



# START620

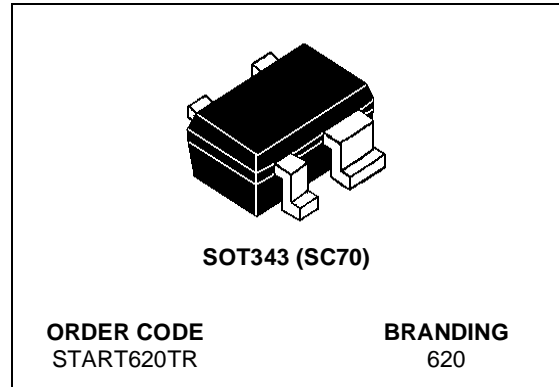
## NPN SiGe RF Transistor

### PRELIMINARY DATA

- LOW NOISE FIGURE:  $NF_{min} = 0.8\text{dB}$   
@ 1.8GHz, 5mA, 2V
- COMPRESSION  $P_{1\text{dB}} = 13\text{dBm}$   
@ 1.8GHz, 20mA, 2V
- ULTRA MINIATURE SOT343 PACKAGE

### DESCRIPTION

The START620 is a member of the START family that provide market with the state of the art of RF silicon process. It uses ST's Silicon Germanium technology. This technology offers ft's of up to 45GHz and  $F_{max}$ 's of over 60GHz. The START620 offers the best mix of gain and NF for given breakdown voltage ( $BV_{ceo} = 3.3\text{V}$ ). It reaches performance level only achieved with GaAs products before.



### APPLICATIONS

- LNA FOR GSM/DCS, CDMA, WCDMA, BLUETOOTH
- GENERAL PURPOSE 500MHZ-5GHZ

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{ceo}$	Collector emitter voltage	3.3	V
$V_{cbo}$	Collector base voltage	10	V
$V_{ebo}$	Emitter base voltage	1.5	V
$I_c$	Collector current	40	mA
$I_b$	Base current	4	mA
$P_{tot}$	Total dissipation, $T_s = 101$	135	mW
$T_{stg}$	Storage temperature	-65 to 150	°C
$T_j$	Max. operating junction temperature	150	°C

### ABSOLUTE MAXIMUM RATINGS

$R_{thjs}$	Thermal Resistance Junction soldering point	270	°C/W
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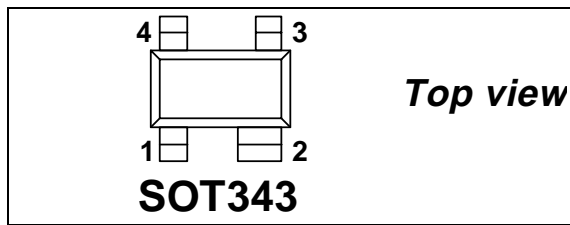
## START620

### ELECTRICAL CHARACTERISTICS (T<sub>j</sub>=25 °C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>obo</sub>	Collector cutoff current	V <sub>cb</sub> = 8V, I <sub>e</sub> = 0A			150	nA
I <sub>ebo</sub>	Emitter-base cutoff current	V <sub>eb</sub> = 1.5V, I <sub>c</sub> = 0A			15	μA
H <sub>fe</sub>	DC current gain	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V		100		
NF <sub>min</sub>	Minimum noise figure	I <sub>c</sub> = 5mA, V <sub>ce</sub> = 2V, f = 1.8GHz, Z <sub>s</sub> = Z <sub>s</sub> opt		0.8		dB
G <sub>a</sub>	NF <sub>min</sub> associated gain	I <sub>c</sub> = 5mA, V <sub>ce</sub> = 2V, f = 1.8GHz		14.5		dB
S <sub>21</sub>   <sup>2</sup>	Insertion power gain	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		16.2		dB
G <sub>ms</sub> <sup>(1)</sup>	Maximum stable gain	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		18.6		dB
P <sub>-1dB</sub>	1dB compression point	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		13		dBm
OIP3	Output third order intercept point	I <sub>c</sub> = 20mA, V <sub>ce</sub> = 2V, f = 1.8GHz		23		dBm

