Ordering number : ENA1114A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

NPN Epitaxial Planar Silicon Transistor

55GN01MA — UHF Wide-band Low-noise Amplifier Applications

Features

- High cut-off frequency : f_T=5.5GHz typ
- High gain : $|S21e|^2$=10dB typ (f=1GHz)

Specifications

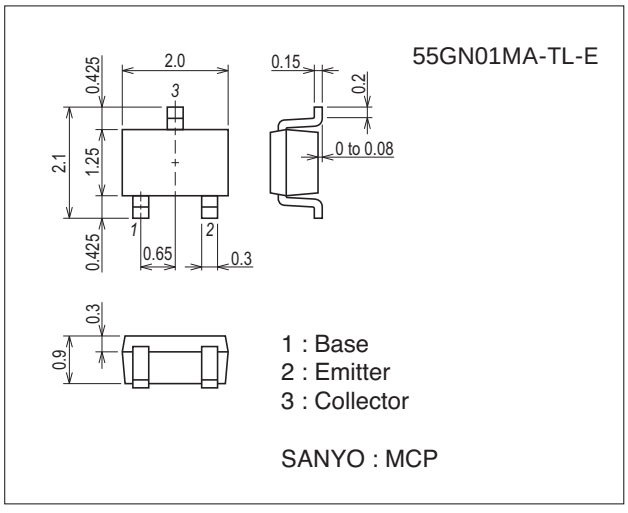
Absolute Maximum Ratings at Ta=25°C

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}		3	V
Collector Current	I_C		70	mA
Collector Dissipation	P_C	When mounted on ceramic substrate (250mm^2×0.8mm)	400	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

