Ordering number : ENA1092A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

NPN Epitaxial Planar Silicon Transistor

2SC5536A — VHF Low-Noise Amplifier, OSC Applications

Features

- Low-noise : NF=1.8dB typ (f=150MHz)
- High gain : $|S21e|^2$=16dB typ (f=150MHz)
- Ultrasmall, slim flat-lead package (1.4mm×0.8mm×0.6mm)
- Halogen free compliance

Specifications

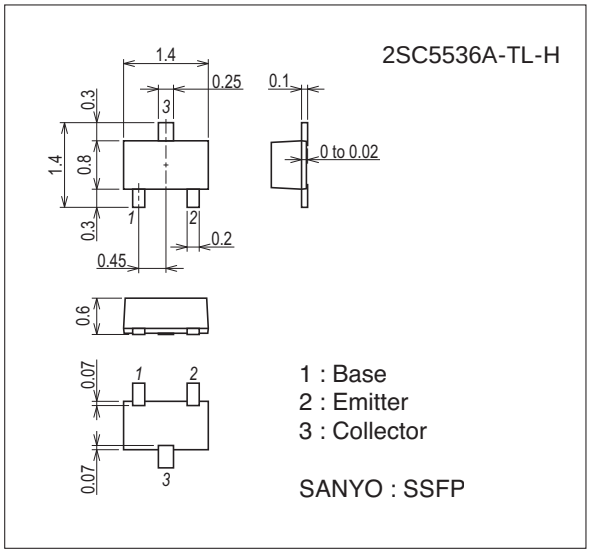
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		20	V
Collector-to-Emitter Voltage	V_{CEO}		12	V
Emitter-to-Base Voltage	V_{EBO}		2	V
Collector Current	I_C		50	mA
Collector Dissipation	P_C		100	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

