
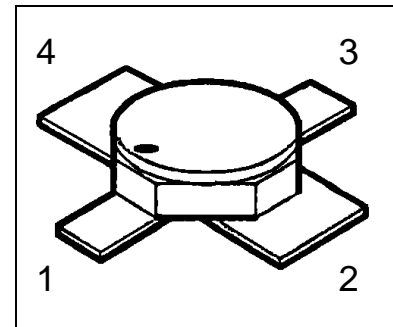


HiRel NPN Silicon Germanium RF Transistor

- **HiRel Discrete and Microwave Semiconductor**
- High gain ultra low noise RF transistor
- Outstanding noise figure $F = 0.7$ dB at 1.8 GHz
Outstanding noise figure $F = 1.0$ dB at 6 GHz
- Hermetically sealed microwave package
-  **ESA Space Qualified**
ESCC Detail Spec. No.: 5611/011



ESD: Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Pin Configuration				Package
		1	2	3	4	
BFY740B-01	-	C	E	B	E	Micro-X

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage $T_a > 0$ °C $T_a \leq 0$ °C	V_{CEO}	4.0 3.5	V V
Collector-base voltage	V_{CBO}	13	V
Emitter-base voltage	V_{EBO}	1.2	V
Collector current ¹⁾	I_C	30	mA
Base current	I_B	3	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_{thJS}	400	K/W
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Notes.:

- 1) For $T_S \leq 125$ °C. For $T_S > 125$ °C derating is required.
- 2) T_S is measured on the emitter lead at the soldering point to the pcb.

Electrical Characteristics

 at $T_A=25^\circ\text{C}$; 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}	-	-	10	μA
Collector-emitter cutoff current ¹⁾ $V_{CE} = 4.0\text{ V}, I_B = 0.1\ \mu\text{A}$	I_{CEX}	-	-	200	μA
Emitter-base cutoff current $V_{EB} = 1.2\text{ V}, I_C = 0$	I_{EBO}	-	-	5	μA
DC current gain $I_C = 20\text{ mA}, V_{CE} = 3\text{ V}$	h_{FE}	130	270	480	-

AC Characteristics

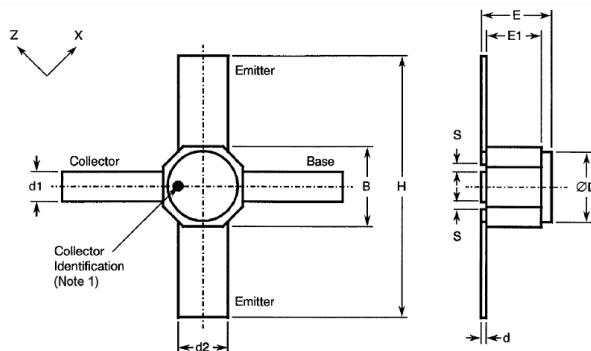
Collector-base capacitance $V_{CB} = 2\text{ V}, V_{BE} = v_{be} = 0, f = 1\text{ MHz}$	C_{CB}	-	0.07	-	pF
Collector-emitter capacitance $V_{CE} = 2\text{ V}, V_{BE} = v_{be} = 0, f = 1\text{ MHz}$	C_{CE}	-	0.45	-	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}, V_{CB} = v_{cb} = 0, f = 1\text{ MHz}$	C_{EB}	-	0.6	-	pF
Noise Figure ($Z_S = Z_{\text{sopt}}$) $I_C = 8\text{ mA}, V_{CE} = 3\text{ V}, f = 1.8\text{ GHz}$ $I_C = 8\text{ mA}, V_{CE} = 3\text{ V}, f = 6.0\text{ GHz}$	F	-	0.7 1.0	-	dB
Insertion power gain ($Z_S = Z_L = 50\ \Omega$) $I_C = 20\text{ mA}, V_{CE} = 3\text{ V}, f = 1.8\text{ GHz}$ $I_C = 20\text{ mA}, V_{CE} = 3\text{ V}, f = 6.0\text{ GHz}$	$ S_{21e} ^2$	-	24 14	-	dB
Power gain ($Z_S = Z_{\text{Sopt}}, Z_L = Z_{\text{Lopt}}$) $I_C = 20\text{ mA}, V_{CE} = 3\text{ V}, f = 1.8\text{ GHz}$	$G_{ms}^{2)}$	-	26.5	-	dB
Power gain ($Z_S = Z_{\text{Sopt}}, Z_L = Z_{\text{Lopt}}$) $I_C = 20\text{ mA}, V_{CE} = 3\text{ V}, f = 6.0\text{ GHz}$	$G_{ma}^{2)}$	-	18.3	-	dB

Notes.:

 1) This Test assures $V(\text{BR})_{CE0} > 4.0\text{ V}$

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

Micro-X Package



Symbols	Dimensions mm	
	Min	Max
B	1.68	1.88
d	0.07	0.15
d1	0.4	0.6
d2	0.92	1.12
ØD	1.55	1.85
E	0.85	1.25
E1	0.66	0.86
H	4	4.4
S	0.08	0.3

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