



2SC5227A

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

ON Semiconductor®

<http://onsemi.com>

Features

- Low-noise : NF=1.0dB typ (f=1GHz)
- High gain : $|S_{21e}|^2=12\text{dB}$ typ (f=1GHz)
- High cut-off frequency : $f_T=7\text{GHz}$ typ

Specifications

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

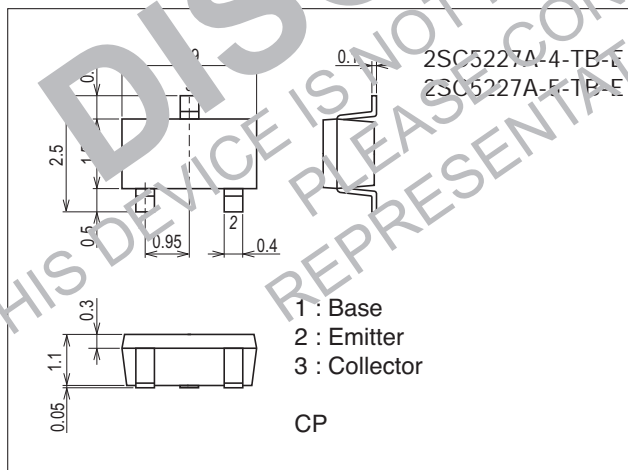
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V _{CBO}		20	V
Collector-to-Emitter Voltage	V _{CEO}		10	V
Emitter-to-Base Voltage	V _{EBO}		2	V
Collector Current	I _C		70	mA
Collector Dissipation	P _C		200	mW
Junction Temperature	T _j		150	°C
Storage Temperature	T _{stg}		-55 to +150	°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)

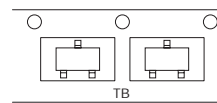
7013A-009



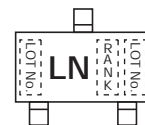
Product & Package Information

- Package : CP
- JEITA, JEDEC : SC-59, TO-236, SOT-23, TO-236AB
- Minimum Packing Quantity : 3,000 pcs./reel

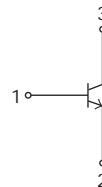
Packing Type: TB



Marking



Electrical Connection



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Electrical Characteristics at Ta=25°C

