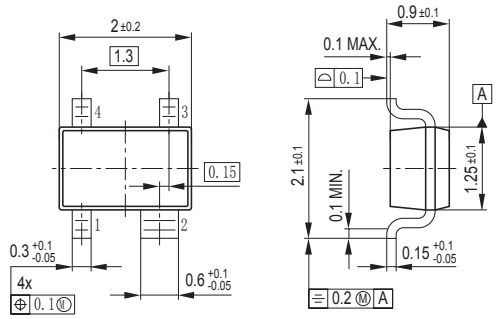
NPN Transistors

BFP740 (KFP740)

SOT-343 Uint: mm



1 Base 3 Collector
2 Emitter 4 Emitter

■ Features

- High gain ultra low noise RF transistor
- High maximum stable gain
- Gold metallization for extra high reliability
- 150 GHz f_T-Silicon Germanium technology
- Outstanding noise figure F = 0.5 dB at 1.8 GHz
  Outstanding noise figure F = 0.85 dB at 6 GHz

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	13	V
Collector - Emitter Voltage	V_{CES}	13	
Collector - Emitter Voltage Ta > 0°C	V_{CEO}	4	
Ta ≤ 0°C		3.5	
Emitter - Base Voltage	V_{EBO}	1.2	
Collector Current - Continuous	I_C	30	mA
Base Current	I_B	3	
Collector Power Dissipation	P_C	160	mW
Junction - soldering point	R_{thJS}	≤380	℃/W
Junction Temperature	T_J	150	℃
Ambient temperature	T_A	-65 to 150	
Storage Temperature Range	T_{stg}	-65 to 150	

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= 100 uA， I_E= 0	13			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= 1 mA， I_B= 0	4	4.7		
Emitter - base breakdown voltage	V_{EBO}	I_E= 100 uA， I_C= 0	1.2			
Collector-base cut-off current	I_{CBO}	V_{CB}= 5 V , I_E= 0			0.1	uA
Collector- emitter cut-off current	I_{CES}	V_{CE}= 13 V ,V_{EBE}= 0			30	
Emitter cut-off current	I_{EBO}	V_{EB}= 1.2V , I_C=0			3	
DC current gain	h_{FE}	V_{CE}= 3V, I_C= 25mA	160		400	
Power gain, maximum stable	G_{ms}	I_C = 25 mA, V_{CE} = 3 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 1.8 GHz (Note.1)		27		dB
Power gain, maximum available	G_{ma}	I_C = 25 mA, V_{CE} = 3 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt}, f = 6 GHz (Note.1)		17		
Noise figure	F	I_C = 8 mA, V_{CE} = 3 V, f = 1.8 GHz, Z_S = Z_{Sopt}		0.5		
		I_C = 8 mA, V_{CE} = 3 V, f = 6 GHz, Z_S = Z_{Sopt}		0.85		
Transducer gain	$\|S_{21e}\|^2$	I_C=25 mA,V_{CE} =3 V, Z_S = Z_L =50 Ω,f=1.8GHz		24.5		
		I_C=25 mA,V_{CE} =3 V, Z_S = Z_L =50 Ω,f=6GHz		13.5		
Third order intercept point at output	IP_3	V_{CE} =3 V, I_C = 25 mA, Z_S=Z_L=50 Ω, f=1.8GHz		25		dBm
1dB Compression point at output	P_{-1dB}	I_C= 25 mA, V_{CE} = 3 V, Z_S=Z_L=50 Ω,f = 1.8GHz		11		
Collector-base capacitance	C_{cb}	V_{CB}= 3V, V_{BE}= 0,f=1MHz		0.08	0.14	pF
Collector-emitter capacitance	C_{ce}	V_{CE}= 3V, V_{BE}= 0,f=1MHz		0.24		
Emitter-base capacitance	C_{eb}	V_{EB}= 0.5V, V_{CB}= 0,f=1MHz		0.44		
Transition frequency	f_T	V_{CE}= 3V, I_C= 25mA,f=2GHz		42		GHz

Note.1: G_{ma} = $|S_{21e} / S_{12e}|$ (k-(k^2-1)1/2), Gms = $|S_{21e} / S_{12e}|$

