Specification Control Drawing

Grade L Devices

For Space Application

= Hi-Rel Silicon Device =

Prepared on : December 16, 2002

NEC Compound Semiconductor Devices, Ltd.

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INTRODUCTION

NEC has decided to introduce a new reliability grade for Satellite applications, Grade L Microwave semiconductors.

The emerging markets of commercial satellites for satellite-based digital communications systems, require low cost, high reliability and shorter TAT. To comply with such requests, Grade L devices with reduced screening and Inspection to MIL-PRF-19500 and MIL-PRF-38535 have been developed. This is based on NEC outstanding quality experience in Hi-Rel history.

Grade L devices are characterized by the following items:

1) Customer Source Inspection (CSI) is not applicable.

2) Test report is not deliverable. When customer absolutely needs test data, it will be available with an additional cost, but limited to four kinds of data:
a) Summary Sheet
b) Bond STRENGTH Test Data
c) Power Burn-in Delta Data
d) Group A Test Data (RF is Sampling basis or 100%)

3) Grade L is available to the parts limited to the attached list.
(Grade L Available Part List)

4) Lot Assurance Tests (QCI Tests) are not applicable.

5) High or low temperature test is not applicable.

Table 1 Grade L Available Part List

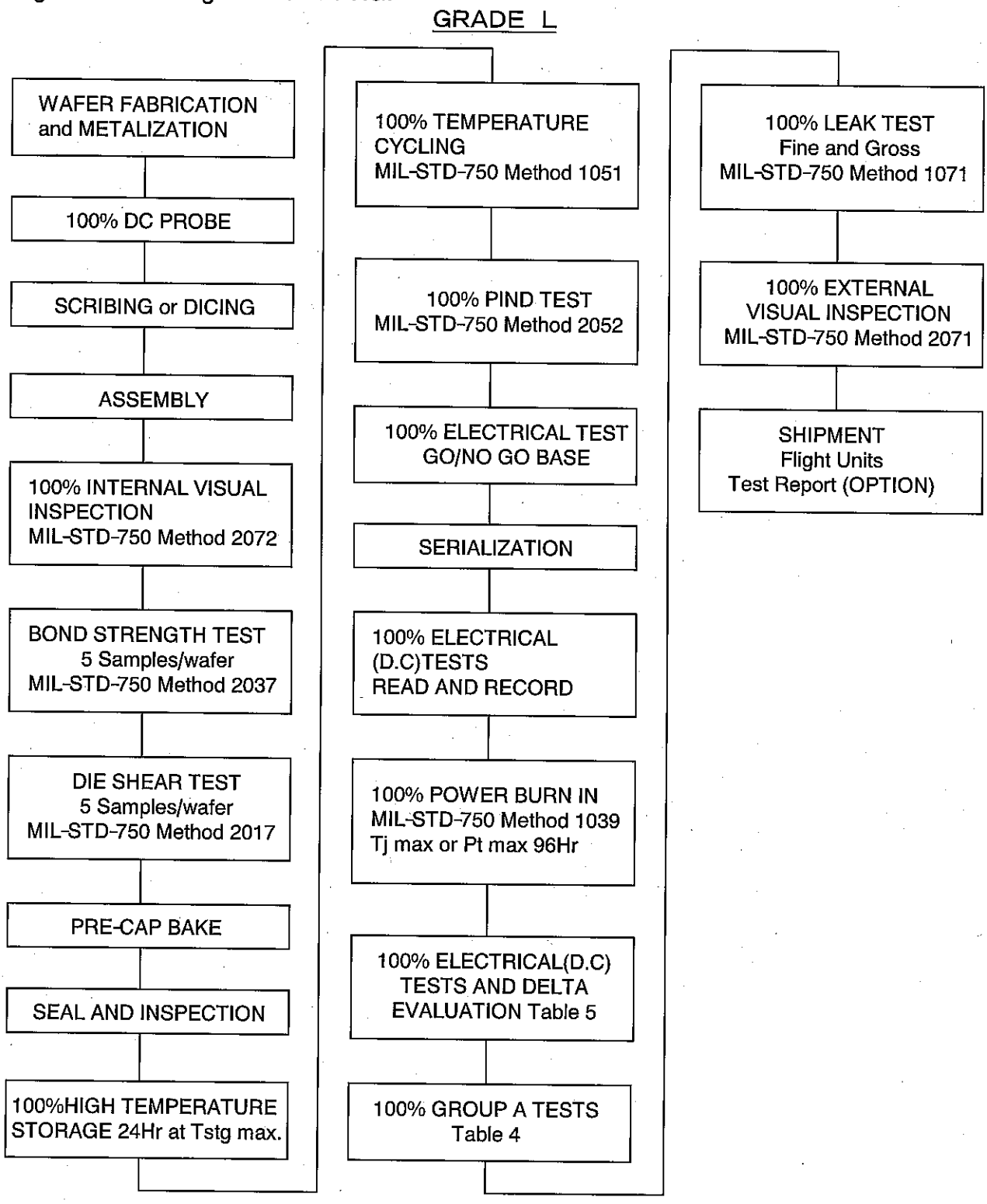
Bipolar Transistor (Small signal)		NE02100(L) NE41600(L) ** NE68000(L) NE68100(L) ** NE73400(L) NE85600(L) * NE89400(L)	** NE02103(L) NE02107(L) NE02108(L) ** NE41603(L) NE41607(L) ** NE68008(L) NE68108(L) ** NE73408(L) NE85608(L) *NE89407(L) *NE89408(L)
SiMMIC	Amplifier	** UPC1677P(L) ** UPC1678P(L) ** UPC2708P(L) UPC2709P(L) ** UPC2710P(L) UPC2711P(L) UPC2712P(L) UPC2713P(L) ** UPC2726P(L)	** UPC1677B(L) ** UPC1678B(L) ** UPC2708B(L) UPC2709B(L) ** UPC2710B(L) UPC2711B(L) UPC2712B(L) UPC2713B(L) ** UPC2726B(L)
	Prescaler	UPB1508P(L) UPB1509P(L) UPB1510P(L)	UPB1508B(L) UPB1509B(L) UPB1510B(L)
	Convertor	**UPC2758P(L) **UPC8106P(L)	**UPC2758B(L) **UPC8106B(L)

* New release

**To be phased out

SiTr PKG.

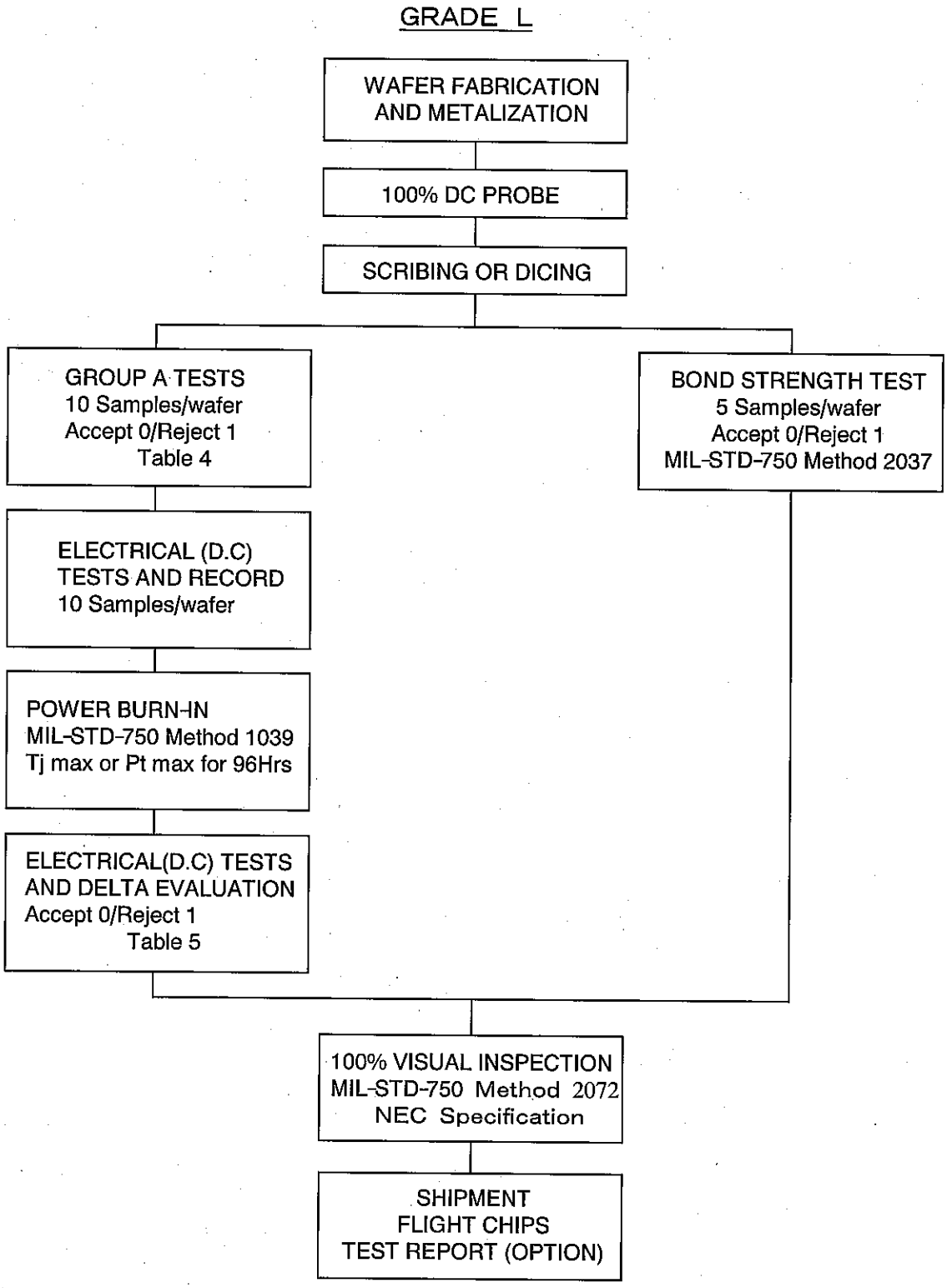
Fig. 1-1 Screening Flow SiTr PKG.



Note Test report (option) includes the following
Summary Sheet.
Bond Strength Test Data.
Power Burn-in Delta Data.
Group A Test Data.

SiTr CHIPS

Fig. 1-2 Screening Flow SiTr Chips



Note Test report (option) includes the following
Summary Sheet.
Bond Strength Test Data.
Power Burn-in Delta Data.
Group A Test Data.

