

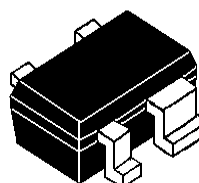


START420

NPN Silicon RF Transistor

PRELIMINARY DATA

- LOW NOISE FIGURE: NFmin = 1.05dB
@ 1.8GHz, 5mA, 2V
- COMPRESSION P1dB = 12.5dBm
@ 1.8GHz, 20mA, 2V
- TRANSITION FREQUENCY 42GHz
- ULTRA MINIATURE SOT343 PACKAGE



SOT343 (SC70)

ORDER CODE
START420

BRANDING
420

DESCRIPTION

The START420 is a member of the START family that provide the state of the art of RF silicon process to the market. Manufactured in the third generation of ST proprietary bipolar process, it offers the best mix of gain and NF for given breakdown voltage(BVceo).

It offers performance level only archived with GaAs products before.

APPLICATIONS

- LNA FOR GSM/DCS, DECT, PCS, PCN, CDMA, W-CDMA
- PREDRIVER FOR DECT
- GENERAL PURPOSE 500MHz-5GHz

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{ceo}	Collector emitter voltage	4.5	V
V _{cbo}	Collector base voltage	15	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	180	mW
T _{stg}	Storage temperature	-65 to 150	°C
T _j	Max. operating junction temperature	150	°C

ABSOLUTE MAXIMUM RATINGS

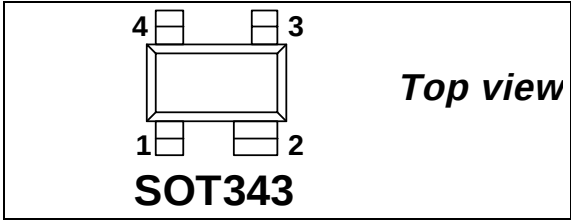
R _{thjs}	Thermal Resistance Junction soldering point	270	°C/W
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ELECTRICAL CHARACTERISTICS (T_j=25 °C,unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{cbo}	Collector cutoff current	V _{cb} = 15V, I _e = 0A			150	nA
I _{ebo}	Emitter-base cutoff current	V _{eb} = 1.5V, I _c = 0A			15	μA
H _{fe}	DC current gain	I _c = 20mA, V _{ce} = 3V	50	90		
NF _{min}	Minimim noise figure	I _c = 5mA, V _{ce} = 2V, f = 1.8GHz, Z _s = Z _s opt		1.05		dB
G _a	NF _{min} associated gain	I _c = 5mA, V _{ce} = 2V, f = 1.8GHz		17.5		dB
S ₂₁ ²	Insertion power gain	I _c = 20mA, V _{ce} = 2V, f = 1.8GHz		19.5		dB
G _{ms} ⁽¹⁾	Maximum stable gain	I _c = 20mA, V _{ce} = 2V, f = 1.8GHz		22.5		dB
P _{-1dB}	1dB compression point	I _c = 20mA, V _{ce} = 2V, f = 1.8GHz		12.5		dBm
OIP3	Ouput third order intercept point	I _c = 20mA, V _{ce} = 2V, f = 1.8GHz		23		dBm

Note(1): G_{ms} = | S₂₁ / S₁₂ |

PINOUT



PIN CONNECTION

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

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

f	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.516	-24.4	39.78	165.3	0.008	91.1	0.939	-11.5
0.5	0.410	-91.3	26.29	122.6	0.024	56.1	0.651	-46.1
0.9	0.358	-132.1	17.50	100.9	0.033	53.2	0.444	-60.8
1	0.356	-139.1	16.03	96.9	0.036	51.4	0.409	-63.0
1.5	0.352	-168.4	11.22	81.0	.046	49.7	0.289	-73.3
1.8	0.366	179.2	9.45	73.7	0.053	47.8	0.246	-78.9
2	0.376	172.0	8.53	68.8	0.057	46.6	0.218	-83.8
2.5	0.408	158.2	6.86	58.3	0.068	42.4	0.165	-98.2
3	0.448	148.4	5.62	48.3	0.078	37.7	0.132	-119.6
3.5	0.489	139.3	4.80	39.3	0.090	31.7	0.119	-146.7
4	0.518	129.5	4.16	30.1	0.099	27.1	0.122	-170.0

COMMON EMITTER S-PARAMETERS ($V_{CE} = 2V$, $I_C = 5mA$)