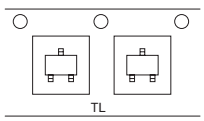
7023A-009



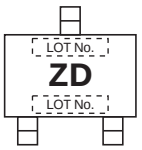
Product & Package Information

- Package : MCP
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

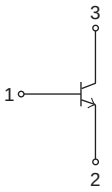
Packing Type: TL



Marking



Electrical Connection

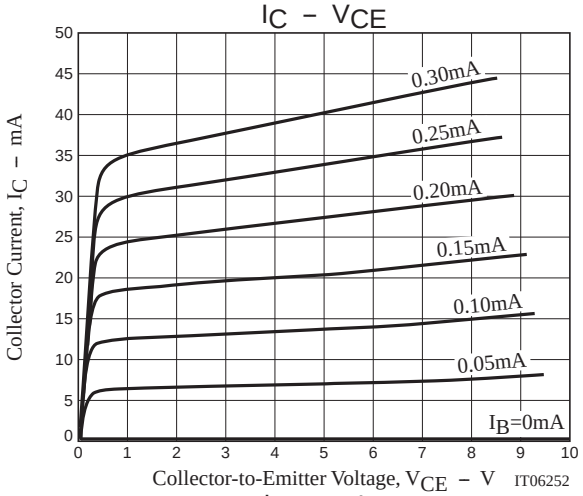


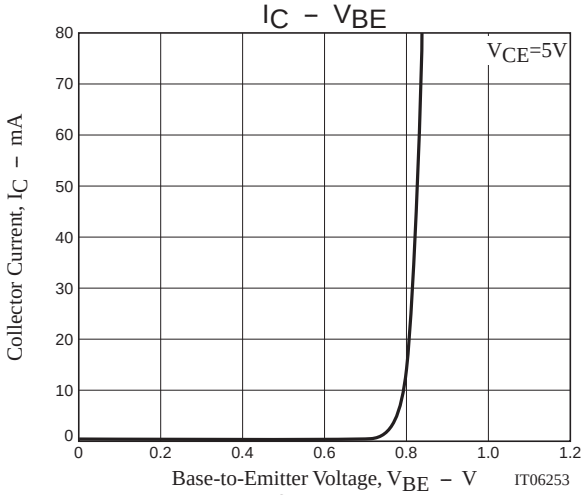
Electrical Characteristics at Ta=25°C

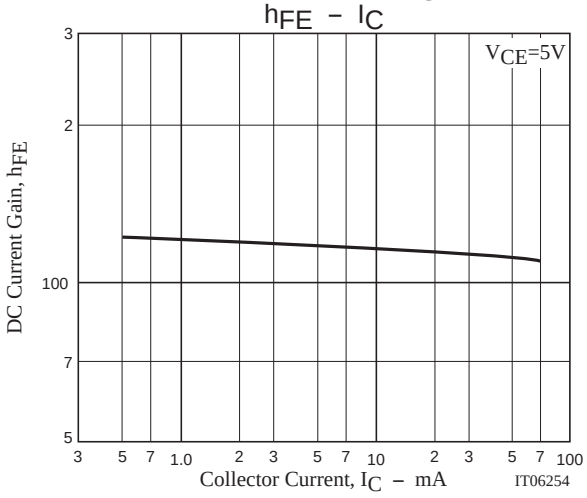
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=10V, I_E=0A			0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=2V, I_C=0A			1	μA
DC Current Gain	h_{FE}	V_{CE}=5V, I_C=10mA	100		180	
Gain-Bandwidth Product	f_T1	V_{CE}=3V, I_C=5mA	3.0	4.5		GHz
	f_T2	V_{CE}=5V, I_C=20mA		5.5		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		1.0	1.3	pF
Reverse Transfer Capacitance	Cre			0.6		pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=5V, I_C=20mA, f=1GHz	7	10		dB
Noise Figure	NF	V_{CE}=3V, I_C=5mA, f=1GHz, Z_O=50Ω		1.9	2.8	dB

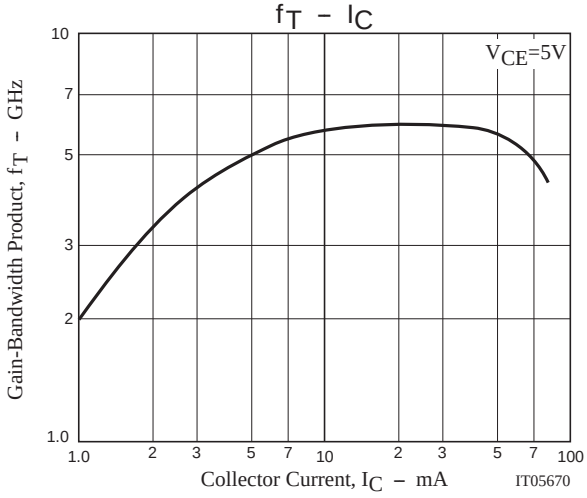
Ordering Information

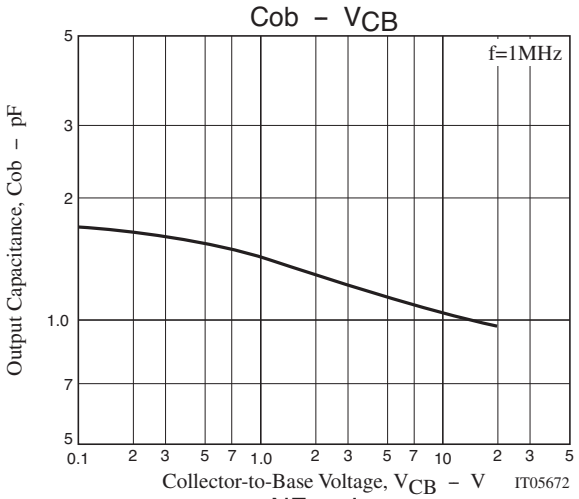
Device	Package	Shipping	memo
55GN01MA-TL-E	MCP	3,000pcs./reel	Pb Free