■ Marking

Marking	R7s

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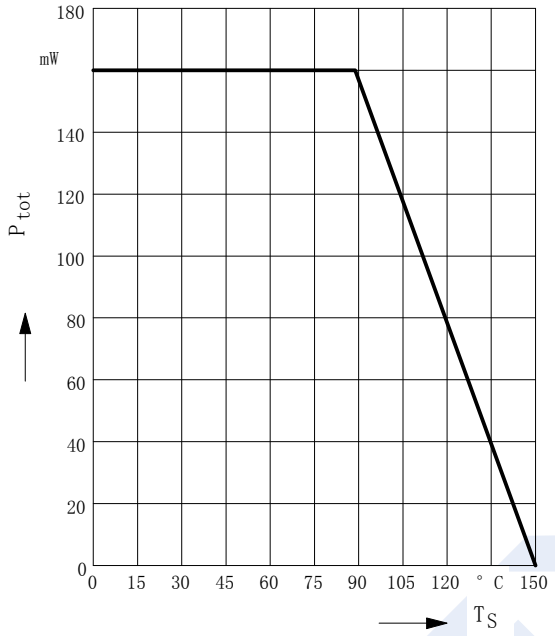
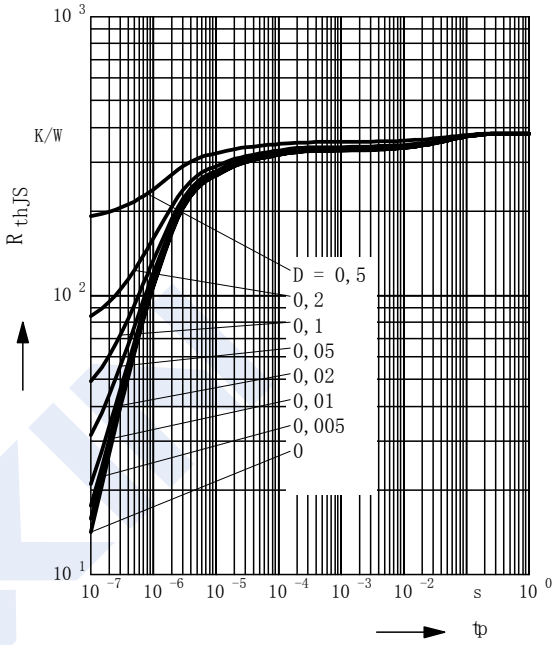
■ Typical Characterisitics

