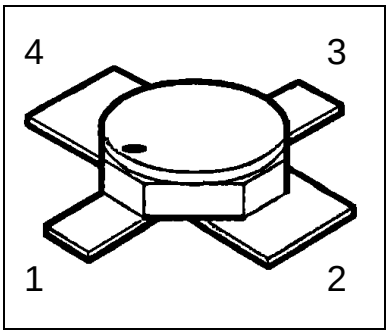
HiRel NPN Silicon Germanium RF Transistor



- ***HiRel* Discrete and Microwave Semiconductor**
- For high power amplifiers
- Ideal for low phase noise oscilators
- Maximum available gain: G_{ma} = 19 dB at 1.8 GHz
  Noise figure F = 0.9 dB at 1.8 GHz
- Hermetically sealed microwave package
- esa **Space Qualified**
  ESCC Detail Spec. No.: 5611/010

ESD: **E**lectro**s**tatic **d**ischarge sensitive device,
observe handling precautions!

Type	Marking	Pin Configuration				Package
		1	2	3	4	
BFY650B-11	-	C	E	B	E	Micro-X

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage T_a > 0 °C T_a ≤ 0 °C	V_{CEO}	 4.0 3.7	 V V
Collector-base voltage	V_{CBO}	13	V
Emitter-base voltage	V_{EBO}	1.2	V
Collector current [1]	I_C	150	mA
Base current	I_B	10	mA
Junction temperature	T_j	175	°C
Operating temperature range	T_{op}	-65...+175	°C
Storage temperature range	T_{stg}	-65...+175	°C
Thermal Resistance			
Junction-soldering point [2]	$R_{th\ JS}$	150	K/W

Notes.:

1) For T_S ≤ 85°C. For T_S > 85 °C derating is required.
2) T_S is measured on the emitter lead at the soldering point to the pcb.

Electrical Characteristics

at T_A=25°C; unless otherwise specified

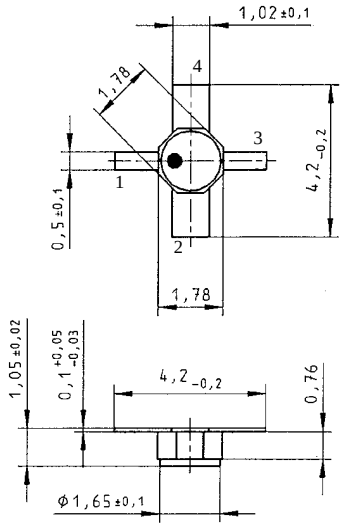
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-base cutoff current V_{CB} = 5 V, I_E = 0	I_{CBO}	-	-	10	µA
Collector-emitter cutoff current [1] V_{CE} = 4.0 V, I_B = 0.1 µA	I_{CEX}	-	-	200	µA
Emitter-base cuttoff current V_{EB} = 1.2 V, I_C = 0	I_{EBO}	-	-	10	µA
DC current gain I_C = 80 mA, V_{CE} = 3 V	h_{FE}	110	180	270	-
AC Characteristics					
Collector-base capacitance V_{CB} = 2 V, V_{BE} = vbe = 0, f = 1 MHz	C_{CB}	-	0.26	-	pF
Collector-emitter capacitance V_{CE} = 2 V, V_{BE} = vbe = 0, f = 1 MHz	C_{CE}	-	0.55	-	pF
Emitter-base capacitance V_{EB} = 0.5V, V_{CB} = vcb = 0, f = 1 MHz	C_{EB}	-	1.4	-	pF
Noise Figure ($Z_S = Z_{sopt}$) I_C = 10 mA, V_{CE} = 3 V, f = 1.8 GHz I_C = 10 mA, V_{CE} = 3 V, f = 6.0 GHz	F	 - -	 0.9 1.4	 - -	dB
Insertion power gain ($Z_S = Z_L$ = 50 Ω) I_C = 80 mA, V_{CE} = 3 V, f = 1.8 GHz I_C = 80 mA, V_{CE} = 3 V, f = 6.0 GHz	$\lvert S_{21e}\rvert^2$	 - -	 16.5 6.7	 - -	dB
Power gain ($Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$) I_C = 80 mA, V_{CE} = 3 V, f = 1.8 GHz	G_{ma} [2]	-	19.2	-	dB
Power gain ($Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$) I_C = 80 mA, V_{CE} = 3 V, f = 6.0 GHz	G_{ma} [2]	-	9.3	-	dB

Notes.:

1) This Test assures V(BR)CE0 > 4.0V

2) $G_{ma} = \left|\frac{S21}{S12}\right|(k - \sqrt{k^2 - 1})$, $G_{ms} = \left|\frac{S21}{S12}\right|$

Micro-X Package



Edition 2012-11

Published by

Infineon Technologies AG

85579 Neubiberg, Germany

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