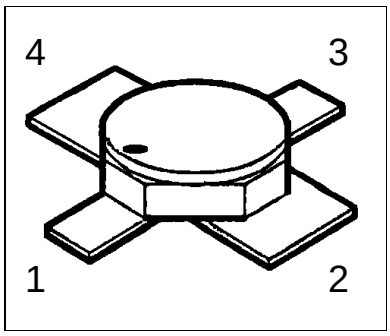
HiRel NPN Silicon RF Transistor



- ***HiRel* Discrete and Microwave Semiconductor**
- For High Gain Low Noise Amplifiers
- For Oscillators up to 10 GHz
- Noise Figure F = 1.1 dB at 1.8 GHz
  Outstanding Gms = 21dB at 1.8 GHz
- Hermetically sealed microwave package
- Transition Frequency f_T = 22 GHz
- SIEGET®25-Line
  Siemens **G**rounded **E**mitter **T**ransistor-
  25 GHz f_T-Line

esa Space Qualified
ESA/SCC Detail Spec. No.: 5611/008
Type Variant No. 02

ESD: **E**lectro**s**tatic **d**ischarge sensitive device,
observe handling precautions!

Type	Marking	Ordering Code	Pin Configuration 1	2	3	4	Package
BFY420 (ql)	-	see below	C	E	B	E	Micro-X

(ql) Quality Level:	P: Professional Quality,	Ordering Code:	Q62702F1662
	H: High Rel Quality,	Ordering Code:	on request
	S: Space Quality,	Ordering Code:	on request
	ES: ESA Space Quality,	Ordering Code:	Q62702F1709

(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	35	mA
Base current	I_B	3.0	mA
Total power dissipation, $T_S \leq 129°C$ [1), 2)]	P_{tot}	160	mW
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)]	$R_{th\ JS}$	< 285	K/W

Notes.:
1) At T_S = + 129 °C. For T_S > + 129 °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°C; unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-base cutoff current V_{CB} = 5 V, I_E = 0	I_{CBO}	-	-	30	nA
Collector-emitter cutoff current [1.)] V_{CE} = 4.5 V, I_B = 1.0µA	I_{CEX}	-	-	200 (t.b.d.)	µA
Emitter-base cuttoff current V_{EB} = 1.5 V, I_C = 0	I_{EBO}	-	-	20	µA
DC current gain I_C = 5 mA, V_{CE} = 1 V	h_{FE}	50	90	150	-

Notes:

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

Electrical Characteristics (continued)

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency I_C = 30mA, V_{CE} = 3 V, f = 2.0 GHz	f_T	20	22	-	GHz
Collector-base capacitance V_{CB} = 2 V, V_{BE} = vbe = 0, f = 1 MHz	C_{CB}	-	0.14	0.9	pF
Collector-emitter capacitance V_{CE} = 2 V, V_{BE} = vbe = 0, f = 1 MHz	C_{CE}	-	0.46	0.85	pF
Emitter-base capacitance V_{EB} = 0.5V, V_{CB} = vcb = 0, f = 1 MHz	C_{EB}	-	0.67	3.0	pF
Noise Figure I_C = 5 mA, V_{CE} = 2 V, f = 1.8 GHz, $Z_S = Z_{sopt}$	F	-	1.1	1.7	dB
Insertion power gain I_C = 20 mA, V_{CE} = 2 V, f = 1.8 GHz $Z_S = Z_L$ = 50 Ω	$\|S_{21e}\|^2$	14	18	-	dB
Power gain I_C = 20 mA, V_{CE} = 2 V, f = 1.8 GHz $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	Gms [1.)]	-	21	-	dB
1dB Compression point I_C = 20 mA, V_{CE} = 2 V, f = 1.8 GHz $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	P_{-1dB}	-	12	-	dBm

Notes.:

1) $G_{ms} = \left|\frac{S21}{S12}\right|$

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.....
BFY420 (ql)
(ql): Quality Level

Ordering Example:

Ordering Code: Q62702F1709
BFY420 ES

For BFY420 in ESA Space Quality Level

Further Informations:

See our WWW-Pages:

- Discrete and RF-Semiconductors (Small Signal Semiconductors)

  www.siemens.de/semiconductor/products/35/35.htm

- *HiRel* Discrete and Microwave Semiconductors

  www.siemens.de/semiconductor/products/35/353.htm

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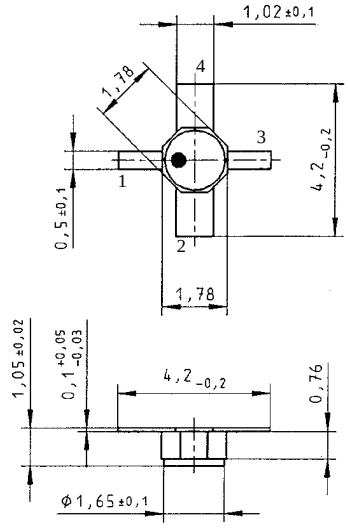
Micro-X Package



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