Ordering number : ENA1106A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

15GN03CA — NPN Epitaxial Planar Silicon Transistor

VHF High-frequency Amplifier Applications

Applications

- VHF, RF, MIXER, OSC, IF amplifier

Features

- High cutoff frequency : f_T=1.5GHz typ
- High gain : $|S21e|^2$=13dB typ (f=0.4GHz)

Specifications

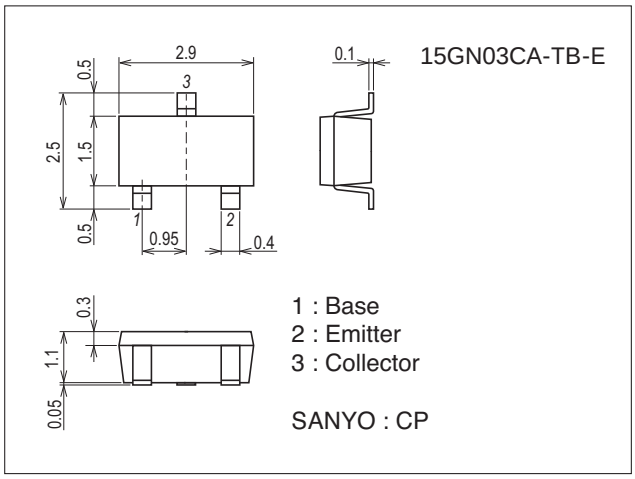
Absolute Maximum Ratings at Ta=25°C

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		200	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

