Ordering number : ENA1091A

2SC5490A

RF Transistor
10V, 30mA, fT=8GHz, NPN Single SSFP

ON Semiconductor®
http://onsemi.com

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Features

- Low-noise : NF=0.9dB typ (f=1GHz)
  : NF=1.4dB typ (f=1.5GHz)
- Low-voltage, low-current operation (V_{CE}=1V, I_C=1mA)
  : f_T=3.5GHz typ
  : $|S21e|^2$=5.5dB typ (f=1.5GHz)
- High gain : $|S21e|^2$=10dB typ (f=1.5GHz)
- High cut-off frequency : f_T=8GHz typ
- Ultrasmall, slim flat-lead package (1.4mm×0.8mm×0.6mm)
- Halogen free compliance

Specifications

Absolute Maximum Ratings at Ta=25°C

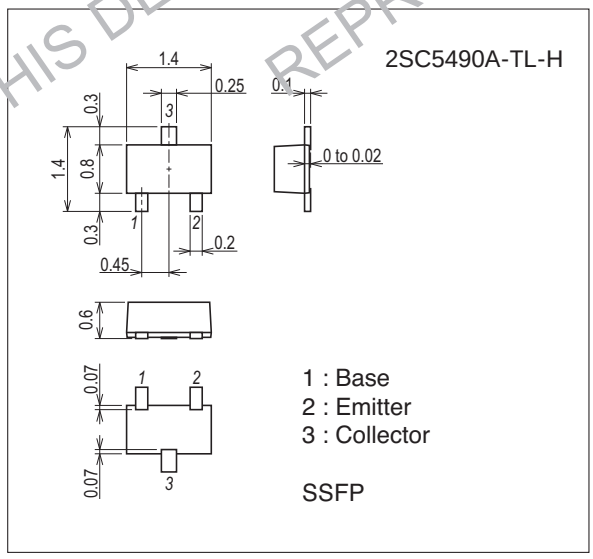
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		20	V
Collector-to-Emitter Voltage	V_{CEO}		10	V
Emitter-to-Base Voltage	V_{EBO}		1.5	V
Collector Current	I_C		30	mA
Collector Dissipation	P_C		100	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

This product is designed to "ESD ... < 200V*", so please take care when handling.
* Machine Model

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

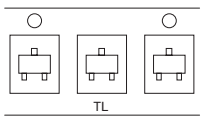
unit : mm (typ)
7029A-002



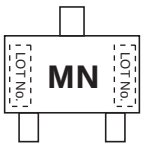
Product & Package Information

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

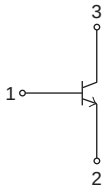
Packing Type: TL



Marking



Electrical Connection



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=10mA	90		200	
Gain-Bandwidth Product	f_T1	V_{CE}=5V, I_C=10mA	5	8		GHz
	f_T2	V_{CE}=1V, I_C=1mA		3.5		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		0.45	0.7	pF
Reverse Transfer Capacitance	Cre			0.3		pF
Forward Transfer Gain	$|S21e|^2$1	V_{CE}=5V, I_C=10mA, f=1.5GHz	8	10		dB
	$|S21e|^2$2	V_{CE}=1V, I_C=1mA, f=1.5GHz		5.5		dB
Noise Figure	NF1	V_{CE}=5V, I_C=5mA, f=1.5GHz		1.4	3.0	dB
	NF2	V_{CE}=2V, I_C=3mA, f=1GHz		0.9		dB

Ordering Information

Device	Package	Shipping	Memo
2SC5490A-TL-H	SSFP	8,000pcs./reel	Pb Free and Halogen Free

