BIPOLARICS, INC. Part Number B12V105

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

PRODUCT DATA SHEET

FEATURES:

- High Gain Bandwidth Product
  f_t = 10 GHz typ @ I_C = 10 mA
- Low Noise Figure
  1.6 dB typ at 1 GHz
  2.0 dB typ at 2 GHz
- High Gain
  $|S_{21}|^2$ = 18.1 dB @ 1 GHz
  12.8 dB @ 2 GHz
- Dice, Plastic, Hermetic and Surface Mount packages available

DESCRIPTION AND APPLICATIONS:

Bipolarics' B12V105 is a high performance silicon bipolar transistor intended for use in low noise application at VHF, UHF and microwave frequencies. High performance low noise performance can be realized at 2 mA or less making the B12V105 an excellent choice for battery applications. From 10 mA to greater than 25 mA, f_t is nominally 10 GHz. Maximum recommended continuous current is 40 mA. A broad range of packages are offered including SOT-23, SOT-143, plastic and ceramic 0.085" Micro-X, 0.070" Stripline and unencapsulated dice.

Absolute Maximum Ratings:

SYMBOL	PARAMETERS	RATING	UNITS
V_{CBO}	Collector-Base Voltage	20	V
V_{CEO}	Collector-Emitter Voltage	12	V
V_{EBO}	Emitter-Base Voltage	1.5	V
$I_{C\ CONT}$	Collector Current	40	mA
T_J	Junction Temperature	200	°C
T_{STG}	Storage Temperature	-65 to 150	°C

PERFORMANCE DATA:

- Electrical Characteristics (T_A = 25°C)

SYMBOL	PARAMETERS & CONDITIONS (V_{CE} =8V, I_C = 10 mA unless stated)	UNIT	MIN.	TYP.	MAX.
f_t	Gain Bandwidth Product	GHz		10	
$\|S_{21}\|^2$	Insertion Power Gain: f = 1.0 GHz, I_C = 10 mA I_C = 25 mA f = 2.0 GHz, I_C = 10 mA I_C = 25 mA			17.5 18.1 12.8 12.6	
P_{1dB}	Power output at 1dB compression: f = 1.0 GHz	dBm		12	
G_{1dB}	Gain at 1dB compression: f = 1.0 GHz	dBm		15	
NF	Noise Figure: V_{CE} =8V, I_C = 2mA f = 1.0 GHz, Z_S = 50Ω	dB		1.6	
h_{FE}	Forward Current Transfer Ratio: f = 1MHz V_{CE} = 8V, I_C = 10 mA		50	100	250
I_{CBO}	Collector Cutoff Current : V_{CB} =8V	µA			0.2
I_{EBO}	Emitter Cutoff Current : V_{EB} =1V	µA			1.0
C_{CB}	Collector Base Capacitance: V_{CB} = 8V f = 1MHz	pF		0.11	

BIPOLARICS, INC. Part Number B12V105

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

PRODUCT DATA SHEET

TYPICAL S PARAMETERS:

BIAS CONDITION: V_{CE} = 5 V, I_C = 2 mA

S-MATRIX: Z_S = 50.0 + J 0.0 Z_L = 50.0 + J 0.0

(NOTE: S-Parameters were taken in a ceramic Micro-X package; See package outline 35)

FREQ.	S11		S21		S12		S22		
S21									
GHz	Mag		Ang	Mag	Ang	Mag		Ang	Mag
dB									
0.20000	0.8709	-19	5.888	172	0.0316	80	0.9549	-10	15.4
0.40000	0.8511	-32	4.623	157	0.0478	76	0.9120	-17	13.3
0.60000	0.8128	-45	4.027	142	0.0660	61	0.8511	-25	12.1
0.80000	0.7762	-55	3.388	137	0.0776	59	0.8511	-32	10.6
1.00000	0.7244	-68	3.273	126	0.0876	53	0.7161	-34	10.3
1.20000	0.6760	-80	3.162	122	0.0933	51	0.6998	-37	10.0
1.40000	0.6309	-100	3.235	116	0.1035	48	0.6531	-47	10.2
1.60000	0.5888	-114	3.019	106	0.1071	47	0.6165	-49	9.6
1.80000	0.5754	-124	2.786	102	0.1096	46	0.6456	-51	8.9
2.00000	0.5623	-137	2.722	88	0.1148	46	0.6025	-54	8.7
2.20000	0.5370	-144	2.691	82	0.1174	45	0.5888	-57	8.6
2.40000	0.5248	-165	2.317	86	0.1188	46	0.5370	-63	7.3
2.60000	0.5370	-174	2.264	84	0.1216	48	0.5308	-64	7.1
2.80000	0.5128	178	2.187	78	0.1244	49	0.5188	-70	6.8
3.00000	0.5069	173	1.949	78	0.1258	50	0.4897	-72	5.8
3.20000	0.4954	166	1.883	73	0.1303	51	0.5011	-78	5.5
3.40000	0.5011	162	1.737	70	0.1333	53	0.4677	-81	4.8
3.60000	0.5128	153	1.717	69	0.1348	55	0.4773	-87	4.7
3.80000	0.5432	152	1.566	63	0.1333	57	0.4773	-96	3.9
4.00000	0.5308	152	1.479	64	0.1348	60	0.4677	-93	3.4
4.20000	0.5188	144	1.445	58	0.1380	61	0.5069	-102	3.2