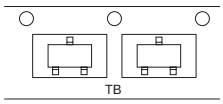
7013A-009



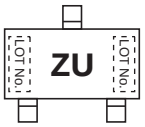
Product & Package Information

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

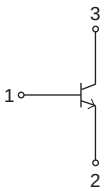
Packing Type: TB



Marking



Electrical Connection

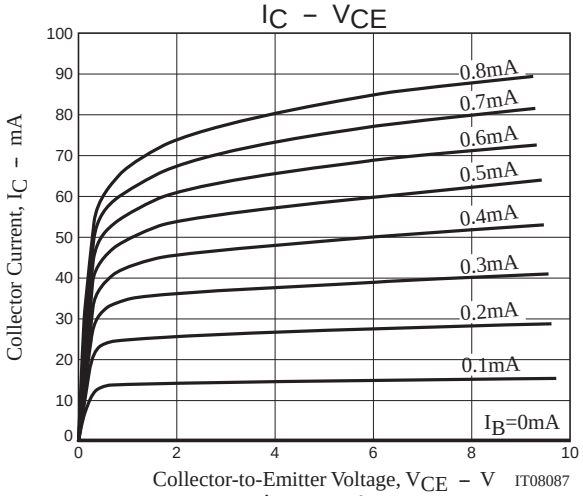


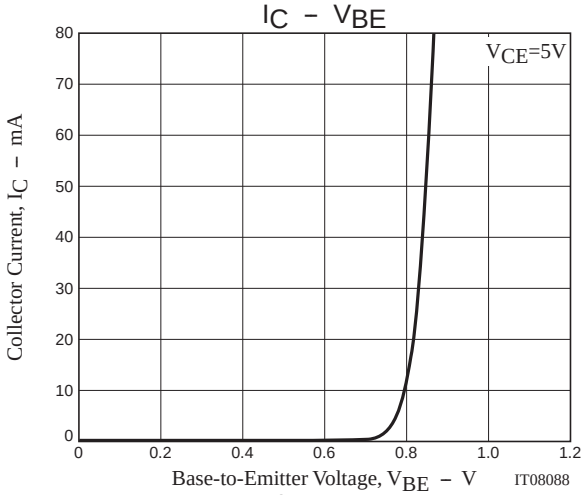
Electrical Characteristics at Ta=25°C

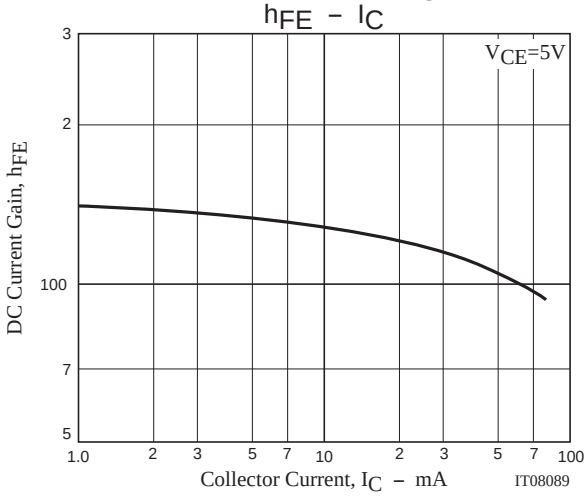
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=10V, I_E=0A			0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=2V, I_C=0A			1	μA
DC Current Gain	h_{FE}	V_{CE}=5V, I_C=10mA	100		180	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=20mA	1.0	1.5		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		0.95	1.25	pF
Reverse Transfer Capacitance	Cre			0.65		pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=5V, I_C=20mA, f=0.4GHz	10	13		dB
Noise Figure	NF	V_{CE}=3V, I_C=2mA, f=0.4GHz		1.6		dB

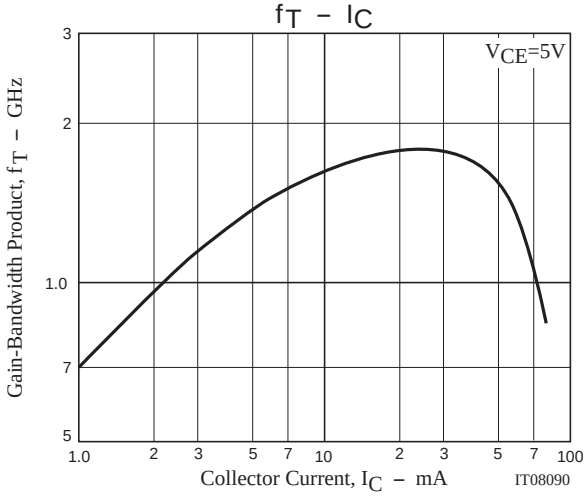
Ordering Information

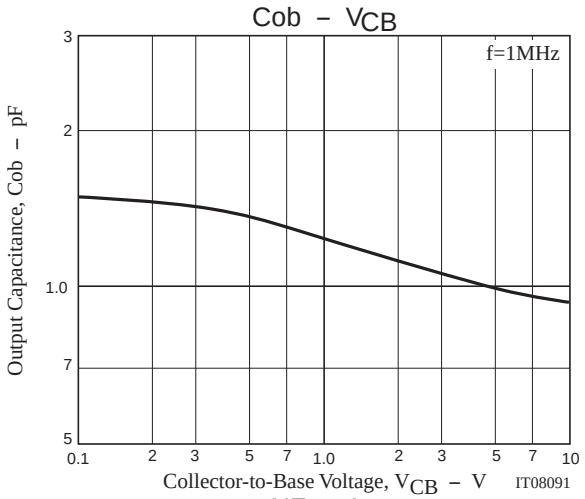
Device	Package	Shipping	memo
15GN03CA-TB-E	CP	3,000pcs./reel	Pb Free