Table 2 Preconditioning and Screening for Bipolar Transistors

EXAMINATION OR TEST	MIL-STD 750 METHOD	CONDITION	RELIABILITY GRADE L
Bond Strength Test	2037	Record Data	n=5
Die Shear Test	2017	Samples subjected to the bond strength test shall be used for this test Record data	n=5
Internal Visual (Pre-cap) Inspection	2072	NEC Specification	100%
Pre cap Bake	—	2Hrs at 300℃	100%
High Temperature Storage	1032	24Hrs min. at T STG. Max.	100%
Temperature Cycling	1051	Condition C, 20 cycles 100%	100%
PIND Test	2052	Condition A,	100%
Serialization	—		100%
Electrical Test	3001D 3026D 3076	Per data sheet limit Record data Per Table 4	100%
Power Burn-in	1039	Condition B, Tj max,PT max 96Hrs min.	100%
Electrical Test and Delta Parameter	3001D 3026D 3076	Per data sheet limit and Table 5 Record data	100%
Group A Test	—	Table 4	100% Note.
Hermetic Fine Leak Gross Leak	1071	Condition H 5×10^{-9} Pa m^3/sec.Max. Condition C,	100%
External Visual Inspection	2071		100%

Note) DC 100%, RF is Sampling Basis or 100%, depending on the parts.

Table 3 - 1 Absolute Maximum Ratings

Ta=25℃

Part No	Symbols	Parameters	Ratings	Units
NE02100(L) NE02103(L) NE02107(L) NE02108(L)	V_{CBO}	Collector to Base Voltage	25	V
	V_{CEO}	Collector to Emitter Voltage	12	V
	V_{EBO}	Emitter to Base Voltage	3	V
	Ic	Collector Current	70	mA
	Tj	Junction Temperature	200	℃
	$T_{STG.}$	Storage Temperature	-65～+200	℃
	Rth(j-c)		70(-00,-03) 90(-07,-08)	℃/W
NE41600(L) NE41603(L) NE41607(L)	V_{CBO}	Collector to Base Voltage	35	V
	V_{CEO}	Collector to Emitter Voltage	18	V
	V_{EBO}	Emitter to Base Voltage	3	V
	Ic	Collector Current	100	mA
	Tj	Junction Temperature	200	℃
	$T_{STG.}$	Storage Temperature	-65～+200	℃
	Rth(j-c)		50(-00,-03,-07)	℃/W
NE68000(L) NE68008(L)	V_{CBO}	Collector to Base Voltage	20	V
	V_{CEO}	Collector to Emitter Voltage	10	V
	V_{EBO}	Emitter to Base Voltage	1.5	V
	Ic	Collector Current	35	mA
	Tj	Junction Temperature	200	℃
	$T_{STG.}$	Storage Temperature	-65～+200	℃
	Rth(j-c)		80(-00) 100(-08)	℃/W
NE68100(L) NE68108(L)	V_{CBO}	Collector to Base Voltage	20	V
	V_{CEO}	Collector to Emitter Voltage	10	V
	V_{EBO}	Emitter to Base Voltage	1.5	V
	Ic	Collector Current	65	mA
	Tj	Junction Temperature	200	℃
	$T_{STG.}$	Storage Temperature	-65～+200	℃
	Rth(j-c)		80(-00) 110(-08)	℃/W

Table 3 - 2 Absolute Maximum Ratings

Ta=25°C

Part No	Symbols	Parameters	Ratings	Units
NE73400(L) NE73408(L)	V_{CBO}	Collector to Base Voltage	30	V
	V_{CEO}	Collector to Emitter Voltage	14	V
	V_{EBO}	Emitter to Base Voltage	3	V
	Ic	Collector Current	50	mA
	Tj	Junction Temperature	200	°C
	$T_{STG.}$	Storage Temperature	-65～+200	°C
	Rth(j-c)		90(-00) 110(-08)	°C/W
NE85600(L) NE85608(L)	V_{CBO}	Collector to Base Voltage	20	V
	V_{CEO}	Collector to Emitter Voltage	12	V
	V_{EBO}	Emitter to Base Voltage	3.0	V
	Ic	Collector Current	100	mA
	Tj	Junction Temperature	200	°C
	$T_{STG.}$	Storage Temperature	-65～+200	°C
	Rth(j-c)		80(-00) 100(-08)	°C/W
NE89400(L) NE89407(L) NE89408(L)	V_{CBO}	Collector to Base Voltage	9.0	V
	V_{CEO}	Collector to Emitter Voltage	3.0	V
	V_{EBO}	Emitter to Base Voltage	1.5	V
	Ic	Collector Current	35	mA
	Tj	Junction Temperature	200	°C
	$T_{STG.}$	Storage Temperature	-65～+200	°C
	Rth(j-c)		80(-00) 120(-07,-08)	°C/W

Table 4 - 1 Electrical Characteristics : Group A

Ta=25°C

Part No	Parameter	Test Condition	Limits		Units
NE02100(L) NE02103(L) NE02107(L) NE02108(L)	I_{CBO}	VCB=15V IE=0	—	1	uA
	I_{EBO}	VEB=2V IC=0	—	1	uA
	hFE	VCE=10V IC=20mA	20	250	—
	C_{CB}	VCB=10V IE=0 f=1MHz	—	1	pF
	$\|S21E\|^2$	VCE=10V IC=20mA f=1GHz	11	—	dB
	NF	VCE=10V IC=5mA f=1GHz	—	3.5	dB
NE41600(L) NE41603(L) NE41607(L)	I_{CBO}	VCB=20V IE=0	—	0.1	uA
	I_{EBO}	VEB=2V IC=0	—	0.1	uA
	hFE	VCE=10V IC=50mA	30	200	—
	C_{CB}	VCB=10V IE=0 f=1MHz	—	2	pF
	$\|S21E\|^2$	VCE=10V IC=30mA f=1GHz	7	—	dB
	NF	VCE=10V IC=5mA f=1GHz	—	4	dB
NE68000(L) NE68008(L)	I_{CBO}	VCB=10V IE=0	—	1	uA
	I_{EBO}	VEB=1V IC=0	—	1	uA
	hFE	VCE=6V IC=10mA	50	250	—
	C_{CB}	VCB=10V IE=0 f=1MHz	—	0.7	pF
	$\|S21E\|^2$	VCE=6V IC=10mA f=2GHz	10.5	—	dB
	NF	VCE=6V IC=5mA f=2GHz	—	2.4	dB
NE68100(L) NE68108(L)	I_{CBO}	VCB=10V IE=0	—	1	uA
	I_{EBO}	VEB=1V IC=0	—	1	uA
	hFE	VCE=8V IC=20mA	50	200	—
	C_{CB}	VCB=10V IE=0 f=1MHz	—	0.7	pF
	$\|S21E\|^2$	VCE=8V IC=20mA f=2GHz	9	—	dB
	NF	VCE=8V IC=7mA f=2GHz	—	2.3	dB

Table 4 - 2 Electrical Characteristics : Group A

Ta=25℃

Part No	Parameter	Test Condition	Limits		Units
NE73400(L) NE73408(L)	I_{CBO}	VCB=15V IE=0	—	0.1	uA
	I_{EBO}	VEB=2V IC=0	—	0.1	uA
	hFE	VCE=10V IC=10mA	25	200	—
	C_{CB}	VCB=10V IE=0 f=1MHz	—	1.5	pF
	$\lvert S21E \rvert^2$	VCE=10V IC=10mA f=1GHz	8	—	dB
	NF	VCE=10V IC=3mA f=0.5GHz	—	3.5	dB
NE85600(L) NE85608(L)	I_{CBO}	VCB=15V IE=0	—	1	uA
	I_{EBO}	VEB=1V IC=0	—	1	uA
	hFE	VCE=10V IC=20mA	50	300	—
	C_{CB}	VCB=10V IE=0 f=1MHz	—	1	pF
	$\lvert S21E \rvert^2$	VCE=10V IC=20mA f=2GHz	7	—	dB
	NF	VCE=10V IC=7mA f=2GHz	—	3.4	dB
NE89400(L) NE89407(L) NE89408(L)	I_{CBO}	VCB=5V IE=0	—	0.1	uA
	I_{EBO}	VEB=1V IC=0	—	0.1	uA
	hFE	VCE=1V IC=5mA	50	100	—
	Cre	VCB=0.5V IE=0 f=1MHz	—	1	pF
	$\lvert S21E \rvert^2$	VCE=1V IC=20mA f=2GHz	10	—	dB
	NF	VCE=1V IC=5mA f=2GHz	—	2.5	dB

Table 5 Delta Parameters and Criteria Screening of Bipolar Transistors

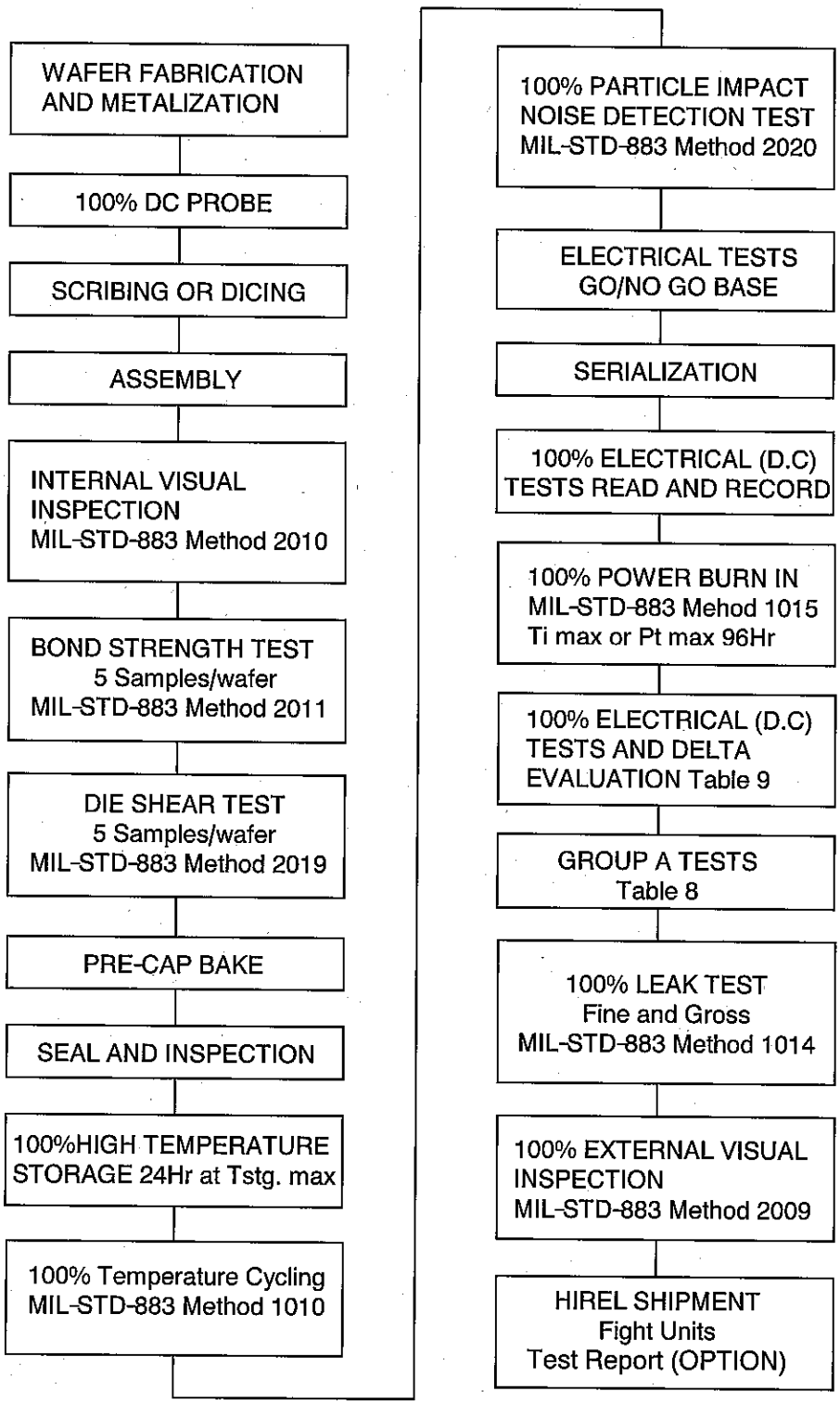
Symbol	Maximum Allowable Delta for Power Burn-in
	Grade L Small Signal
ICBO	+10nA or +100% *
IEBO	+10nA or +100% *
hFE	±15%

*Whichever is greater.