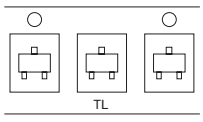
7029A-002



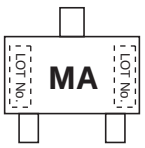
Product & Package Information

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

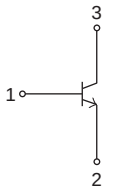
Packing Type: TL



Marking



Electrical Connection

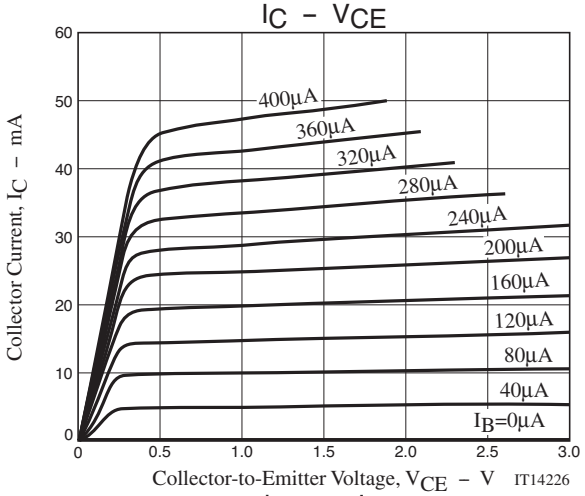


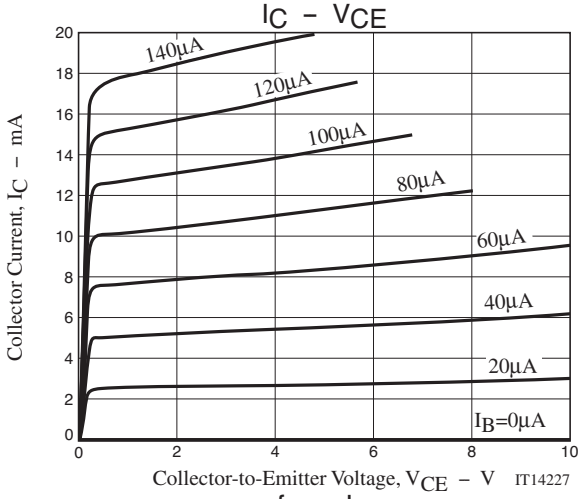
Electrical Characteristics at Ta=25°C

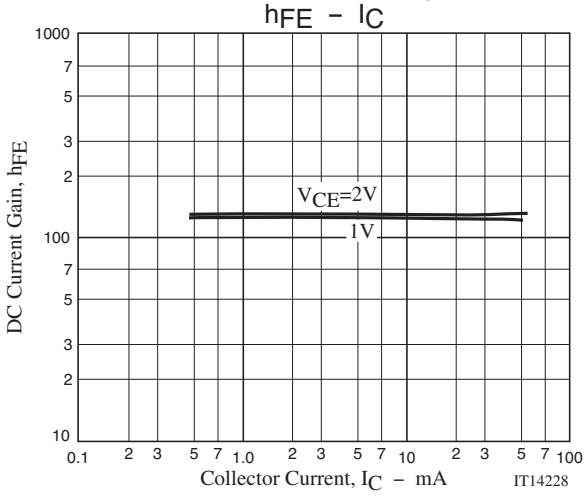
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=10V, I_E=0A			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=1V, I_C=0A			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=2V, I_C=3mA	80		200	
	$h_{FE}2$	V_{CE}=2V, I_C=50mA	70			
Gain-Bandwidth Product	f_T	V_{CE}=2V, I_C=3mA	1.0	1.7		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		1.1	1.8	pF
Reverse Transfer Capacitance	Cre			0.8		pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=2V, I_C=3mA, f=150MHz	13	16		dB
Noise Figure	NF			1.8	3.0	dB

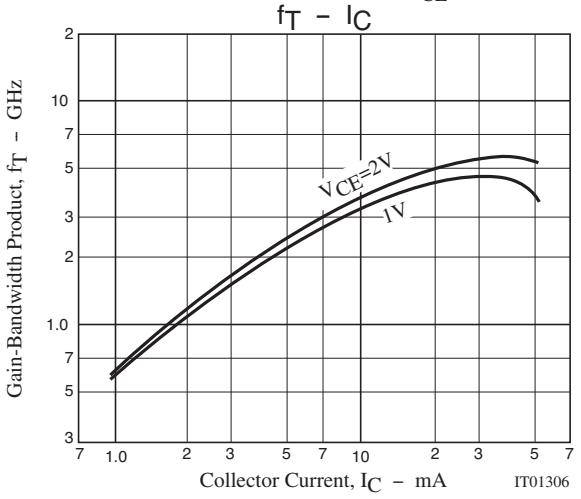
Ordering Information

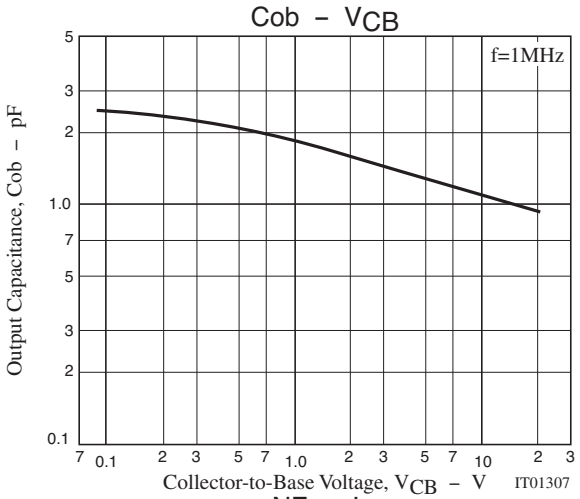
Device	Package	Shipping	memo
2SC5536A-TL-H	SSFP	8,000pcs./reel	Pb Free and Halogem Free

