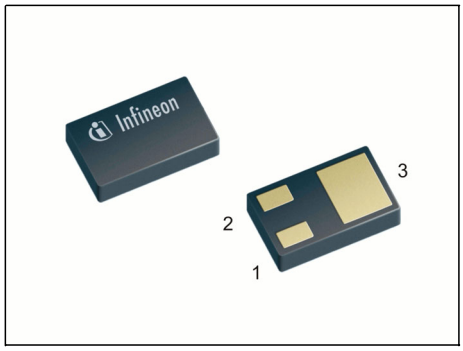
Linear Low Noise SiGe:C Bipolar RF Transistor



- High gain ultra low noise RF transistor
- Based on Infineon's reliable high volume Silicon Germanium technology
- Provides outstanding performance for a wide range of wireless applications up to 10 GHz
- Ideal for WLAN and all 5-6 GHz applications
- High *OIP3* and P_{-1dB} for driver stages
- High maximum stable and available gain
  G_{ms} = 21 dB at 1.8 GHz, G_{ma} = 11.5 dB at 6 GHz
- Pb-free (RoHS compliant) and halogen-free very thin small leadless package (package height 0.32 mm max. ideal for modules)
- Qualification report according to AEC-Q101 available

RoHS HAL

ESD (**E**lectro**s**tatic **d**ischarge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration			Package
BFR750L3RH	R8	1=B	2=C	3=E	TSLP-3-9

Maximum Ratings at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}		V
T_A = 25 °C		4	
T_A = -55 °C		3.5	
Collector-emitter voltage	V_{CES}	13	
Collector-base voltage	V_{CBO}	13	
Emitter-base voltage	V_{EBO}	1.2	
Collector current	I_C	90	mA
Base current	I_B	9	
Total power dissipation[1)]	P_{tot}	360	mW
$T_S \leq$ 96°C			
Junction temperature	T_J	150	°C
Storage temperature	T_{Stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[2)]	R_{thJS}	150	K/W

Electrical Characteristics at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	4	4.7	-	V
I_C = 3 mA, I_B = 0					
Collector-emitter cutoff current	I_{CES}	-	-	100	µA
V_{CE} = 13 V, V_{BE} = 0					
Collector-base cutoff current	I_{CBO}	-	-	100	nA
V_{CB} = 5 V, I_E = 0					
Emitter-base cutoff current	I_{EBO}	-	-	10	µA
V_{EB} = 0.5 V, I_C = 0					
DC current gain	h_{FE}	160	250	400	-
I_C = 60 mA, V_{CE} = 3 V, pulse measured					

[1] T_S is measured on the emitter lead at the soldering point to the pcb

[2] For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)

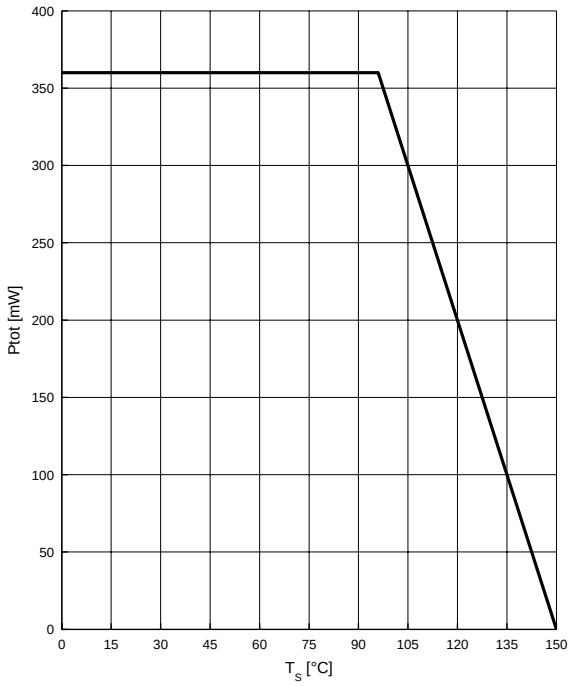
Electrical Characteristics at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 60 mA, V_{CE} = 3 V, f = 2 GHz	f_T	-	37	-	GHz
Collector-base capacitance V_{CB} = 3 V, f = 1 MHz, emitter grounded	C_{cb}	-	0.24	0.42	pF
Collector emitter capacitance V_{CE} = 3 V, f = 1 MHz, base grounded	C_{ce}	-	0.31	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, collector grounded	C_{eb}	-	0.97	-	
Minimum noise figure	NF_{min}				dB
I_C = 25 mA, V_{CE} = 3 V, f = 1.8 GHz, $Z_S = Z_{Sopt}$		-	0.6	-	
I_C = 25 mA, V_{CE} = 3 V, f = 6 GHz, $Z_S = Z_{Sopt}$		-	1.1	-	
Power gain, maximum stable[1)] I_C = 60 mA, V_{CE} = 3 V, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 1.8 GHz	G_{ms}	-	21	-	dB
Power gain, maximum available[1)] I_C = 60 mA, V_{CE} = 3 V, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 6 GHz	G_{ma}	-	11.5	-	dB
Transducer gain	$\lvert S_{21e}\rvert^2$				dB
I_C = 60 mA, V_{CE} = 3 V, $Z_S = Z_L$ = 50 Ω, f = 1.8 GHz		-	18	-	
I_C = 60 mA, V_{CE} = 3 V, $Z_S = Z_L$ = 50 Ω, f = 6 GHz		-	8	-	
Third order intercept point at output[2)] V_{CE} = 3 V, I_C = 60 mA, f = 1.8 GHz, $Z_S = Z_L$ = 50 Ω	$IP3$	-	29.5	-	dBm
1dB compression point at output I_C = 60 mA, V_{CE} = 3 V, $Z_S = Z_L$ = 50 Ω, f = 1.8 GHz	P_{-1dB}	-	16.5	-	