SiMMIC PKG.

Fig. 2-1 Screening Flow SiMMIC

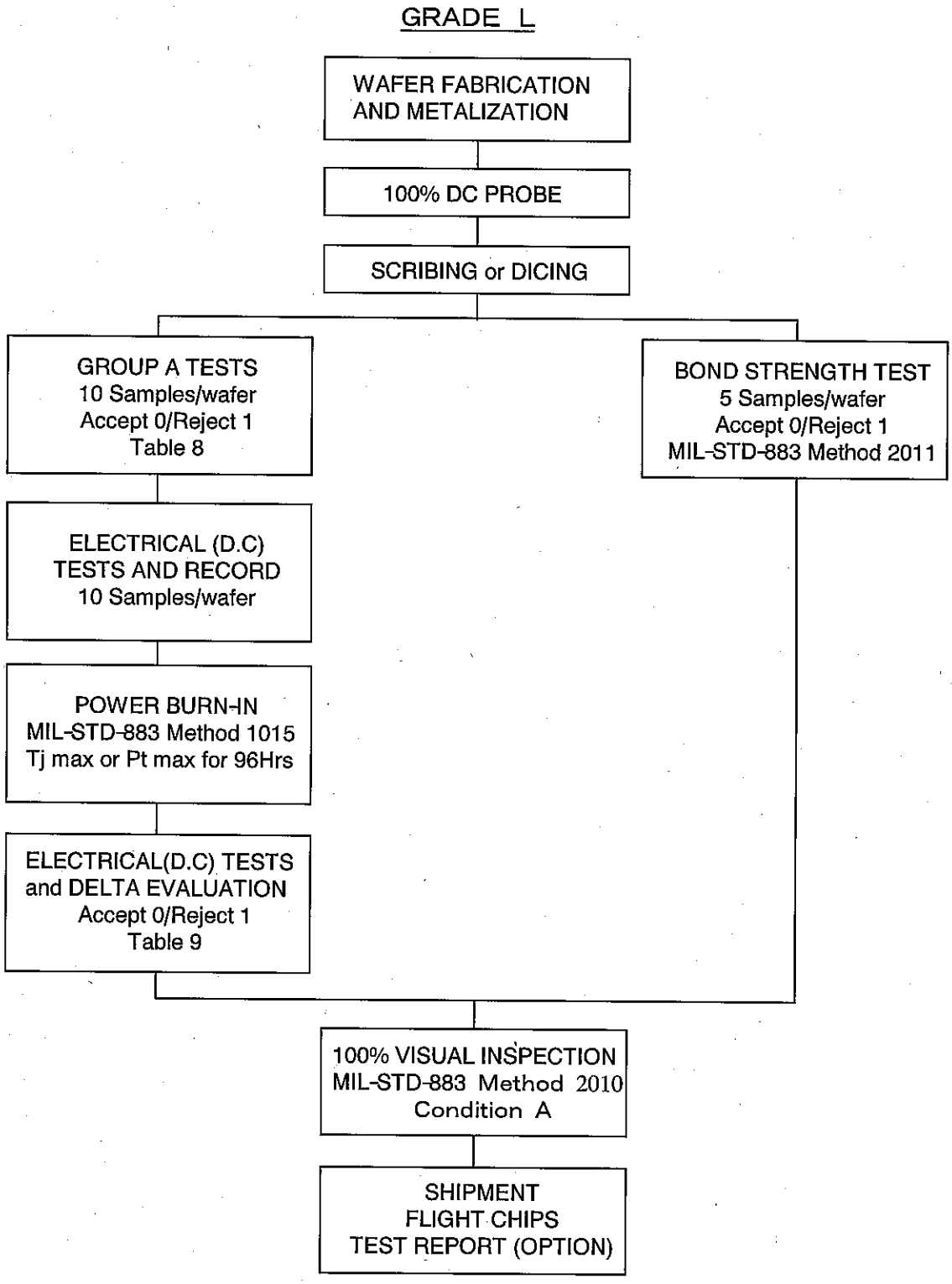
GRADE L



Note Test report (option) includes the following
Summary Sheet.
Bond strength Test Data.
Power Burn-in Delta Data.
Group A Test Data.

SiMMIC CHIPS

Fig. 2-2 Screening Flow SiMMIC Chips



Note Test report (option) includes the following
- Summary Sheet.
- Bond strengthTest Data.
- Power Burn-in Delta Data.
- Group A Test Data.

Table 6 Preconditioning and Screening for Packaged Silicon MMICs

EXAMINATION OR TEST	MIL-STD 883 METHOD	CONDITION	RELIABILITY GRADE L
Bond Strength Test	2011	Condition D	n=5
Die Shear Test	2019		n=5
Internal Visual (Pre-cap) Inspection	2010	Condition B	100%
Pre Cap Bake	—	2Hr Ta=200℃	100%
High Temperature Storage	1008	24Hrs at Ta=200℃	100%
Temperature Cycling	1010	Condition D -65℃ to +200℃	100%
PIND Test	2020	Condition A	100%
Serialization	—		100%
Electrical Test	—	Table 8	100%
Power Burn-in	1015	Condition B Ta=125℃ 96Hrs min.	100%
Electrical Test and Delta Parameter	—	Table 9	100%
Group A Test	—	Per data sheet and Table 8	100% Note.
Hermetic Fine Leak Gross Leak	1014	Condition A1 5×10^{-9} Pa m^3/sec.Max. Condition C	100%
External Visual Inspection	2009		100%

Note) DC 100%, RF is Sampling Basis or 100%, depending on the parts.

Table 7 - 1 Absolute Maximum Ratings

Ta=25℃

Part No	Symbols	Parameters	Ratings	Units
UPC1677P(L) UPC1677B(L)	Vcc	Supply Voltage	6	V
	Icc	Supply Current	110	V
	PT	Total Power Dissipation	1.5	W
	PIN	Input Power	+10	mA
	Top	Operating Temperature	-55to+150	℃
	Tstg	Storage Temperature	-65to+200	℃
	Rth(j-c)		50	℃/W
UPC1678P(L) UPC1678B(L)	Vcc	Supply Voltage	6	V
	PIN	Input Power	+10	dBm
	PT	Total Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+150	℃
	Tstg	Storage Temperature	-65to+200	℃
	Rth(j-c)		50	℃/W
UPC2708P(L) UPC2708B(L) UPC2711P(L) UPC2711B(L)	Vcc	Supply Voltage	6	V
	PIN	Input Power	+10	dBm
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+150	℃
	Tstg	Storage Temperature	-65to+200	℃
	Rth(j-c)		50	℃/W
UPC2709P(L) UPC2709B(L) UPC2712P(L) UPC2712B(L)	Vcc	Supply Voltage	6	V
	PIN	Input Power	+10	dBm
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+150	℃
	Tstg	Storage Temperature	-65to+200	℃
	Rth(j-c)		50	℃/W

Table 7 - 2 Absolute Maximum Rating

Ta=25°C

Part No	Symbols	Parameters	Ratings	Units
UPC2710P(L) UPC2710B(L) UPC2713P(L) UPC2713B(L)	Vcc	Supply Voltage	6	V
	PIN	Input Power	+10	dBm
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+150	°C
	Tstg	Storage Temperature	-65to+200	°C
	Rth(j-c)		50	°C/W
UPC2726P(L) UPC2726B(L)	Vcc	Supply Voltage	6	V
	PIN	Input Power	0	dBm
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-40to+85	°C
	Tstg	Storage Temperature	-65to+200	°C
	Rth(j-c)		50	°C/W
UPB1508P(L) UPB1508B(L)	Vcc	Supply Voltage	-0.5to+6.0	V
	VIN	Input Voltage	-0.5to+6.0	V
	PIN	Input Power	+10	dBm
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+125	°C
	Tstg	Storage Temperature	-65to+200	°C
	Rth(j-c)		50	°C/W
UPB1509P(L) UPB1509B(L)	Vcc	Supply Voltage	-0.5to+6.0	V
	VIN	Input Voltage	-0.5to+6.0	V
	PIN	Input Power	+10	dBm
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+125	°C
	Tstg	Storage Temperature	-65to+200	°C
	Rth(j-c)		50	°C/W

Table 7 - 3 Absolute Maximum Rating

Ta=25℃

Part No	Symbols	Parameters	Ratings	Units
UPB1510P(L) UPB1510B(L)	Vcc	Supply Voltage	-0.5to+6.0	V
	VIN	Input Voltage	-0.5to+6.0	V
	PIN	Input Power	+10	dBm
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+125	℃
	TSTG	Storage Temperature	-65to+200	℃
	Rth(j-c)		50	℃/W
UPC2758P(L) UPC2758B(L) UPC8106P(L) UPC8106B(L)	Vcc.VPS	Supply Voltage	5.5	V
	PT	Power Dissipation	1.5	W
	Top	Operating Temperature	-55to+150	℃
	TSTG	Storage Temperature	-65to+200	℃
	Rth(j-c)		50	℃/W