Total power dissipation $P_{tot} = f(T_S)$

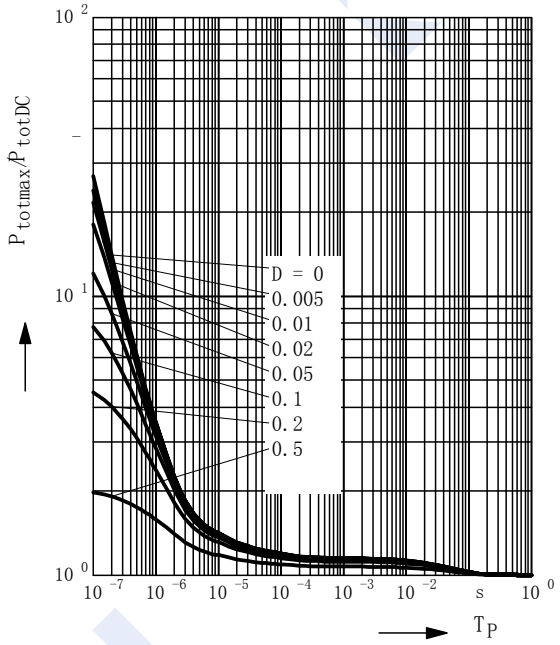


Permissible Pulse Load $R_{thJS} = f(t_p)$



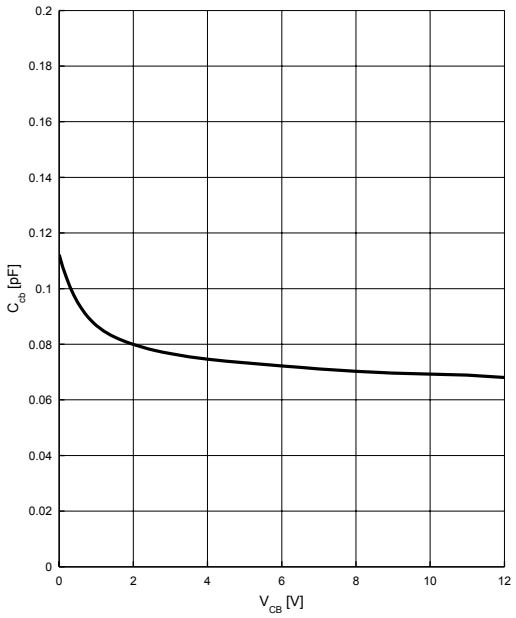
Permissible Pulse Load

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



Collector-base capacitance $C_{cb} = f(V_{CB})$

f = 1 MHz



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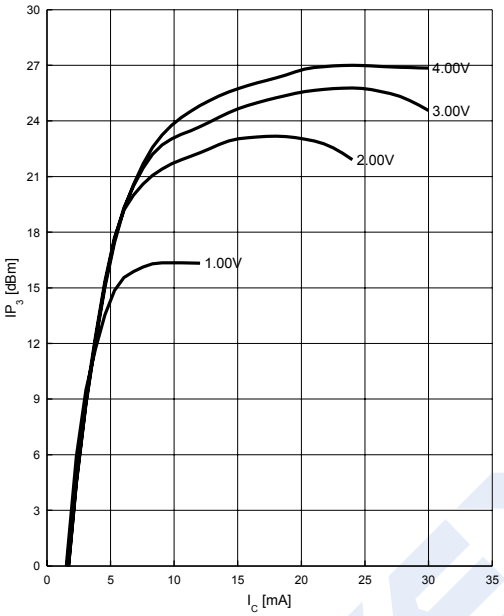
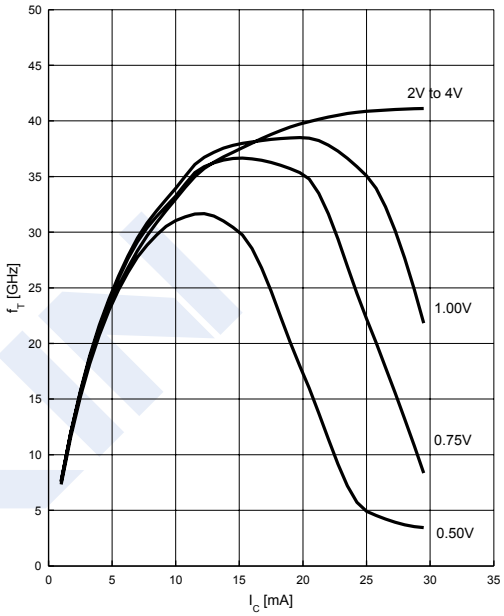
■ Typical Characterisitics

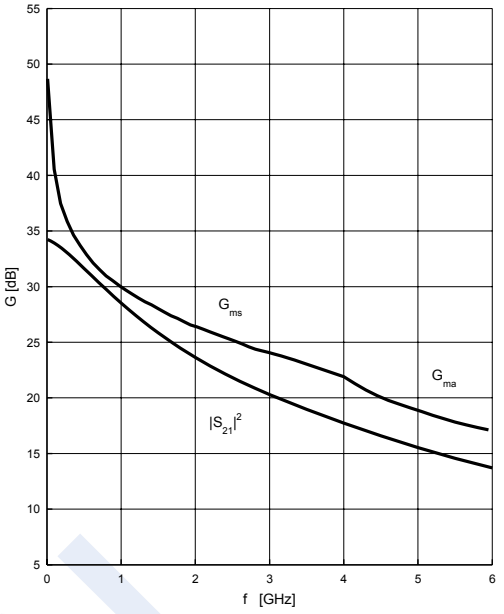
Third order Intercept Point $IP_3 = f(I_C)$
(Output, $Z_S = Z_L = 50\ \Omega$)
V_{CE} = parameter, f = 1.8 GHz



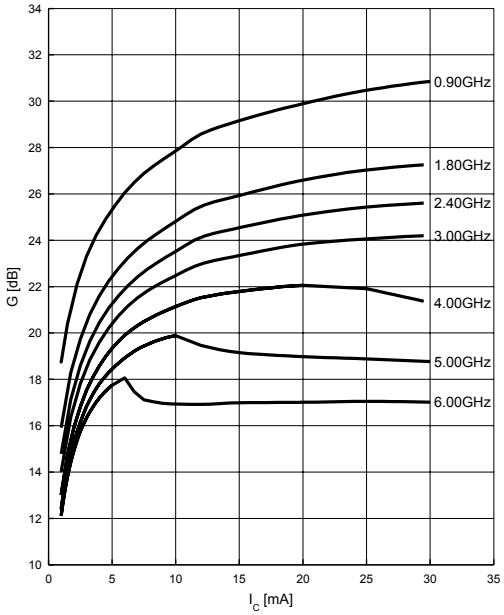
Transition frequency $f_T = f(I_C)$
f = 2 GHz
V_{CE} = parameter