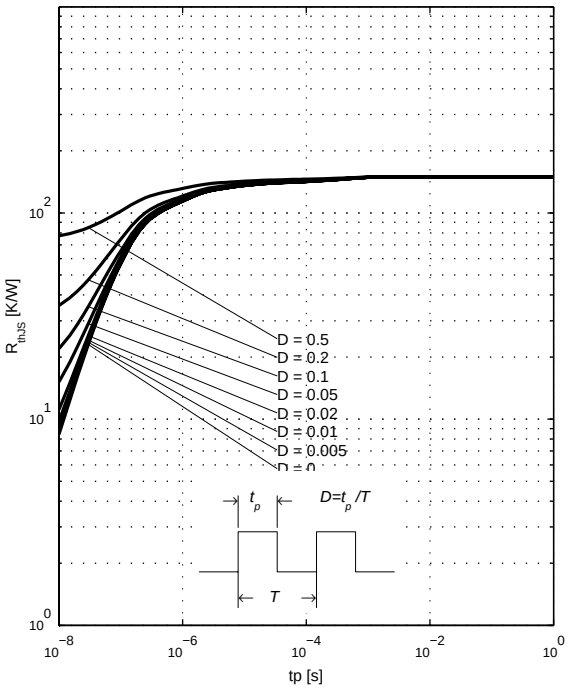
[1] $G_{ma} = |S_{21e} / S_{12e}| (k-(k^2-1)^{1/2})$, $G_{ms} = |S_{21e} / S_{12e}|$

[2] IP3 value depends on termination of all intermodulation frequency components.
Termination used for this measurement is 50Ω from 0.1 MHz to 6 GHz