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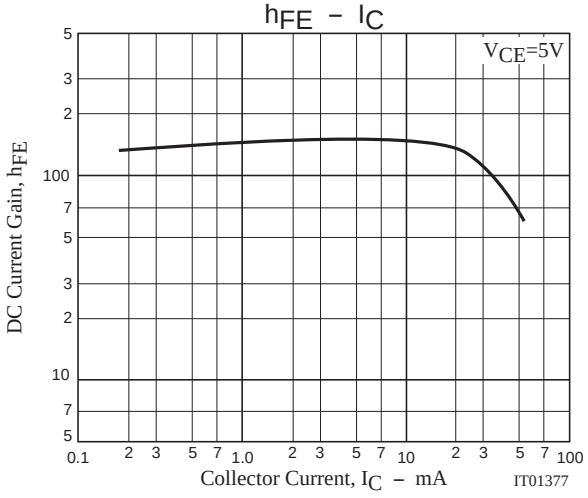
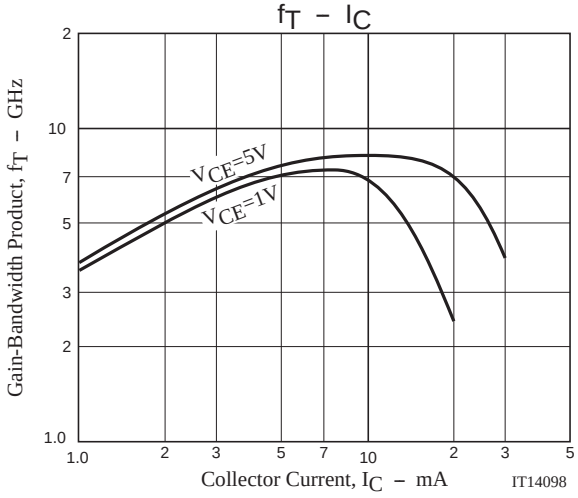
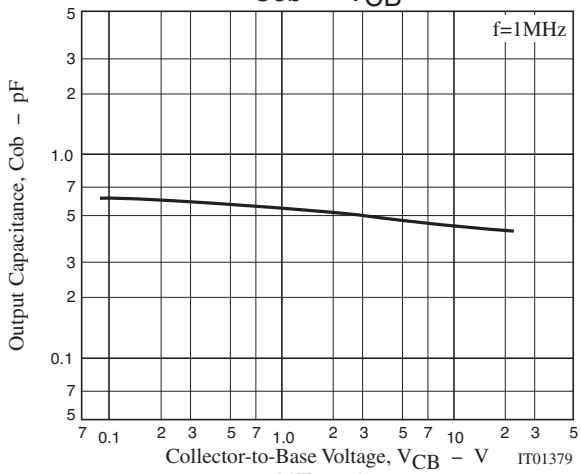
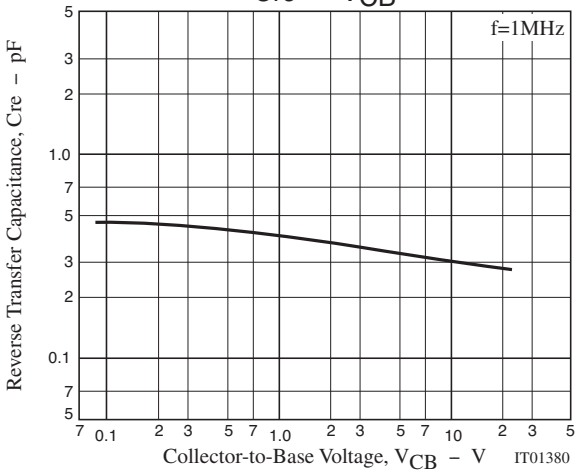