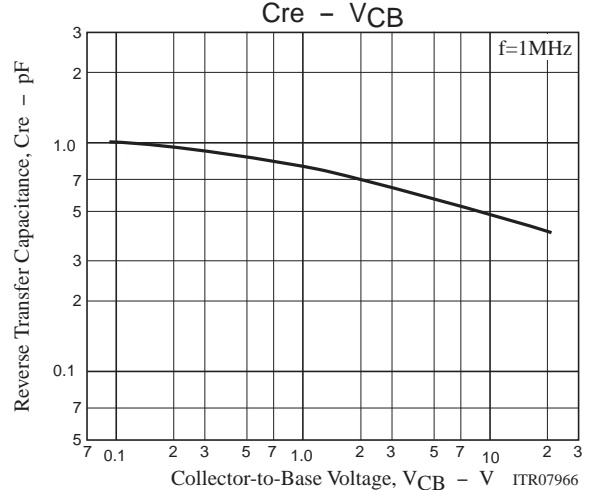
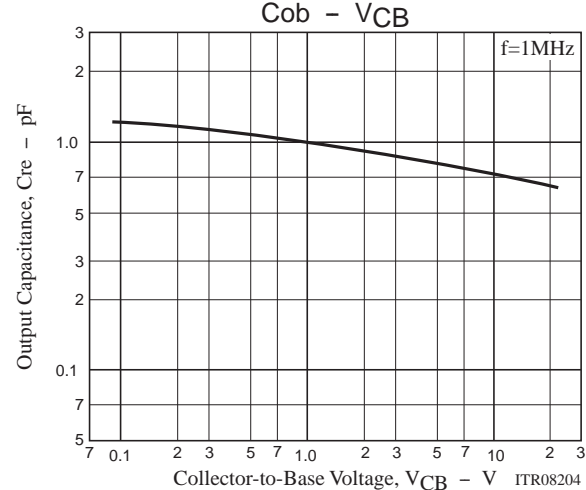
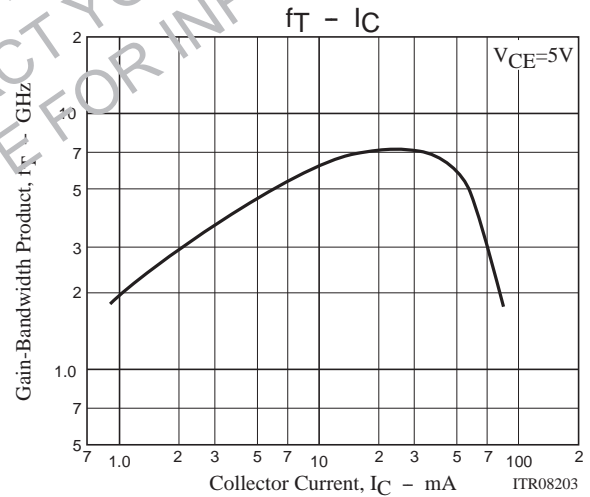
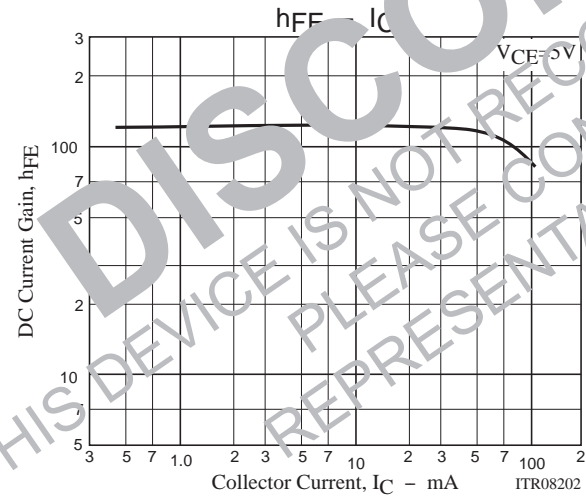
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=10V, I_E=0A$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=1V, I_C=0A$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=5V, I_C=20mA$	60*		270*	
Gain-Bandwidth Product	f_T	$V_{CE}=5V, I_C=20mA$	5	7		GHz
Output Capacitance	C_{ob}	$V_{CB}=10V, f=1MHz$		0.75	1.2	pF
Reverse Transfer Capacitance	C_{re}	$V_{CB}=10V, f=1MHz$		0.5		pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=5V, I_C=20mA, f=1GHz$	9	12		dB
	$ S_{21e} ^2$	$V_{CE}=2V, I_C=3mA, f=1GHz$		8		dB
Noise Figure	NF	$V_{CE}=5V, I_C=7mA, f=1GHz$		1.0	1.8	dB