Table 8 - 1 Electrical Characteristics : Group A Ta=25°C

Part No	Parameter	Test Condition	Limits		Units
UPC1677P(L) UPC1677B(L)	Icc	Vcc=5V	63	93	mA
	GS	Vcc=5V f=500MHz	22	—	dB
	POUT	Vcc=5V f=500MHz PIN=+3dBm	17.5	—	dBm
UPC1678P(L) UPC1678B(L)	Icc	Vcc=5V	40	60	mA
	GS1	Vcc=5V f=500MHz	21	—	dB
	GS2	Vcc=5V f=1.7GHz	18	—	dB
	POUT	Vcc=5V f=500MHz PIN=+3dBm	15.5	—	dBm
UPC2708P(L) UPC2708B(L)	Icc	Vcc=5V	20	33	mA
	GS1	Vcc=5V f=1GHz	13	—	dB
	GS2	Vcc=5V f=2.6GHz	10	—	dB
	POUT	Vcc=5V f=1GHz PIN=+0dBm	7.5	—	dBm
	NF	Vcc=5V f=1GHz	—	8	dB
UPC2709P(L) UPC2709B(L)	Icc	Vcc=5V	19	32	mA
	GS1	Vcc=5V f=1GHz	21	—	dB
	GS2	Vcc=5V f=2GHz	18	—	dB
	POUT	Vcc=5V f=1GHz PIN=+0dBm	9	—	dBm
	NF	Vcc=5V f=1GHz	—	6.5	dB
UPC2710P(L) UPC2710B(L)	Icc	Vcc=5V	16	29	mA
	GS1	Vcc=5V f=500MHz	30	—	dB
	GS2	Vcc=5V f=900MHz	27	—	dB
	POUT	Vcc=5V f=500MHz PIN=-10dBm	11	—	dBm
	NF	Vcc=5V f=500MHz	—	5	dB

Table 8 - 2 Electrical Characteristics : Group A Ta=25°C

Part No	Parameter	Test Condition	Limits		Units
UPC2711P(L) UPC2711B(L)	Icc	Vcc=5V	9	15	mA
	GS1	Vcc=5V f=1GHz	11	—	dB
	GS2	Vcc=5V f=2.5GHz	8	—	dB
	POUT	Vcc=5V f=1GHz PIN=-5dBm	-3	—	dBm
	NF	Vcc=5V f=1GHz	—	6.5	dB
UPC2712P(L) UPC2712B(L)	Icc	Vcc=5V	9	15	mA
	GS1	Vcc=5V f=1GHz	18	—	dB
	GS2	Vcc=5V f=2.2GHz	15	—	dB
	POUT	Vcc=5V f=1GHz PIN=-10dBm	0	—	dBm
	NF	Vcc=5V f=1GHz	—	6	dB
UPC2713P(L) UPC2713B(L)	Icc	Vcc=5V	9	15	mA
	GS1	Vcc=5V f=500MHz	26	33	dB
	GS2	Vcc=5V f=0.9GHz	23	—	dB
	POUT	Vcc=5V f=500MHz PIN=+0dBm	4	—	dBm
	NF	Vcc=5V f=500MHz	—	4.5	dB
UPC2726P(L) UPC2726B(L)	Icc	Vcc=5V	8	15	mA
	GP1	Vcc=5V f=400MHz	11	17	dB
	GP2	Vcc=5V f=1000MHz	8	—	dB
	Po(SAT)1	Vcc=5V f=400MHz PIN=-10dBm	-5	—	dBm
	Po(SAT)2	Vcc=5.2V f=400MHz PIN=-3dBm	-2	—	dBm
	NF	Vcc=5V f=400MHz	—	6	dB

Table 8 - 3 Electrical Characteristics : Group A

Ta=25°C

Part No	Parameter	Test Condition	Limits		Units
UPB1508P(L) UPB1508B(L)	Icc	Vcc=5V	7.0	14.5	mA
	fIN1	PIN=-15～+5dBm	0.5	2.7	GHz
	fIN2	PIN=-10～+5dBm	0.5	3.0	GHz
	POUT	Vcc=5V fIN=2GHz PIN=0dBm	-12	—	dBm
UPB1509P(L) UPB1509B(L)	Icc	Vcc=3V	2.5	5.9	mA
	fIN1	PIN=-20～+0dBm, ×1/2	50	500	MHz
	fIN2	PIN=-20～+0dBm, ×1/8	50	500	MHz
	fIN3	PIN=-20～-5dBm, ×1/2	50	700	MHz
	fIN4	PIN=-20～-5dBm, ×1/8	50	1000	MHz
UPB1510P(L) UPB1510B(L)	Icc	Vcc=5V	9.0	19.0	mA
	fIN1	PIN=-15～+5dBm	0.5	2.7	GHz
	fIN2	PIN=-10～+5dBm	0.5	3.0	GHz
	POUT	Vcc=5V fIN=2GHz PIN=0dBm	-12	—	dBm
UPC2758P(L) UPC2758B(L)	Icc	Vcc=3V	6.6	14.8	mA
	CG1	fRF=2GHz fIF=250MHz PRF=-40dBm	14	20	dB
	CG2	fRF=800MHz fIF=130MHz PRF=-40dBm	16	22	dB
	POUT1	fRF=2GHz fIF=250MHz PRF=-10dBm	-7	—	dBm
	POUT2	fRF=800MHz fIF=130MHz PRF=-10dBm	-7	—	dBm
UPC8106P(L) UPC8106B(L)	Icc	Vcc=3V	4.5	13.5	mA
	CG	fRF=1.9GHz PIF=-30dBm fIF=240MHz	4	—	dB
	POUT	fRF=1.9GHz PIF=-10dBm fIF=240MHz	-8	—	dBm

Table 9 Delta Parameters and Criteria for Silicon MMICs

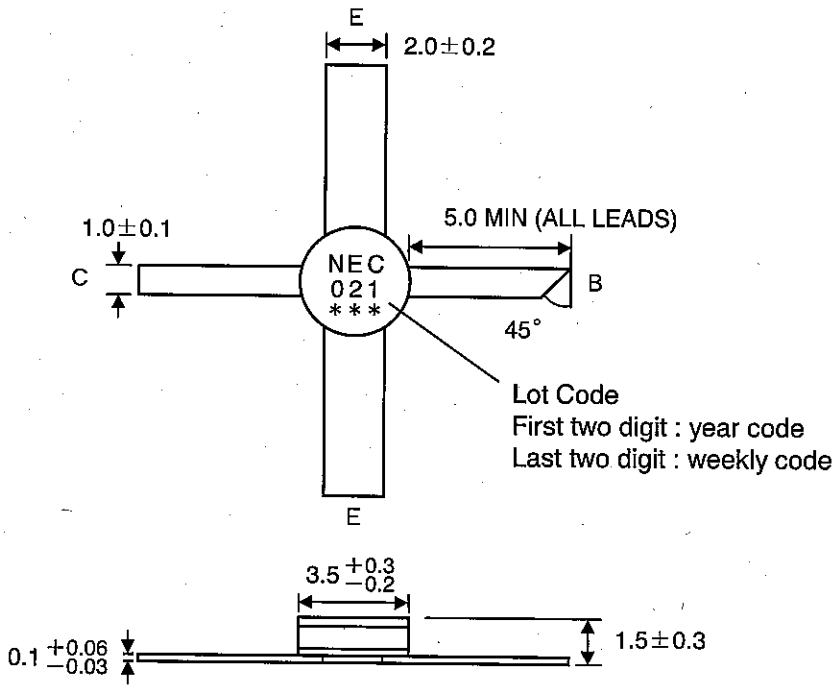
Delta Parameter	Symbol	Maximum Allowable Delta for Power Burn-in
		Grade L Si MMIC
Circuit Current	Icc	±10%

5. PACKAGE (Dimensions, Marking, LEAD Connections)

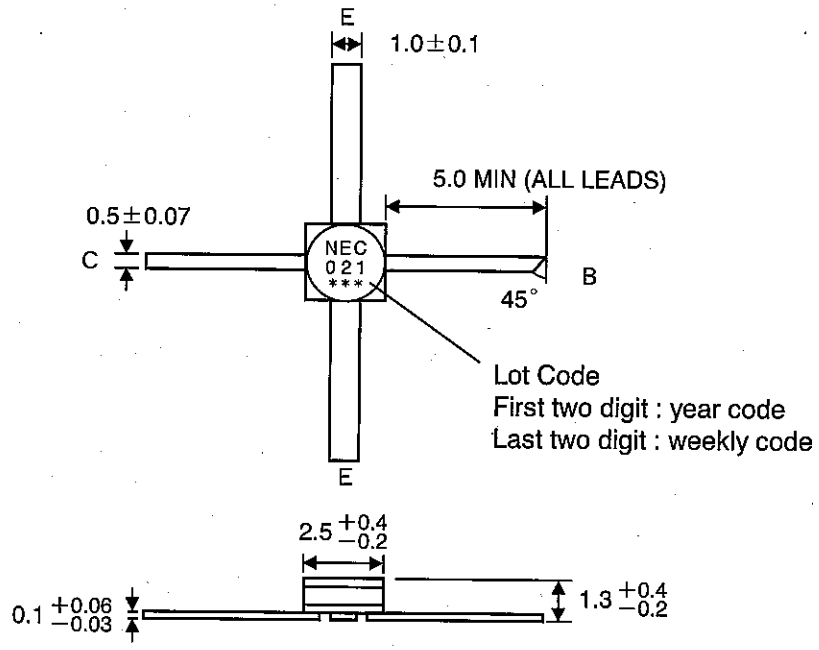
5－1. PACKAGE FOR BIPOLAR TRANSISTOR

(LEAD MATERIAL : KOVAR, LEAD FINISH : Ni／Au plated) (Units in mm)

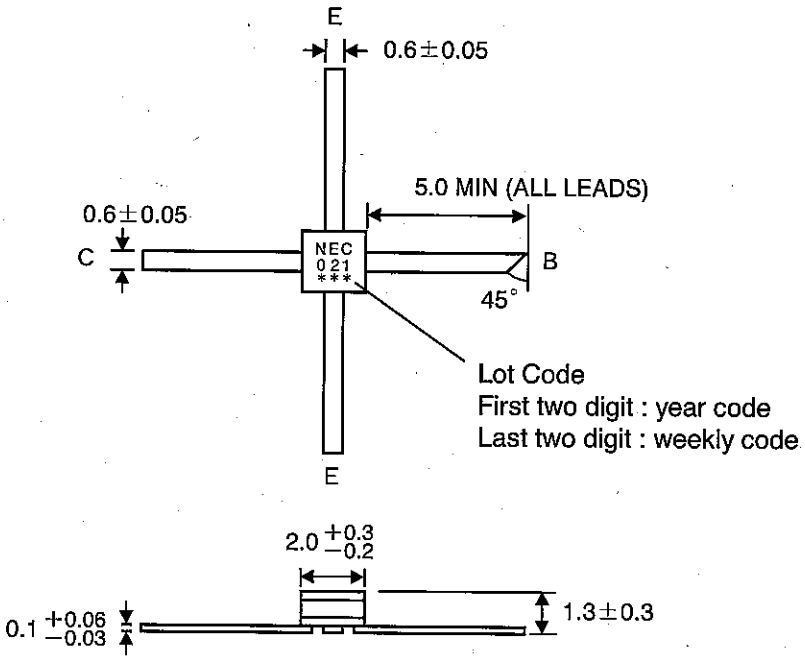
1) NE02103(L)