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

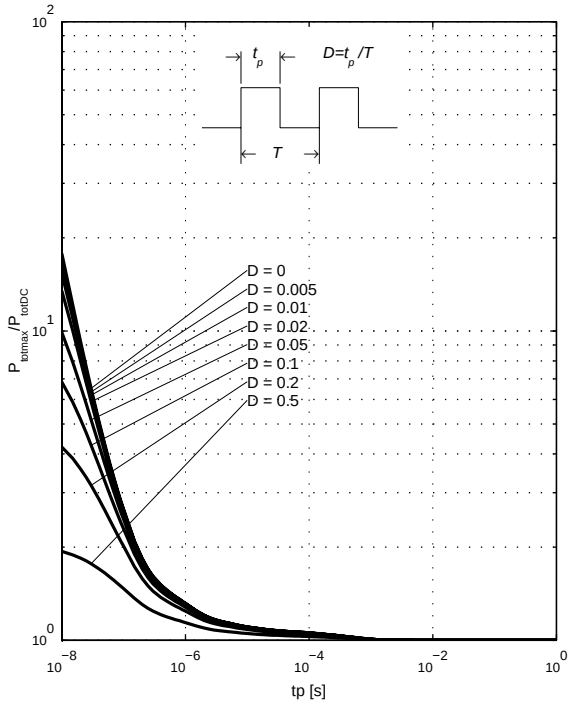


Permissible Puls Load $R_{thJS} = f(t_p)$



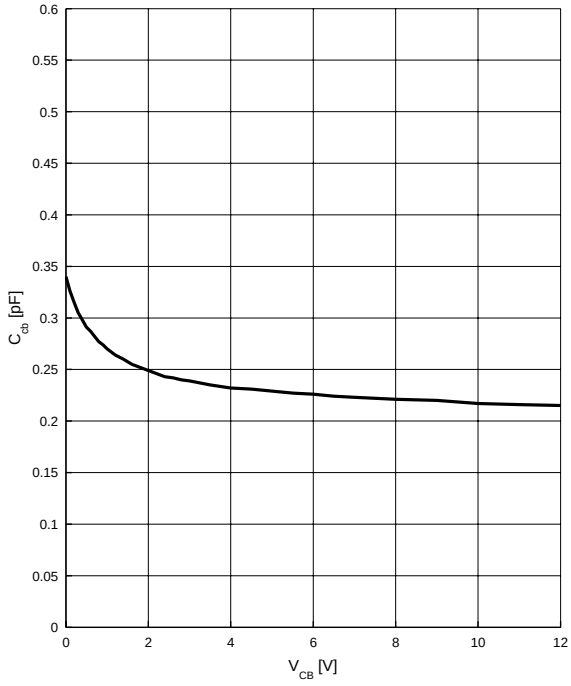
Permissible Pulse Load

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



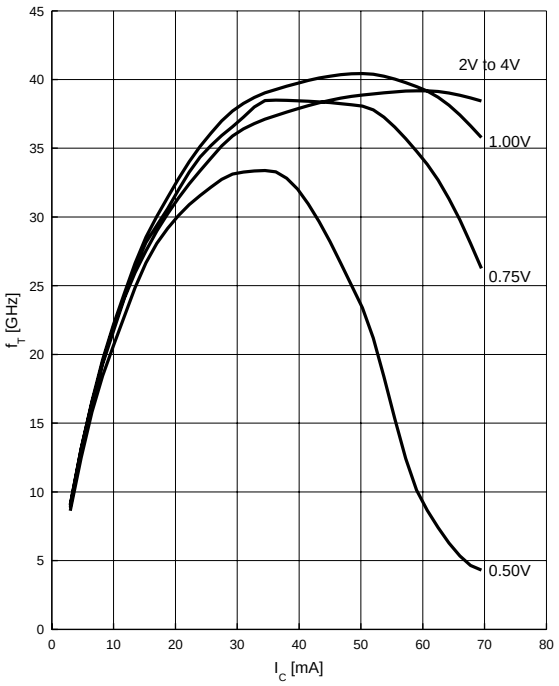
Collector-base capacitance $C_{cb} = f(V_{CB})$