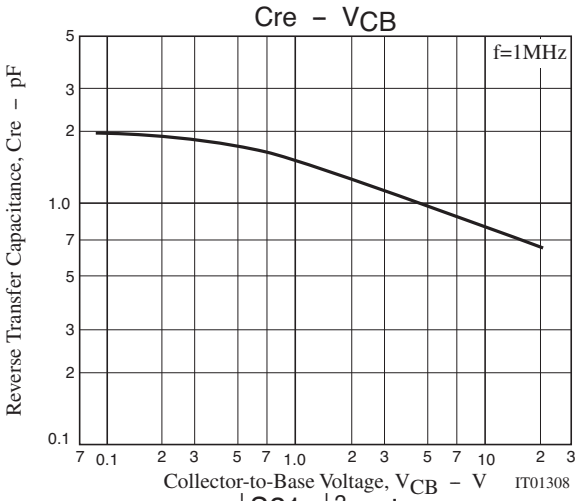


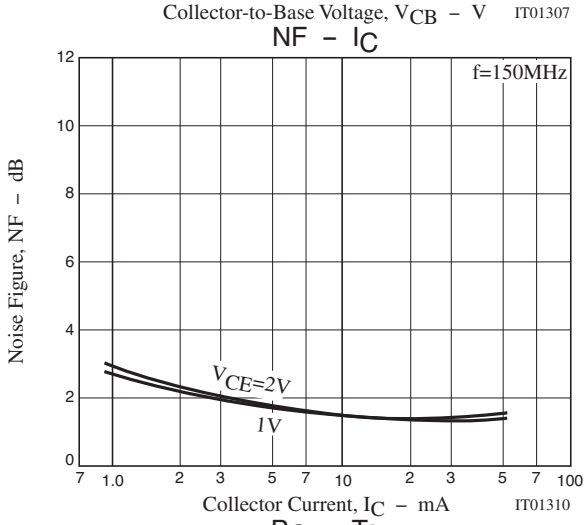


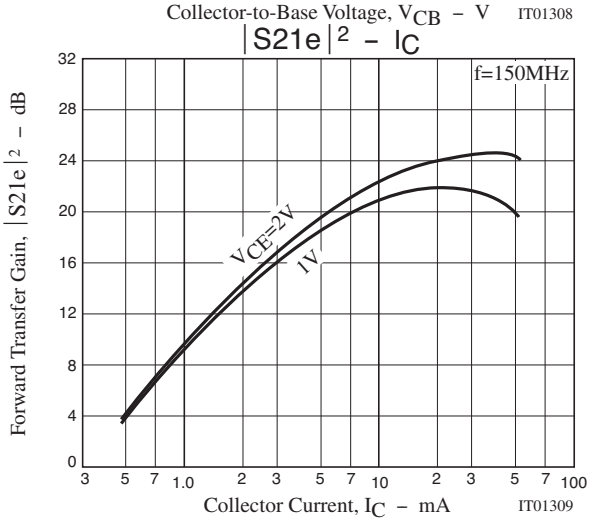


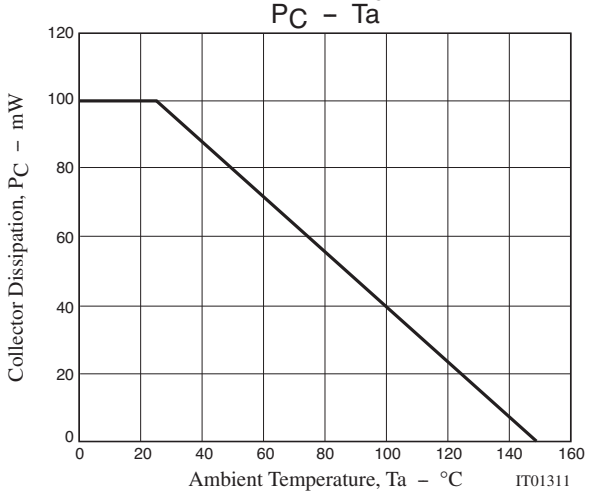



Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT01307


Cre – VCB
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
IT01308


NF – IC
f=150MHz
VCE=2V
1V
Noise Figure, NF – dB
Collector Current, IC – mA
IT01310


|S21e|2 – IC
f=150MHz
VCE=2V
1V
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA
IT01309


