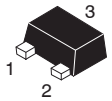
RF Transistor

10 V, 70 mA, f_T = 7 GHz, NPN Single SSFP

2SC5488A



SOT−623 / SSFP
CASE 631AC

Features

- Low−noise: NF = 1.0 dB Typ (f = 1 GHz)
- High Gain: $|S21e|^2$ = 12 dB Typ (f = 1 GHz)
- High Cut−off Frequency: f_T = 7 GHz Typ
- Ultrasmall, Slim Flat−lead Package (1.4 mm x 0.8 mm x 0.6 mm)
- This Device is Pb−Free and Halogen Free

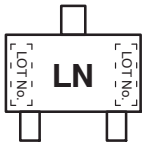
Specifications

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector−to−Base Voltage	20	V
V_{CEO}	Collector−to−Emitter Voltage	10	V
V_{EBO}	Emitter−to−Base Voltage	2	V
I_C	Collector Current	70	mA
P_C	Collector Dissipation	100	mW
Tj	Junction Temperature	150	°C
Tstg	Storage Temperature	−55 to +150	°C

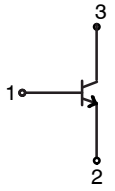
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

MARKING DIAGRAM



LN = Specific Device Code

ELECTRICAL CONNECTION



1: Base
2: Emitter
3: Collector

ORDERING INFORMATION

Device	Package	Shipping†
2SC5488A−TL−H	SOT−623 / SSFP (Pb−Free, Halide Free)	8000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 10 V, I_E = 0 A	–	–	1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 A	–	–	10	μA
DC Current Gain	hFE	V_{CE} = 5 V, I_C = 20 mA	90	–	200	
Gain−Bandwidth Product	f_T	V_{CE} = 5 V, I_C = 20 mA	5	7	–	GHz
Output Capacitance	Cob	V_{CB} = 10 V, f = 1 MHz	–	0.7	1.2	pF
Reverse Transfer Capacitance	Cre		–	0.45	–	pF
Forward Transfer Gain	$\|S21e\|^2 1$	V_{CE} = 5 V, I_C = 20 mA, f = 1 GHz	9	12	–	dB
	$\|S21e\|^2 2$	V_{CE} = 2 V, I_C = 3 mA, f = 1 GHz	–	8.5	–	dB
Noise Figure	NF	V_{CE} = 5 V, I_C = 7 mA, f = 1 GHz	–	1.0	1.8	dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