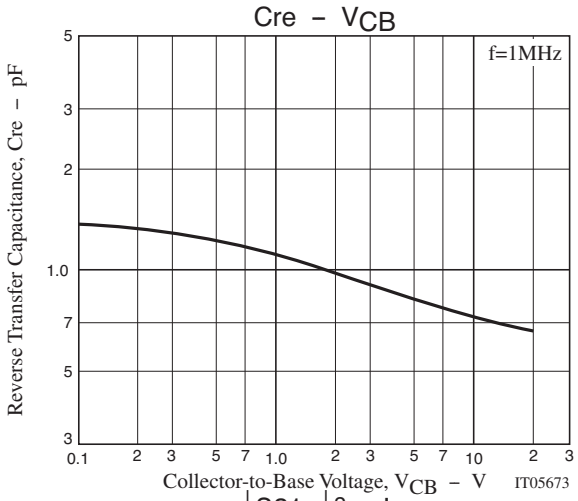


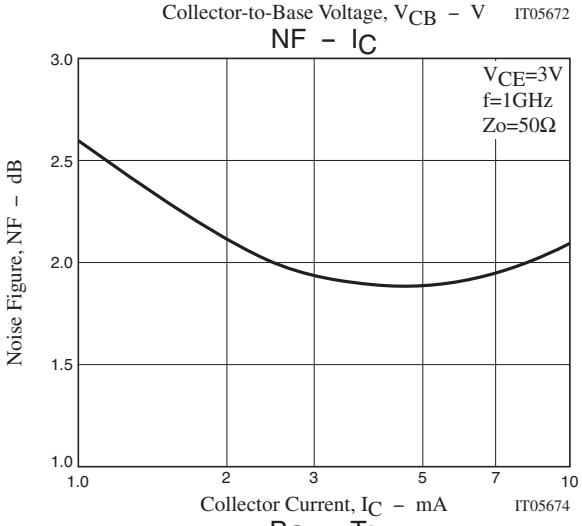


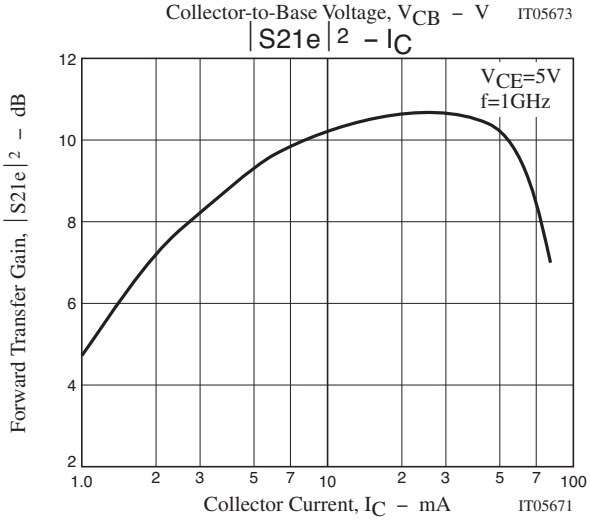


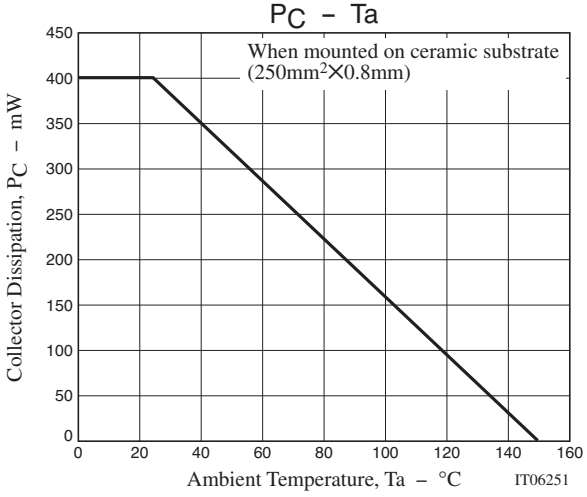



Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT05672


Cre – VCB
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
IT05673


NF – IC
VCE=3V
f=1GHz
Zo=50Ω
Noise Figure, NF – dB
Collector Current, IC – mA
IT05674


|S21e|2 – IC
VCE=5V
f=1GHz
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA
IT05671


PC – Ta
When mounted on ceramic substrate
(250mm2×0.8mm)
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
IT06251

S Parameters (Common emitter)