BIPOLARICS, INC. Part Number B12V105

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

PRODUCT DATA SHEET

TYPICAL S PARAMETERS:

BIAS CONDITION: V_{CE} = 5 V, I_C = 5 mA

S-MATRIX: Z_S = 50.0 + J 0.0 Z_L = 50.0 + J 0.0

(NOTE: S-Parameters were taken in a ceramic Micro-X package; See package outline 35, 36)

FREQ.	S11		S21		S12		S22		
S21									
GHz	Mag		Ang	Mag	Ang	Mag	Ang	Mag	Ang
dB									
0.20000	0.7762	-24	12.02	151	0.0223	74	0.9225	-14	21.6
0.40000	0.7885	-44	10.47	134	0.0398	72	0.8709	-25	20.4
0.60000	0.6382	-60	8.810	106	0.0512	60	0.7413	-31	18.9
0.80000	0.6165	-72	7.244	80	0.0568	59	0.7079	-36	17.2
1.00000	0.5248	-88	6.456	72	0.0616	57	0.6095	-38	16.2
1.20000	0.4677	-102	6.025	57	0.0691	57	0.5559	-40	15.6
1.40000	0.4168	-124	5.188	44	0.0776	57	0.5495	-48	14.3
1.60000	0.3672	-138	4.677	30	0.0822	57	0.5128	-46	13.4
1.80000	0.3548	-146	4.168	20	0.0860	58	0.5069	-50	12.4
2.00000	0.3467	-158	3.901	9	0.0954	59	0.4677	-52	12.0
2.20000	0.3548	-176	3.801	-4	0.1047	60	0.4570	-58	11.6
2.40000	0.3235	171	3.388	-17	0.1071	62	0.4216	-60	10.6
2.60000	0.3672	163	3.273	-27	0.1122	63	0.4315	-62	10.3
2.80000	0.3801	157	3.019	-39	0.1174	63	0.4265	-67	9.6
3.00000	0.3935	153	2.818	-49	0.1230	64	0.4168	-70	9.0
3.20000	0.4120	146	2.722	-60	0.1318	65	0.4073	-75	8.7
3.40000	0.4216	142	2.570	-70	0.1348	65	0.3890	-79	8.2
3.60000	0.4786	135	2.511	-82	0.1380	67	0.3890	-83	8.0
3.80000	0.4731	132	2.290	-92	0.1412	69	0.3981	-86	7.2
4.00000	0.4841	131	2.187	-101	0.1445	70	0.3870	-88	6.8
4.20000	0.5495	128	2.162	-112	0.1548	68	0.3801	-99	6.7

BIPOLARICS, INC. Part Number B12V105

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

PRODUCT DATA SHEET

TYPICAL S PARAMETERS:

BIAS CONDITION: V_{CE} = 8 V, I_C = 10 mA

S-MATRIX: Z_S = 50.0 + J 0.0 Z_L = 50.0 + J 0.0

(NOTE: S-Parameters were taken in a ceramic Micro-X package; See package outline 35, 36)

