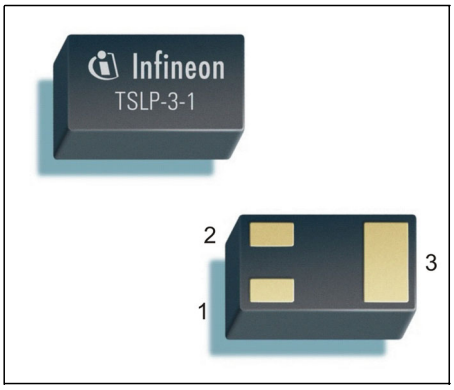
Linear Low Noise Silicon Bipolar RF Transistor



- High current capability and low noise figure for wide dynamic range
- Collector design supports supply voltage up to 5V
- Ideal for low phase noise oscillators up to 3.5 GHz
- Low noise figure 1.1 dB at 1.8 GHz
- Pb-free (RoHS compliant) and halogen-free thin small leadless package
- Qualification report according to AEC-Q101 available

RoHS HAL

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

Type	Marking	Pin Configuration			Package
BFR380L3	FC	1 = B	2 = E	3 = C	TSLP-3-1

Maximum Ratings at T_A = 25 °C, unless otherwise specified

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	80	mA
Base current	I_B	14	
Total power dissipation[1)] $T_S \leq 96$°C	P_{tot}	380	mW
Junction temperature	T_J	150	°C
Storage temperature	T_{Stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[2)]	R_{thJS}	140	K/W

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

[2] For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)

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	I_{CES}				nA
V_{CE} = 5 V, V_{BE} = 0		-	1	30	
V_{CE} = 15 V, V_{BE} = 0		-	-	1000	
Collector-base cutoff current V_{CB} = 5 V, I_E = 0	I_{CBO}	-	-	30	
Emitter-base cutoff current V_{EB} = 1 V, I_C = 0	I_{EBO}	-	10	500	
DC current gain I_C = 40 mA, V_{CE} = 3 V, pulse measured	h_{FE}	90	120	160	-

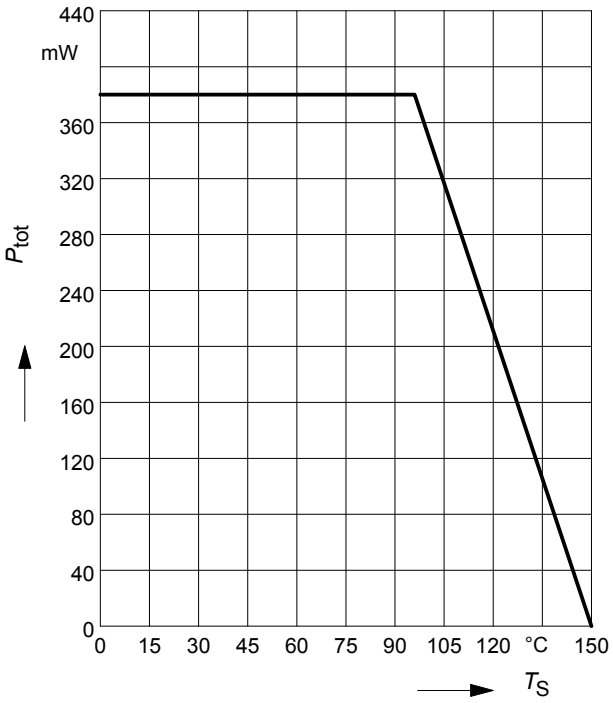
Electrical Characteristics at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 40 mA, V_{CE} = 3 V, f = 1 GHz	f_T	11	14	-	GHz
Collector-base capacitance V_{CB} = 5 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.45	0.8	pF
Collector emitter capacitance V_{CE} = 5 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.18	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	1	-	
Minimum noise figure I_C = 8 mA, V_{CE} = 3 V, Z_S = Z_{Sopt} , f = 1.8 GHz	NF_{min}	0.5	1.1	2.1	dB
Power gain, maximum available[1)] I_C = 40 mA, V_{CE} = 3 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt}, f = 1.8 GHz f = 3 GHz	G_{ma}	 11.5 7.5	 14 10	 16.5 12.5	
Transducer gain I_C = 40 mA, V_{CE} = 3 V, Z_S = Z_L = 50Ω , f = 1.8 GHz f = 3 GHz	$\lvert S_{21e}\rvert^2$	 9.5 5.5	 11.5 7.5	 13.5 9.5	dB
Third order intercept point at output[2)] V_{CE} = 3 V, I_C = 40 mA, f = 1.8 GHz, Z_S = Z_L = 50Ω	$IP3$	-	29.5	-	dBm
1dB compression point at output I_C = 40 mA, V_{CE} = 3V, f = 1.8 GHz Z_S = Z_L = 50Ω Z_S = Z_{Sopt}, Z_L = Z_{Lopt}	P_{-1dB}	 - -	 16 19.5	 - -	