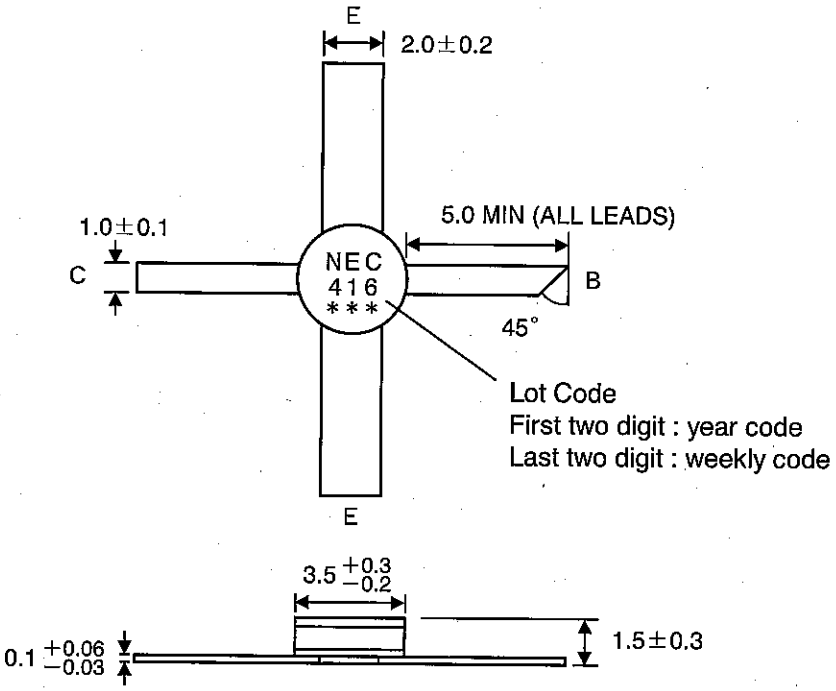
2) NE02107(L)



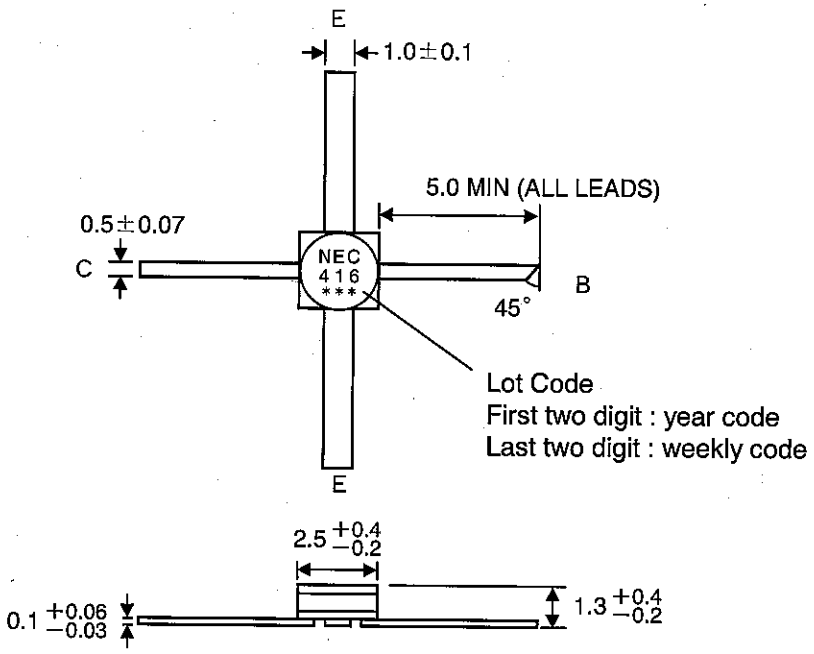
3) NE02108(L)



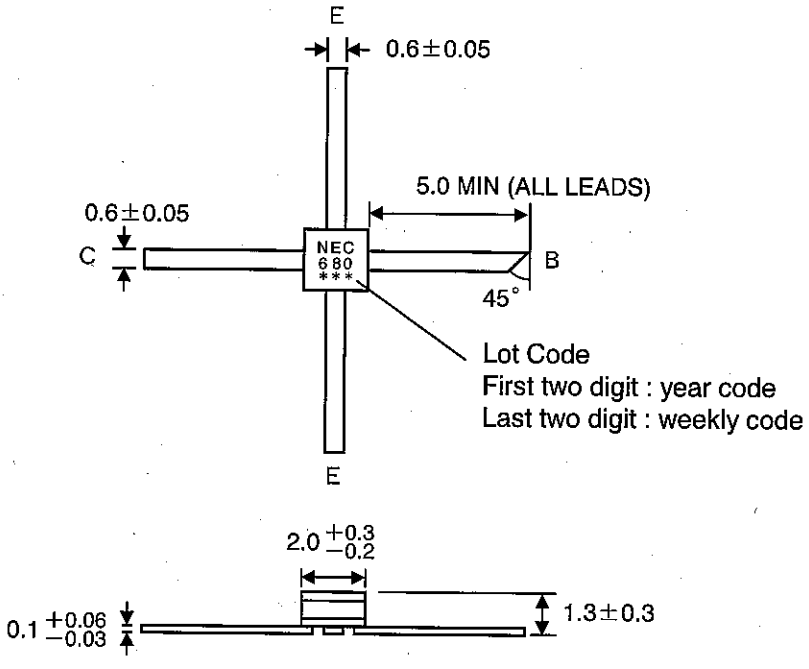
4) NE41603(L)



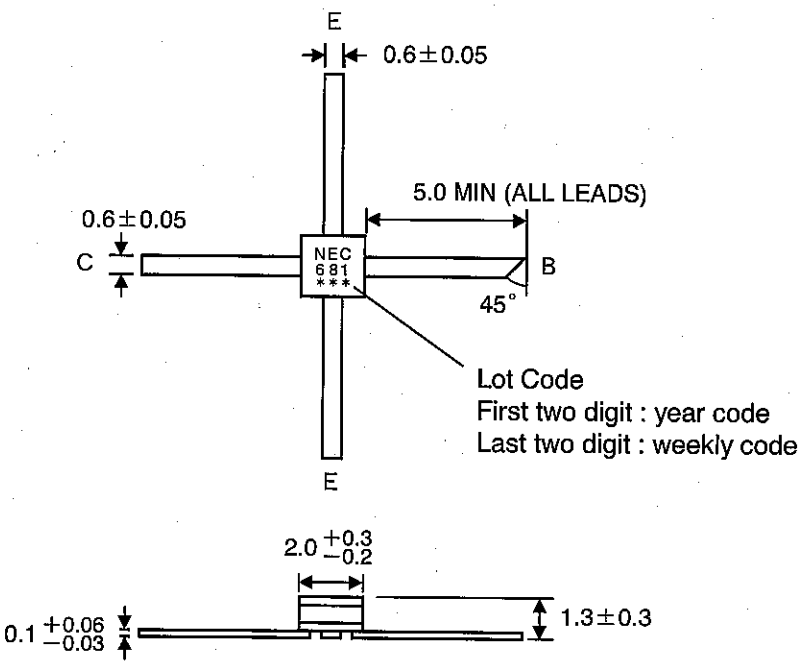
5) NE41607(L)



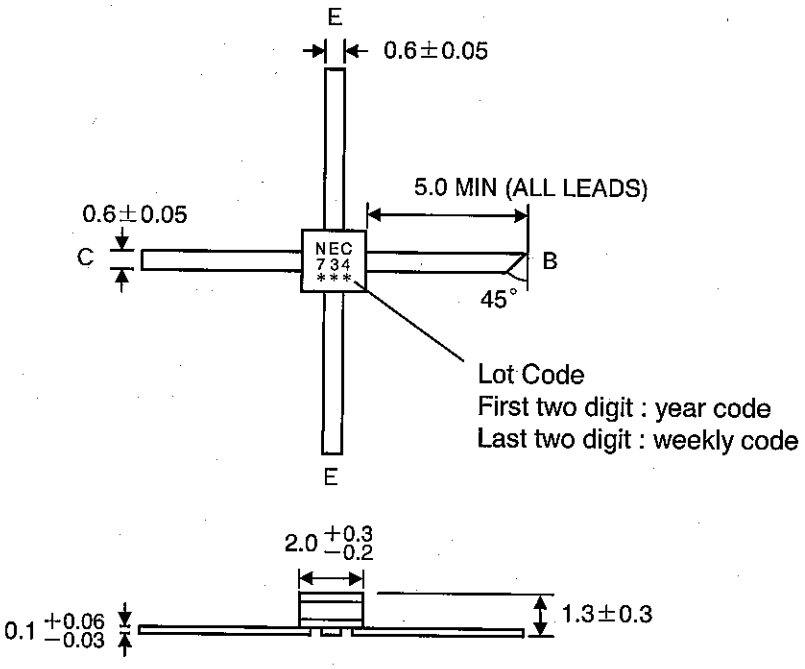
6) NE68008(L)



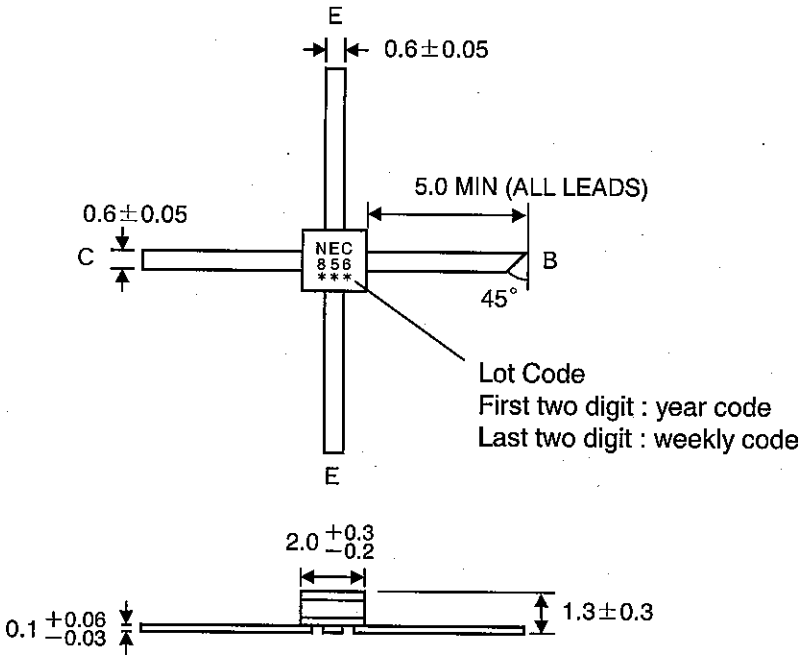
7) NE68108(L)