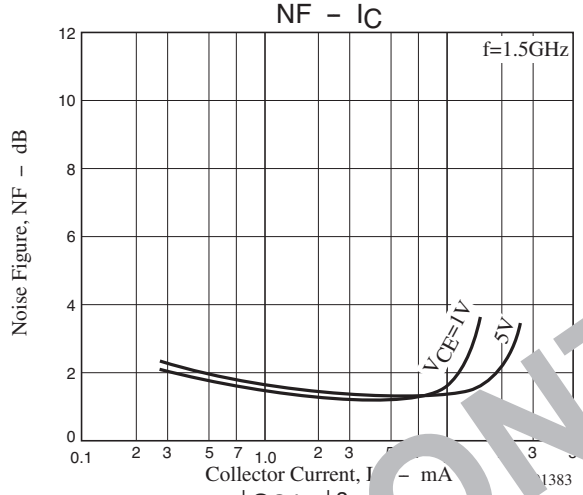
Cob – V_{CB}



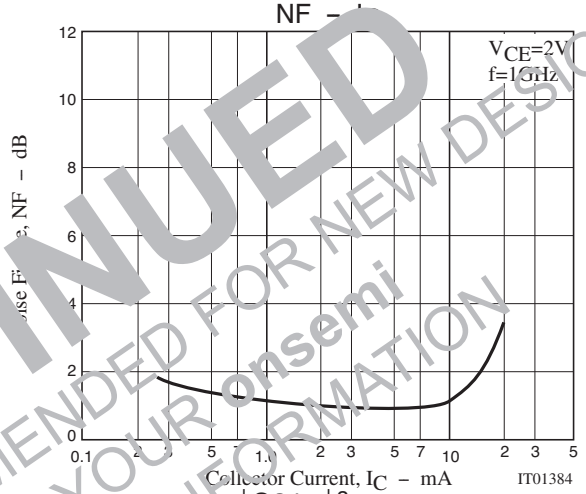
Cre – V_{CB}



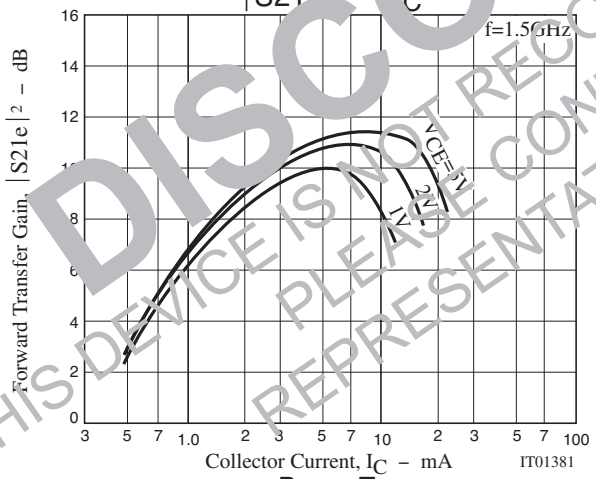
NF – I_C



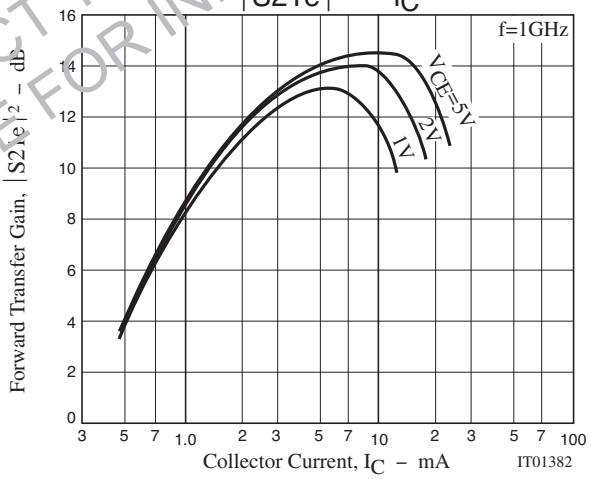
NF – I_C



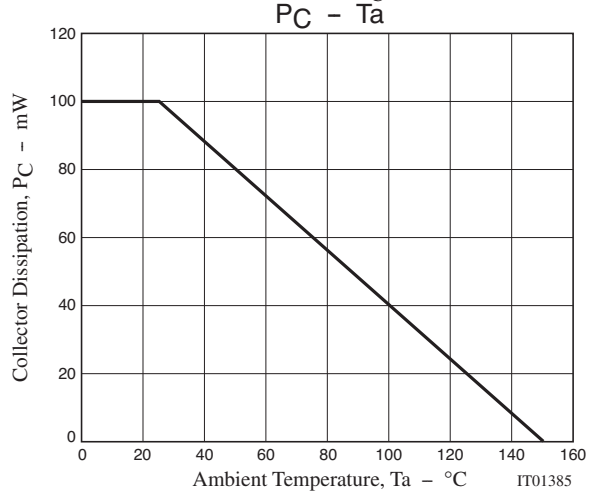
$|S21e|^2$ – I_C



$|S21e|^2$ – I_C



P_C – Ta



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S Parameters (Common emitter)