PC – Ta
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
IT01311

S Parameters (Common emitter)

V_{CE}=2V, I_C=1mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
50	0.961	-26.3	3.67	162.9	0.040	74.8	0.980	-7.3
100	0.937	-52.0	2.90	148.5	0.074	61.5	0.938	-13.4
150	0.917	-72.8	2.69	135.6	0.099	50.4	0.890	-18.0
200	0.890	-89.5	2.47	125.0	0.114	41.3	0.843	-21.5
250	0.893	-100.7	2.23	116.6	0.124	33.8	0.803	-24.4
300	0.880	-111.3	1.93	108.8	0.130	28.3	0.785	-26.5
350	0.868	-122.4	1.83	102.9	0.135	23.9	0.747	-28.6
400	0.873	-127.6	1.58	96.8	0.136	19.9	0.747	-30.5
450	0.858	-135.4	1.52	92.7	0.137	16.8	0.720	-32.3
500	0.866	-138.9	1.31	87.3	0.135	14.0	0.724	-34.3

V_{CE}=2V, I_C=3mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
50	0.888	-37.5	9.15	157.9	0.038	69.9	0.942	-15.0
100	0.860	-68.6	8.01	140.2	0.064	54.0	0.829	-26.1
150	0.835	-91.8	6.76	127.0	0.080	43.3	0.723	-32.9
200	0.810	-108.7	5.56	117.8	0.088	35.6	0.636	-36.7
250	0.800	-121.4	4.93	110.1	0.095	30.8	0.581	-39.1
300	0.792	-130.6	4.17	104.6	0.098	27.4	0.533	-40.9
350	0.791	-137.9	3.73	98.9	0.098	24.8	0.510	-42.2
400	0.787	-143.8	3.28	95.2	0.100	23.0	0.482	-43.3
450	0.785	-148.4	2.99	91.0	0.098	22.2	0.472	-44.6
500	0.783	-152.5	2.69	88.1	0.100	21.3	0.457	-45.7

V_{CE}=2V, I_C=10mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
50	0.733	-64.8	22.70	145.6	0.031	60.7	0.825	-33.9
100	0.722	-105.2	16.71	125.0	0.046	44.9	0.605	-53.9
150	0.719	-126.7	12.55	113.3	0.052	38.2	0.462	-64.8
200	0.713	-139.6	9.94	106.2	0.055	36.3	0.371	-71.4
250	0.716	-147.8	8.10	101.0	0.059	35.6	0.314	-76.1
300	0.716	-153.8	6.88	96.9	0.060	36.2	0.276	-79.7
350	0.716	-158.8	5.96	93.4	0.062	37.4	0.248	-82.6
400	0.717	-162.1	5.25	90.7	0.065	38.6	0.228	-85.1
450	0.715	-165.3	4.70	88.2	0.067	40.6	0.215	-86.7
500	0.716	-167.6	4.24	85.9	0.069	42.1	0.204	-88.6

V_{CE}=2V, I_C=30mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
50	0.605	-104.0	36.87	131.9	0.022	54.3	0.672	-59.9
100	0.660	-137.6	23.04	112.9	0.030	44.3	0.450	-89.4
150	0.677	-151.7	16.23	104.1	0.034	45.3	0.352	-106.7
200	0.681	-159.5	12.43	99.4	0.038	47.4	0.302	-118.6
250	0.686	-164.5	10.04	95.6	0.042	50.8	0.276	-127.0
300	0.687	-168.1	8.44	92.8	0.045	53.9	0.260	-133.7
350	0.689	-170.8	7.27	90.2	0.050	56.5	0.251	-138.8
400	0.691	-173.0	6.38	88.3	0.055	58.3	0.244	-142.9
450	0.691	-174.8	5.70	86.4	0.059	60.5	0.239	-145.6
500	0.691	-176.5	5.14	84.7	0.064	61.5	0.237	-148.2