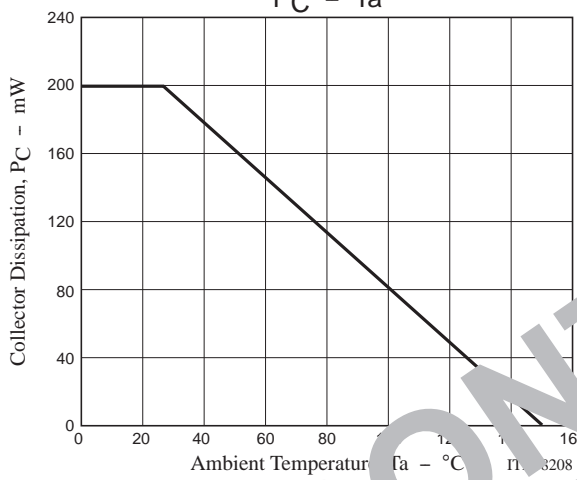
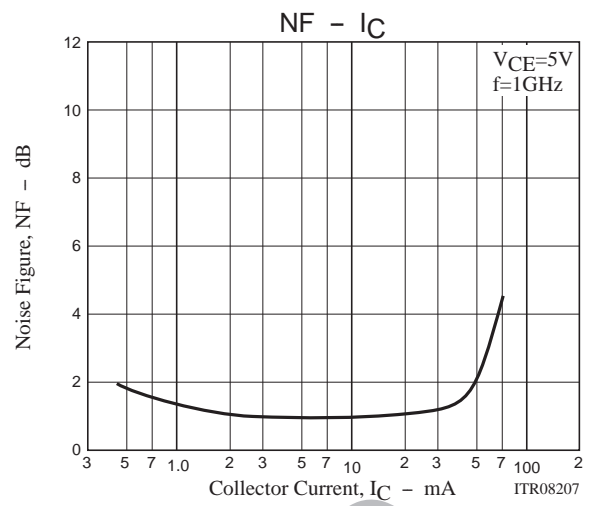
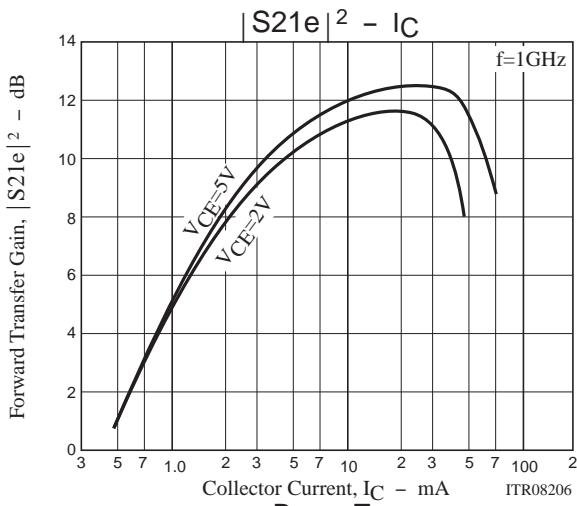
* : The 2SC5227A is classified by 20mA h_{FE} as follows :

Rank	3	4	5
h_{FE}	60 to 120	90 to 180	135 to 270

Ordering Information

Device	Package	Shipping	Lead Free
2SC5227A-4-TB-E	CP	3,000pcs./reel	Yes
2SC5227A-5-TB-E	CP	3,000pcs./reel	Yes

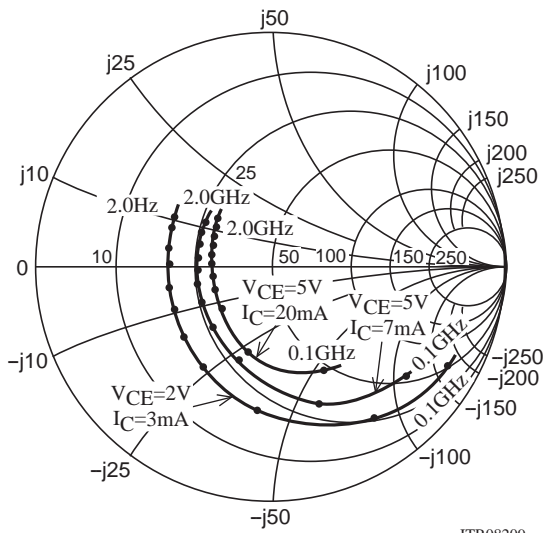




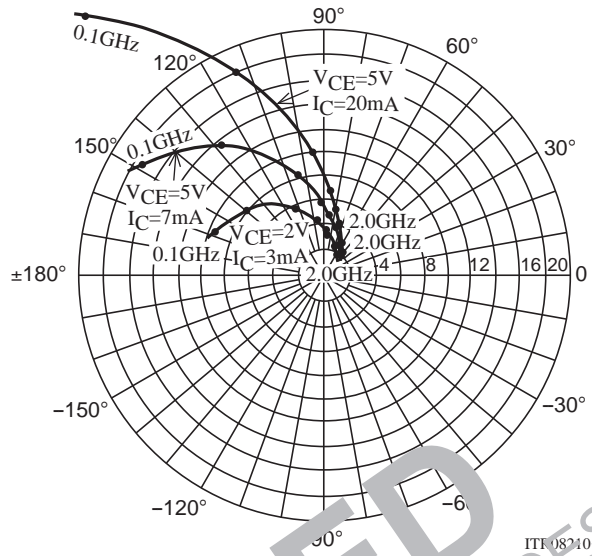
DISCONTINUED
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 REPRESENTATIVE FOR INFORMATION