V_{CE}=5V, I_C=5mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.830	-43.97	13.127	147.99	0.038	67.23	0.872	-22.91
200	0.694	-77.62	10.294	125.90	0.060	54.39	0.700	-35.46
400	0.540	-117.92	6.419	101.76	0.081	48.13	0.501	-44.05
600	0.481	-140.06	4.518	88.76	0.095	49.82	0.424	-46.75
800	0.461	-155.07	3.503	78.58	0.111	52.28	0.393	-49.83
1000	0.451	-165.52	2.877	70.19	0.128	54.96	0.381	-53.19
1200	0.445	-174.34	2.452	62.66	0.146	56.81	0.375	-57.17
1400	0.445	178.04	2.147	56.03	0.168	58.15	0.377	-61.74
1600	0.445	171.32	1.918	49.61	0.189	58.43	0.382	-66.69
1800	0.445	164.86	1.737	43.71	0.211	58.38	0.386	-71.55
2000	0.449	158.60	1.595	38.11	0.237	58.17	0.390	-76.75
2200	0.452	152.58	1.467	32.97	0.265	57.40	0.396	-82.35
2400	0.450	146.68	1.363	28.29	0.289	56.02	0.399	-87.23
2600	0.453	141.54	1.274	24.12	0.315	55.05	0.402	-92.59
2800	0.462	136.46	1.198	20.67	0.346	53.73	0.407	-98.30
3000	0.472	131.80	1.143	17.49	0.377	51.74	0.405	-104.52

V_{CE}=5V, I_C=10mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.684	-64.81	20.386	135.46	0.033	61.46	0.746	-32.56
200	0.537	-103.63	13.552	113.26	0.046	54.93	0.530	-42.92
400	0.442	-139.55	7.523	93.84	0.066	56.90	0.365	-45.97
600	0.418	-156.47	5.145	83.67	0.087	60.27	0.318	-46.89
800	0.415	-167.86	3.934	75.21	0.109	62.42	0.302	-49.45
1000	0.412	-175.67	3.211	67.90	0.131	63.30	0.299	-52.76
1200	0.411	177.29	2.725	61.28	0.155	63.24	0.299	-56.97
1400	0.415	171.08	2.375	55.21	0.179	62.62	0.304	-61.81
1600	0.418	165.63	2.121	49.25	0.203	61.52	0.311	-66.89
1800	0.419	159.97	1.918	43.74	0.228	60.43	0.315	-71.68
2000	0.424	154.44	1.760	38.40	0.254	58.94	0.320	-76.83
2200	0.429	148.97	1.619	33.44	0.281	57.20	0.326	-82.56
2400	0.427	143.60	1.506	28.88	0.304	55.14	0.329	-86.87
2600	0.431	139.13	1.408	24.76	0.329	53.64	0.334	-92.16
2800	0.441	134.54	1.327	21.16	0.358	51.96	0.339	-97.67
3000	0.451	130.40	1.266	17.89	0.386	49.84	0.338	-103.91

V_{CE}=5V, I_C=20mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.527	-90.16	26.224	123.28	0.026	59.94	0.598	-40.43
200	0.438	-127.59	15.340	104.33	0.037	60.44	0.396	-45.63
400	0.399	-155.68	8.065	89.00	0.060	65.69	0.282	-44.29
600	0.393	-167.56	5.453	80.60	0.084	67.76	0.256	-44.57
800	0.397	-176.18	4.149	73.14	0.109	68.31	0.250	-47.52
1000	0.398	177.84	3.379	66.41	0.134	67.71	0.252	-51.39
1200	0.401	172.13	2.862	60.19	0.159	66.77	0.255	-55.96
1400	0.406	166.95	2.491	54.45	0.186	65.32	0.262	-61.04
1600	0.411	162.22	2.222	48.82	0.210	63.20	0.270	-66.49
1800	0.414	157.06	2.008	43.51	0.235	61.52	0.275	-71.29
2000	0.419	152.07	1.840	38.32	0.261	59.51	0.282	-76.53
2200	0.425	146.91	1.693	33.45	0.288	57.59	0.289	-82.27
2400	0.424	141.87	1.574	29.00	0.312	55.28	0.293	-86.65
2600	0.429	137.61	1.472	24.92	0.336	53.54	0.298	-91.76
2800	0.438	133.38	1.387	21.39	0.365	51.63	0.304	-97.07
3000	0.449	129.47	1.321	18.07	0.392	49.39	0.303	-103.60

S Parameters (Common emitter)

