
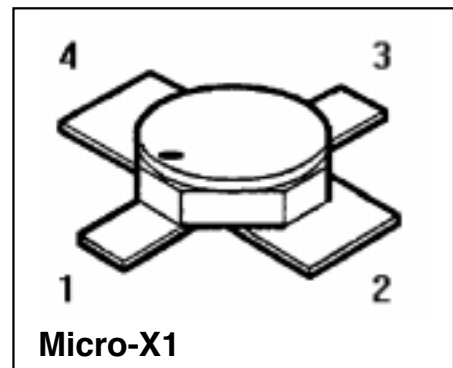


### Features

- **HiRel Discrete and Microwave Semiconductor**
- For low noise, low power amplifiers at collector currents from 0.2 mA to 8 mA
- Hermetically sealed microwave package
- $f_T = 7.2$  GHz,  $F = 2.5$  dB at 2 GHz
-  **esa** qualified
- ESA/SCC Detail Spec. No.: 5611/006



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

Type	Marking	Ordering Code	Pin Configuration				Package
BFY 280 (ql)	–	see below	C	E	B	E	Micro-X1

(ql) Quality Level: P: Professional Quality, Ordering Code: Q97302026

H: High Rel Quality, Ordering Code: on request

S: Space Quality, Ordering Code: on request

ES: ESA Space Quality, Ordering Code: Q97111414

(see **Chapter Order Instructions** for ordering example)

**Table 1 Maximum Ratings**

Parameter	Symbol	Limit Values	Unit
Collector-emitter voltage	$V_{CEO}$	8	V
Collector-emitter voltage, $V_{BE} = 0$	$V_{CES}$	15	V
Collector-base voltage	$V_{CBO}$	15	V
Emitter-base voltage	$V_{EBO}$	2	V
Collector current	$I_C$	10	mA
Base current	$I_B$	1.2 <sup>1)</sup>	mA
Total power dissipation, $T_S \leq 104$ °C <sup>2)</sup>	$P_{tot}$	80	mW
Junction temperature	$T_j$	200	°C
Operating temperature range	$T_{op}$	– 65 ... + 200	°C
Storage temperature range	$T_{stg}$	– 65 ... + 200	°C

### Thermal Resistance

Junction soldering point <sup>2)</sup>	$R_{th JS}$	< 450	K/W
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<sup>1)</sup> The maximum permissible base current for  $V_{FBE}$  measurements is 5 mA (spot measurement duration < 1 s).

<sup>2)</sup>  $T_S$  is measured on the collector lead at the soldering point to the pcb.

## Electrical Characteristics

**Table 2** DC Characteristics at  $T_A = 25\text{ °C}$  unless otherwise specified

Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Collector-base cutoff current $V_{CB} = 10\text{ V}, I_E = 0$	$I_{CBO}$	–	–	100	$\mu\text{A}$
Collector-emitter cutoff current $V_{CE} = 8\text{ V}, I_B = 0.1\text{ }\mu\text{A}$ <sup>3)</sup>	$I_{CEX}$	–	–	100	$\mu\text{A}$
Collector-base cutoff current $V_{CB} = 8\text{ V}, I_E = 0$	$I_{CBO}$	–	–	50	nA
Emitter-base cutoff current $V_{EB} = 2\text{ V}, I_C = 0$	$I_{EBO}$	–	–	25	$\mu\text{A}$
Emitter-base cutoff current $V_{EB} = 1\text{ V}, I_C = 0$	$I_{EBO}$	–	–	0.5	$\mu\text{A}$
Base-emitter forward voltage $I_E = 5\text{ mA}, I_C = 0$	$V_{FBE}$	–	–	1	V
DC current gain $I_C = 0.25\text{ mA}, V_{CE} = 1\text{ V}$	$h_{FE}$	30	100	175	–

<sup>3)</sup> This test assures  $V_{(BR)CE0} > 8\text{ V}$ .

**Table 3 AC Characteristics** at  $T_A = 25\text{ °C}$  unless otherwise specified

Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Transition frequency $I_C = 6\text{ mA}, V_{CE} = 5\text{ V}, f = 500\text{ MHz}$	$f_T$	6.5	7.2		GHz
Collector-base capacitance $V_{CB} = 5\text{ V}, V_{BE} = v_{be} = 0, f = 1\text{ MHz}$	$C_{CB}$	–	0.2	0.27	pF
Collector-emitter capacitance $V_{CE} = 10\text{ V}, V_{BE} = v_{be} = 0, f = 1\text{ MHz}$	$C_{CE}$	–	0.34	–	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}, V_{CB} = v_{cb} = 0, f = 1\text{ MHz}$	$C_{EB}$	–	0.4	0.5	pF
Noise figure $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}, f = 2\text{ GHz},$ $Z_S = Z_{Sopt}$	$F$	–	2.2	2.9	dB
Power gain $I_C = 6\text{ mA}, V_{CE} = 5\text{ V}, f = 2\text{ GHz},$ $Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$	$G_{ma}^{4)}$	13	14	–	dB
Transducer gain $I_C = 6\text{ mA}, V_{CE} = 5\text{ V}, f = 2\text{ GHz},$ $Z_S = Z_L = 50\text{ }\Omega$	$ S_{21e} ^2$	9.5	11	–	dB

$$4) G_{ma} = \left| \frac{S_{21}}{S_{12}} \right| (k - \sqrt{k^2 - 1}), G_{ms} = \left| \frac{S_{21}}{S_{12}} \right|$$

