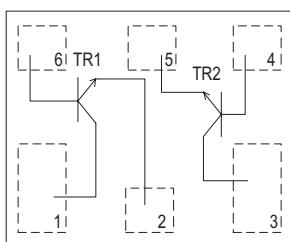
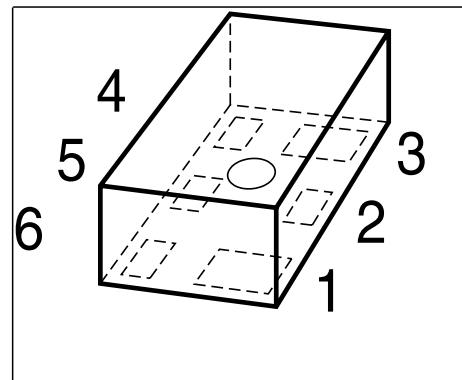


### NPN Silicon RF Transistor

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 transistors ( TR1, TR2: die as BFR360L3)



**ESD:** Electrostatic discharge 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 <sup>1)</sup>	$P_{tot}$	210	mW
$T_S \leq 101^\circ\text{C}$			
Junction temperature	$T_j$	150	$^\circ\text{C}$
Ambient temperature	$T_A$	-65 ... 150	
Storage temperature	$T_{stg}$	-65 ... 150	

### Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>2)</sup>	$R_{thJS}$	$\leq 230$	K/W

<sup>1</sup>  $T_S$  is measured on the collector lead at the soldering point to the pcb

<sup>2</sup> For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

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

**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

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

<sup>1</sup> $G_{\text{ma}} = |S_{21e}| / S_{12e} | (k - (k^2 - 1)^{1/2})$ 
<sup>2</sup>IP3 value depends on termination of all intermodulation frequency components.  
Termination used for this measurement is  $50\Omega$  from 0.1 MHz to 6 GHz