FREQ.	S11		S21		S12		S22		
S21									
GHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang	dB
0.20000	0.6025	-46	15.84	160	0.0177	70	0.8912	-17	24.0
0.40000	0.5888	-78	14.12	144	0.0301	65	0.7762	-30	23.0
0.60000	0.4954	-109	11.09	124	0.0407	56	0.6309	-36	20.9
0.80000	0.4786	-122	9.332	118	0.0457	58	0.6095	-40	19.4
1.00000	0.4265	-136	7.498	109	0.0506	58	0.5128	-39	17.5
1.20000	0.4027	-151	6.456	102	0.0537	60	0.5248	-42	16.2
1.40000	0.4027	-168	6.025	99	0.0616	62	0.4677	-49	15.6
1.60000	0.3935	-180	5.308	94	0.0676	62	0.4315	-50	14.5
1.80000	0.3890	176	4.897	90	0.0707	64	0.4415	-52	13.8
2.00000	0.3890	170	4.518	85	0.0741	66	0.4027	-53	13.1
2.20000	0.4216	158	4.365	82	0.0803	65	0.4120	-58	12.8
2.40000	0.4168	149	3.890	79	0.0812	67	0.3758	-62	11.8
2.60000	0.4623	145	3.715	77	0.0912	69	0.3845	-64	11.4
2.80000	0.4786	140	3.388	74	0.0933	68	0.3672	-70	10.6
3.00000	0.4897	138	3.198	74	0.1000	71	0.3758	-71	10.1
3.20000	0.4841	133	3.019	71	0.1059	70	0.3880	-76	9.6
3.40000	0.4954	128	2.818	67	0.1011	72	0.3630	-75	9.0
3.60000	0.5495	123	2.660	66	0.1188	72	0.3935	-84	8.5
3.80000	0.5754	121	2.371	62	0.1188	72	0.3548	-90	7.5
4.00000	0.5821	120	2.137	62	0.1230	76	0.3890	-86	6.6
4.20000	0.5888	117	2.018	58	0.1318	74	0.3548	-94	6.1

BIPOLARICS, INC. Part Number B12V105

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

PRODUCT DATA SHEET

TYPICAL S PARAMETERS:

BIAS CONDITION: V_{CE} = 8 V, I_C = 25 mA

S-MATRIX: Z_S = 50.0 + J 0.0 Z_L = 50.0 + J 0.0

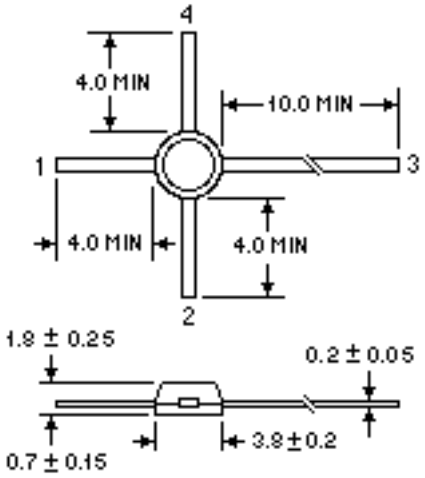
(NOTE: S-Parameters were taken in a ceramic Micro-X package; See package outline 35, 36)

FREQ.	S11		S21		S12		S22		
S21									
GHz	Mag		Ang	Mag	Ang	Mag	Ang	Mag	Ang
dB									
0.20000	0.4466	-55	17.78	154	0.0149	56	0.7585	-22	25.0
0.40000	0.4265	-98	14.62	136	0.0234	62	0.6456	-34	23.3
0.60000	0.3715	-127	12.44	116	0.0301	64	0.5069	-33	21.9
0.80000	0.3672	-140	9.855	105	0.0342	68	0.5011	-36	19.9
1.00000	0.3467	-145	8.035	102	0.0407	69	0.4466	-33	18.1
1.20000	0.3019	-158	7.244	96	0.0467	71	0.4786	-34	17.2
1.40000	0.3311	-165	6.025	93	0.0543	72	0.4027	-43	15.6
1.60000	0.3801	-172	5.308	88	0.0638	72	0.3715	-41	14.5
1.80000	0.4027	-176	4.677	86	0.0645	74	0.3630	-46	13.4
2.00000	0.4120	168	4.265	84	0.0699	76	0.3630	-47	12.6
2.20000	0.4365	157	4.027	80	0.0785	77	0.3548	-53	12.1
2.40000	0.4315	149	3.672	77	0.0915	77	0.3273	-57	11.3
2.60000	0.4731	146	3.467	76	0.0891	78	0.3235	-61	10.8
2.80000	0.4897	141	3.235	73	0.0933	78	0.3162	-67	10.2
3.00000	0.4786	141	3.019	73	0.1000	80	0.3198	-69	9.6
3.20000	0.4954	137	2.804	70	0.1071	80	0.3198	-74	9.2
3.40000	0.5308	134	2.732	68	0.1109	79	0.2951	-76	8.7
3.60000	0.5559	128	2.630	65	0.1202	80	0.3162	-82	8.4
3.80000	0.5432	128	2.398	64	0.1206	79	0.2851	-94	7.6
4.00000	0.5370	129	2.364	64	0.1258	81	0.3162	-91	7.1
4.20000	0.5623	125	2.137	61	0.1348	80	0.3162	-90	6.6