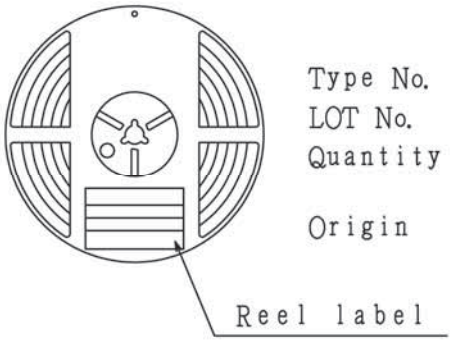
Embossed Taping Specification

2SC5536A-TL-H

1. Packing Format

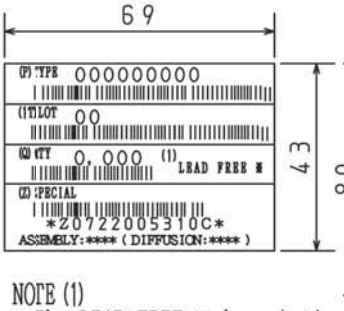
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
SSFP	SSFP	8,000	40,000	240,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Packing method



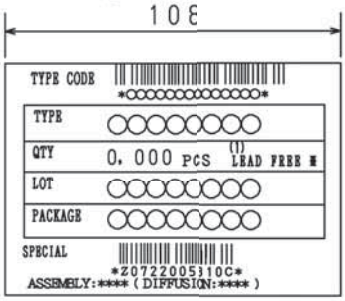
Reel label, Inner box label

(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.

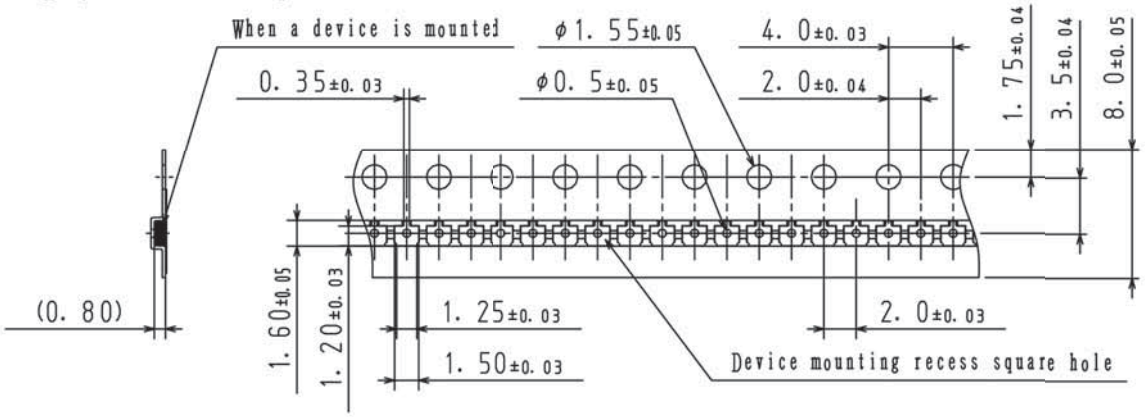


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

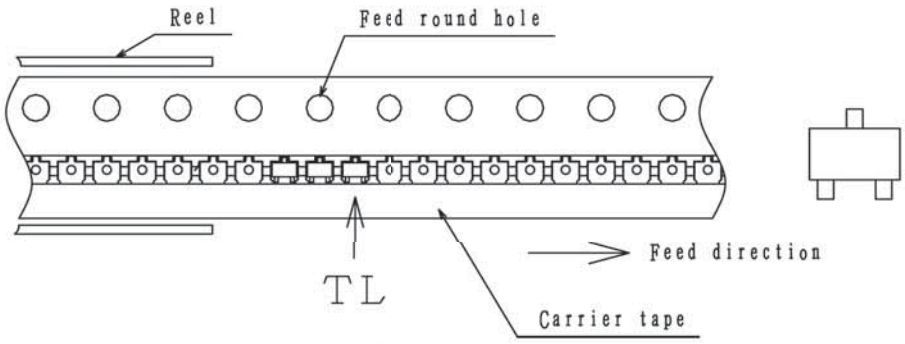
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



