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2SC5488A

RF Transistor

10V, 70mA, $f_T=7\text{GHz}$, NPN Single SSFP

Features

- Low-noise : $NF=1.0\text{dB}$ typ ($f=1\text{GHz}$)
- High gain : $|S_{21e}|^2=12\text{dB}$ typ ($f=1\text{GHz}$)
- High cut-off frequency : $f_T=7\text{GHz}$ typ
- Ultrasmall, slim flat-lead package ($1.4\text{mm} \times 0.8\text{mm} \times 0.6\text{mm}$)
- Halogen free compliance

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

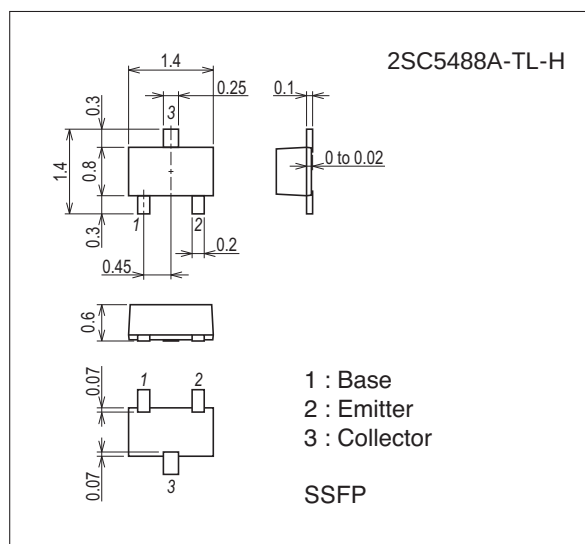
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		20	V
Collector-to-Emitter Voltage	V_{CEO}		10	V
Emitter-to-Base Voltage	V_{EBO}		2	V
Collector Current	I_C		70	mA
Collector Dissipation	P_C		100	mW
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

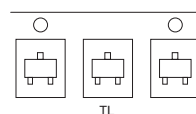
7029A-002



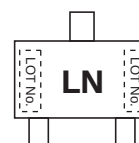
Product & Package Information

- Package : SSFP
- JEITA, JEDEC : SC-81
- Minimum Packing Quantity : 8,000 pcs./reel

