



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

NPN Epitaxial Planar Silicon Transistor

MCH4013 — UHF to X Band Low-Noise Amplifier and OSC Applications

Features

- High cut-off frequency : $f_T=22.5\text{GHz}$ typ ($V_{CE}=3\text{V}$)
- Low operating voltage
- High gain : $|S_{21e}|^2=16\text{dB}$ typ ($f=2\text{GHz}$)

Specifications

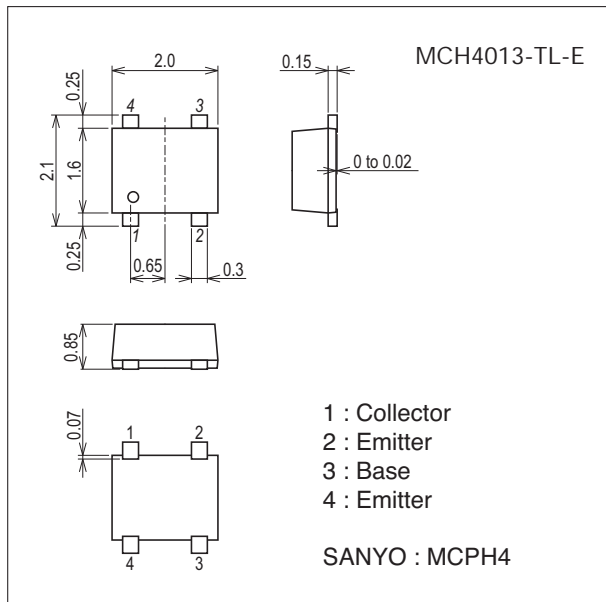
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		10	V
Collector-to-Emitter Voltage	V_{CEO}		3.5	V
Emitter-to-Base Voltage	V_{EBO}		2.5	V
Collector Current	I_C		15	mA
Collector Dissipation	P_C		50	mW
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Package Dimensions

unit : mm (typ)

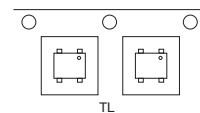
7020A-002



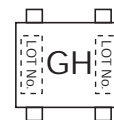
Product & Package Information

- Package : MCPH4
- JEITA, JEDEC : SC-82, SC-82AB, SOT-343
- Minimum Packing Quantity : 3,000 pcs./reel

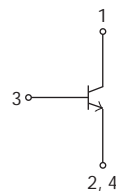
Packing Type : TL



Marking



Electrical Connection



MCH4013

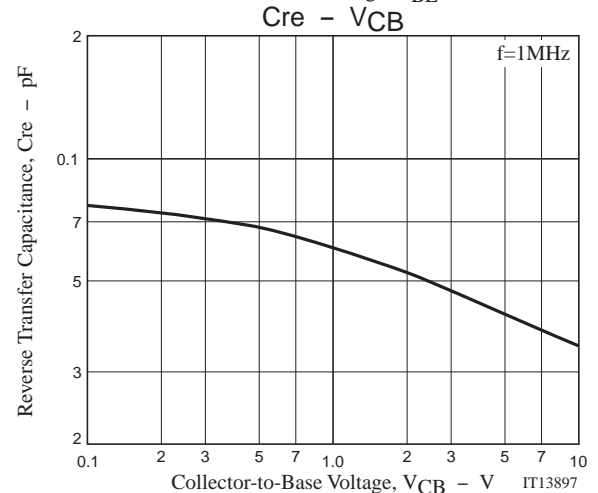
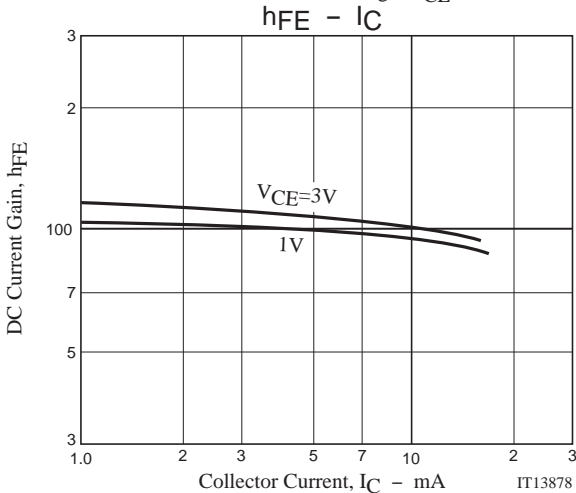
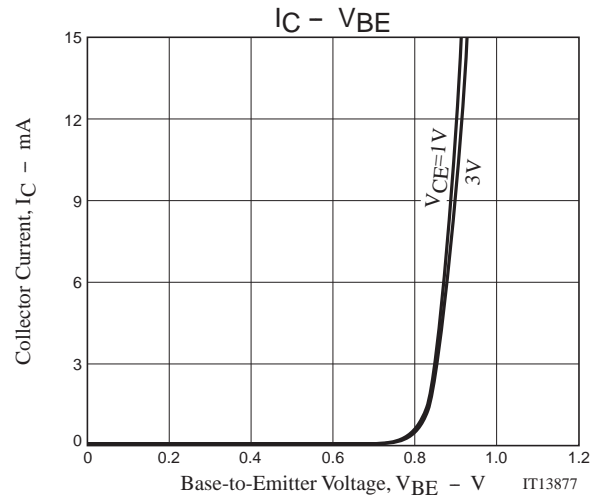
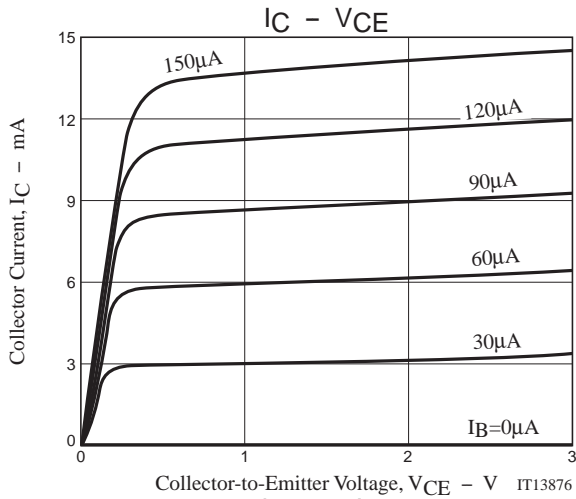
Electrical Characteristics at Ta=25°C