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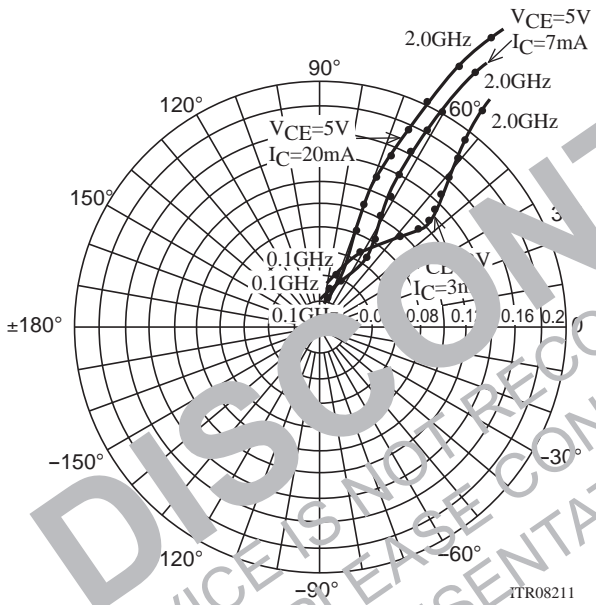
f=100MHz, 200MHz to 2000MHz(200MHz Step)



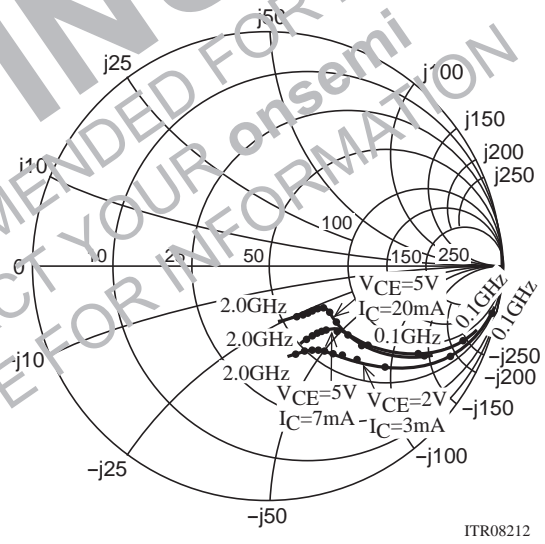
f=100MHz, 200MHz to 2000MHz(200MHz Step)



f=100MHz, 200MHz to 2000MHz(200MHz Step)



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S Parameters (Common emitter)

V_{CE}=5V, I_C=7mA, Z_O=50Ω

Freq(MHz)	S11	∠S11	S21	∠S21	S12	∠S12	S22	∠S22
100	0.722	-41.6	17.352	148.7	0.029	70.9	0.883	-21.3
200	0.587	-73.2	13.419	127.6	0.046	60.8	0.710	-33.1
400	0.426	-113.0	8.371	105.1	0.067	56.9	0.507	-40.7
600	0.369	-136.6	5.914	92.7	0.084	58.4	0.423	-42.5
800	0.344	-152.9	4.593	83.9	0.102	60.3	0.382	-43.9
1000	0.334	-165.7	3.750	76.7	0.121	61.5	0.360	-46.3
1200	0.326	-177.9	3.178	70.3	0.141	62.0	0.350	-49.1
1400	0.324	172.3	2.784	64.9	0.162	61.8	0.341	-52.2
1600	0.328	163.4	2.476	59.5	0.183	61.2	0.334	-56.4
1800	0.335	154.5	2.246	54.6	0.204	60.5	0.328	-60.8
2000	0.346	147.5	3.073	50.0	0.226	59.6	0.328	-65.4

V_{CE}=5V, I_C=20mA, Z_O=50Ω

Freq(MHz)	S11	∠S11	S21	∠S21	S12	∠S12	S22	∠S22
100	0.477	-66.8	28.090	133.6	0.022	61.7	0.550	-32.7
200	0.358	-104.1	17.995	112.9	0.035	63.2	0.506	-41.6
400	0.288	-142.2	9.903	95.9	0.051	58.3	0.350	-42.4
600	0.273	-159.8	6.777	86.7	0.081	59.9	0.299	-41.8
800	0.270	-171.7	5.181	79.9	0.101	70.2	0.278	-43.2
1000	0.271	178.7	4.209	73.9	0.121	69.1	0.269	-45.9
1200	0.273	169.4	3.554	68.5	0.153	67.9	0.264	-49.6
1400	0.275	161.1	3.085	63.6	0.177	66.2	0.258	-53.3
1600	0.284	153.4	2.749	59.1	0.202	64.3	0.253	-58.3
1800	0.294	145.6	2.475	54.6	0.224	62.5	0.249	-63.4
2000	0.302	140.8	2.295	50.6	0.248	60.4	0.248	-68.7