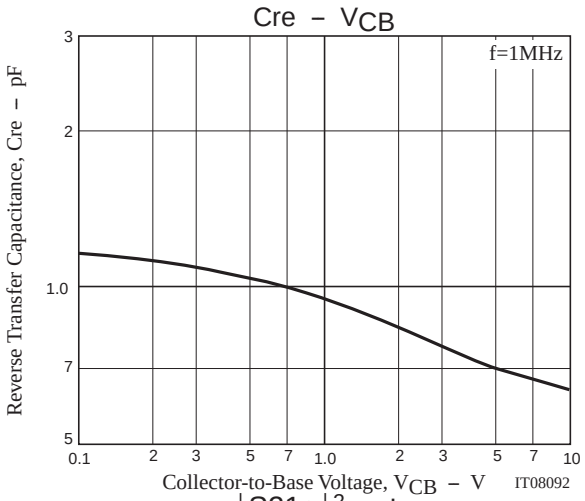


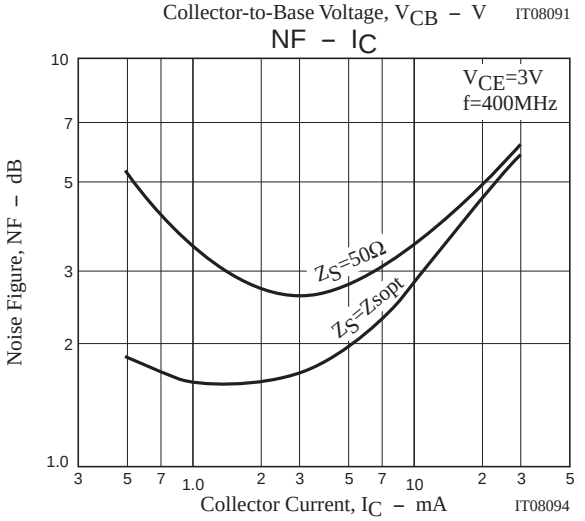


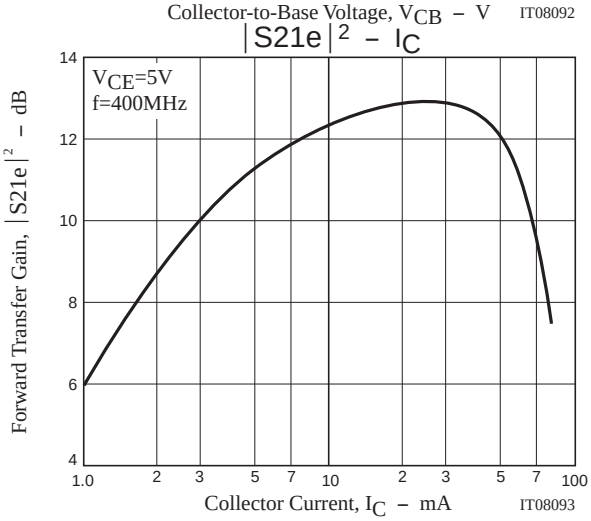


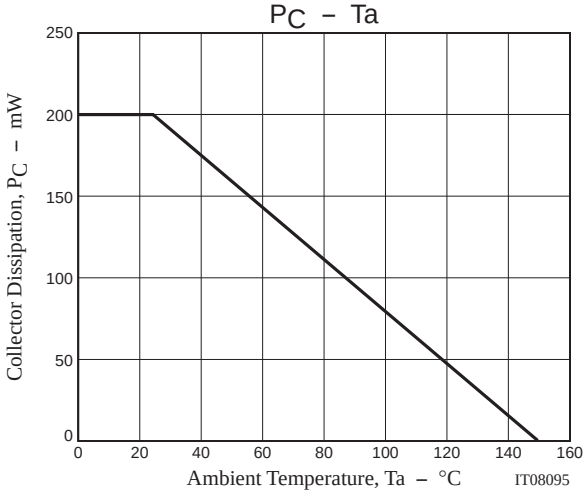



Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT08091


Cre – VCB
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
IT08092


NF – IC
VCE=3V
f=400MHz
ZS=50Ω
ZS=Zsopt
Noise Figure, NF – dB
Collector Current, IC – mA
IT08094


|S21e|2 – IC
VCE=5V
f=400MHz
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA
IT08093


PC – Ta
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
IT08095

S Parameters (Common emitter)

V_{CE}=5V, I_C=1mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.918	-34.17	3.328	154.00	0.040	67.14	0.963	-9.32
200	0.816	-63.46	2.833	133.91	0.063	50.52	0.897	-15.61
300	0.719	-87.48	2.349	118.47	0.075	39.90	0.847	-19.59
400	0.650	-106.66	1.974	106.31	0.081	33.68	0.816	-22.72
500	0.603	-123.45	1.709	96.50	0.081	30.41	0.795	-25.65
600	0.579	-137.17	1.492	88.62	0.078	30.45	0.785	-28.56
700	0.562	-149.31	1.328	81.55	0.074	30.61	0.779	-31.42
800	0.557	-159.59	1.197	75.34	0.070	34.97	0.777	-34.68
900	0.557	-168.64	1.094	70.12	0.068	41.63	0.773	-38.02
1000	0.560	-176.38	1.003	65.13	0.066	50.34	0.773	-41.22

V_{CE}=5V, I_C=3mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.799	-55.14	7.483	141.00	0.033	59.88	0.886	-14.45
200	0.641	-93.26	5.412	118.03	0.047	44.28	0.773	-18.84
300	0.553	-118.80	4.036	104.19	0.050	40.23	0.719	-21.00
400	0.512	-136.73	3.182	94.58	0.052	40.73	0.693	-22.61
500	0.492	-150.89	2.627	86.95	0.055	44.74	0.683	-24.93
600	0.488	-161.99	2.244	80.86	0.056	49.28	0.677	-27.44
700	0.487	-171.08	1.958	75.25	0.059	55.44	0.675	-30.18
800	0.492	-178.68	1.749	70.37	0.063	62.40	0.675	-33.31
900	0.502	174.60	1.575	65.89	0.068	67.82	0.674	-36.39
1000	0.508	168.93	1.433	61.61	0.078	74.10	0.677	-39.25