## Order Instructions

Full type variant including quality level must be specified by the orderer. For HiRel Discrete and Microwave Semiconductors the ordering code specifies device family and quality level.

Ordering Form:

Ordering Code: Q...  
BFY280 (x) (ql)  
(ql): Quality Level

Ordering Example:

Ordering Code: Q97111414  
BFY280 ES  
For BFY280 in ESA Space Quality Level

## Further Information

See our WWW-Pages:

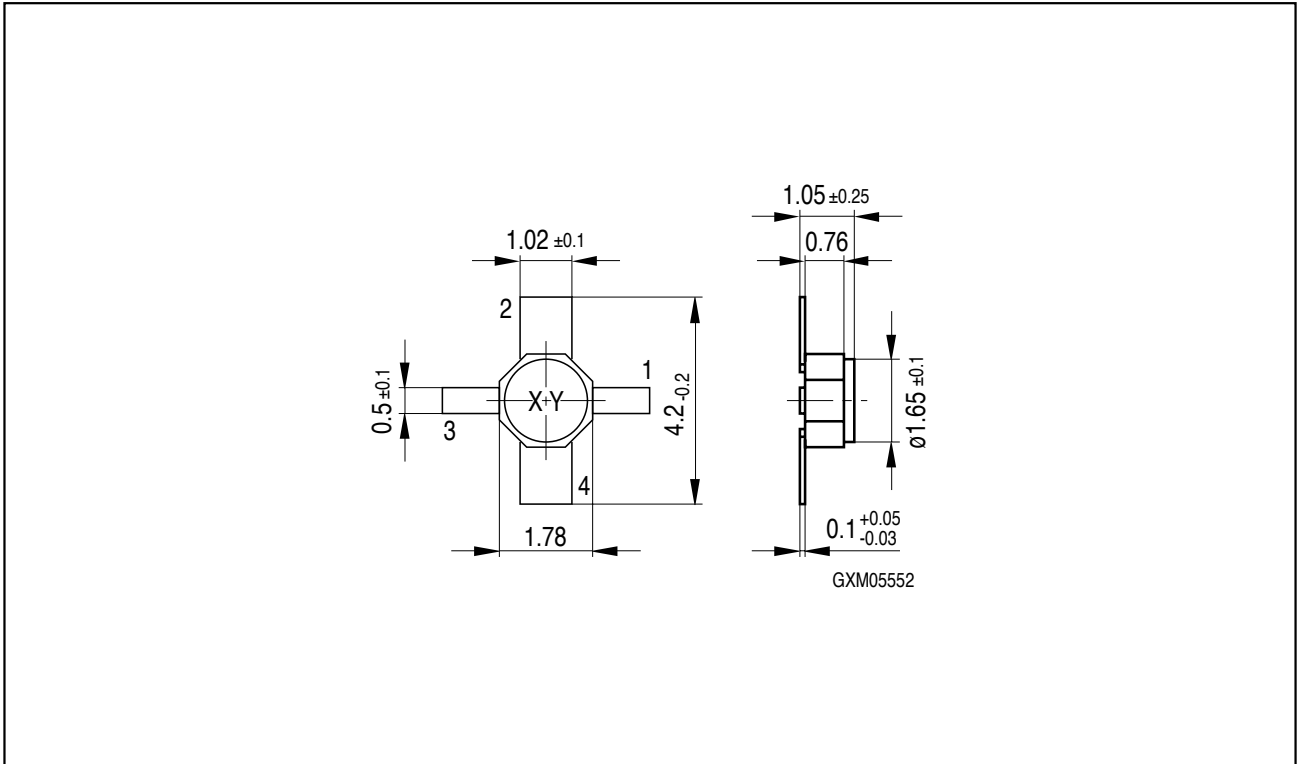
- Discrete and RF-Semiconductors (Small Signal Semiconductors)  
[www.siemens.de/semiconductor/products/35/35.htm](http://www.siemens.de/semiconductor/products/35/35.htm)
- HiRel Discrete and Microwave Semiconductors  
[www.siemens.de/semiconductor/products/35/353.htm](http://www.siemens.de/semiconductor/products/35/353.htm)

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**Figure 1**      **Micro-X1 Package**