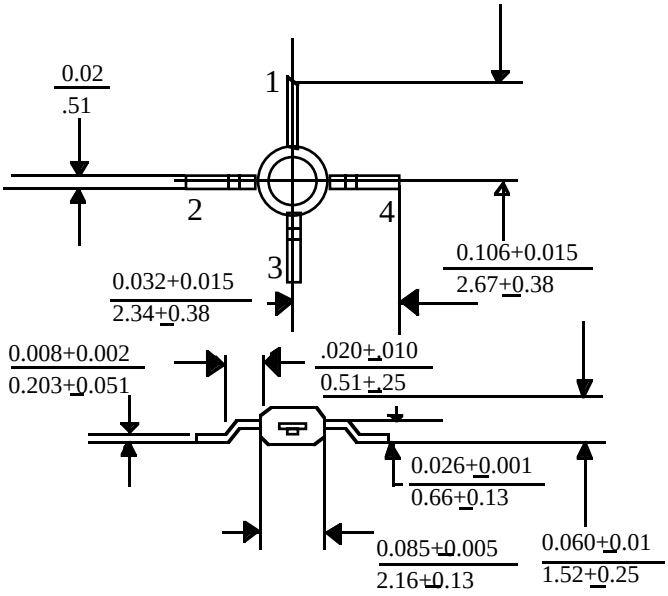
BIPOLARICS, INC. Part Number B12V105

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

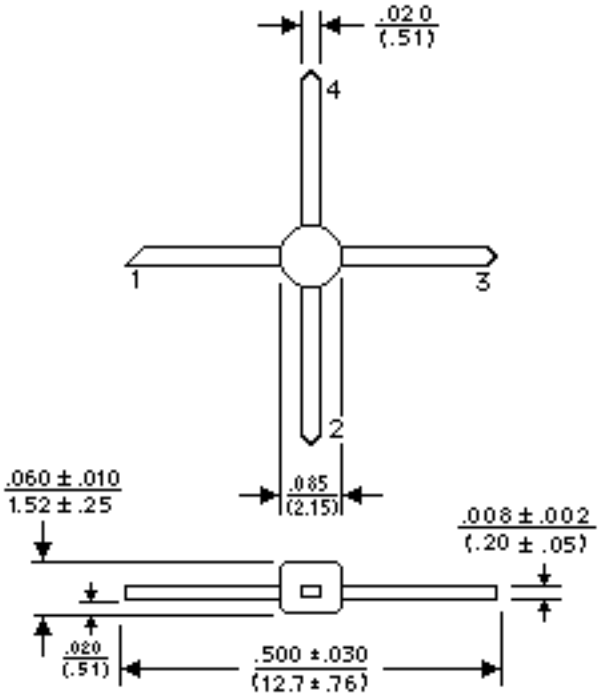
04 Package: 0.145" Plastic Macro-X



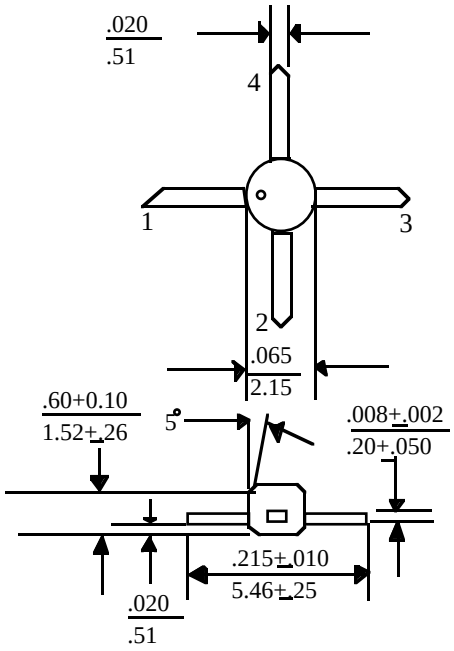
86 Package: 0.085" Plastic Micro-X, Surface Mount