V_{CE}=5V, I_C=5mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.703	-69.63	10.162	132.63	0.030	54.51	0.821	-16.94
200	0.550	-109.80	6.625	110.25	0.037	43.19	0.704	-19.31
300	0.490	-133.75	4.733	98.16	0.041	44.91	0.660	-20.36
400	0.464	-149.68	3.666	89.82	0.045	49.05	0.643	-21.83
500	0.458	-161.66	3.003	83.25	0.049	56.14	0.635	-23.97
600	0.460	-170.95	2.537	77.83	0.054	60.18	0.632	-26.46
700	0.465	-178.51	2.212	72.71	0.058	65.91	0.631	-29.05
800	0.472	174.93	1.962	68.10	0.067	71.03	0.633	-32.06
900	0.482	169.11	1.764	64.09	0.075	76.57	0.634	-35.26
1000	0.491	164.18	1.602	59.88	0.085	78.96	0.635	-38.26

V_{CE}=5V, I_C=10mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.568	-91.34	13.492	121.50	0.022	51.19	0.729	-18.79
200	0.463	-130.04	7.837	102.18	0.030	50.01	0.628	-18.37
300	0.435	-149.86	5.435	92.29	0.035	56.54	0.598	-18.84
400	0.427	-162.69	4.153	85.23	0.041	59.99	0.587	-20.20
500	0.431	-171.77	3.374	79.57	0.047	67.05	0.586	-22.36
600	0.438	-179.07	2.842	74.63	0.055	70.37	0.585	-24.64
700	0.446	174.71	2.460	69.90	0.062	74.51	0.587	-27.44
800	0.457	169.18	2.181	65.54	0.072	78.16	0.588	-30.30
900	0.469	164.67	1.954	61.61	0.080	80.51	0.592	-33.49
1000	0.482	160.55	1.775	57.60	0.092	82.60	0.596	-36.43

S Parameters (Common emitter)

V_{CE}=5V, I_C=15mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.506	-103.02	14.843	116.40	0.020	52.22	0.680	-19.13
200	0.433	-139.11	8.300	98.87	0.027	55.27	0.595	-17.41
300	0.418	-156.74	5.691	89.86	0.032	60.47	0.571	-17.79
400	0.416	-167.49	4.336	83.26	0.040	65.01	0.567	-19.20
500	0.423	-175.59	3.518	77.72	0.047	70.77	0.564	-21.38
600	0.434	177.94	2.949	72.99	0.056	75.36	0.566	-23.76
700	0.441	172.60	2.558	68.36	0.064	77.18	0.566	-26.43
800	0.454	167.70	2.257	64.14	0.073	80.34	0.573	-29.43
900	0.468	163.21	2.026	60.20	0.084	82.23	0.576	-32.58
1000	0.478	159.35	1.833	56.21	0.094	82.82	0.579	-35.40

V_{CE}=5V, I_C=20mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.473	-110.94	15.555	113.24	0.018	48.75	0.651	-18.99
200	0.420	-144.96	8.504	96.80	0.025	55.46	0.577	-16.75
300	0.412	-160.51	5.806	88.35	0.032	64.32	0.556	-16.94
400	0.412	-170.47	4.415	81.97	0.040	69.43	0.553	-18.38
500	0.423	-177.81	3.567	76.52	0.047	73.49	0.552	-20.62
600	0.434	176.33	2.998	72.06	0.054	76.85	0.554	-23.22
700	0.443	171.32	2.597	67.40	0.064	79.43	0.555	-25.76
800	0.457	166.61	2.289	62.99	0.075	80.21	0.562	-28.77
900	0.470	162.56	2.044	58.98	0.084	82.61	0.567	-31.92
1000	0.484	159.03	1.849	54.97	0.095	83.62	0.572	-34.90

