
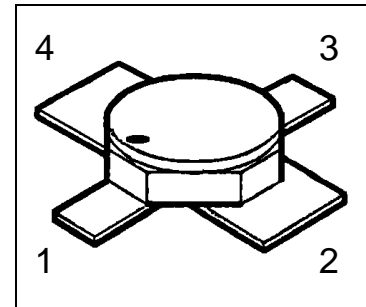


**HiRel NPN Silicon RF Transistor**

- **HiRel Discrete and Microwave Semiconductor**
- For Medium Power Amplifiers
- Compression Point  $P_{-1dB} = 19dBm$  1.8 GHz  
Max. Available Gain  $G_{ma} = 16dB$  at 1.8 GHz
- Hermetically sealed microwave package
- Transition Frequency  $f_T = 20$  GHz
- **SIEGET<sup>®</sup> 25-Line**  
**Infineon Technologies Grounded Emitter Transistor-**  
**25 GHz  $f_T$ -Line**
-  **ESA Space Qualified**  
ESA/SCC Detail Spec. No.: 5611/008  
Type Variant No. 03



**ESD: Electrostatic discharge sensitive device,**  
observe handling precautions!

Type	Marking	Ordering Code	Pin Configuration				Package
			1	2	3	4	
BFY450 (ql)	-	see below	C	E	B	E	Micro-X

(ql) Quality Level: P: Professional Quality  
H: High Rel Quality  
S: Space Quality  
ES: ESA Space Quality

(see order instructions for ordering example)

**Maximum Ratings**

Parameter	Symbol	Values	Unit
Collector-emitter voltage	$V_{CEO}$	4.5	V
Collector-base voltage	$V_{CBO}$	15	V
Emitter-base voltage	$V_{EBO}$	1.5	V
Collector current	$I_C$	100	mA
Base current	$I_B$	10	mA
Total power dissipation, $T_S \leq 110^\circ\text{C}$ <sup>1), 2)</sup>	$P_{tot}$	450	mW
Junction temperature	$T_j$	175	$^\circ\text{C}$
Operating temperature range	$T_{op}$	-65...+175	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-65...+175	$^\circ\text{C}$

**Thermal Resistance**

Junction-soldering point <sup>2)</sup>	$R_{thJS}$	< 145	K/W
--	------------	-------	-----

**Notes.:**

- 1) At  $T_S = +110^\circ\text{C}$ . For  $T_S > +110^\circ\text{C}$  derating is required.  
 2)  $T_S$  is measured on the collector lead at the soldering point to the pcb.

**Electrical Characteristics**

 at  $T_A = 25^\circ\text{C}$ ; unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics**

Collector-base cutoff current $V_{CB} = 5\text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Collector-emitter cutoff current <sup>1.)</sup> $V_{CE} = 4.5\text{ V}, I_B = 1.0\mu\text{A}$	$I_{CEX}$	-	-	200 (t.b.d.)	$\mu\text{A}$
Emitter-base cutoff current $V_{EB} = 1.5\text{ V}, I_C = 0$	$I_{EBO}$	-	-	50	$\mu\text{A}$
DC current gain $I_C = 20\text{ mA}, V_{CE} = 1\text{ V}$	$h_{FE}$	50	90	150	-

**Notes:**

- 1.) This Test assures  $V(BR)_{CE0} > 4.5\text{V}$

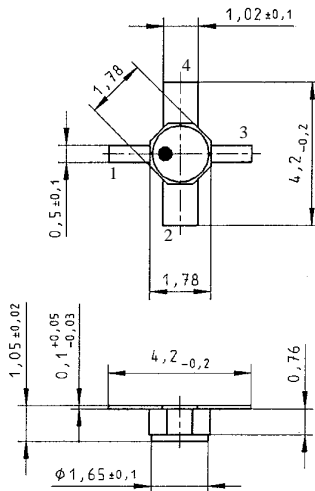
**Electrical Characteristics** (continued)

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Transition frequency $I_C = 90\text{mA}$ , $V_{CE} = 3\text{ V}$ , $f = 1.0\text{ GHz}$ $I_C = 90\text{mA}$ , $V_{CE} = 3\text{ V}$ , $f = 2.0\text{ GHz}$	$f_T$	18 -	22 17	- -	GHz
Collector-base capacitance $V_{CB} = 2\text{ V}$ , $V_{BE} = v_{be} = 0$ , $f = 1\text{ MHz}$	$C_{CB}$	-	0.42	0.9	pF
Collector-emitter capacitance $V_{CE} = 2\text{ V}$ , $V_{BE} = v_{be} = 0$ , $f = 1\text{ MHz}$	$C_{CE}$	-	1.27	2.6	pF
Emitter-base capacitance $V_{EB} = 0.5\text{V}$ , $V_{CB} = v_{cb} = 0$ , $f = 1\text{ MHz}$	$C_{EB}$	-	2.0	3	pF
Noise Figure $I_C = 10\text{ mA}$ , $V_{CE} = 2\text{ V}$ , $f = 1.8\text{ GHz}$ , $Z_S = Z_{\text{sopt}}$	F	-	1.25	2.0	dB
Insertion power gain $I_C = 50\text{ mA}$ , $V_{CE} = 2\text{ V}$ , $f = 1.8\text{ GHz}$ $Z_S = Z_L = 50\ \Omega$	$ S_{21e} ^2$	8.0	12	-	dB
Power gain $I_C = 50\text{ mA}$ , $V_{CE} = 2\text{ V}$ , $f = 1.8\text{ GHz}$ $Z_S = Z_{\text{Sopt}}$ , $Z_L = Z_{\text{Lopt}}$	$G_{ma}^{1)}$	-	16.0	-	dB
1dB Compression point $I_C = 50\text{ mA}$ , $V_{CE} = 2\text{ V}$ , $f = 1.8\text{ GHz}$ $Z_S = Z_{\text{Sopt}}$ , $Z_L = Z_{\text{Lopt}}$	$P_{-1\text{dB}}$	-	19	-	dBm

**Notes.:**

$$1) \quad G_{ma} = \frac{|S_{21}|}{|S_{12}|} (k - \sqrt{k^2 - 1}), \quad G_{ms} = \frac{|S_{21}|}{|S_{12}|}$$

## Micro-X Package



Edition 2011-02

Published by

Infineon Technologies AG

85579 Neubiberg, Germany

© Infineon Technologies AG 2011

All Rights Reserved.

### Attention please!

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenheitsgarantie"). With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of a third party.

### Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

### Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system.

Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.