f = 1 MHz



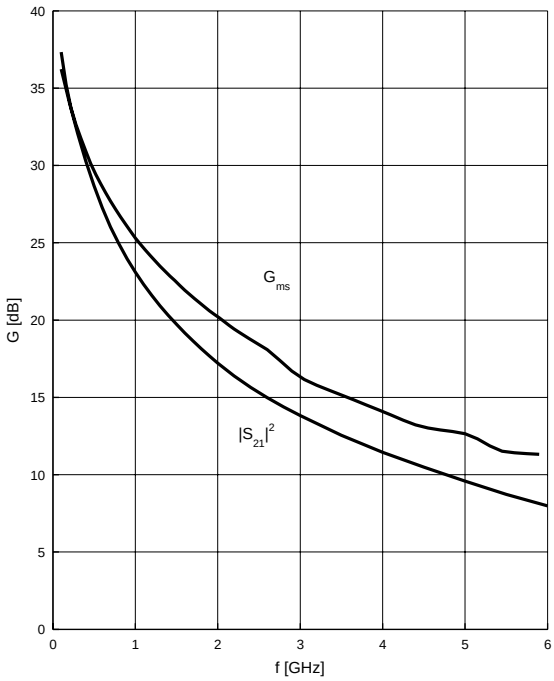
Transition frequency $f_T = f(I_C)$

V_{CE} = parameter, f = 1 GHz



Power gain G_{ma}, $G_{ms} = f(f)$

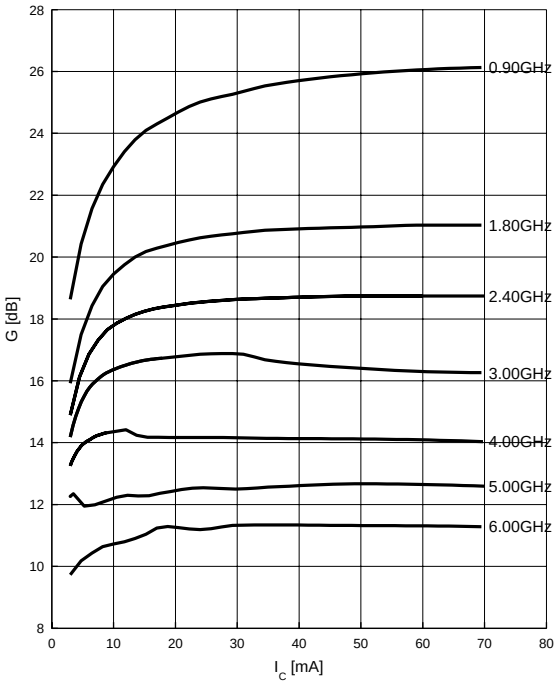
V_{CE} = 3 V, I_C = 60 mA



Power gain G_{ma}, $G_{ms} = f(I_C)$

V_{CE} = 3 V

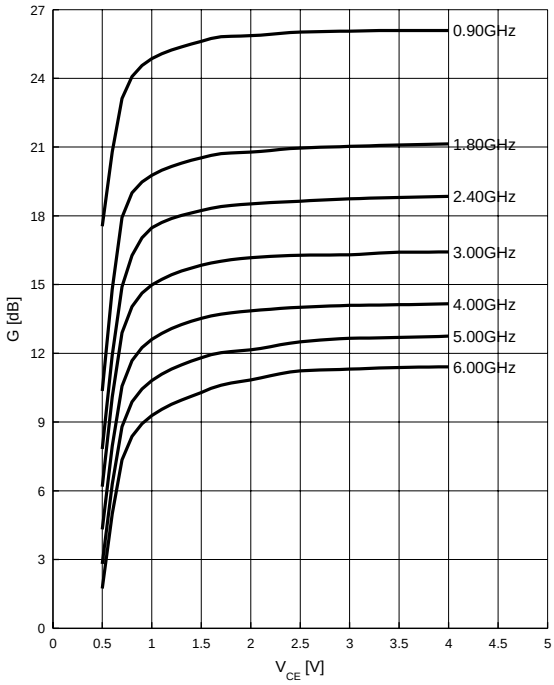
f = parameter



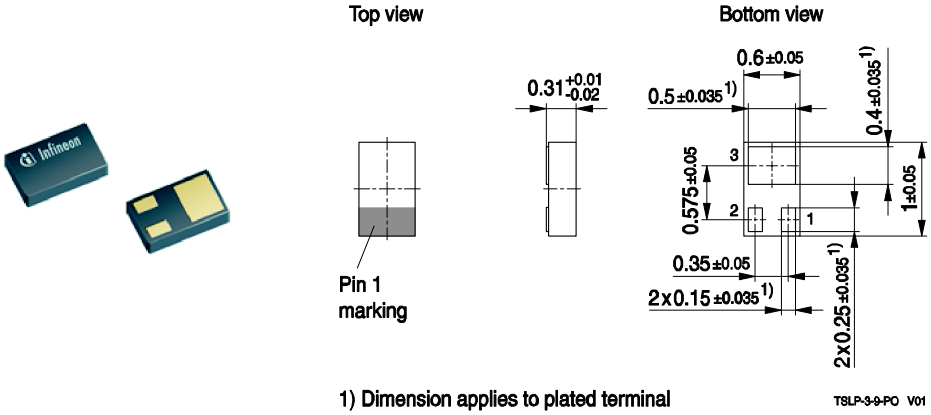
Power gain G_{ma}, $G_{ms} = f(V_{CE})$

I_C = 60 mA

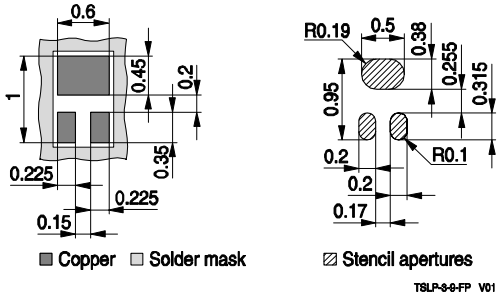
f = parameter



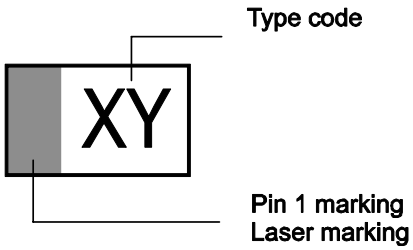
Package Outline



Foot Print

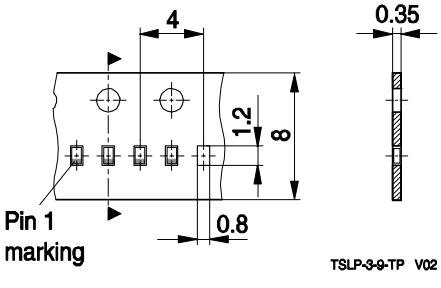


Marking Layout (Example)



Standard Packing

Reel Ø 180 mm: 15.000 Pieces/Reel
Reel Ø 330 mm: 50.000 Pieces/Reel



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