V_{CE}=5V, I_C=30mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.444	-121.15	16.032	109.59	0.018	56.45	0.620	-18.33
200	0.414	-151.46	8.590	94.42	0.023	58.54	0.558	-15.68
300	0.413	-164.93	5.826	86.42	0.031	69.33	0.543	-15.93
400	0.418	-173.75	4.420	80.00	0.040	71.41	0.541	-17.58
500	0.429	179.87	3.560	74.72	0.048	75.89	0.545	-19.95
600	0.442	174.95	2.980	69.97	0.056	78.14	0.546	-22.37
700	0.454	170.06	2.575	65.31	0.067	79.78	0.550	-25.11
800	0.467	165.62	2.268	61.02	0.077	81.97	0.556	-27.94
900	0.485	161.83	2.027	57.14	0.086	83.95	0.563	-31.50
1000	0.497	158.27	1.829	53.02	0.096	84.97	0.570	-34.37

V_{CE}=5V, I_C=50mA, Z_O=50Ω

Freq(MHz)	|S11|	∠S11	|S21|	∠S21	|S12|	∠S12	|S22|	∠S22
100	0.436	-135.54	15.112	105.16	0.016	53.23	0.591	-16.61
200	0.431	-160.16	7.915	91.13	0.021	62.83	0.547	-14.06
300	0.439	-170.89	5.332	83.37	0.030	71.57	0.538	-15.05
400	0.447	-177.86	4.022	77.04	0.039	75.43	0.538	-16.92
500	0.462	176.77	3.231	71.43	0.046	77.82	0.543	-19.30
600	0.477	172.03	2.708	66.71	0.057	81.23	0.548	-22.35
700	0.490	167.59	2.318	61.92	0.065	82.45	0.553	-25.43
800	0.507	163.59	2.037	57.52	0.076	84.13	0.559	-28.69
900	0.523	159.90	1.813	53.42	0.087	86.15	0.566	-32.45
1000	0.539	156.32	1.629	49.36	0.099	87.07	0.573	-35.73

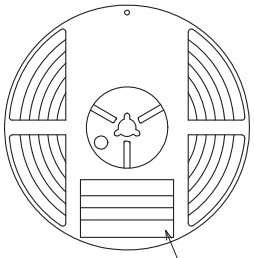
Embossed Taping Specification

15GN03CA-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

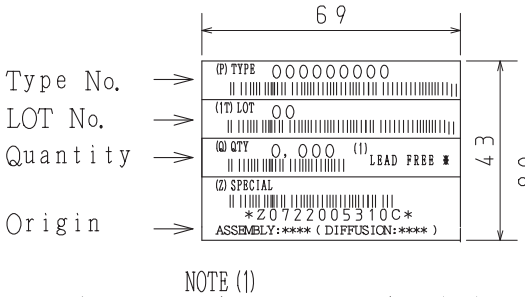
Packing method



Reel label

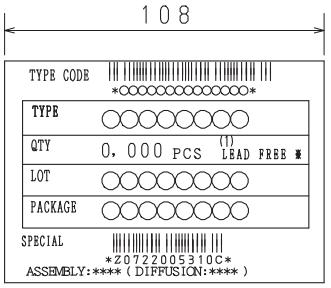
Reel label, Inner box label

(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.

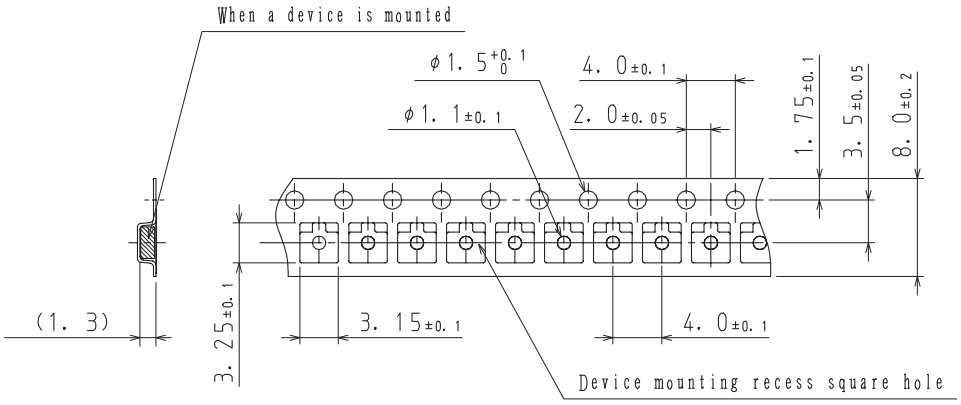


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

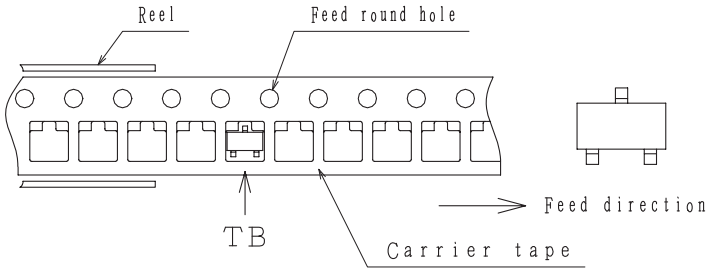
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