Note(1): G<sub>ms</sub> = |S<sub>21</sub> / S<sub>12</sub>|

### PINOUT



### PIN CONNECTION

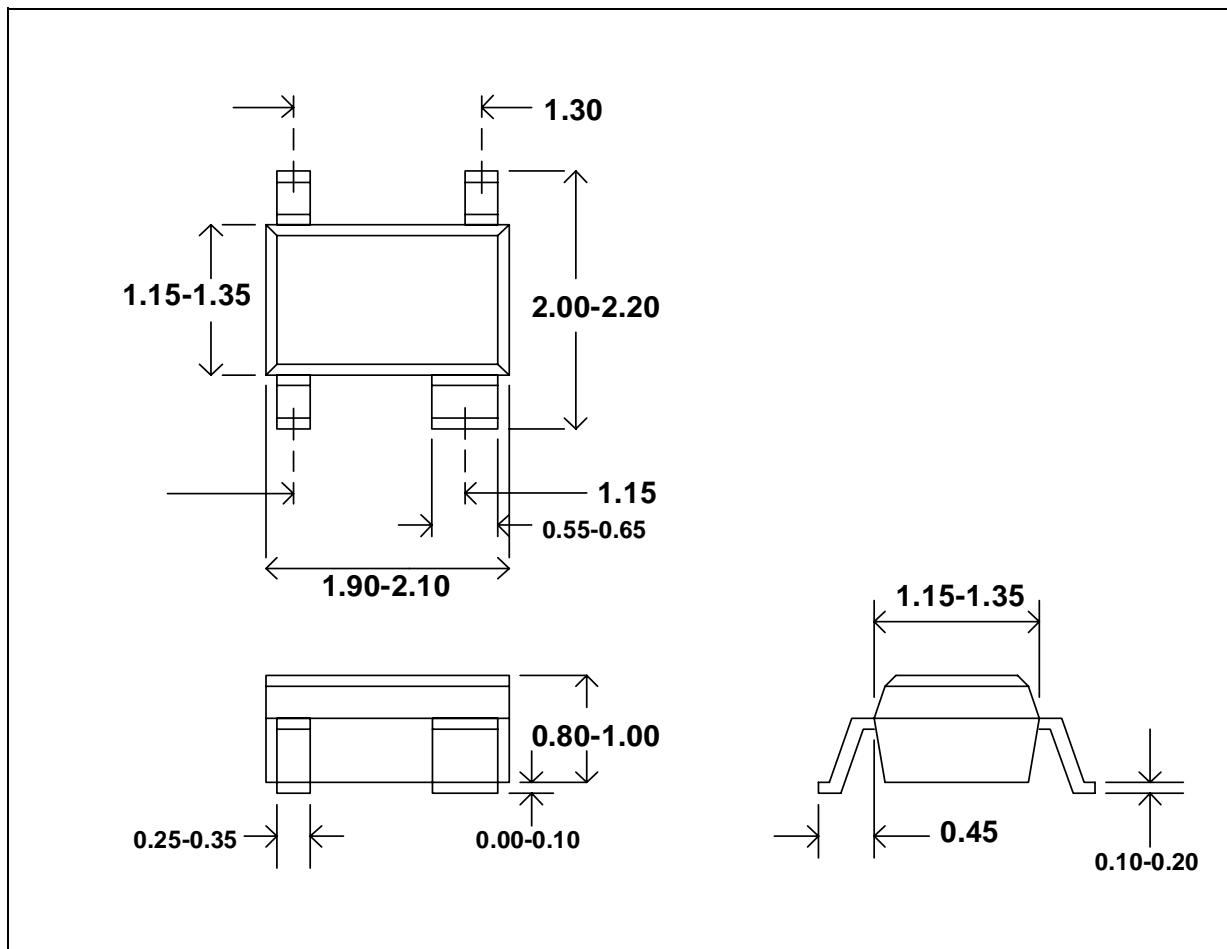
Pin No.	Description
1	BASE
3	COLLECTOR
2,4	EMITTER

COMMON EMITTER S-PARAMETERS (  $V_{CE} = 2V$ ,  $I_C = 20mA$  )

FREQ (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
0.1	0.505	-21	35.490	163	0.009	80	0.940	-14
0.5	0.322	-69	19.713	134	0.030	84	0.611	-38
0.9	0.245	-88	12.607	130	0.048	100	0.484	-43
1	0.237	-92	11.751	130	0.052	102	0.470	-44
1.5	0.193	-97	7.564	133	0.071	118	0.430	-46
1.8	0.188	-95	6.534	139	0.088	127	0.443	-48
2	0.190	-89	5.834	144	0.093	133	0.449	-49
2.5	0.218	-76	4.639	154	0.109	148	0.497	-55
3	0.219	-86	3.688	165	0.160	170	0.455	-66
3.5	0.209	-80	3.537	172	0.181	174	0.412	-73
4	0.195	-89	3.006	180	0.200	173	0.355	-80

**START620**

**PACKAGE DIMENSIONS SOT343 (SC-70 4 leads)**



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