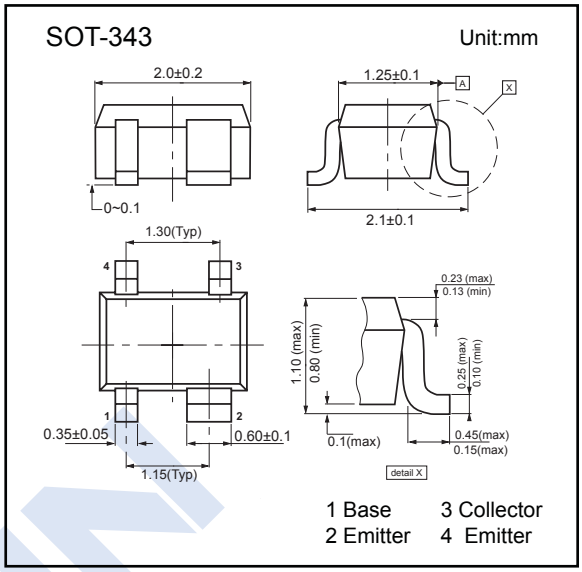
NPN Silicon RF Transistor

2KC1106

■ Features

- For high gain low noise amplifiers
- For oscillators up to 10 GHz
- Noise figure F = 1.05 dB at 1.8 GHz
  outstanding G_{ms} = 20 dB at 1.8 GHz
- Transition frequency f_T = 25 GHz
- Gold metalization for high reliability



■ Absolute Maximum Ratings (T_A = 25 °C, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	15	V
Collector - Emitter Voltage	V_{CEO}	4.5	
Emitter - Base Voltage	V_{EBO}	1.5	
Collector Current	I_C	35	mA
Base current	I_B	3	
Total Power Dissipation) $T_S \leqslant 107$℃	P_{tot}	160	mW
Junction - soldering point *1	$R_{\theta JS}$	270	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature range	T_{stg}	-65 to 150	

*1 T_S is measured on the collector lead at thsoldering point to the pcb.

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■ Electrical Characteristics (T_A= 25 °C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= 100 μA， I_E=0	15			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= 1 mA， I_B=0	4.5			
Emitter - base breakdown voltage	V_{EBO}	I_E= 100 μA， I_C=0	1.5			
Collector-base cut-off current	I_{CBO}	V_{CB}= 5 V , I_E=0			200	nA
Emitter cut-off current	I_{EBO}	V_{EB}= 1.5 V , I_C=0			35	μA
DC current gain	h_{FE}	V_{CE}= 4V, I_C= 20mA	50		150	
Collector-base capacitance	C_{Cb}	V_{CB} = 2 V, f = 1 MHz		0.15	0.24	pF
Collector emitter capacitance	C_{ce}	V_{CE} = 2 V, f = 1 MHz		0.41		
Emitter-base capacitance	C_{eb}	V_{EB} = 0.5 V, f = 1 MHz		0.55		
Noise figure	F	I_C = 5 mA, V_{CE} = 2 V, Z_S = Zsopt, f = 1.8 GHz		1.05	1.4	dB
Power gain *1	G_{ms}	I_C = 20 mA, V_{CE} = 2 V, Z_S = Zsopt, Z_L = Z_{lopt}, f = 1.8 GHz		20		
Insertion power gain	|S21|2	I_C = 20 mA, V_{CE} = 2 V, Z_S = Z_L = 50Ω， f = 1.8 GHz	14	17		
Third order intercept point	IP_3	I_C = 20 mA, V_{CE} = 2 V, Z_S = Zsopt, Z_L = Z_{Lopt} f = 1.8 GHz		22		dBm
1dB Compression point at output	P_{-1dB}	I_C = 20 mA, V_{CE} = 2 V, Z_S = Zsopt, Z_L = Z_{lopt}		12		
Transition frequency	f_T	I_C = 30 mA, V_{CE} = 3 V, f = 2 GHz	20	25		GHz