V_{CE}=2V, I_C=3mA, Z_O=50Ω

Freq(MHz)	S11	∠S11	S21	∠S21	S12	∠S12	S22	∠S22
100	0.858	-30.0	9.283	157.3	0.039	73.6	0.944	-15.6
200	0.728	-57.4	8.036	138.7	0.068	61.4	0.834	-27.5
400	0.607	-97.1	5.756	113.9	0.099	48.4	0.641	-40.5
600	0.528	-123.2	4.302	98.1	0.114	44.4	0.525	-46.5
800	0.486	-141.6	3.414	87.0	0.125	43.9	0.465	-50.2
1000	0.460	-156.4	2.834	78.0	0.137	45.4	0.429	-53.7
1200	0.453	-169.4	2.429	70.3	0.149	47.5	0.408	-57.3
1400	0.440	-179.8	2.143	63.6	0.163	49.2	0.395	-60.9
1600	0.441	-170.1	1.919	57.4	0.179	50.8	0.385	-65.4
1800	0.447	-160.4	1.739	51.7	0.196	52.3	0.381	-70.1
2000	0.454	-152.5	1.621	46.4	0.215	53.3	0.379	-75.2

Embossed Taping Specification

2SC5227A-4-TB-E, 2SC5227A-5-TB-E

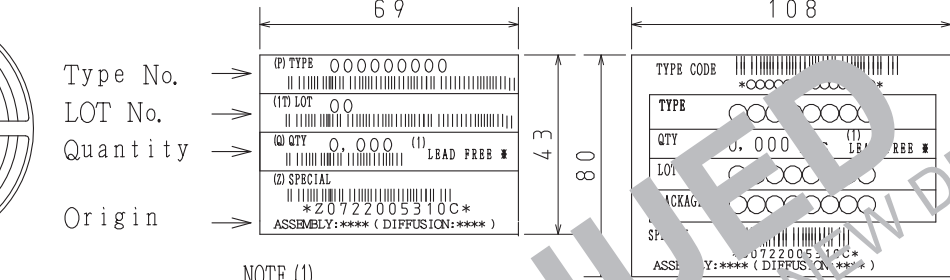
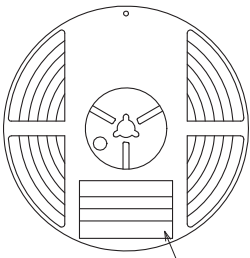
1. Packing Format

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)
CP	CP	3,000	15,000	90,000	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.

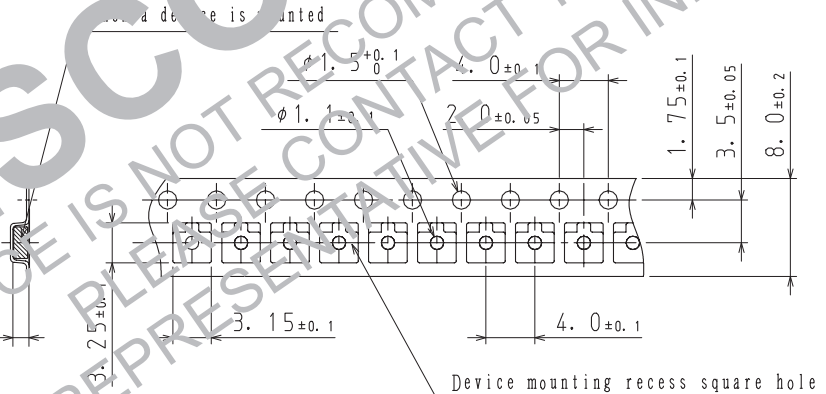


NOTE (1)
 The LEAD FREE * description shows the surface treatment of the terminal is lead free.