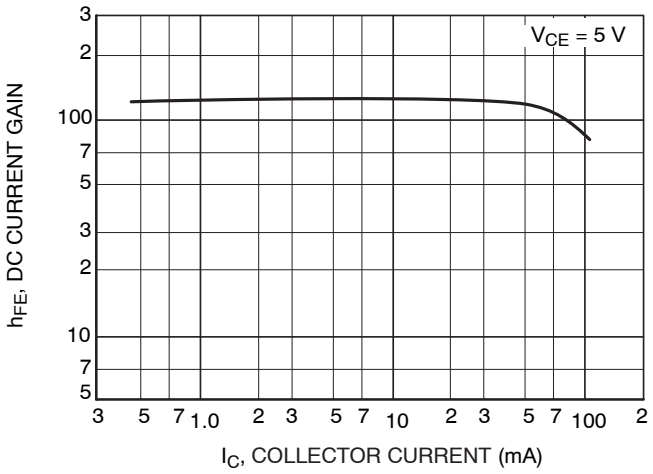


Figure 1. h_{FE} – I_C

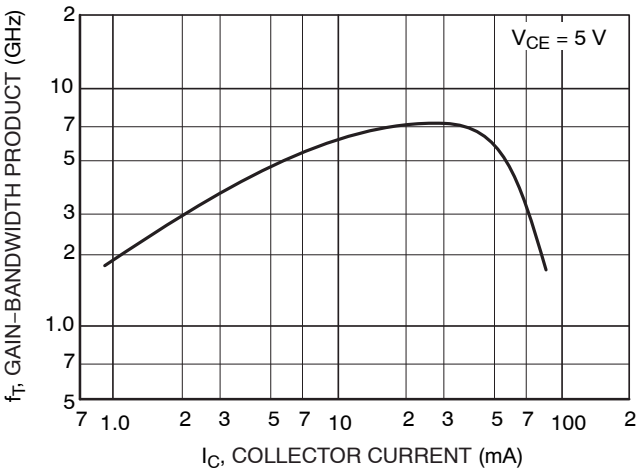


Figure 2. f_T – I_C

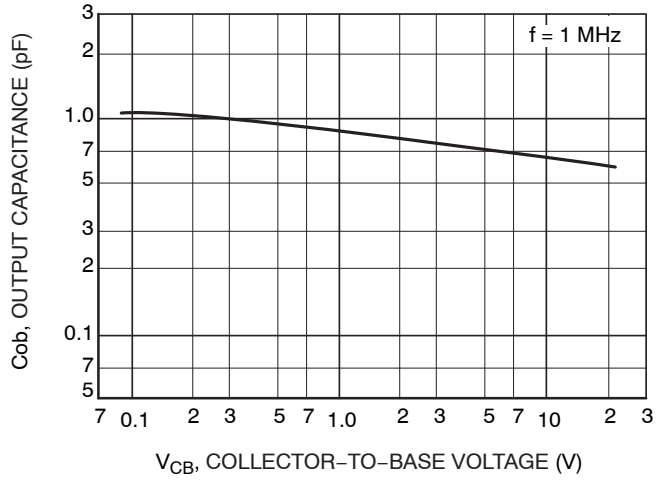


Figure 3. Cob – V_{CB}

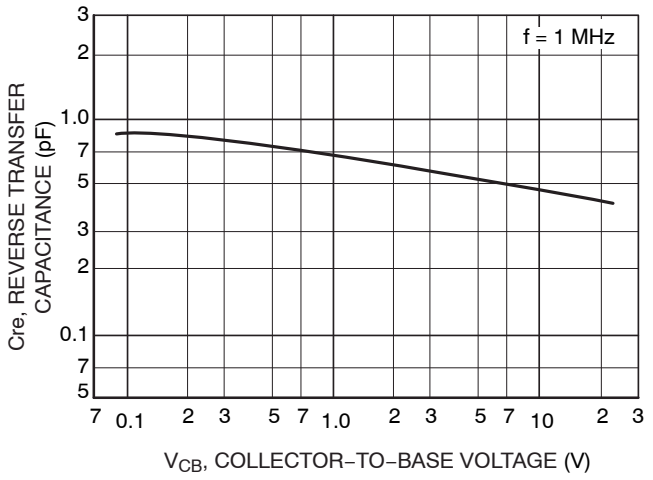


Figure 4. Cre – V_{CB}

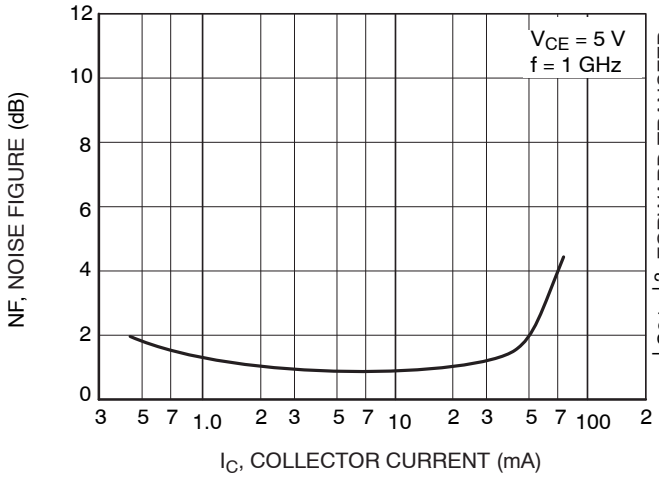


Figure 5. NF – I_C

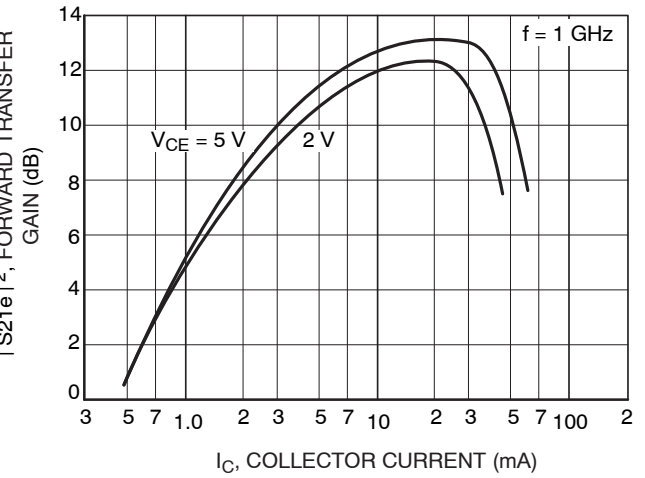


Figure 6. $|S21e|^2$ – I_C

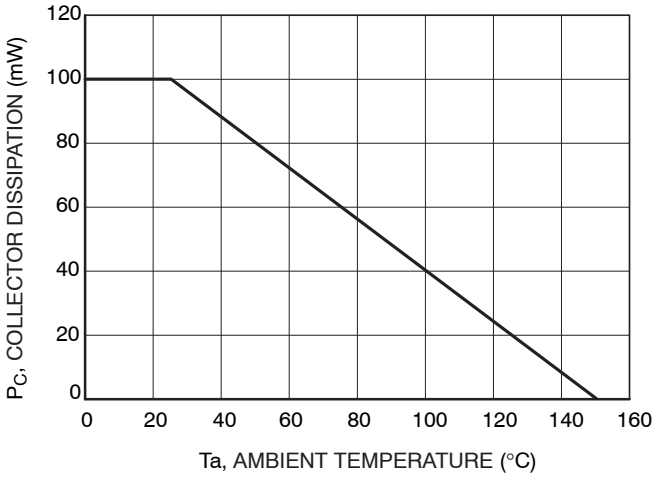


Figure 7. P_C – Ta

S Parameters (Common Emitter)

V_{CE} = 5 V, I_C = 7 mA, Z_O = 50 Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.786	–40.7	17.507	151.3	0.028	70.1	0.898	–20.4
200	0.677	–72.4	13.998	131.4	0.046	58.0	0.739	–33.4
400	0.546	–112.7	9.061	108.6	0.064	49.6	0.525	–43.7
600	0.492	–135.2	6.442	96.1	0.076	49.3	0.423	–46.7
800	0.473	–150.0	5.005	87.3	0.087	50.8	0.374	–44.4
1000	0.465	–160.0	4.073	80.4	0.099	52.6	0.346	–49.7
1200	0.457	–169.5	3.449	74.0	0.111	54.0	0.332	–51.6
1400	0.451	–176.2	2.989	68.6	0.124	55.2	0.321	–54.1
1600	0.449	177.8	2.658	63.8	0.138	56.6	0.319	–56.2
1800	0.454	172.5	2.378	58.4	0.151	56.7	0.313	–60.0
2000	0.460	167.1	2.154	54.0	0.166	56.7	0.311	–63.2

V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.601	–65.8	28.967	137.1	0.023	64.1	0.757	–32.9