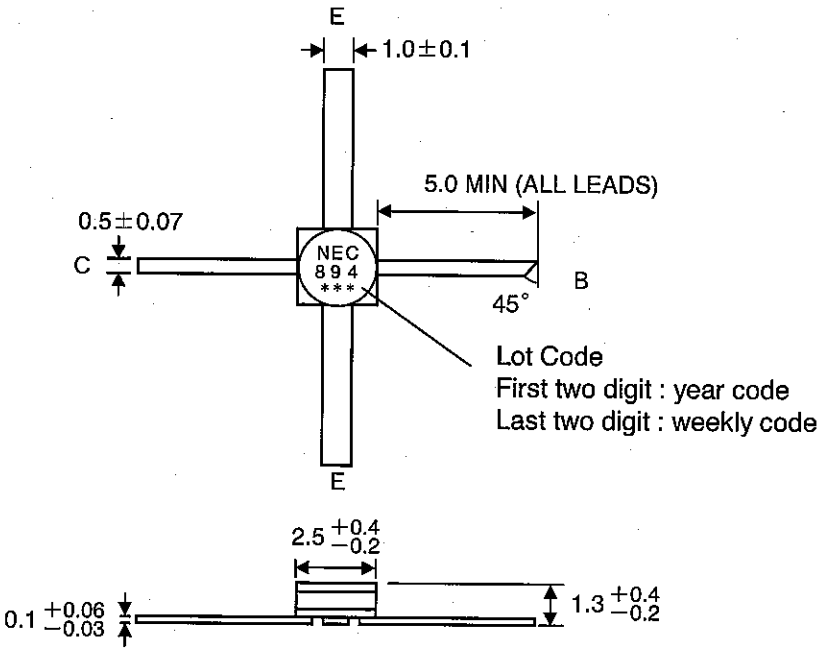
8) NE73408(L)



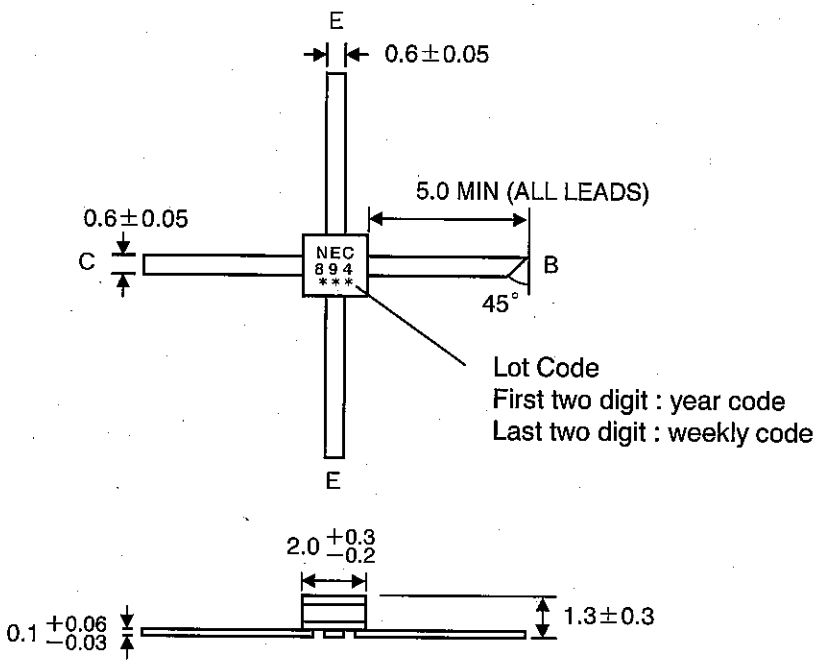
9) NE85608(L)



10) NE89407(L)



11) NE89408(L)

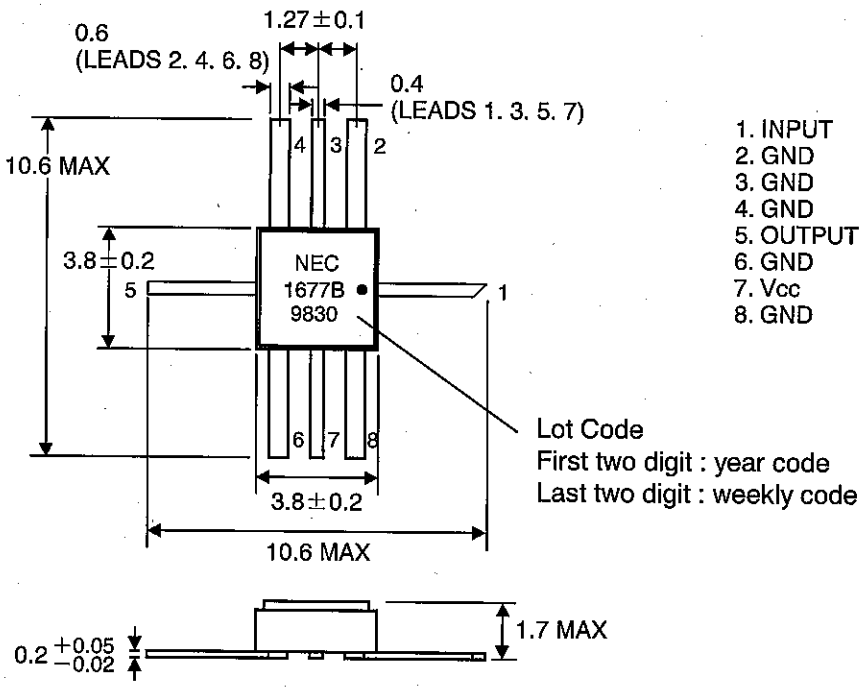

E
0.6±0.05
5.0 MIN (ALL LEADS)
0.6±0.05
C
NEC
894
***
B
45°
Lot Code
First two digit : year code
Last two digit : weekly code
E
2.0 +0.3 −0.2
0.1 +0.06 −0.03
1.3±0.3

5－2 PACKAGE FOR SiMMIC

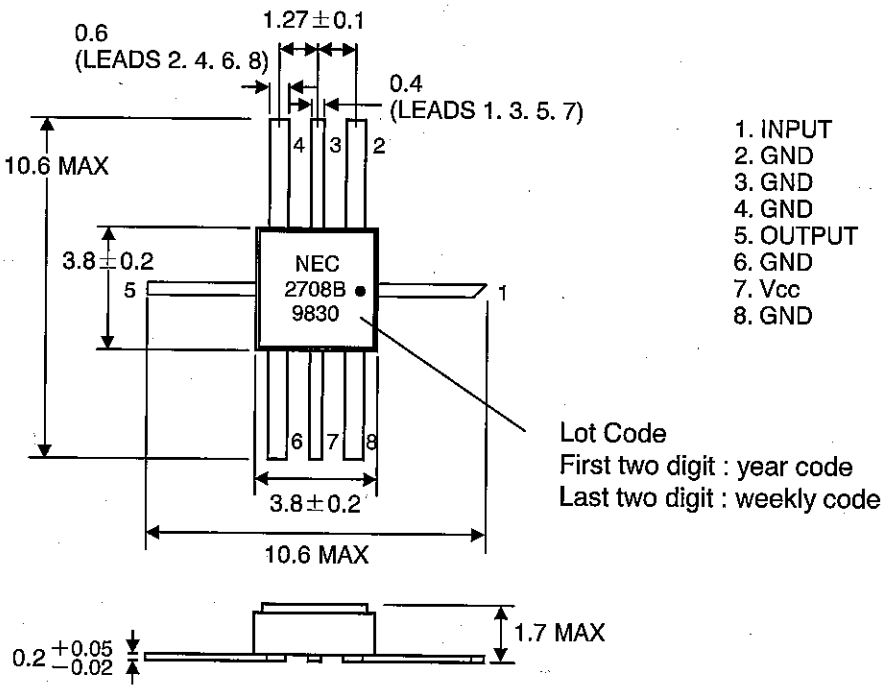
(LEAD MATERIAL : LEAD, FINISH : See the note of this para 5-2)

(Units in mm)

1) UPC1677B(L) , 1678B(L)

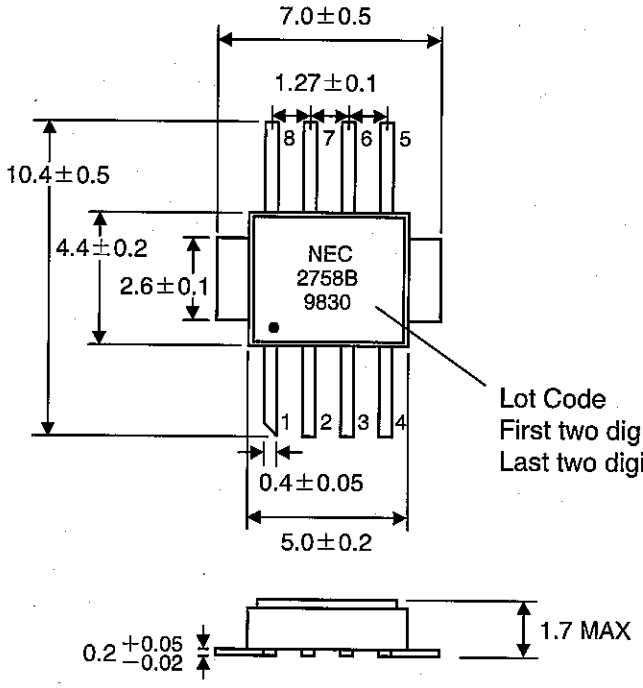


2) UPC2708B(L) , 2709B(L) , 2710B(L) , 2711B(L) , 2712B(L) , 2713B(L)



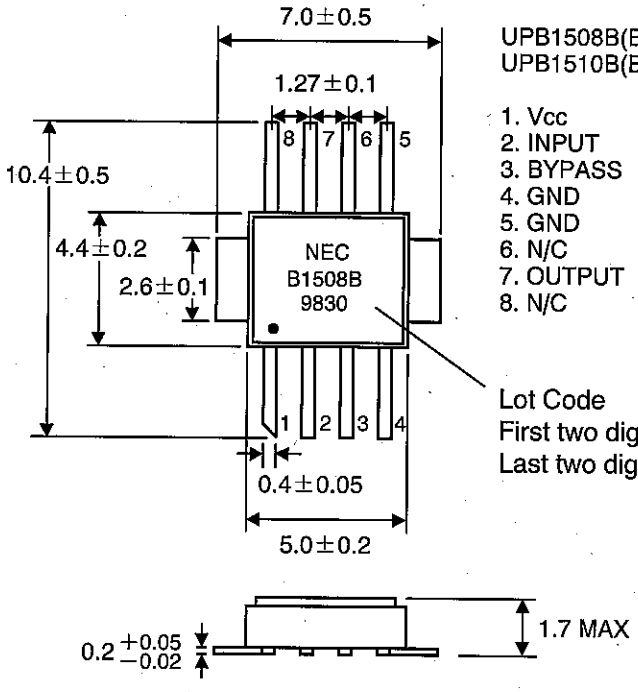
3) UPC2758B(L) , UPC8106B(L)

