2) Base
(3) Collector

2SC4082
ROHM : UMT3
EIAJ : SC-70
(1) Emitter
(2) Base
(3) Collector
Each lead has same dimensions

2SC3837K
ROHM : SMT3
EIAJ : SC-59
(1) Emitter
(2) Base
(3) Collector
Each lead has same dimensions

●**Electrical characteristics** (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV$_{CBO}$	30	–	–	V	I$_C$ = 10µA
Collector-emitter breakdown voltage	BV$_{CEO}$	20	–	–	V	I$_C$ = 1mA
Emitter-base breakdown voltage	BV$_{EBO}$	3	–	–	V	I$_E$ = 10µA
Collector cutoff current	I$_{CBO}$	–	–	0.5	µA	V$_{CB}$ = 15V
Emitter cutoff current	I$_{EBO}$	–	–	0.5	µA	V$_{EB}$ = 2V
Collector-emitter saturation voltage	V$_{CE(sat)}$	–	–	0.5	V	I$_C$/I$_B$ = 20mA/4mA
DC current transfer ratio	h$_{FE}$	82	–	180	–	V$_{CE}$/I$_C$ = 10V/10mA
Transition frequency	f$_T$	600	1500	–	MHz	V$_{CE}$ = 10V , I$_E$ = −10mA , f = 200MHz
Output capacitance	Cob	–	0.9	1.5	pF	V$_{CB}$ = 10V , I$_E$ = 0A , f = 1MHz
Collector-base time constant	rbb'·Cc	–	6	13	ps	V$_{CB}$ = 10V , I$_C$ = 10mA , f = 31.8MHz
Noise factor	NF	–	4.5	–	dB	V$_{CE}$ = 12V , I$_C$ = 2mA , f = 200MHz , Rg = 50Ω

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

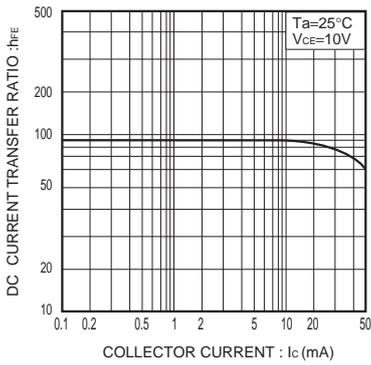●**Electrical characteristic curves**

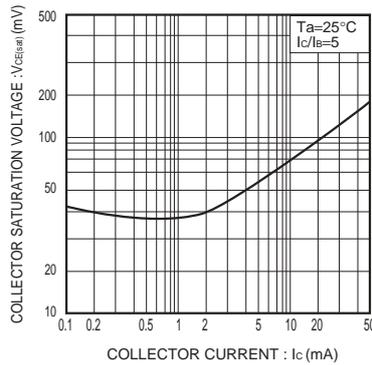Fig.1 DC current gain vs. collector current

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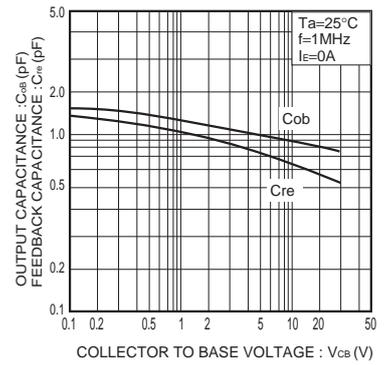vs. collector current

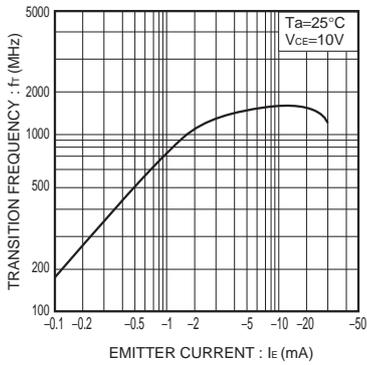Fig.3 Capacitance vs. reverse bias voltage

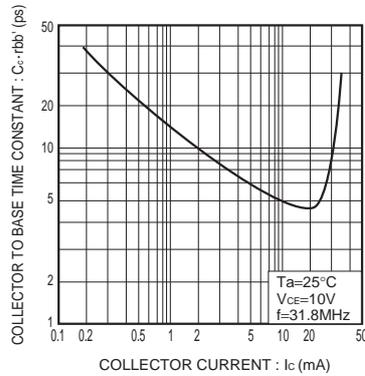Fig.4 Gain bandwidth product vs. emitter current

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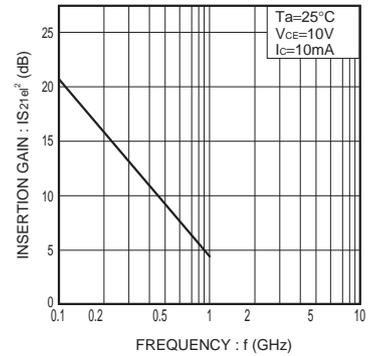vs. collector current

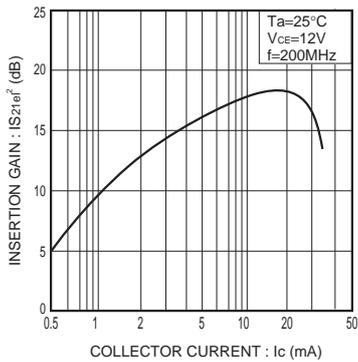

Fig.6 Insertion gain vs. frequency

Fig.7 Insertion gain vs. collector current
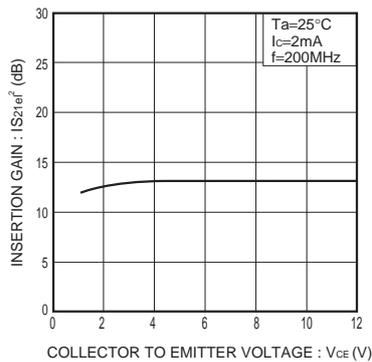

Fig.8 Insertion gain vs. collector voltage

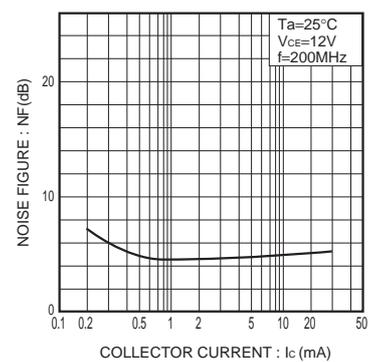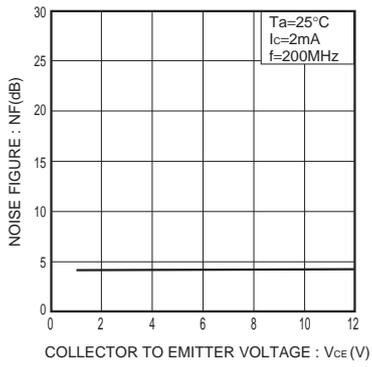Fig.9 Noise factor vs. collector current

Fig.10 Noise factor vs. collector voltage

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Notes

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