200	0.497	–103.7	19.309	116.6	0.035	57.0	0.534	–50.3
400	0.435	–139.6	10.891	98.6	0.050	58.7	0.345	–50.3
600	0.419	–156.6	7.461	89.3	0.065	61.3	0.280	–50.7
800	0.414	–166.6	5.695	82.5	0.081	63.1	0.251	–51.3
1000	0.413	–174.0	4.613	77.0	0.098	63.8	0.235	–52.9
1200	0.413	178.6	3.870	71.8	0.114	63.9	0.226	–55.1
1400	0.411	173.8	3.345	66.9	0.131	63.6	0.221	–57.7
1600	0.413	169.6	2.960	62.7	0.148	63.2	0.220	–60.2
1800	0.416	165.1	2.655	58.0	0.165	61.8	0.219	–64.8
2000	0.422	160.3	2.406	54.0	0.182	60.6	0.218	–68.3

V_{CE} = 2 V, I_C = 3 mA, Z_O = 50 Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.888	–30.2	9.280	158.6	0.038	73.6	0.949	–15.1
200	0.815	–56.4	8.218	141.3	0.067	60.5	0.849	–26.9
400	0.690	–96.0	6.074	116.7	0.098	45.1	0.657	–41.1
600	0.616	–120.7	4.517	101.4	0.112	38.4	0.539	–47.6
800	0.584	–138.0	3.610	90.4	0.120	35.8	0.475	–51.2
1000	0.566	–150.7	2.995	81.9	0.125	35.7	0.434	–54.5
1200	0.555	–161.2	2.540	74.2	0.131	36.5	0.410	–57.5
1400	0.546	–169.3	2.213	67.5	0.137	38.4	0.393	–60.7
1600	0.541	–176.4	1.982	62.0	0.143	40.7	0.391	–64.0
1800	0.545	177.1	1.774	55.9	0.152	42.5	0.382	–67.8
2000	0.547	170.9	1.614	50.9	0.163	44.7	0.381	–72.1