V_{CE}=5V, I_C=30mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.461	-105.76	28.111	117.59	0.023	60.62	0.521	-42.88
200	0.412	-139.73	15.717	100.76	0.034	64.40	0.344	-44.71
400	0.393	-162.64	8.133	87.05	0.058	69.84	0.255	-41.81
600	0.394	-172.24	5.483	79.25	0.084	70.67	0.237	-42.42
800	0.400	-179.58	4.169	72.10	0.110	70.59	0.235	-45.80
1000	0.401	175.18	3.392	65.52	0.135	69.45	0.239	-49.94
1200	0.405	169.95	2.870	59.47	0.161	68.00	0.244	-54.75
1400	0.412	165.14	2.496	53.81	0.187	66.24	0.252	-60.09
1600	0.417	160.67	2.226	48.20	0.212	64.03	0.260	-65.80
1800	0.422	155.72	2.010	42.96	0.237	62.33	0.267	-70.89
2000	0.428	150.84	1.841	37.78	0.263	60.20	0.275	-76.12
2200	0.434	145.91	1.692	32.98	0.291	58.16	0.282	-81.97
2400	0.433	140.96	1.574	28.60	0.314	55.69	0.286	-86.52
2600	0.438	136.73	1.469	24.51	0.339	53.89	0.291	-91.68
2800	0.447	132.49	1.384	21.02	0.367	52.12	0.298	-97.10
3000	0.459	128.65	1.319	17.72	0.395	49.72	0.298	-103.63

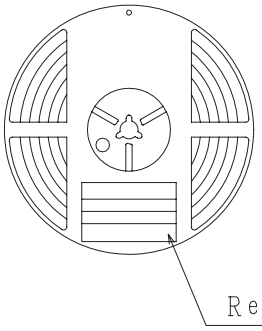
Embossed Taping Specification

55GN01MA-TL-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)
MCP	MCP	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

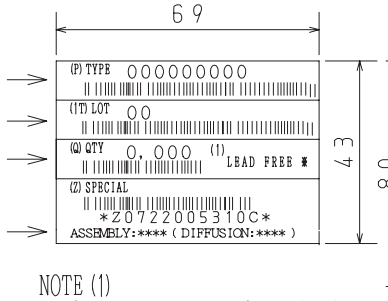
Packing method



Reel label

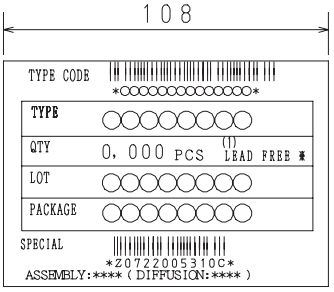
Reel label, Inner box label

(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.



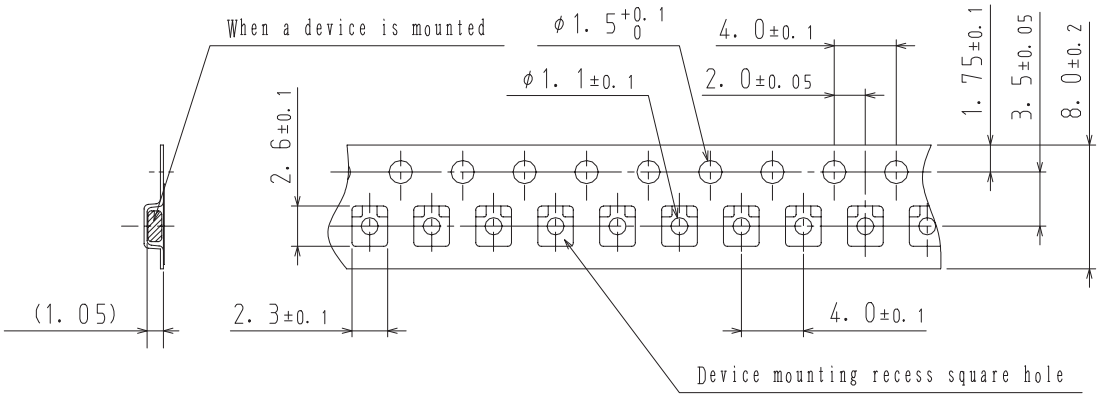
NOTE (1)