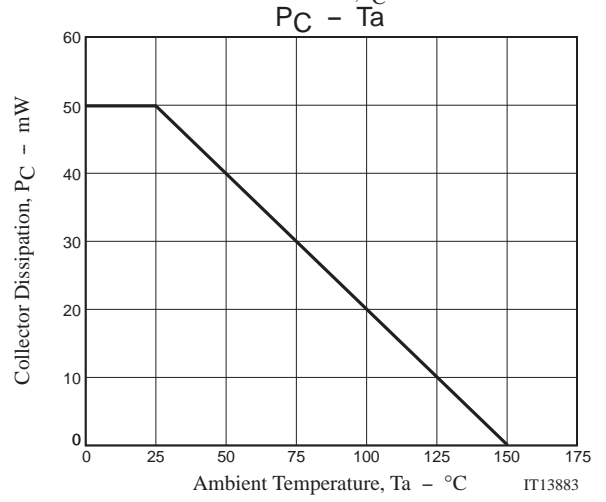
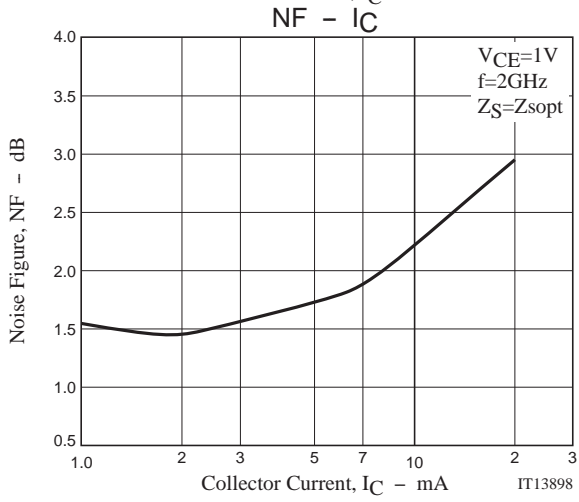
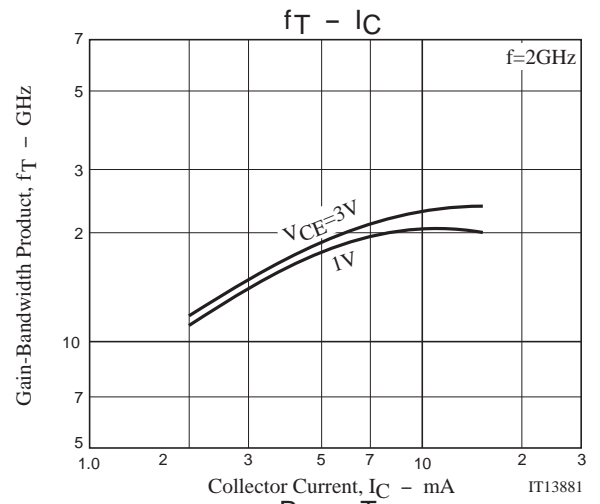
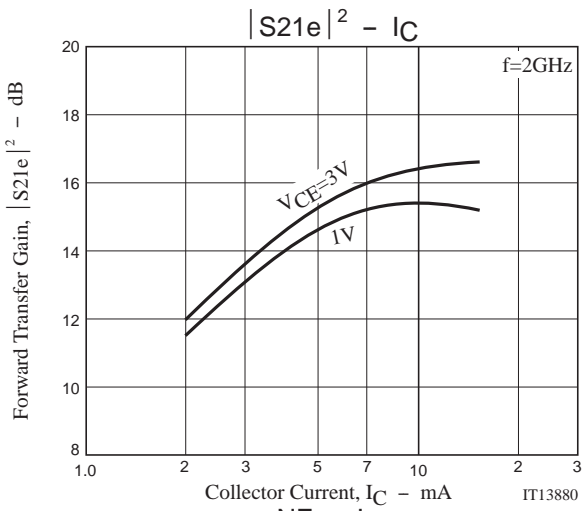
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=5V, I_E=0A$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=1V, I_C=0A$			1.0	μA
DC Current Gain	h_{FE}	$V_{CE}=1V, I_C=5mA$	70		150	
Gain-Bandwidth Product	f_T	$V_{CE}=3V, I_C=10mA$	17	22.5		GHz
Reverse Transfer Capacitance	C_{re}	$V_{CB}=1V, f=1MHz$		0.06		pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=3V, I_C=10mA, f=2GHz$	12	16		dB
Noise Figure	NF	$V_{CE}=1V, I_C=2mA, f=2GHz$		1.5	2.0	dB