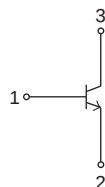
Packing Type: TL



Marking



Electrical Connection



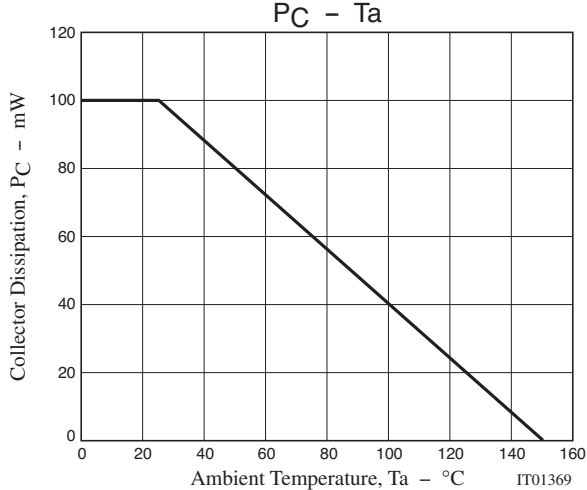
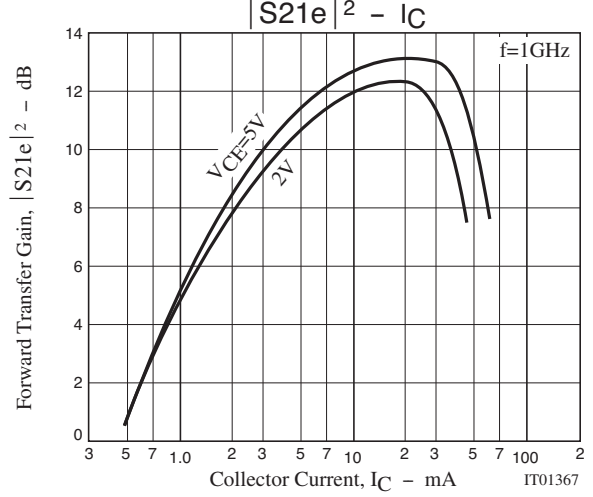
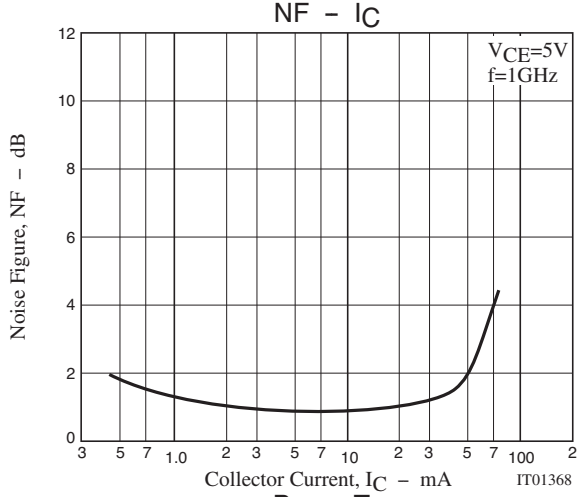
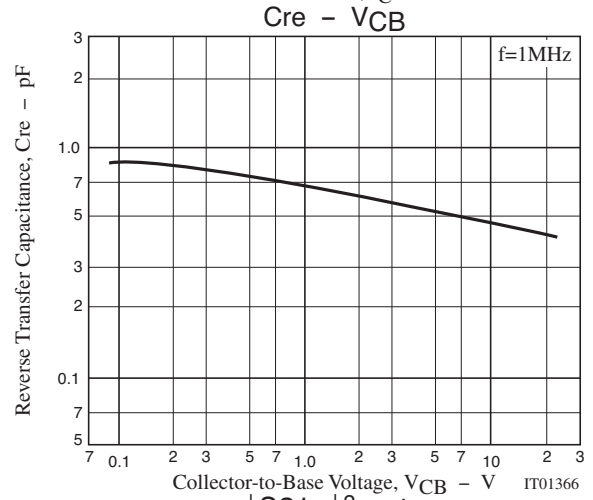
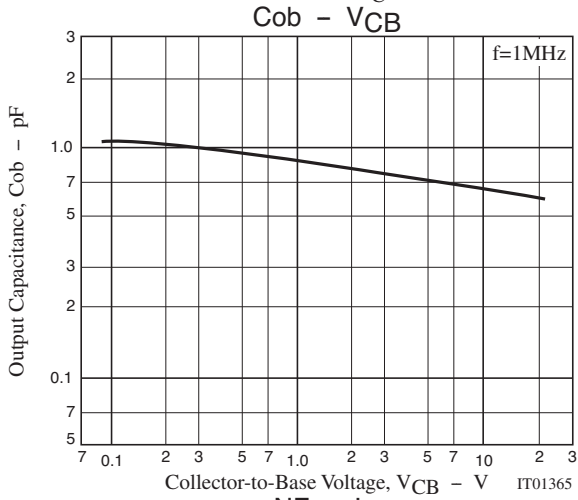
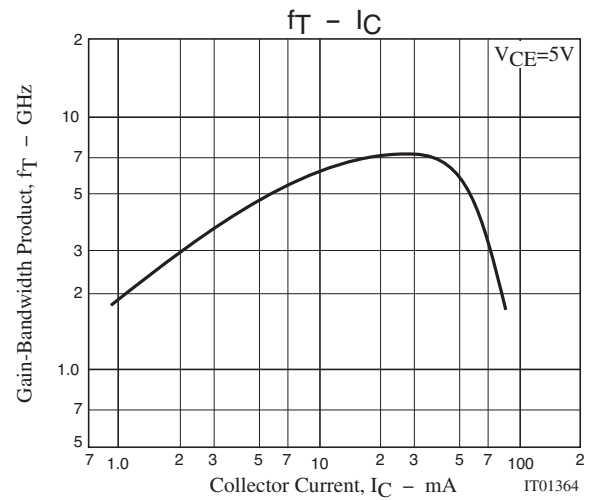
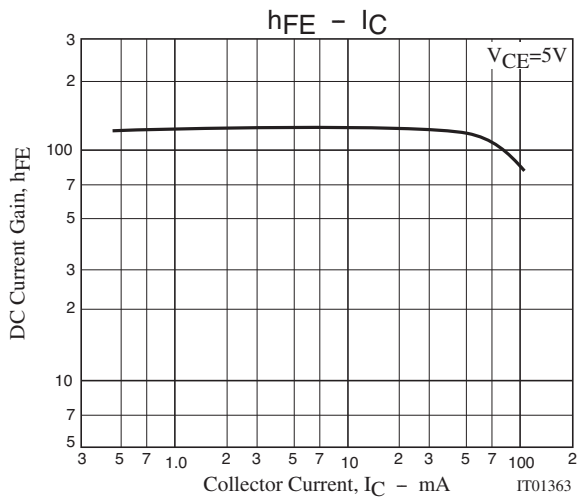
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Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V _{CB} =10V, I _E =0A			1.0	μA
Emitter Cutoff Current	IEBO	V _{EB} =1V, I _C =0A			10	μA
DC Current Gain	h _{FE}	V _{CE} =5V, I _C =20mA	90		200	
Gain-Bandwidth Product	f _T	V _{CE} =5V, I _C =20mA	5	7		GHz
Output Capacitance	C _{ob}	V _{CB} =10V, f=1MHz		0.7	1.2	pF
Reverse Transfer Capacitance	C _{re}			0.45		pF
Forward Transfer Gain	S _{21e} ² ₁	V _{CE} =5V, I _C =20mA, f=1GHz	9	12		dB
	S _{21e} ² ₂	V _{CE} =2V, I _C =3mA, f=1GHz		8.5		dB
Noise Figure	NF	V _{CE} =5V, I _C =7mA, f=1GHz		1.0	1.8	dB