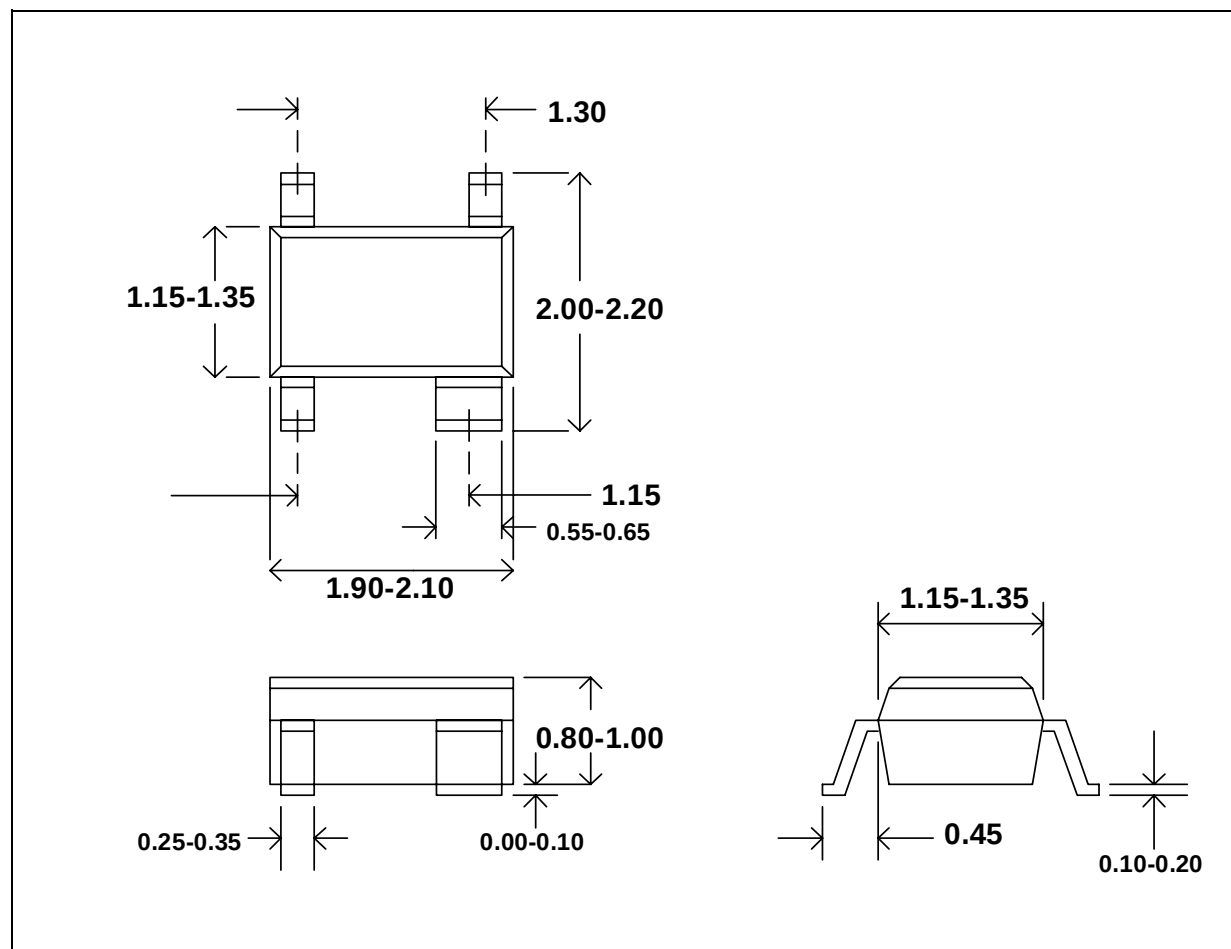
f	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.5	0.754	-48.5	13.68	142.7	0.036	61.7	0.878	-28.3
0.9	0.638	-81.3	11.21	120.2	0.054	47.8	0.725	-44.3
1	0.617	-88.7	10.64	115.3	0.057	44.4	0.689	-47.5
1.5	0.522	-122.0	8.311	95.1	0.068	34.3	0.536	-60.6
1.8	0.496	-139.4	7.25	85.5	0.072	29.7	0.469	-66.8
2	0.485	-150.1	6.65	79.2	0.075	27.5	0.427	-71.0
2.5	0.485	-172.3	5.50	65.7	0.081	22.3	0.346	-81.0
3	0.508	170.1	4.54	54.0	0.086	17.8	0.284	-92.2
3.5	0.532	155.9	3.92	42.7	0.093	13.6	0.239	-106.2
4	0.544	142.9	3.42	31.8	0.098	11.0	0.210	-120.5

COMMON EMITTER NOISE PARAMETERS ($V_{CE} = 2V$, $I_C = 5mA$)

f	F _{min} ⁽¹⁾	G _a ⁽¹⁾	Γ_{opt}		R _n	r _n	F ₅₀ ⁽²⁾	S ₂₁ ² ⁽²⁾
GHz	dB	dB	MAG	ANG	Ω	-	dB	dB
1.8	1.05	17.6	0.33	61	9	0.18	1.23	17.2
2.4	1.15	15.3	0.26	83	8.5	0.17	1.28	15.1
3	1.3	13.5	0.24	114	7	0.14	1.42	13.1
3.6	1.45	12.5	0.29	156	5	0.1	1.63	11.6

Note: (1) Input matched for minimum noise figure, output for maximum gain

(2) Z_s = Z_L = 50 Ω



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