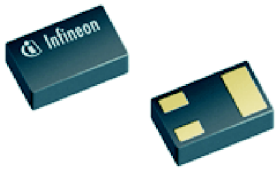
[1] $G_{ma} = \lvert S_{21e} / S_{12e}\rvert\ (k-(k^2-1)^{1/2})$

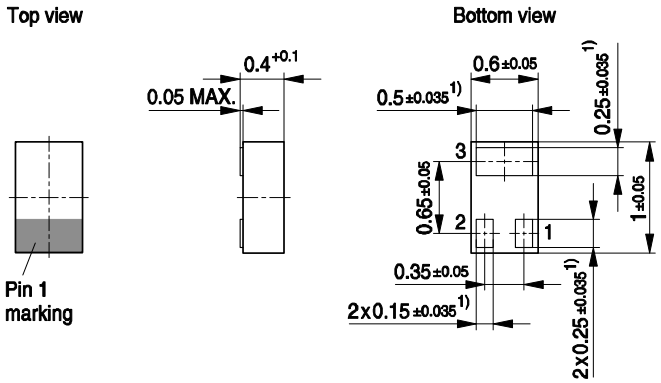
[2] IP3 value depends on termination of all intermodulation frequency components.
Termination used for this measurement is 50Ω from 0.1 MHz to 6 GHz

Total power dissipation $P_{tot} = f(T_S)$



Package Outline

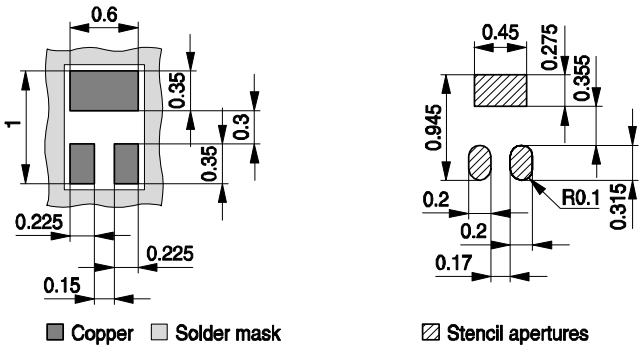




1) Dimension applies to plated terminal

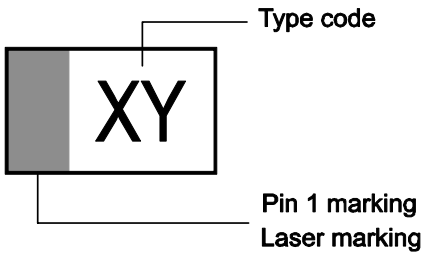
TSLP-3-1-PO V03

Foot Print



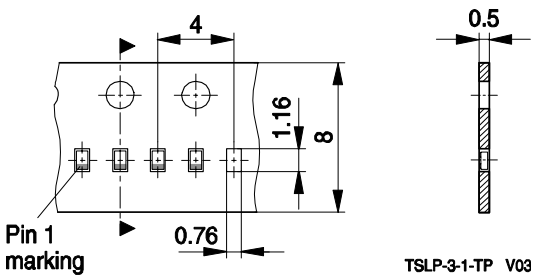
TSLP-3-1-FP V01

Marking Layout (Example)



Standard Packing

Reel Ø 330 mm: 15.000 Pieces/ Reel



TSLP-3-1-TP V03

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