(Units in mm)



UPC2758B(B)	UPC8106B(B)
1. IF OUTPUT	1. RF INPUT
2. GND	2. GND
3. RF IN PUT	3. IF INPUT
4. NC	4. NC
5. NC	5. NC
6. LO INPUT	6. LO INPUT
7. PS	7. PS
8. Vcc	8. Vcc

4) UPB1508B(L) , 1509B(L) , 1510B(L) , UPC2726B(L)



UPB1508B(B) UPB1510B(B)	UPB1509B(L)	UPC2726B(L)
1. Vcc	1. Vcc 1	1. $\overline{OUT}$
2. INPUT	2. INPUT	2. Vcc
3. BYPASS	3. BYPASS	3. NC
4. GND	4.GND	4. $\overline{IN}$
5. GND	5. M1	5. $\overline{IN}$
6. N/C	6. M2	6. NC
7. OUTPUT	7. OUTPUT	7. NC
8. N/C	8. Vcc 2	8. OUT
		GND: Backside Metal

Note :

LEAD MATERIAL	LEAD FINISH	RART NUMBER
Copper Clad iron	Ni／Au Plated	UPC1677B(L) UPC2710B(L) UPC1678B(L) UPC2711B(L) UPC2708B(L) UPC2712B(L) UPC2709B(L) UPC2713B(L)
Copper Clad KOVAR	Ni／Au Plated	UPB1508B(L) UPC8106B(L) UPB1509B(L) UPC2758B(L) UPB1510B(L) UPC2726B(L)

6. CHIP Design (Pad Connections, Chip Drawings)

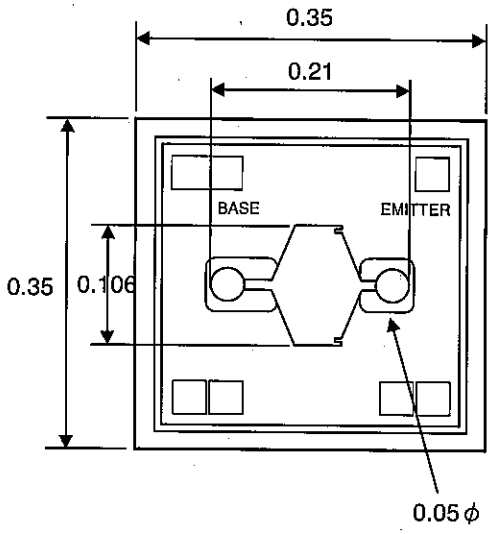
6－1. Chip for Bipolar Transistor

1) NE02100(L)

①Metallization
- －Emitter and Base Metal : Au
- －Bonding Pad Metal : Au
- －Backside Metal : Au

②Chip Configuration
- －Chip Thickness : 160±20μm
- －Chip Size : 0.35×0.35mm
- －Passivation Film : SiO_2

③Chip Drawing (Units in mm)

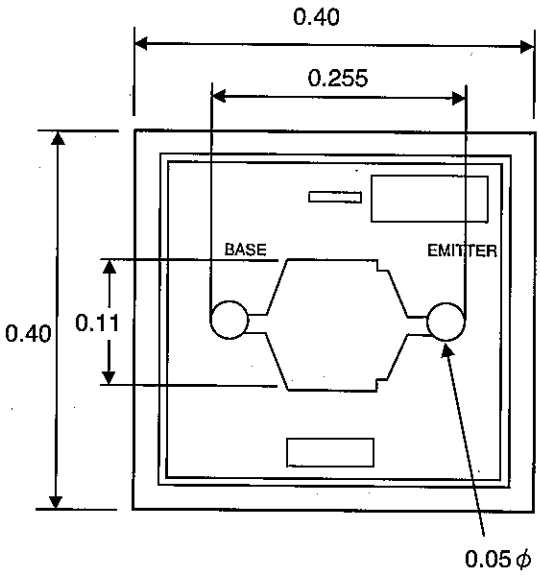


2) NE41600(L)

①Metallization
- －Emitter and Base Metal : Au
- －Bonding Pad Metal : Au
- －Backside Metal : Au

②Chip Configuration
- －Chip Thickness : 160±20μm
- －Chip Size : 0.40×0.40mm
- －Passivation Film : SiO_2

③Chip Drawing (Units in mm)

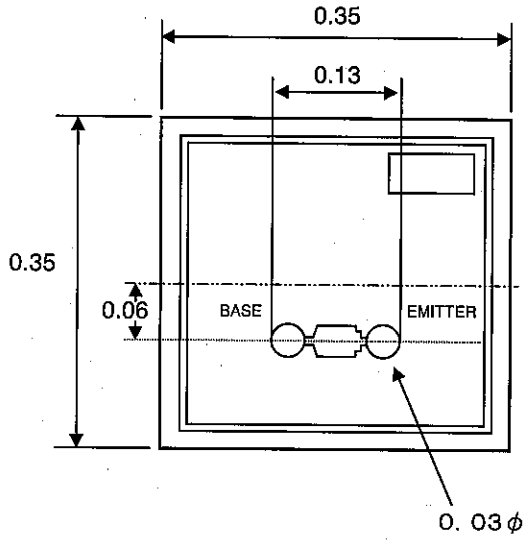


3) NE68000(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 160±20μm
- Chip Size : 0.35×0.35mm
- Passivation Film : SiN

③Chip Drawing (Units in mm)

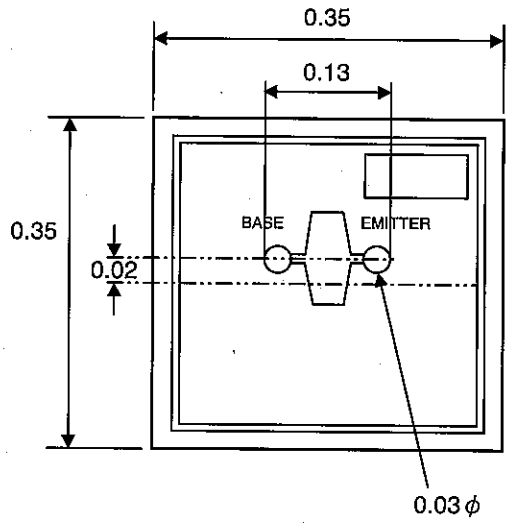


4) NE68100(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 160±20μm
- Chip Size : 0.35×0.35mm
- Passivation Film : SiN

③Chip Drawing (Units in mm)

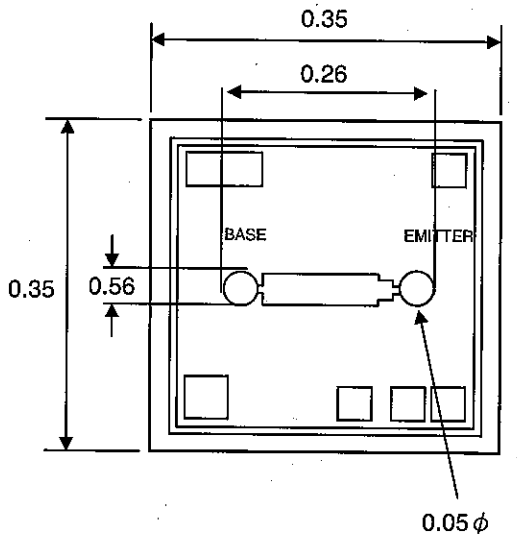


5) NE73400(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 160±20μm
- Chip Size : 0.35×0.35mm
- Passivation Film : SiO_2

③Chip Drawing (Units in mm)

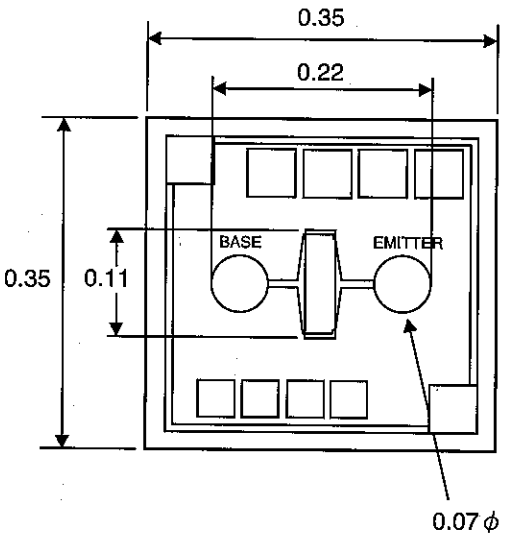


6) NE85600(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 160±20μm
- Chip Size : 0.35×0.35mm
- Passivation Film : SiN

③Chip Drawing (Units in mm)

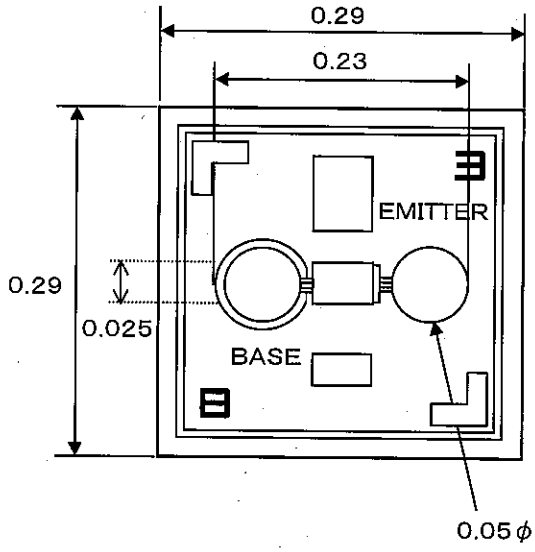


7) NE89400(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 160±20μm
- Chip Size : 0.29×0.29mm
- Passivation Film : SiN

③Chip Drawing (Units in mm)



6. CHIP Design (Pad Connections, Chip Drawings)

6－2. Chip for Si MMIC

1) UPC1677P(L)、1678P(L)