Note) Pay attention to handling since it is liable to be affected by static electricity due to the high-frequency process adopted.

Ordering Information

Device	Package	Shipping	memo
MCH4013-TL-E	MCPH4	3,000pcs./reel	Pb Free





MCH4013

Embossed Taping Specification

MCH4013-TL-E

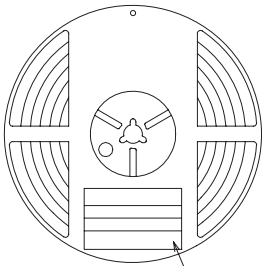
1. Packing Format

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)
MCPH4	MCP4	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

Reel label, Inner box label
(unit:mm)

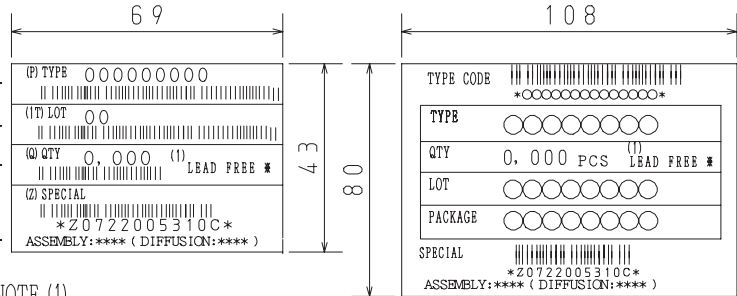
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label



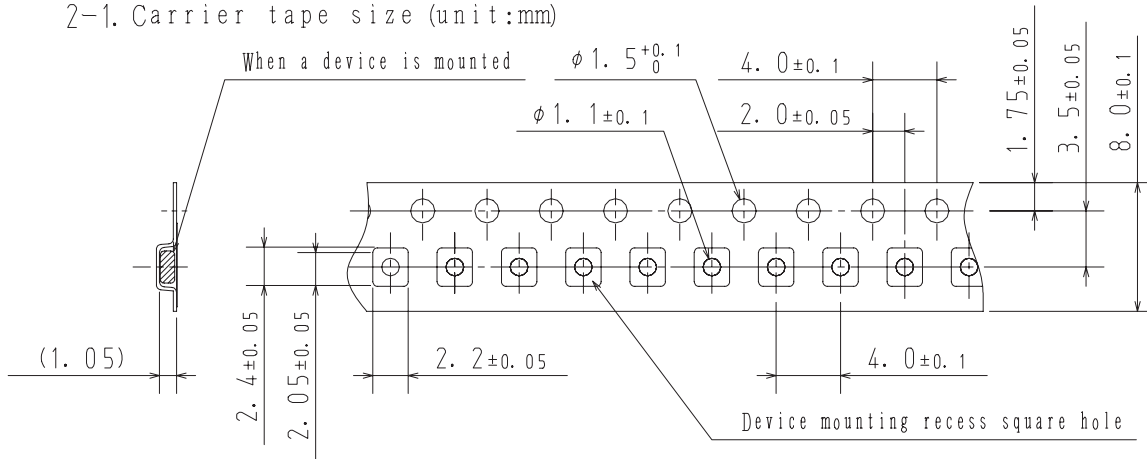
NOTE (1)