*1 G_{ms} = |S_{21} / S_{12}|

■ Marking

Marking	AMs

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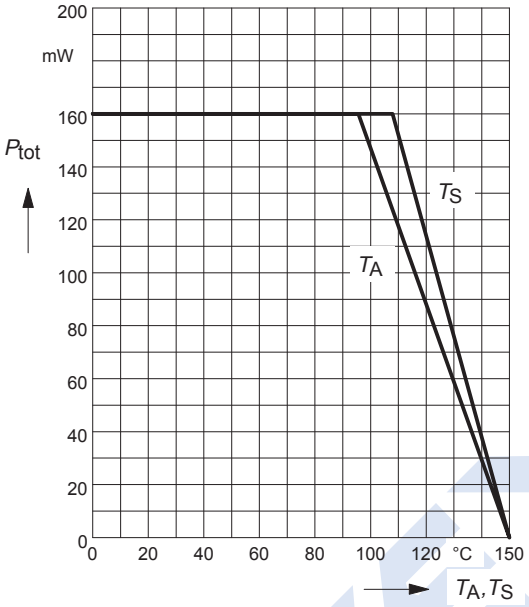
■ Electrical characteristic curves

Total power dissipation $P_{tot} = f(T_A^*, T_S)$

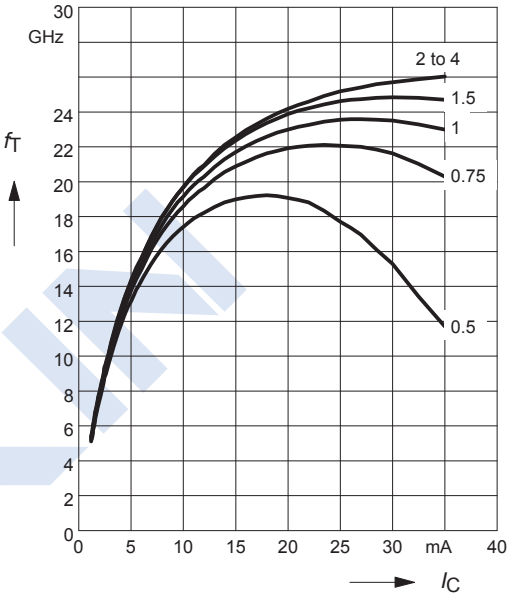
* Package mounted on epoxy



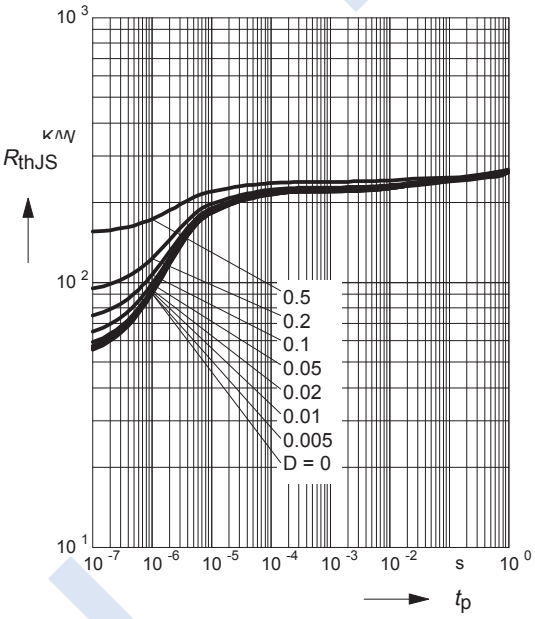
Transition frequency $f_T = f(I_C)$

f = 2 GHz

V_{CE} = parameter in V

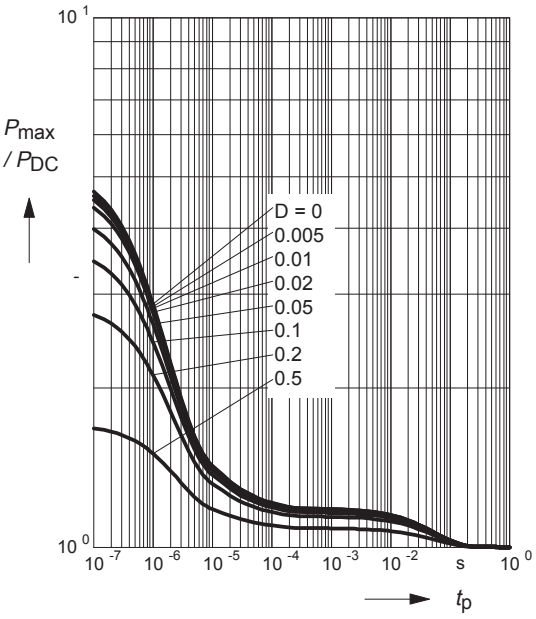