Ordering Information

Device	Package	Shipping	memo
2SC5488A-TL-H	SSFP	8,000pcs./reel	Pb Free and Halogen Free



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S Parameters (Common emitter)

$V_{CE}=5V$, $I_C=7mA$, $Z_O=50\Omega$

Freq(MHz)	S11	$\angle S11$	S21	$\angle S21$	S12	$\angle S12$	S22	$\angle S22$
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

$V_{CE}=5V$, $I_C=20mA$, $Z_O=50\Omega$

Freq(MHz)	S11	$\angle S11$	S21	$\angle S21$	S12	$\angle S12$	S22	$\angle S22$
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

$V_{CE}=2V$, $I_C=3mA$, $Z_O=50\Omega$

Freq(MHz)	S11	$\angle S11$	S21	$\angle S21$	S12	$\angle S12$	S22	$\angle S22$
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

Embossed Taping Specification

2SC5488A-TL-H

1. Packing Format

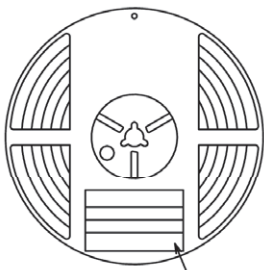
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
SSFP	SSFP	8,000	40,000	240,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Reel label, Inner box label
(unit:mm)

Outer box label

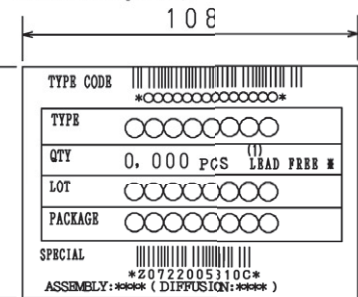
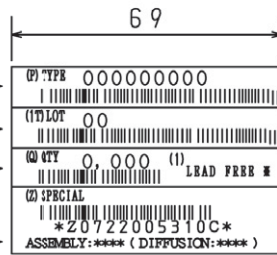
It is a label at the time of factory shipments.
The form of a label may change in physical
distribution process.

Packing method



Reel label

Type No.
LOT No.
Quantity
Origin



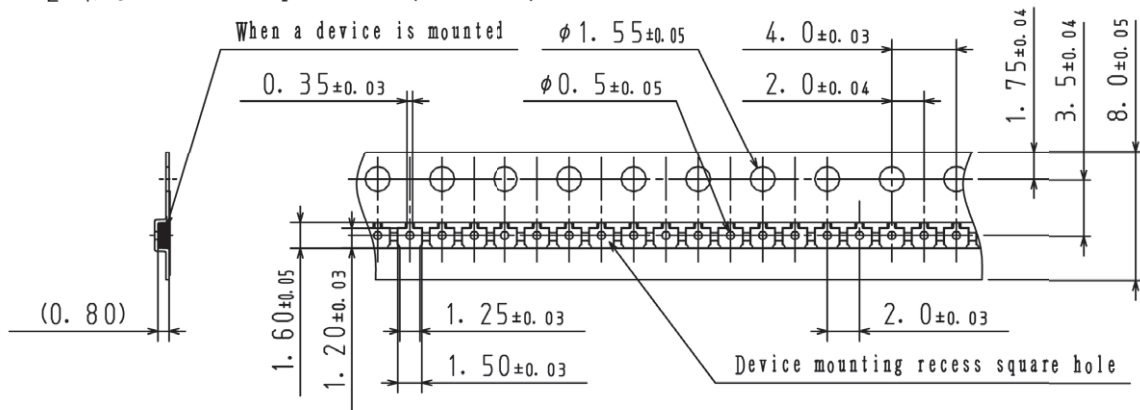
NOTE (1)

