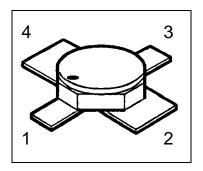


HiRel NPN Silicon RF Transistor

- HiRel Discrete and Microwave Semiconductor
- For low noise, high-gain amplifiers up to 2GHz.
- For linear broadband amplifiers
- Hermetically sealed microwave package
- f_T= 6,5 GHz
 F = 3 dB at 2 GHz

ESA/SCC Detail Spec. No.: 5611/006

Type Variant No. 07



ESD: Electrostatic discharge sensitive device, observe handling precautions!

Туре	Marking	Ordering Code	Pin Configuration		Package		
BFY196 (ql)	-	see below	С	Е	В	Е	Micro-X1

(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}	12	V		
Collector-emitter voltage, V _{BE} =0	V _{CES}	20	V		
Collector-base voltage	V_{CBO}	20	V		
Emitter-base voltage	V _{EBO}	2	V		
Collector current	I _C	100	mA		
Base current	I _B	12 1)	mA		
Total power dissipation, $T_S \le 105^{\circ}C^{2), 3)}$	P _{tot}	700	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 3.)	R _{th JS}	< 135	K/W		

Electrical Characteristics

at T_A=25°C; unless otherwise specified

Parameter	Symbol	Values		Unit		
		min.	typ.	max.		
DC Characteristics						
Collector-base cutoff current	I _{CBO}	-	-	100	μA	
$V_{CB} = 20 \text{ V}, I_{E} = 0$						
Collector-emitter cutoff current	I _{CEX}	-	-	1000	μΑ	
$V_{CE} = 12 \text{ V}, I_{B} = 1 \mu A^{-1.)}$						
Collector-base cutoff current	I _{CBO}	-	-	50	nA	
$V_{CB} = 10 \text{ V}, I_{E} = 0$						
Emitter base cuttoff current	I _{EBO}	-	-	25	μΑ	
$V_{EB} = 2 \text{ V}, I_{C} = 0$						
Emitter base cuttoff current	I _{EBO}	-	-	0.5	μΑ	
$V_{EB} = 1 \text{ V}, I_{C} = 0$						

Notes:

1.) This Test assures V(BR)CE0 > 12V

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¹⁾ The maximum permissible base current for V_{FBE} measurements is 50mA (spotmeasurement duration < 1s)

²⁾ At $T_S = +\ 105$ °C. For $T_S > +\ 105$ °C derating is required. 3) T_S is measured on the collector lead at the soldering point to the pcb.



Electrical Characteristics (continued)

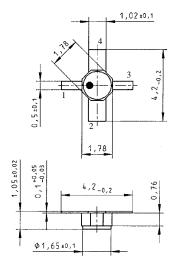
Parameter	Symbol		Values	Unit	
		min.	typ.	max.	
DC Characteristics	•	•	•	•	•
Base-Emitter forward voltage	V_{FBE}	-	-	1	V
$I_E = 50 \text{ mA}, I_C = 0$					
DC current gain	h _{FE}	50	100	175	-
$I_C = 50 \text{ mA}, V_{CE} = 8 \text{ V}$					
AC Characteristics					
Transition frequency	f _T	6	6.5	-	GHz
$I_C = 70$ mA, $V_{CE} = 5$ V, $f = 500$ MHz					
Collector-base capacitance	ССВ	-	1	1.3	pF
$V_{CB} = 10 \text{ V}, V_{BE} = \text{vbe} = 0, f = 1 \text{ MHz}$					
Collector-emitter capacitance	C _{CE}	-	0.44	-	pF
$V_{CE} = 10 \text{ V}, V_{BE} = \text{vbe} = 0, f = 1 \text{ MHz}$					
Emitter-base capacitance	C _{EB}	-	3,6	4,3	pF
$V_{EB} = 0.5V$, $V_{CB} = vcb = 0$, $f = 1 \text{ MHz}$					
Noise Figure	F	-	3	3.5	dB
$I_C = 20 \text{ mA}, V_{CE} = 5 \text{ V}, f = 2 \text{ GHz},$					
$Z_S = Z_{Sopt}$					
Power gain	Gma 1.)	10	11	-	dB
$I_C = 70$ mA, $V_{CE} = 5V$, $f = 2$ GHz					
$Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$					
Transducer gain	$ S_{21e} ^2$	4	5	-	dB
$I_C = 70$ mA, $V_{CE} = 5$ V, $f = 2$ GHz					
$Z_S = Z_L = 50 \Omega$					
Output Power	P _{OUT}	18.5	19.5	-	dBm
I_C = 80 mA, V_{CE} = 5 V, f = 2 GHz ,					
P_{IN} =15 dBm, $Z_S = Z_L = 50 \Omega$					

Notes.:

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



Micro-X1 Package



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