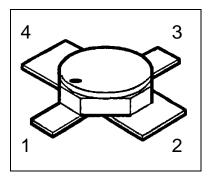


HiRel NPN Silicon RF Transistor

- HiRel Discrete and Microwave Semiconductor
- For low noise, high-gain amplifiers up to 2GHz.
- For linear broadband amplifiers
- Hermetically sealed microwave package
- f_T= 8 GHz
 F = 2.3 dB at 2 GHz
- CSA Space Qualified ESA/SCC Detail Spec. No.: 5611/006 Type Variant No. 06

ESD: Electrostatic discharge sensitive device, observe handling precautions!



Туре	Marking	Ordering Code	Pin C	Config	juratio	on	Package
			1	2	34		
BFY193 (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	Ι _C	80	mA
Base current	I _B	10 ¹⁾	mA
Total power dissipation, T _S \leq 104°C ^{2), 3)}	P _{tot}	580	mW
Junction temperature	Tj	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}	< 165	K/W
Notoo			

Notes.:

1) The maximum permissible base current for V_{FBE} measurements is 30mA (spot-

measurement duration < 1s)

2) At $T_s = +104$ °C. For $T_s > +104$ °C derating is required. 3) T_s is measured on the collector 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	I _{CBO}	-	-	100	μA
$V_{CB} = 20 \text{ V}, I_{E} = 0$					
Collector-emitter cutoff current	I _{CEX}	-	-	600	μA
$V_{CE} = 12 \text{ V}, \text{ I}_{B} = 0.5 \mu \text{A}^{-1.3}$					
Collector-base cutoff current	I _{CBO}	-	-	50	nA
$V_{CB} = 10 \text{ V}, \text{ I}_{E} = 0$					
Emitter base cuttoff current	I _{EBO}	-	-	25	μA
$V_{EB} = 2 V, I_{C} = 0$					
Emitter base cuttoff current	I _{EBO}	-	-	0.5	μA
$V_{EB} = 1 V, I_{C} = 0$					

Notes:

1.) This Test assures V(BR)CE0 > 12V IFAG IMM RPD D HIR



Electrical Characteristics (continued)

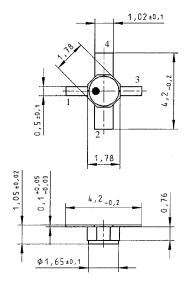
Parameter	Symbol		Values	6	Unit
		min.	typ.	max.	
DC Characteristics	·				
Base-Emitter forward voltage	V _{FBE}	-	-	1	V
$I_{\rm E} = 30$ mA, $I_{\rm C} = 0$					
DC current gain	h _{FE}	50	100	175	-
$I_{C} = 30$ mA, $V_{CE} = 8$ V					
AC Characteristics	·				
Transition frequency	f _T				GHz
I_{C} = 40mA, V_{CE} = 5 V, f = 500 MHz		6,5	7.5	-	
$I_{\rm C}=50$ mA, $V_{\rm CE}=8$ V, $f=500$ MHz		-	8	-	
Collector-base capacitance	C _{CB}	-	0.56	0.75	pF
$V_{CB}=10~V,~V_{BE}=vbe=0,~f=1~MHz$					
Collector-emitter capacitance	C _{CE}	-	0.34	-	pF
$V_{CE} = 10 \text{ V}, V_{BE} = vbe = 0, f = 1 MHz$					
Emitter-base capacitance	C _{EB}	-	1.9	2.4	pF
$V_{\text{EB}} = 0.5 \text{V}, V_{\text{CB}} = \text{vcb} = 0, \text{f} = 1 \text{MHz}$					
Noise Figure	F	-	2.3	2.9	dB
$I_{\rm C}$ = 15 mA, $V_{\rm CE}$ = 5 V, f = 2 GHz,					
$Z_{\rm S} = Z_{\rm Sopt}$					
Power gain	Gma ^{1.)}	12.5	13.5	-	dB
$I_{\rm C}$ = 40 mA, $V_{\rm CE}$ = 5V, f = 2 GHz					
$Z_{S} = Z_{Sopt}$, $Z_{L} = Z_{Lopt}$					
Transducer gain	$ S_{21e} ^2$	8	9	-	dB
I_{C} = 40 mA, V_{CE} = 5 V, f = 2 GHz					
$Z_S = Z_L = 50 \ \Omega$					
Output Power	P _{OUT}	16.5	17.5	-	dBm
I_{C} = 50 mA, V_{CE} = 5 V, f = 2GHz,					
P_{IN} =10dBm, Z_S = Z_L = 50 Ω					

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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