The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

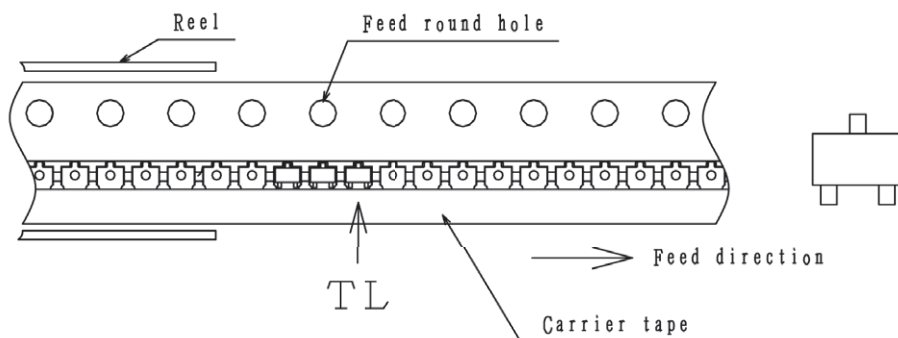
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

2-1. Carrier tape size (unit:mm)

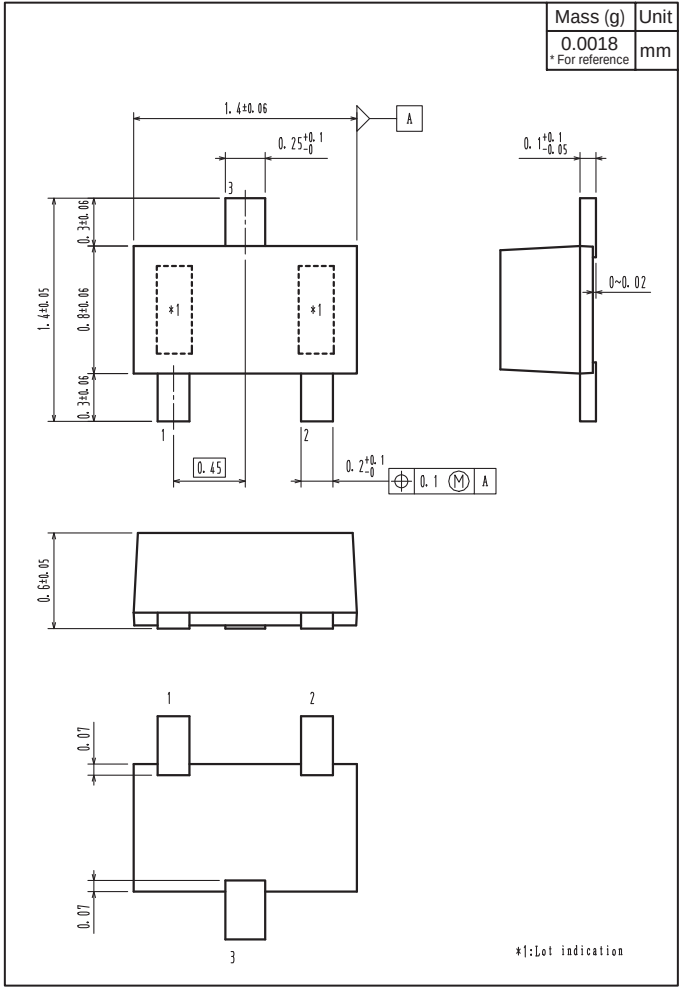


2-2. Device placement direction

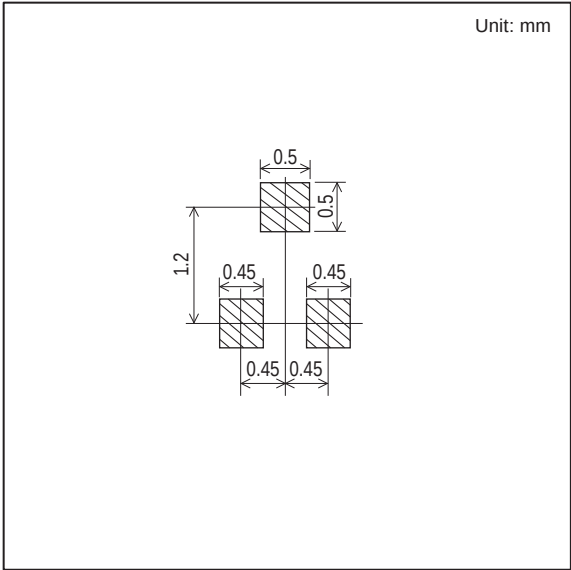


Those with pin 1 index on the feed hole side.....TL

Outline Drawing
2SC5488A-TL-H



Land Pattern Example



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