Permissible Pulse Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

$P_{totmax}/P_{totDC} = f(t_p)$



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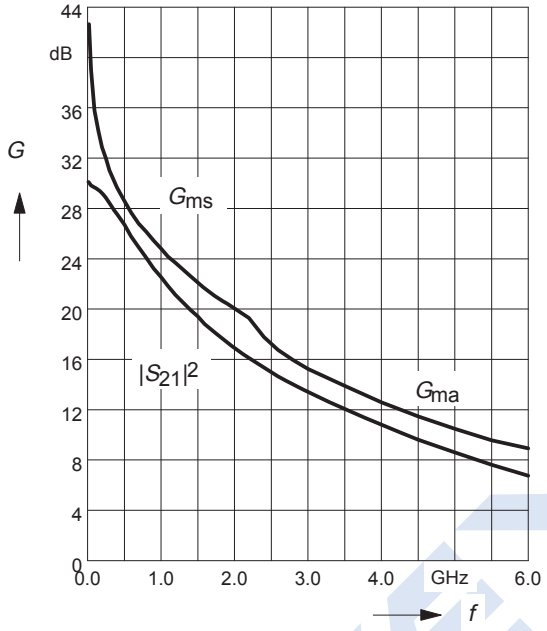
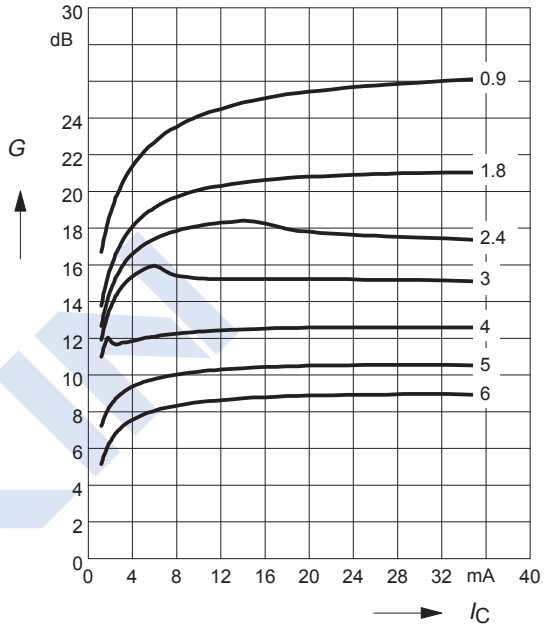
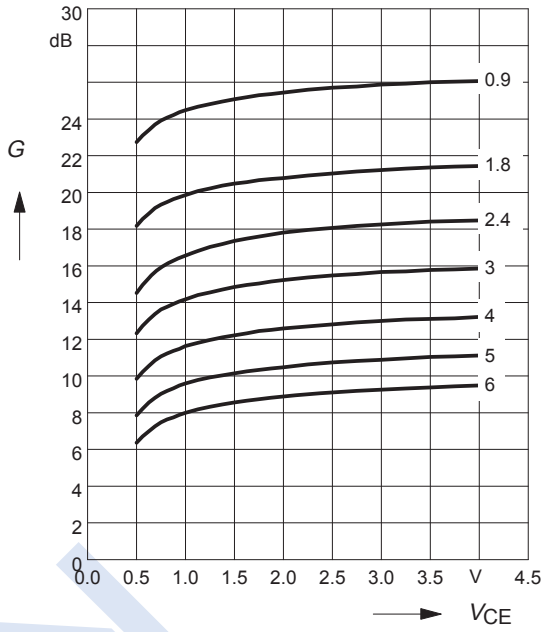
Power gain G_{ma}, G_{ms}, $|S_{21}|^2 = f(f)$
V_{CE} = 2V, I_C = 20 mA



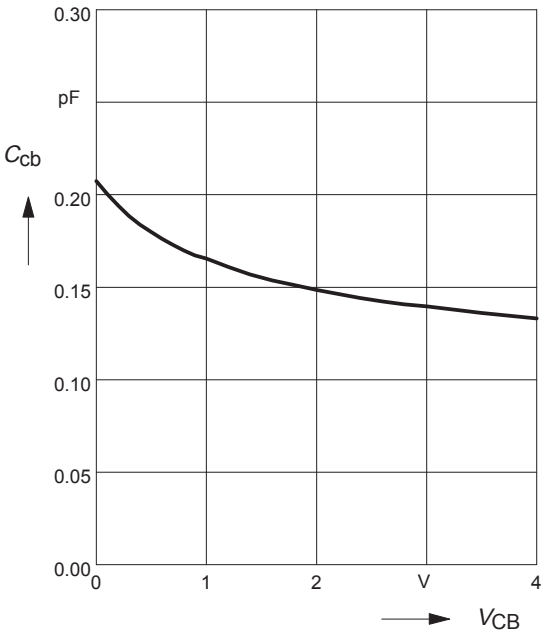
Power gain G_{ma}, $G_{ms} = f(I_C)$
V_{CE} = 2V
f = parameter in GHz