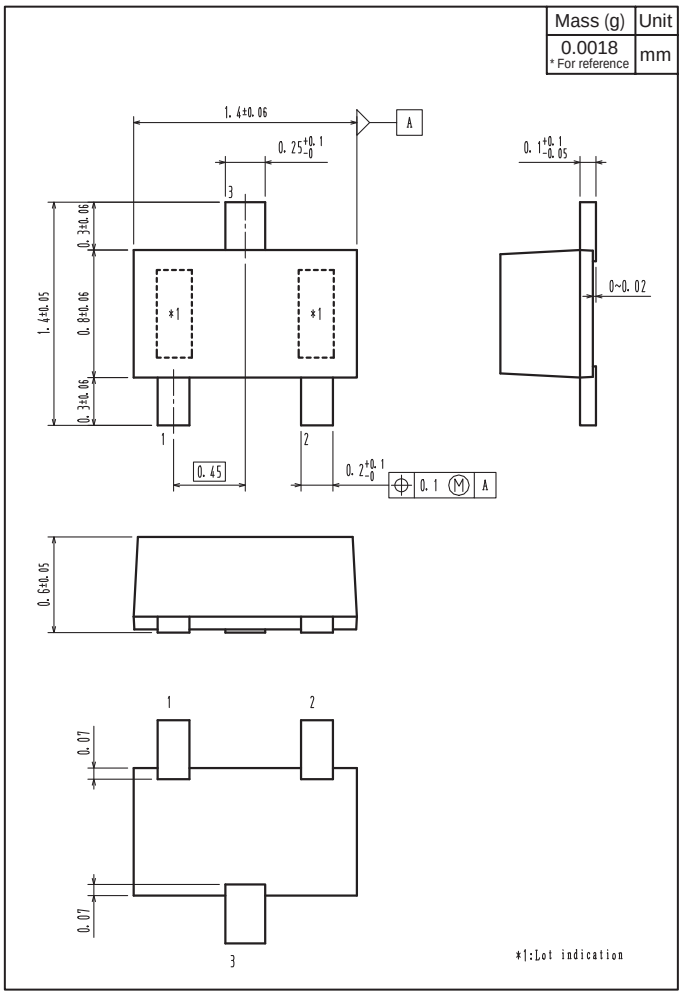
2-2. Device placement direction



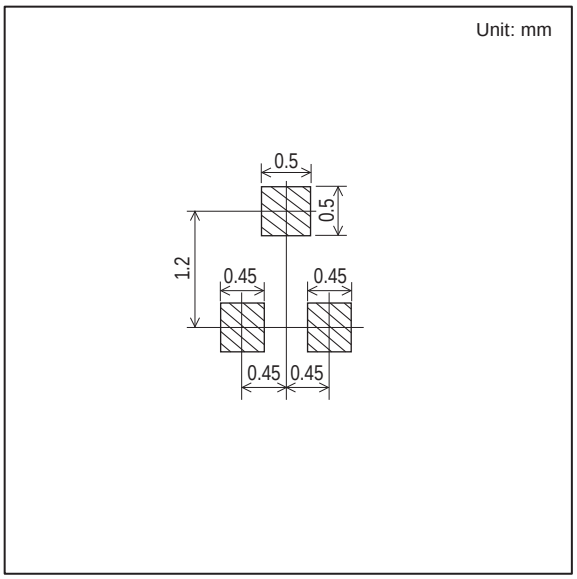
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

2SC5536A-TL-H



Land Pattern Example



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