85 Package: 0.085" Plastic Micro-X



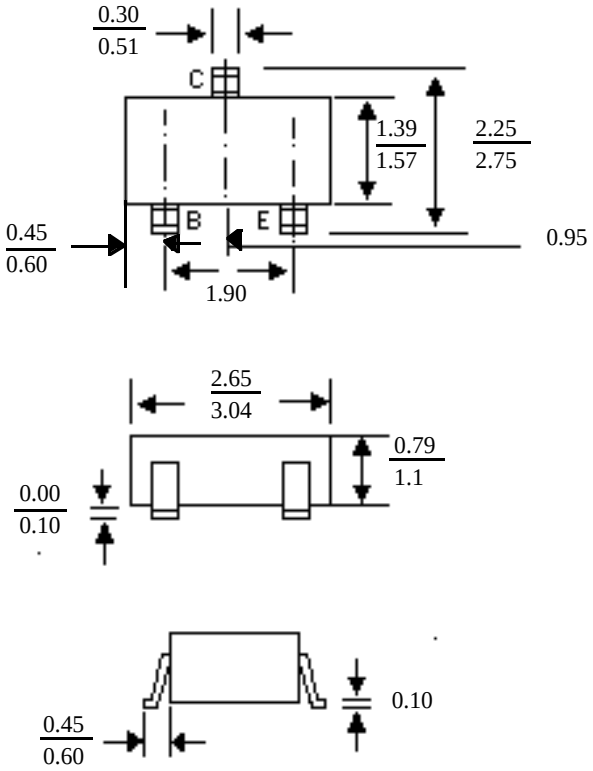
87 Package: 0.085" Plastic Micro-X, Short Lead



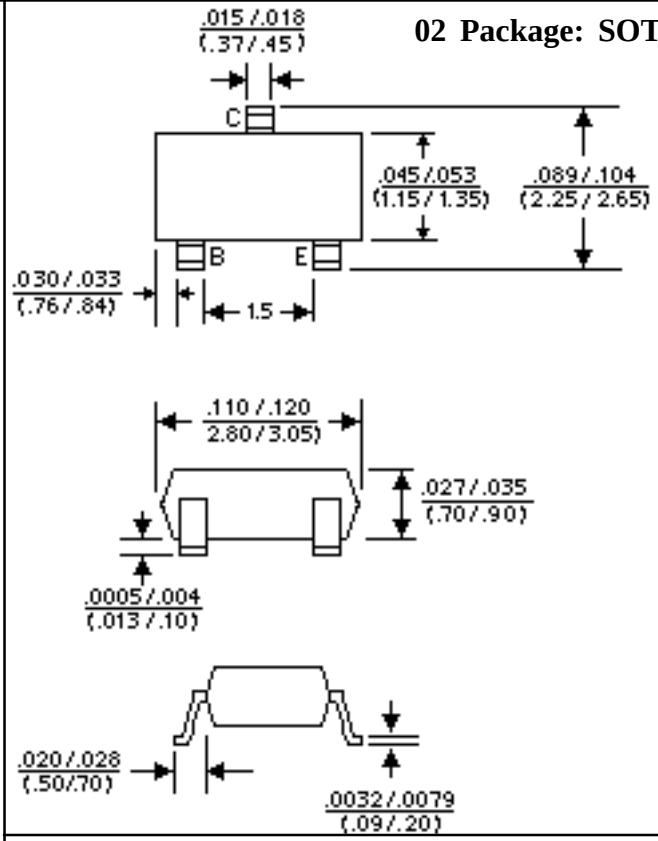
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NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