Land Pattern Example

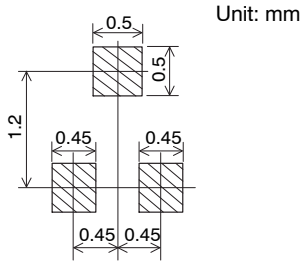


Figure 8. Land Pattern Example

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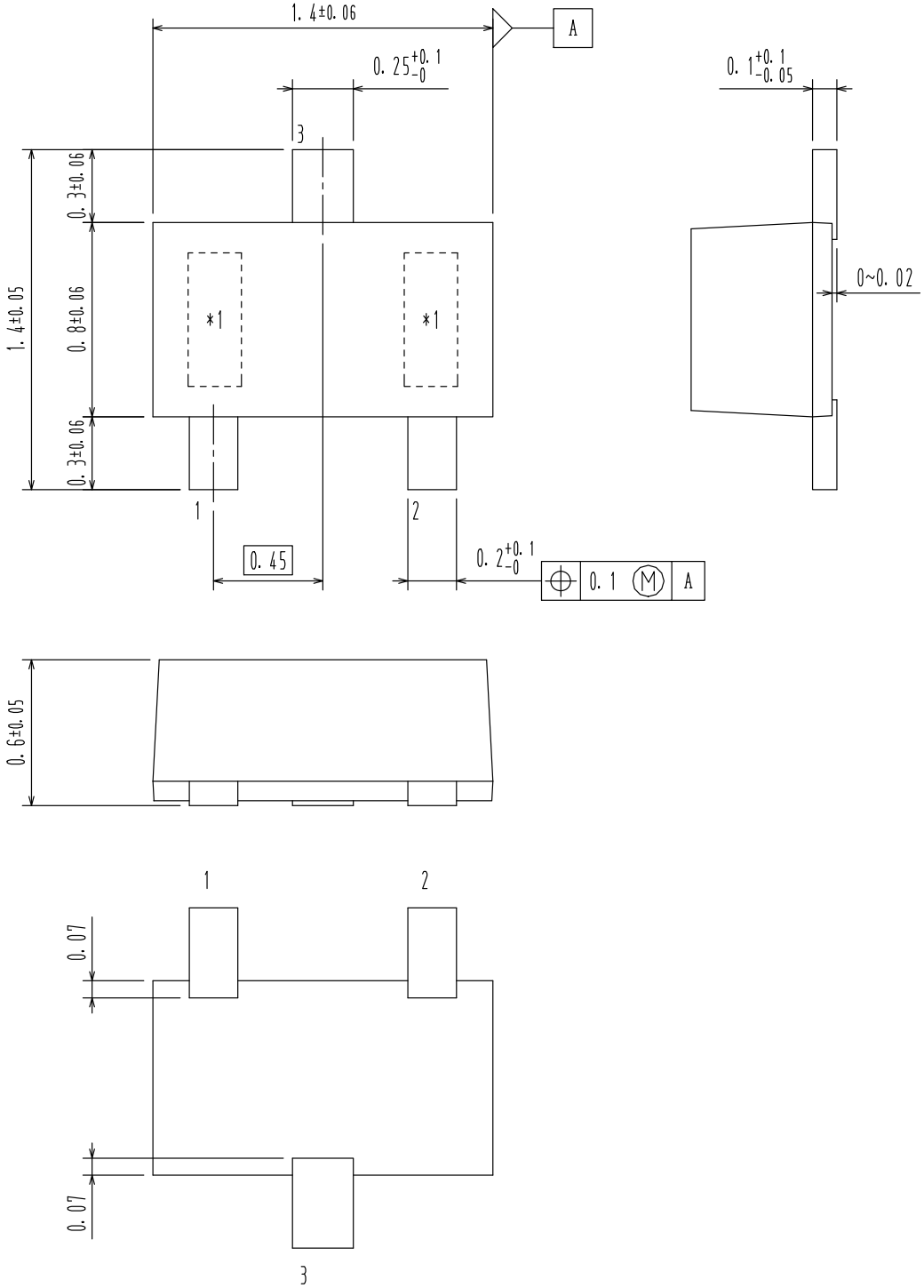
ISSUE O

DATE 29 FEB 2012



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