V_{CE}=5V, I_C=5mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
200	0.782	-37.1	12.043	148.4	0.038	69.7	0.889	-19.5
400	0.623	-65.4	9.431	126.6	0.057	60.8	0.758	-28.3
600	0.502	-85.6	7.415	112.2	0.072	56.5	0.646	-33.3
800	0.420	-102.4	6.000	101.5	0.083	55.2	0.577	-35.9
1000	0.369	-114.7	5.025	93.6	0.094	55.1	0.538	-37.6
1200	0.339	-127.2	4.323	86.7	0.105	55.6	0.513	-38.7
1400	0.311	-137.2	3.785	80.6	0.115	55.6	0.490	-39.7
1600	0.296	-144.9	3.391	75.3	0.127	56.7	0.480	-41.3
1800	0.285	-156.5	3.018	70.1	0.139	56.4	0.466	-43.5
2000	0.277	-164.2	2.767	65.7	0.150	56.7	0.460	-45.5

V_{CE}=5V, I_C=10mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
200	0.641	-52.7	16.527	137.8	0.031	67	0.820	-22.9
400	0.468	-85.4	11.299	115.7	0.048	.5	[illegible]	-30.2
600	0.377	-106.6	8.303	103.1	0.060	6	0.549	-32.2
800	0.321	-124.1	6.502	94.0	0.07	60.9	0.499	-33.2
1000	0.293	-136.1	5.342	87.4	[illegible]84	1.9	0.477	-33.9
1200	0.280	-146.7	4.546	81.4	0.0	62.7	0.462	-35.0
1400	0.266	-156.6	3.947	76.4	0.1	63.0	0.449	-36.2
1600	0.263	-163.2	3.527	71.4	[illegible]123	63.7	0.444	-37.8
1800	0.263	-173.5	3.121	[illegible]0	0.136	62.8	0.435	-39.9
2000	0.264	-179.8	2.864	62	0.150	62.4	0.434	-42.4

V_{CE}=2V, I_C=3mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
200	0.851	-30.4	[illegible].644	154.1	0.042	73.0	0.937	-16.4
400	0.724	-55.[illegible]	7.310	133.3	0.073	61.3	0.820	-27.9
600	[illegible]612	-76[illegible]	6.083	118.6	0.093	54.2	0.709	-35.7
800	[illegible]	-93.0	5.085	106.9	0.107	50.4	0.628	-40.4
1000	0.461	-106.1	4.343	98.1	0.118	48.3	0.572	-43.7
1200	0.423	-118.6	3.806	90.0	0.128	47.5	0.536	-45.8
1400	0.382	-129.4	3.349	83.3	0.137	46.9	0.506	-47.3
1600	0.366	-135.0	3.036	77.5	0.147	47.4	0.485	-49.5
1800	0.341	-148.8	2.685	71.7	0.157	47.2	0.463	-51.9
2000	0.333	-157.7	2.479	66.7	0.167	47.6	0.453	-54.1

V_{CE}=1V, I_C=1mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
200	0.945	-18.7	3.431	162.9	0.053	78.1	0.982	-10.3
400	0.892	-36.9	3.263	147.1	0.099	66.9	0.939	-19.7
600	0.826	-52.9	3.004	133.2	0.136	57.5	0.879	-27.7
800	0.754	-67.9	2.765	120.4	0.164	49.7	0.815	-34.8
1000	0.691	-81.1	2.539	109.9	0.184	43.4	0.758	-40.0
1200	0.639	-94.3	2.366	99.8	0.199	38.4	0.727	-44.3
1400	0.589	-104.9	2.143	91.2	0.207	34.1	0.683	-47.8
1600	0.558	-114.1	1.969	83.6	0.213	31.7	0.653	-51.4
1800	0.522	-124.4	1.797	76.2	0.218	28.7	0.621	-54.9
2000	0.490	-134.9	1.701	69.7	0.219	27.0	0.601	-58.1

