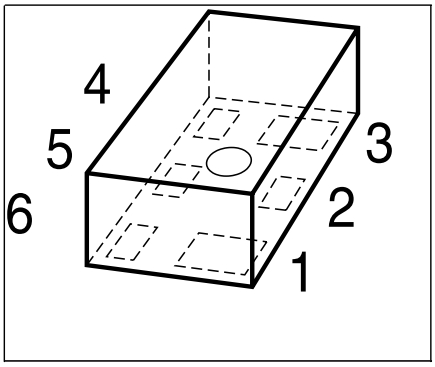
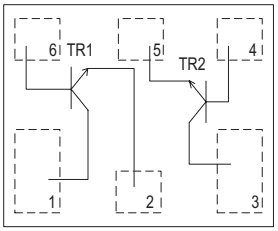
NPN Silicon RF Transistor

Preliminary data

- Low voltage/ Low current operation
- For low noise amplifiers
- For Oscillators up to 3.5 GHz and Pout > 10 dBm
- Low noise figure: 1.0 dB at 1.8 GHz

Built in 2 transitors (TR1, TR2: die as BFR360L3)





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

Type	Marking	Pin Configuration						Package
BFS360L6	FB	1=C1	2=E1	3=C2	4=B2	5=E2	6=B1	TSLP-6-1

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	6	V
Collector-emitter voltage	V_{CES}	15	
Collector-base voltage	V_{CBO}	15	
Emitter-base voltage	V_{EBO}	2	
Collector current	I_C	35	mA
Base current	I_B	4	
Total power dissipation[1)] $T_S \leq 101°C$	P_{tot}	210	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[2)]	R_{thJS}	≤ 230	K/W

[1] T_S is measured on the collector lead at the soldering point to the pcb

[2] For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	6	9	-	V
Collector-emitter cutoff current V_{CE} = 15 V, V_{BE} = 0	I_{CES}	-	-	10	µA
Collector-base cutoff current V_{CB} = 5 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter-base cutoff current V_{EB} = 1 V, I_C = 0	I_{EBO}	-	-	1	µA
DC current gain I_C = 15 mA, V_{CE} = 3 V	h_{FE}	60	130	200	-

Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 15 mA, V_{CE} = 3 V, f = 1 GHz	f_T	-	14	-	GHz
Collector-base capacitance V_{CB} = 5 V, f = 1 MHz, emitter grounded	C_{cb}	-	0.3	-	pF
Collector emitter capacitance V_{CE} = 5 V, f = 1 MHz, base grounded	C_{ce}	-	0.15	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, collector grounded	C_{eb}	-	0.43	-	
Noise figure I_C = 3 mA, V_{CE} = 3 V, Z_S = Z_{Sopt}, f = 1,8 GHz I_C = 3 mA, V_{CE} = 3 V, Z_S = Z_{Sopt}, f = 3 GHz	F_{min}	 - -	 1 1.5	 - -	dB
Power gain, maximum available[1)] I_C = 15 mA, V_{CE} = 3 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt}, f = 1.8 GHz I_C = 15 mA, V_{CE} = 3 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt}, f = 3 GHz	G_{ma}	 - -	 14.5 10	 - -	
Transducer gain I_C = 15 mA, V_{CE} = 3 V, Z_S = Z_L = 50Ω , f = 1.8 GHz I_C = 15 mA, V_{CE} = 3 V, Z_S = Z_L = 50Ω , f = 3 GHz	$\lvert S_{21e}\rvert^2$	 - -	 12 8	 - -	dB
Third order intercept point at output[2)] V_{CE} = 3 V, I_C = 15 mA, f = 1.8 GHz, Z_S = Z_L = 50Ω	IP_3	-	24	-	dBm
1dB Compression point at output I_C = 15 mA, V_{CE} = 3 V, Z_S = Z_L = 50Ω , f = 1.8 GHz	P_{-1dB}	-	9	-	

[1] $G_{ma} = |S_{21e} / S_{12e}| (k-(k^2-1)^{1/2})$

[2] IP3 value depends on termination of all intermodulation frequency components.
Termination used for this measurement is 50Ω from 0.1 MHz to 6 GHz