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

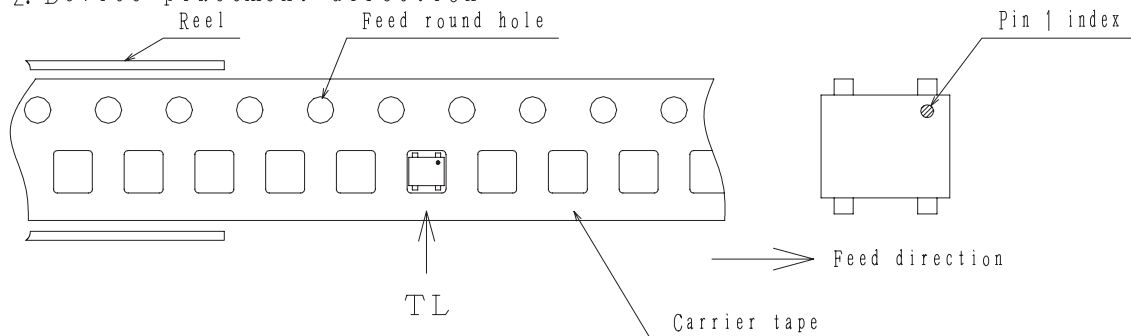
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



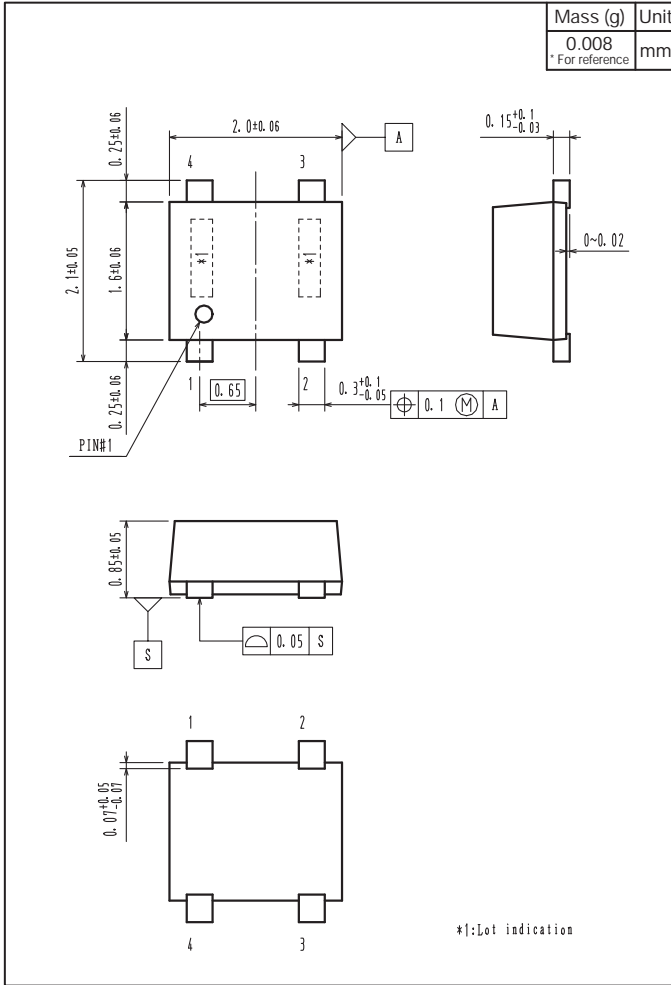
2-2. Device placement direction



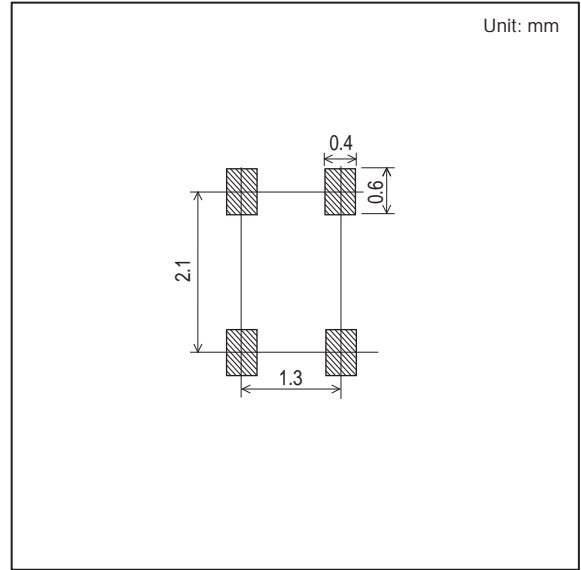
Those with pin 1 index on the feed hole side.....TL

MCH4013

Outline Drawing MCH4013-TL-E



Land Pattern Example



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