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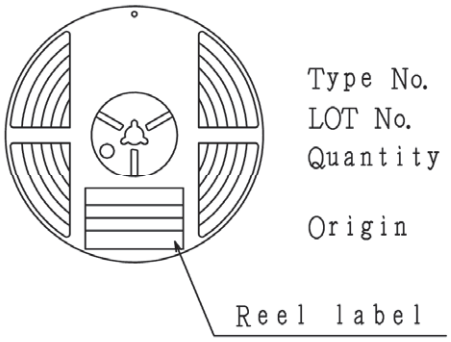
Embossed Taping Specification

2SC5490A-TL-H

1. Packing Format

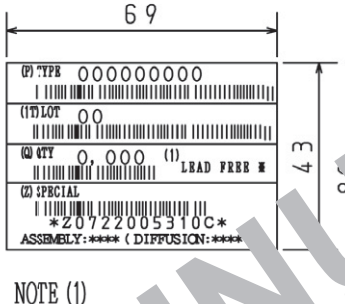
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
SSFP	SSFP	8,000	40,000	240,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Packing method



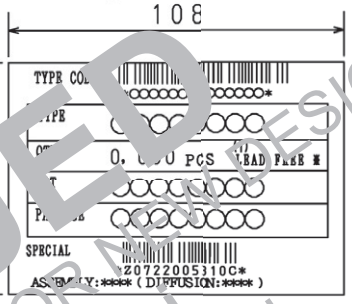
Reel label, Inner box label

(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.



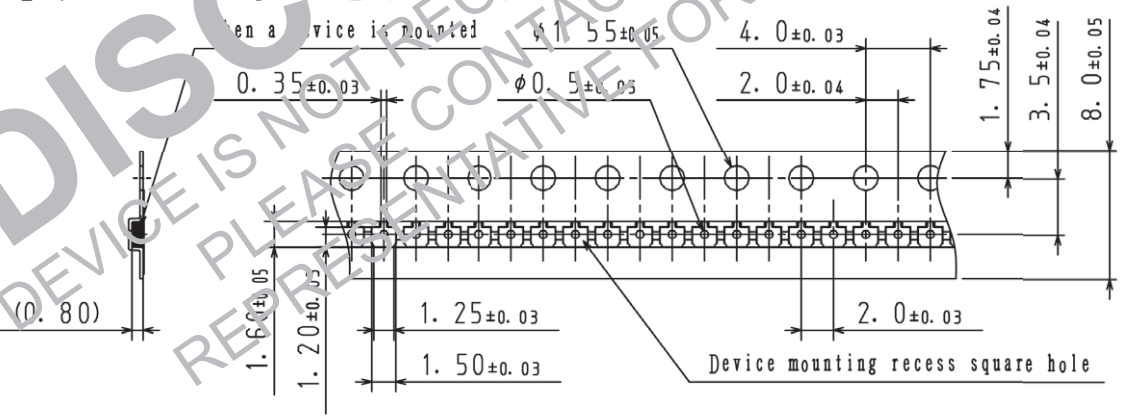
NOTE (1)

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

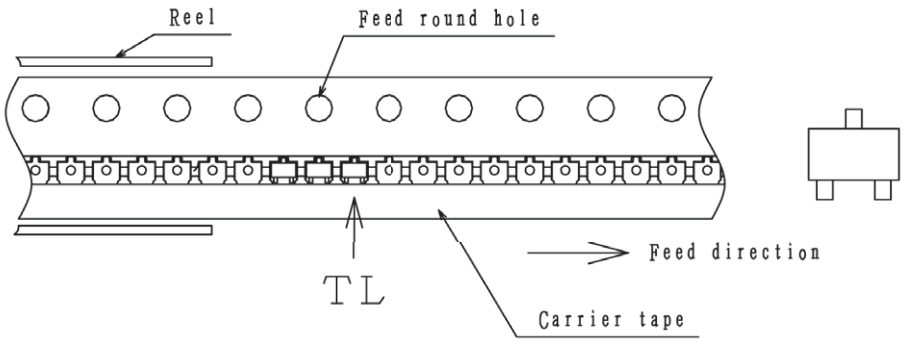
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE A	JEITA Phase 3