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

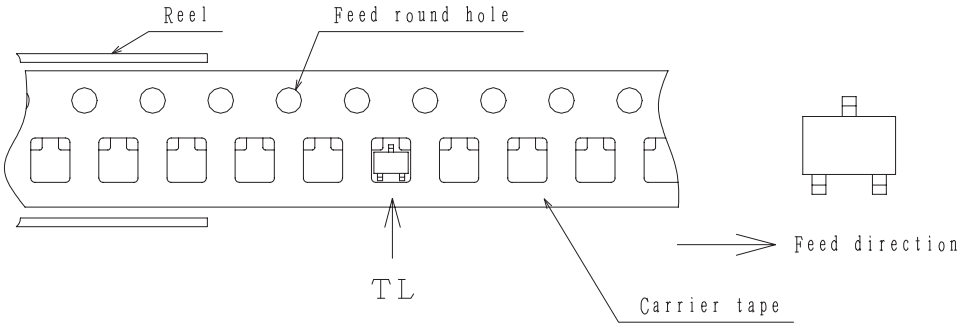
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



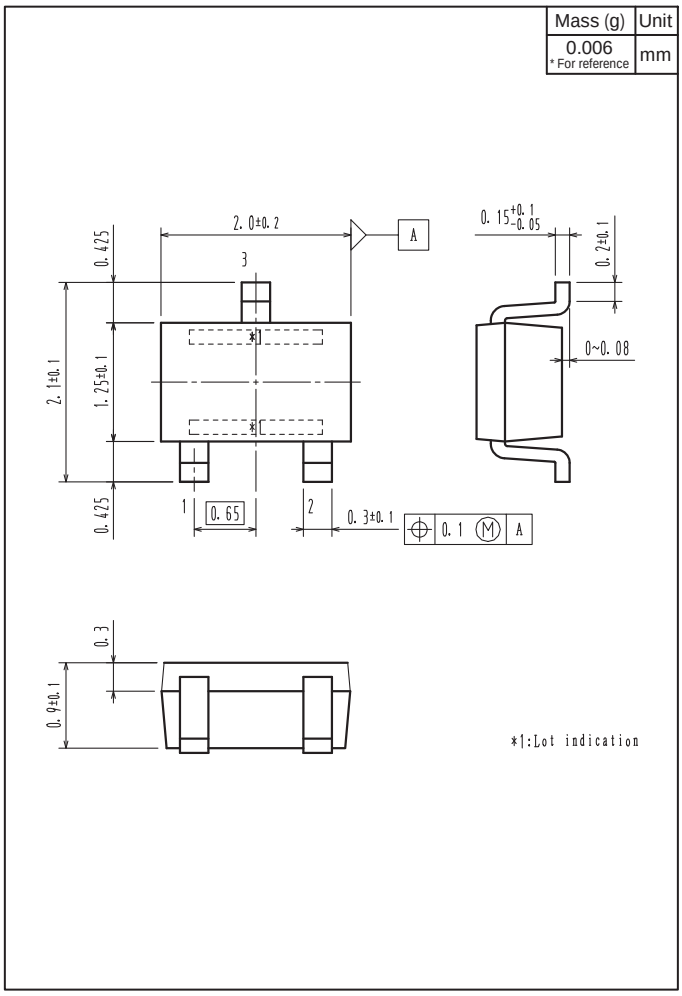
2-2. Device placement direction



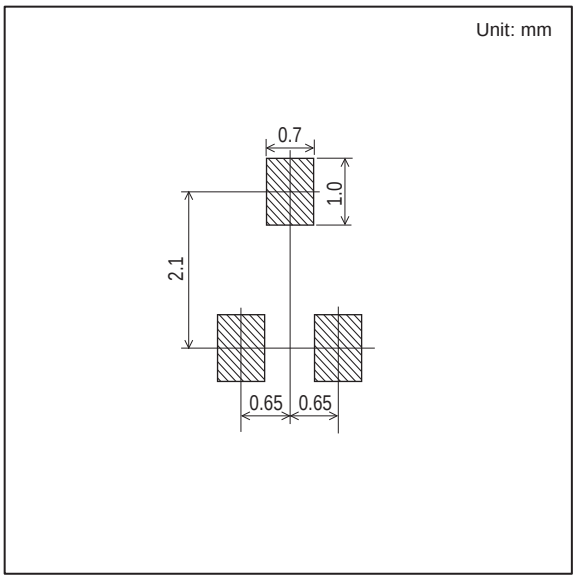
Those with oen electrode terminal on the feed hole side·····TL

Outline Drawing

55GN01MA-TL-E



Land Pattern Example



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