Power gain $G_{ma}, G_{ms} = f(f)$
V_{CE} = 3 V, I_C = 25 mA



Power gain $G_{ma}, G_{ms} = f(I_C)$
V_{CE} = 3 V
f = parameter



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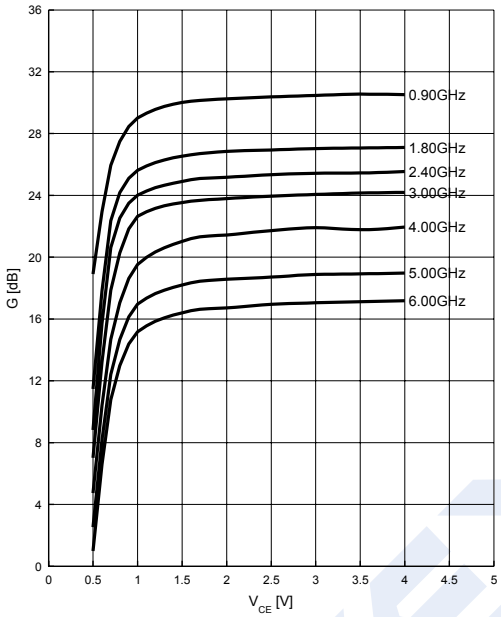
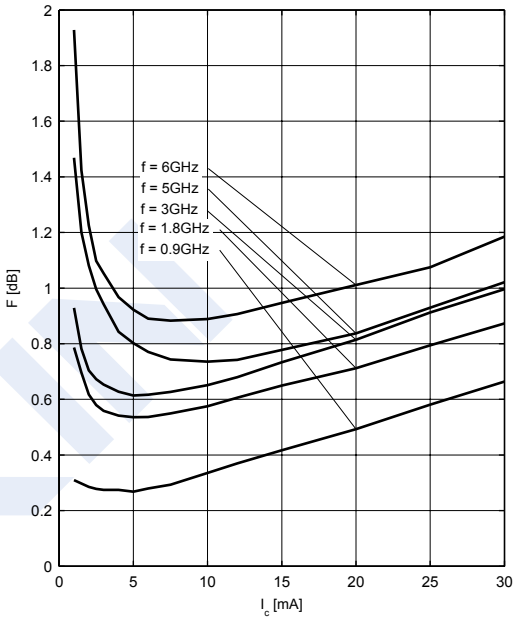
■ Typical Characterisitics

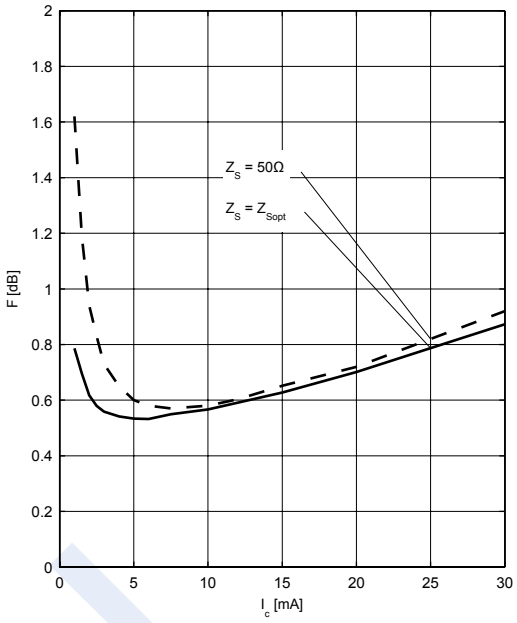
Power gain G_{ma}, G_{ms} = f (V_{CE})
I_C = 25 mA
f = parameter



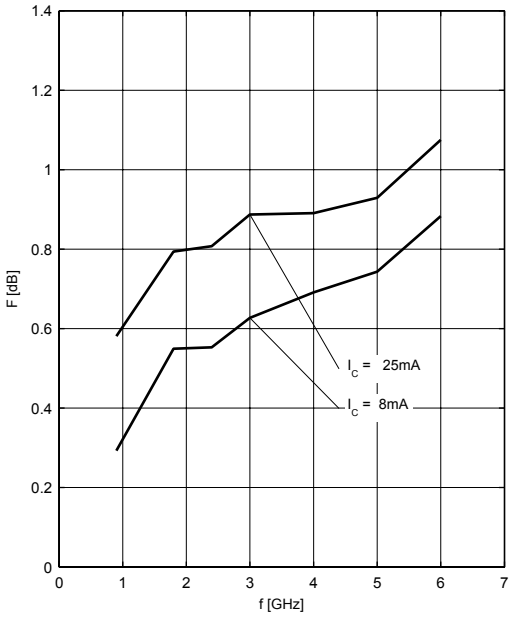
Noise figure F = f(I_C)
V_{CE} = 3V, f = parameter
Z_S = Z_{Sopt}



Noise figure F = f(I_C)
V_{CE} = 3V, f = 1.8 GHz



Noise figure F = f(f)
V_{CE} = 3 V, Z_S = Z_{Sopt}



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■ Typical Characterisitics

Source impedance for min.
noise figure vs. frequency
V_{CE} = 3 V, I_C = 8 mA / 25 mA