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

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Outline Drawing

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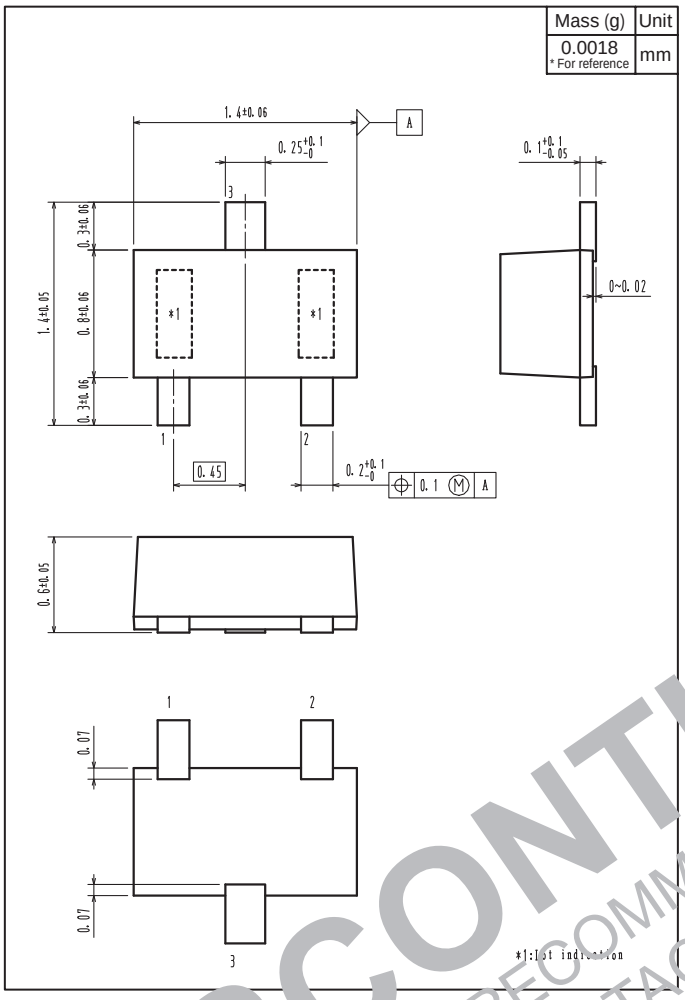
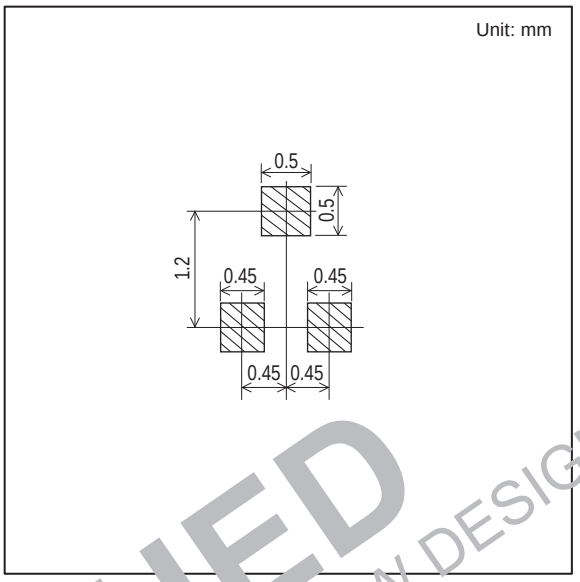


Land Pattern Example



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