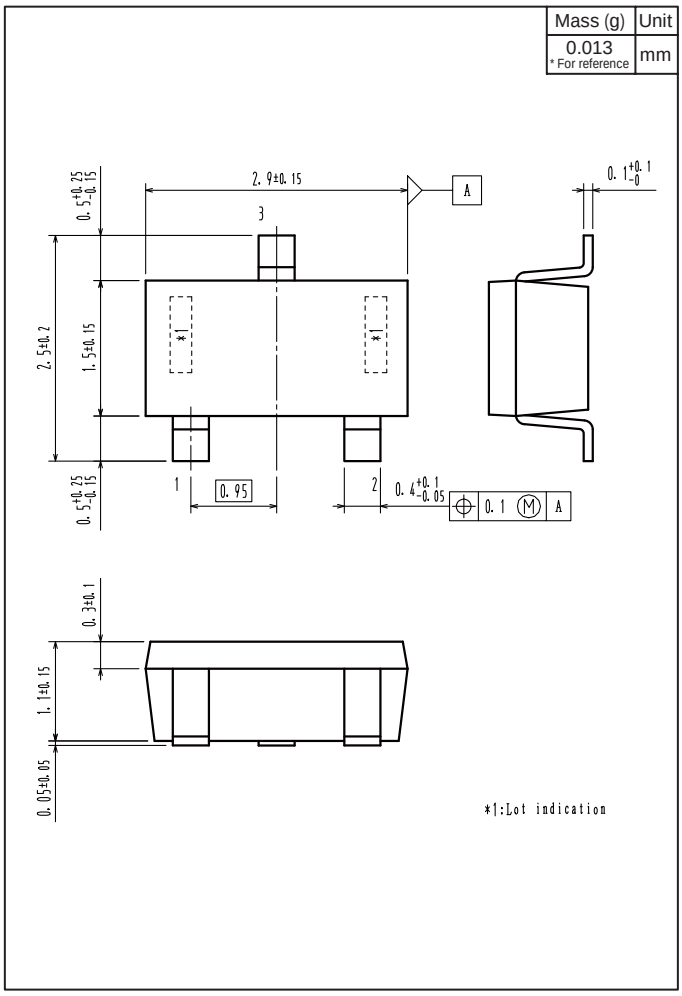
2-2. Device placement direction



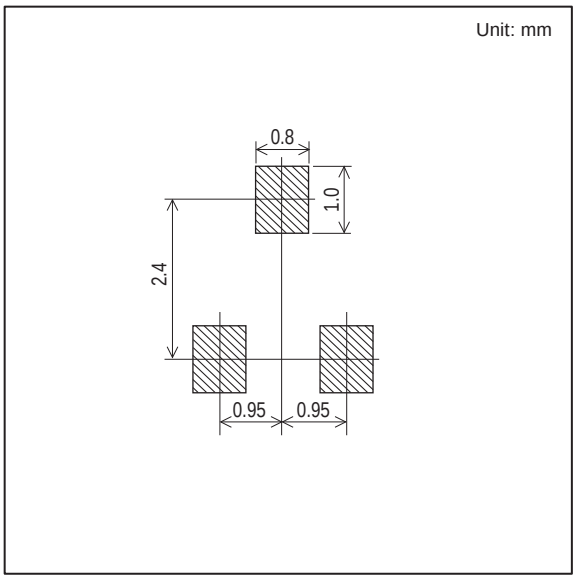
Those with one electrode terminal on the feed hole side……TB

Outline Drawing

15GN03CA-TB-E



Land Pattern Example



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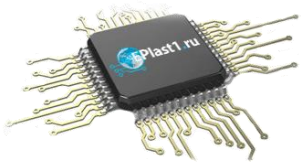
Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.