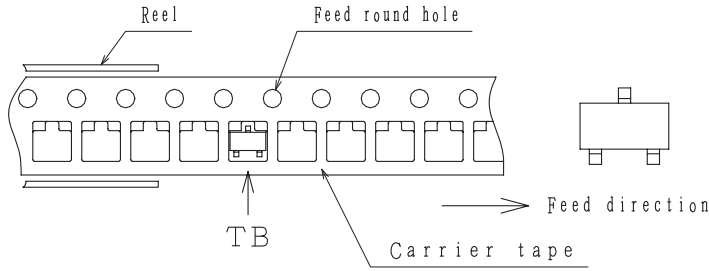
Label	JEITA Phase
LEAD FREE *	JEITA Phase 3A
LEAD FREE	JEITA Phase 3

2. Taping configuration

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



2-2. Device placement direction

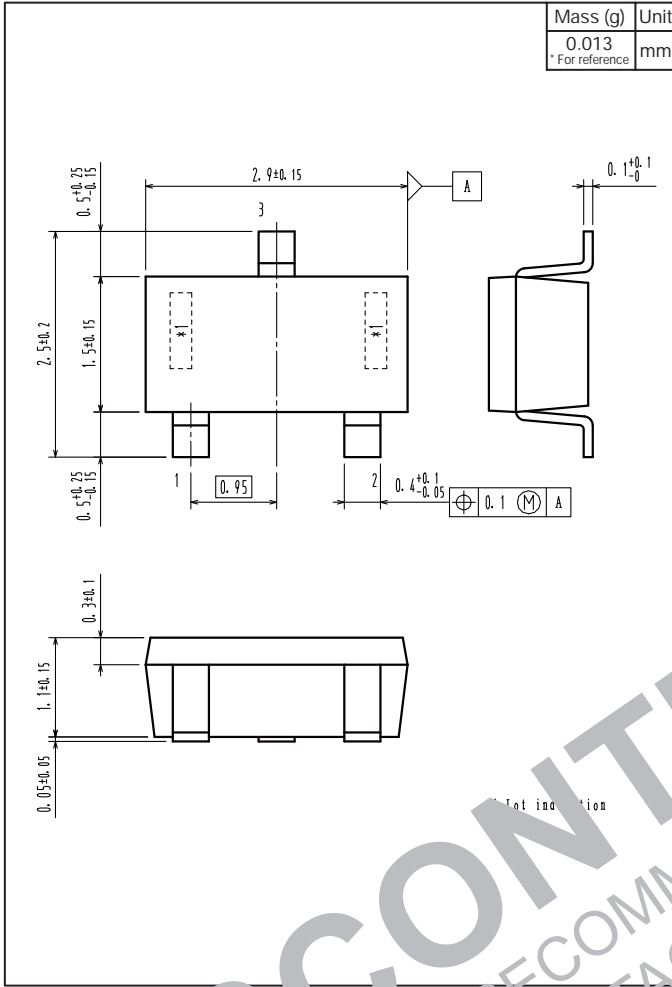


Those with one electrode terminal on the feed hole side.....TB

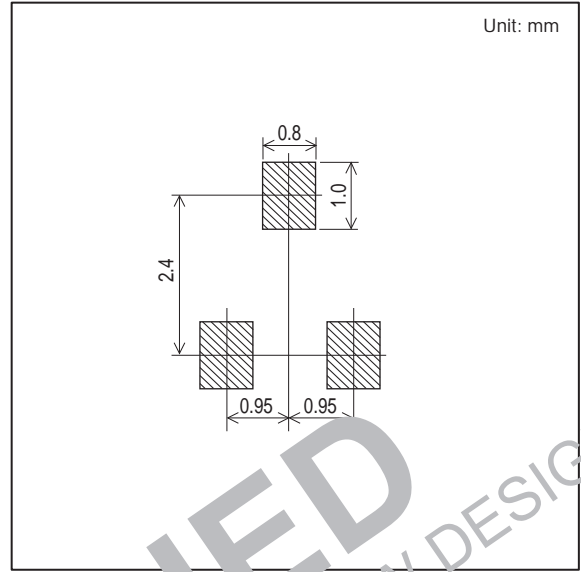
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Outline Drawing

2SC5227A-4-TB-E, 2SC5227A-5-TB-E



Land Pattern Example



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