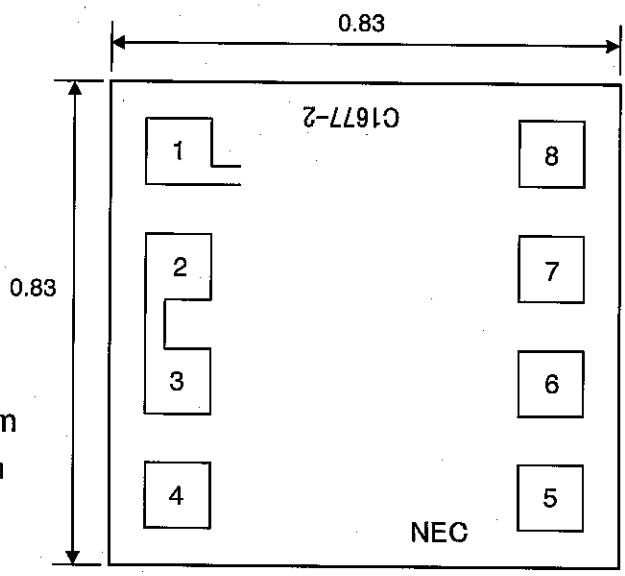
①Metallization

－Emitter and Base Metal : Au
－Bonding Pad Metal : Au
－Backside Metal : Au

②Chip Configuration

－Chip Thickness : 200±20μm
－Chip Size : 0.83×0.83mm
－Bonding Pad Size : 100×100μm
－Passivation Film : SiN

③Chip Drawing (Units in mm)



PAD CONNECTIONS

1. INPUT	5. OUTPUT
2. GND	6. GND
3. GND	7. GND
4. GND	8. Vcc

2) UPC2708P(L)、2709P(L)、2710P(L) 2711P(L)、2712P(L)、2713P(L)

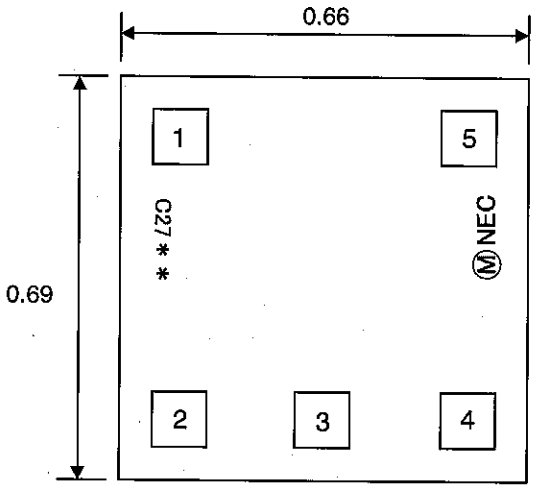
①Metallization

－Emitter and Base Metal : Au
－Bonding Pad Metal : Au
－Backside Metal : Au

②Chip Configuration

－Chip Thickness : 200±20μm
－Chip Size : 0.66×0.69mm
－Bonding Pad Size : 100×100μm
－Passivation Film : SiN

③Chip Drawing (Units in mm)



PAD CONNECTIONS

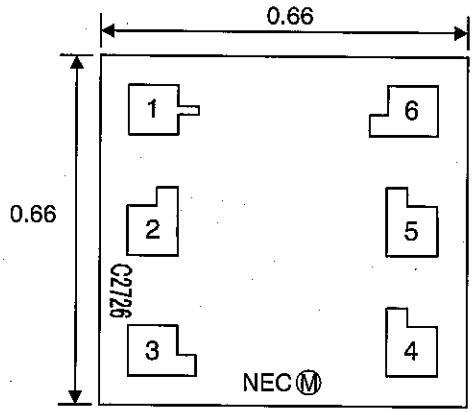
1. INPUT	4. OUTPUT
2. GND	5. Vcc
3. GND	

3) UPC2726P(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 200±20 μm
- Chip Size : 0.66×0.66mm
- Bonding Pad Size : 100×100 μm
- Passivation Film : SiN

③Chip Drawing (Units in mm)



PAD CONNECTIONS

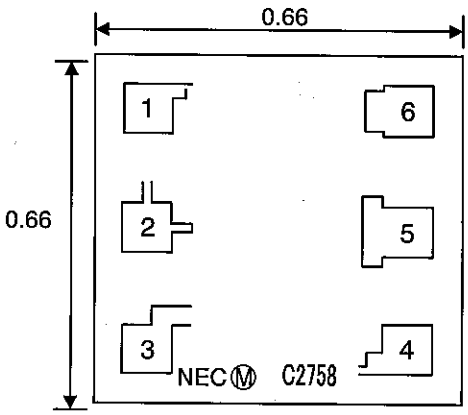
1. IN	4. $\overline{\text{OUT}}$
2. GND	5. $\overline{\text{OUT}}$
3. $\overline{\text{IN}}$	6. Vcc

4) UPC2758P(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 200±20 μm
- Chip Size : 0.66×0.66mm
- Bonding Pad Size : 100×100 μm
- Passivation Film : SiN

③Chip Drawing (Units in mm)



PAD CONNECTIONS

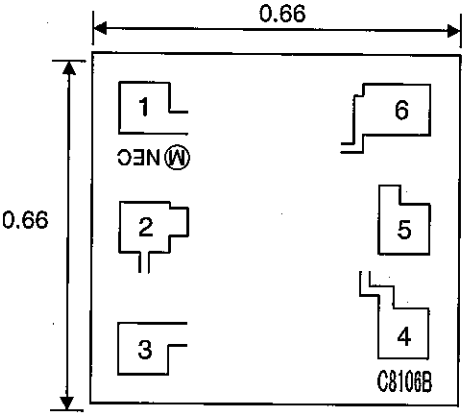
1. IF OUTPUT	4. LO INPUT
2. GND	5. PS
3. RF INPUT	6. Vcc

5) UPC8106P(L)

①Metallization
- Emitter and Base Metal : Au
- Bonding Pad Metal : Au
- Backside Metal : Au

②Chip Configuration
- Chip Thickness : 200±20 μm
- Chip Size : 0.66×0.66mm
- Bonding Pad Size : 100×100 μm
- Passivation Film : SiN

③Chip Drawing (Units in mm)



PAD CONNECTIONS

1. RF OUTPUT	4. LO INPUT
2. GND	5. PS
3. IF INPUT	6. Vcc

5) UPB1508P(L)、1510P(L)

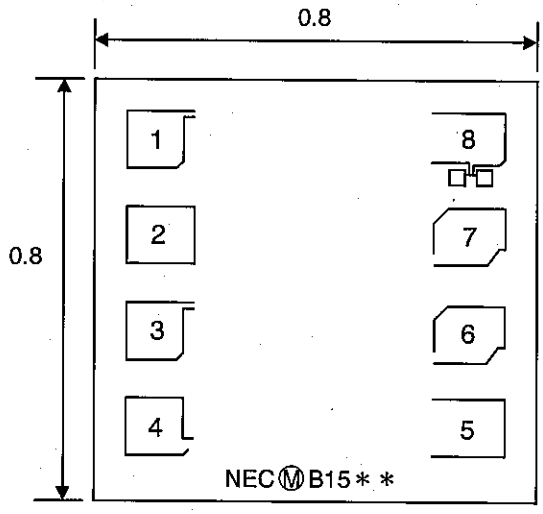
①Metallization

－Emitter and Base Metal : Au
－Bonding Pad Metal : Au
－Backside Metal : Au

②Chip Configuration

－Chip Thickness : 200±20 μm
－Chip Size : 0.8×0.8mm
－Bonding Pad Size : 100×100 μm
－Passivation Film : SiN

③Chip Drawing (Units in mm)



PAD CONNECTIONS

1. GND	5. Vcc
2. N／D	6. IN
3. OUT	7. INb
4. N／D	8. GND

6) UPB1509P(L)

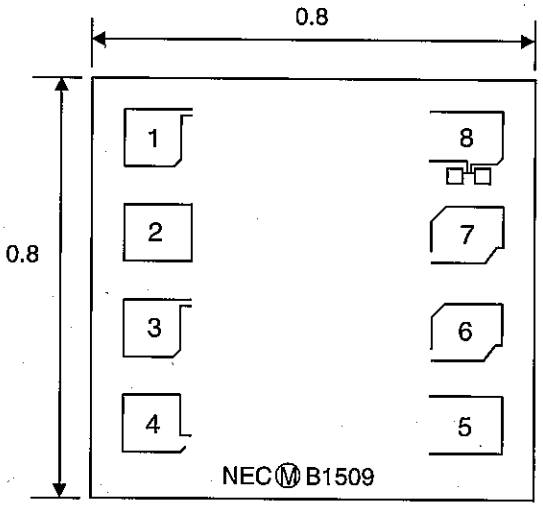
①Metallization

－Emitter and Base Metal : Au
－Bonding Pad Metal : Au
－Backside Metal : Au

②Chip Configuration

－Chip Thickness : 200±20 μm
－Chip Size : 0.8×0.8mm
－Bonding Pad Size : 100×100 μm
－Passivation Film : SiN

③Chip Drawing (Units in mm)



PAD CONNECTIONS

1. M1	5. Vcc1
2. M2	6. IN
3. OUT	7. INb
4. Vcc2	8. GND

GET-30698

Revision Change Record (Appendix 1/1)

Revision	Description	Date	Prepared	Approved
A	Original Issue	April 1, '98 April 1, '98	A.Horita T.Wako K.Yamanaka	M.Itoh M.Matsuo
B	Added NE680##(L) in Table Ⅰ,Ⅲand Ⅳ	Dec.18, '98	A.Horita T.Wako K.Yamanaka	M.Ishino M.Matsuo
C	Added UPB15##(L) in Table Ⅰ,Ⅶand Ⅷ	March.5, '98	A.Horita T.Wako K.Yamanaka	M.Ishino M.Matsuo
D	Revised for Lead Material of SiMMIC Added note "discon" for prescaler	September. 2, '99	T.Wako K.Yamanaka	M. Matsuo M. Ishino
E	·Added UPC2726B(L) in Table Ⅰ, Ⅶand Ⅷ ·Reviewed Rth in Table3-1 ·Page 5/37, MIL-STD-883 Method 2010 of 100% INTERNAL VISUAL INSPECTION is changed to MIL-STD-750 Method 2072 ·The same note as table 2 is added in Table6	March. 5, '02	T.Wako Y.Sato	K.Itoh T.Yokokawa
F	· Added New Release NE89400(L) ,07(L) and,08(L) in Table Ⅰ,Ⅲ and Ⅳ. · Added the parts to phased out to Table1. · Deleted UPB584B(L),585B(L) and 587B(L) · Added note "phased out for Tr. and Amp. · Page 7/37: Added "NEC Specification" for applicable Internal Visual Inspection specification · Deleted "10Cycles Grade D" for Temp. Cycling Condition. · Changed to 5×10^{-9}Pam^3/sec.Max. for SI unit Fine Leak criteria · Page15/37 :added "2Hr Ta=200℃" for Pre Cap Bake Condition · Changed to 5×10^{-9}Pam^3/sec.Max. for SI unit Fine Leak criteria · Page31/37 :Chip Thickness for NE02100 (L) changed to 160±20um · Page35/37 :Chip Thickness for UPC1677P (L), 1678P(L) changed to 200±20um	December. 16'02.	A. Horita T. Wako Y. Satoh	K. Itoh T. Yokokawa