Power gain G_{ma}, $G_{ms} = f(V_{CE})$
I_C = 20 mA
f = parameter in GHz



Collector-base capacitance $C_{cb} = f(V_{CB})$
V_{BE} = 0, f = 1MHz



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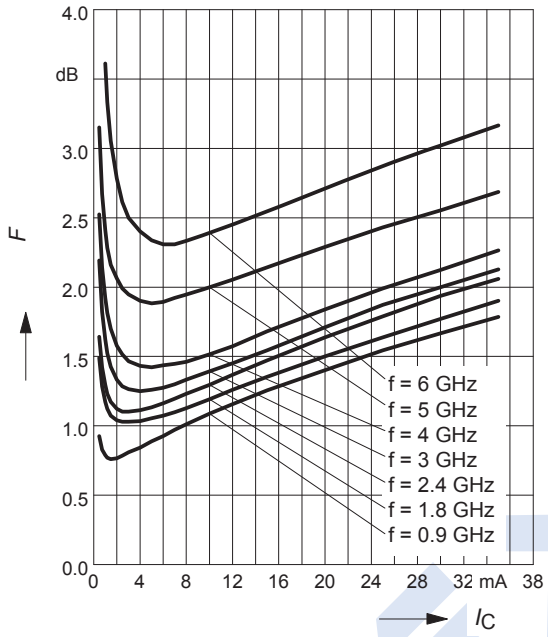
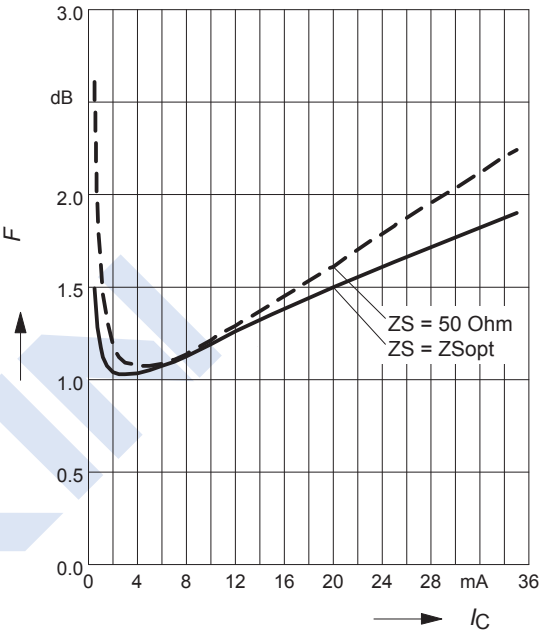
Noise figure $F = f(I_C)$

V_{CE} = 2 V, $Z_S = Z_{Sopt}$



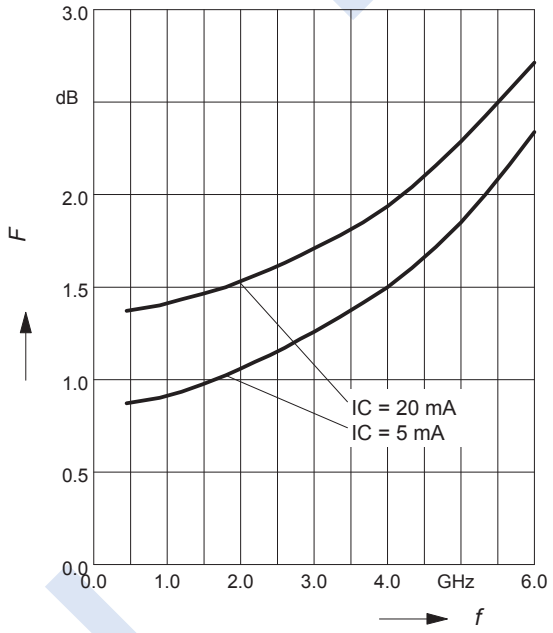
Noise figure $F = f(I_C)$

V_{CE} = 2 V, f = 1.8 GHz



Noise figure $F = f(f)$

V_{CE} = 2 V, $Z_S = Z_{Sopt}$



Source impedance for min.

Noise Figure versus Frequency

V_{CE} = 2 V, I_C = 5 mA / 20 mA