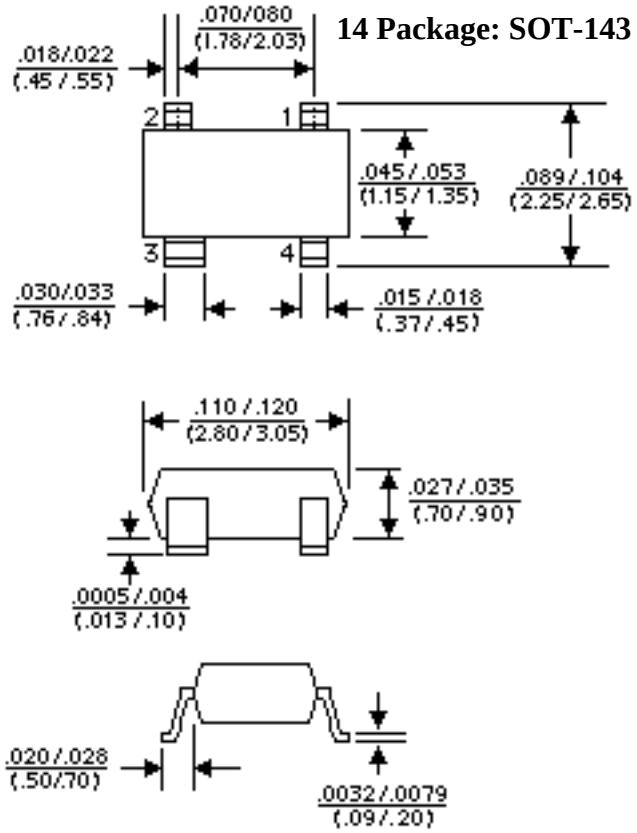
02J Package: SOT-23J



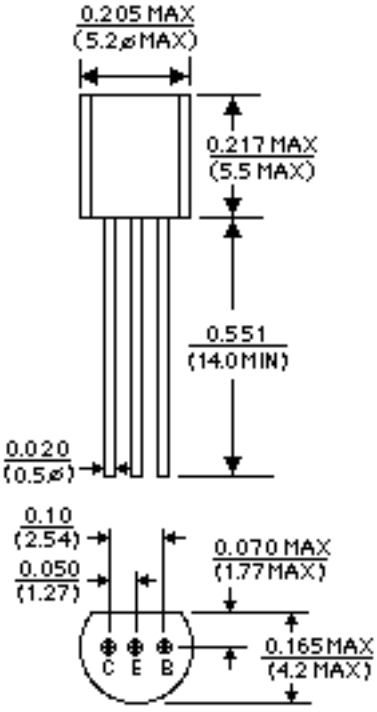
02 Package: SOT-23



14 Package: SOT-143



92 Package: TO-92



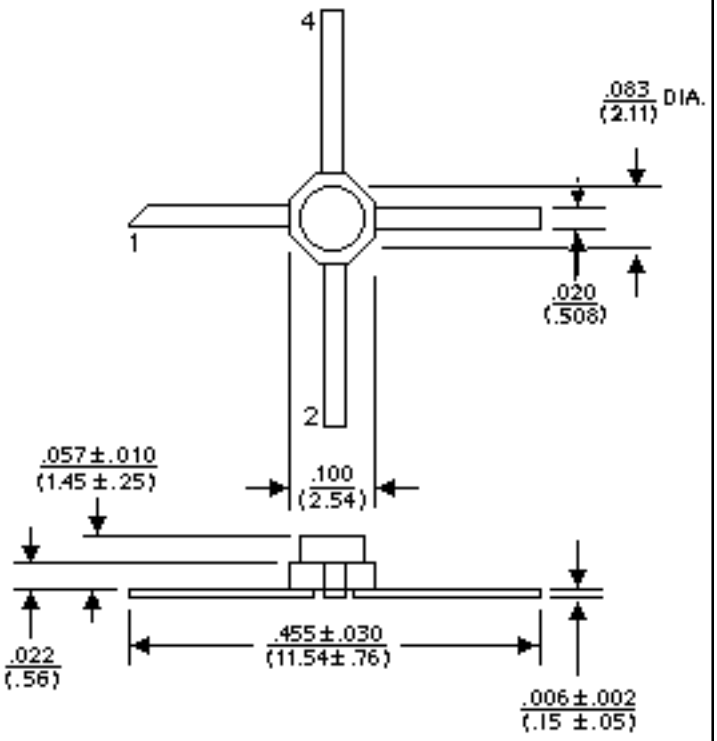
BIPOLARICS, INC. Part Number B12V105

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

ORDERING INFORMATION:

P/N Including Pkg	Temp Range/App
B12V105 00	-55 to +125˚C
B12V105 02	-40 to +85˚C
B12V105 14	-40 to +85˚C
B12V105 35	-55 to +125˚C
B12V105 92	-40 to +85˚C

85 Package: Micro-X 0.085" Ceramic



NOTES: (unless otherwise specified)

1. Dimensions are $\frac{\text{in}}{(\text{mm})}$
2. Tolerances:
   in .xxx = ± .005
   mm .xx = ± .13
3. All dimensions nominal; subject to change without notice

LEAD	1	2	3	4
14, 85, 86, 87, 35 & 04 Packages	Base	Emitter	Collector	Emitter

BIPOLARICS, INC.
46766 Lakeview Blvd.
Fremont, CA 94538
Phone: (510) 226-6565 FAX: (510) 226-6765

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» **“LifeElectronics” LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

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Email: org@lifeelectronics.ru

www.lifeelectronics.ru