



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

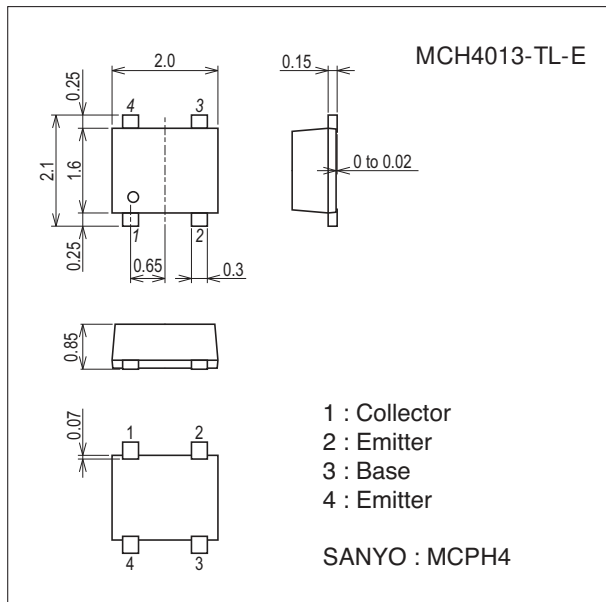
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

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)

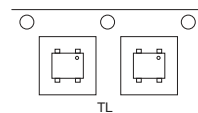
7020A-002



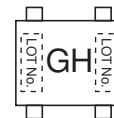
Product & Package Information

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

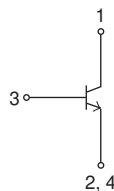
Packing Type : TL



Marking



Electrical Connection



MCH4013

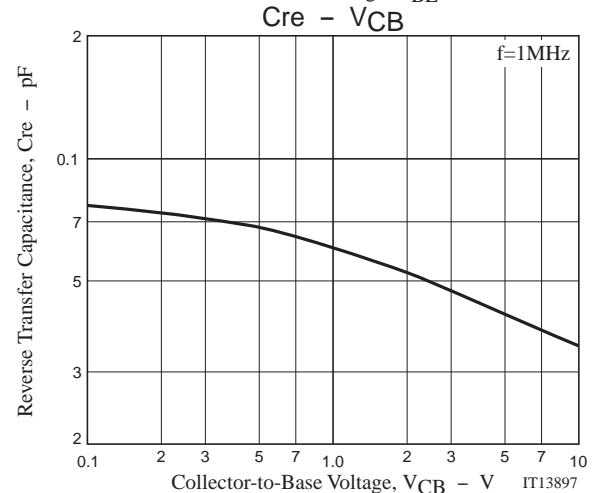
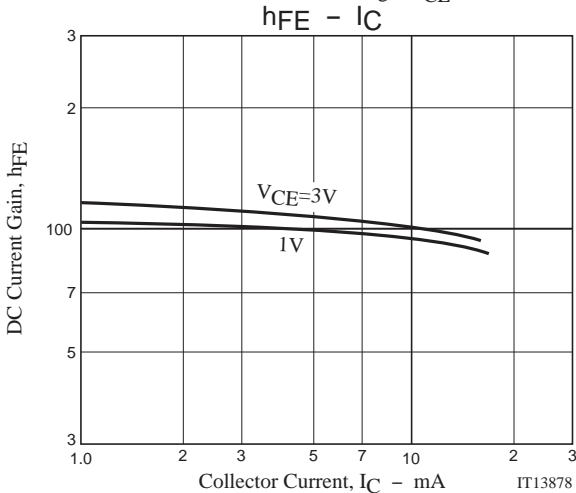
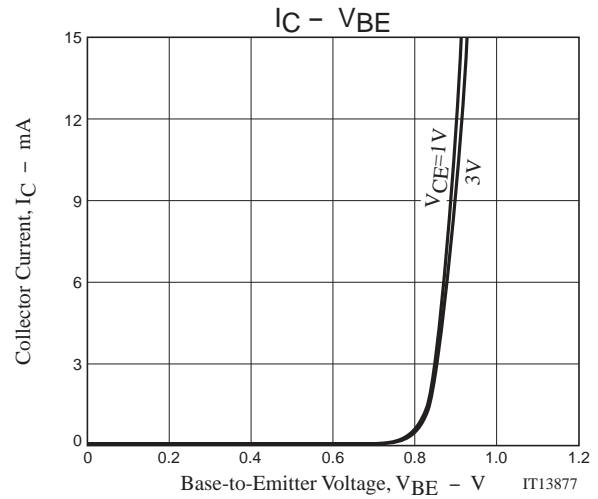
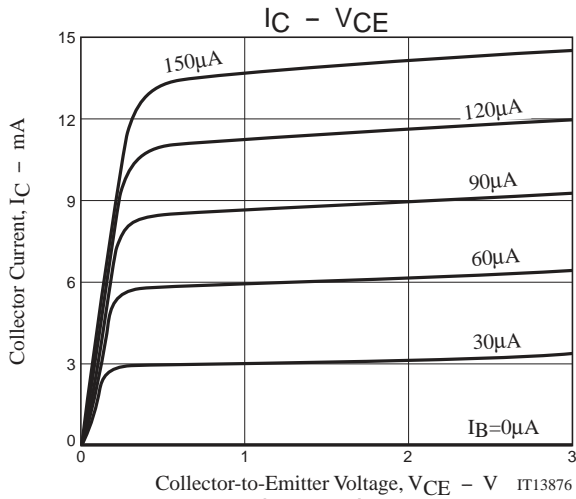
Electrical Characteristics at Ta=25°C

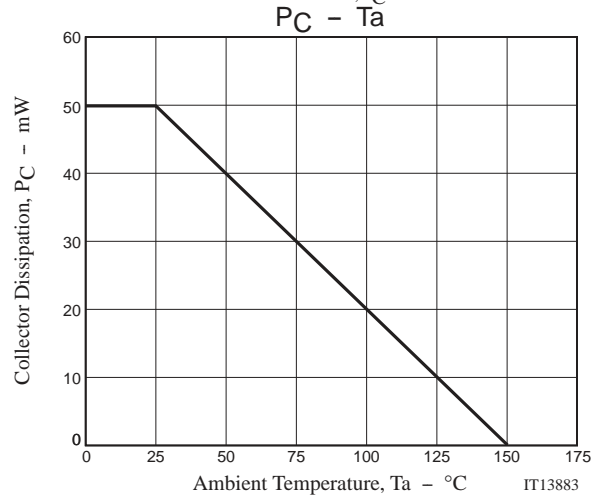
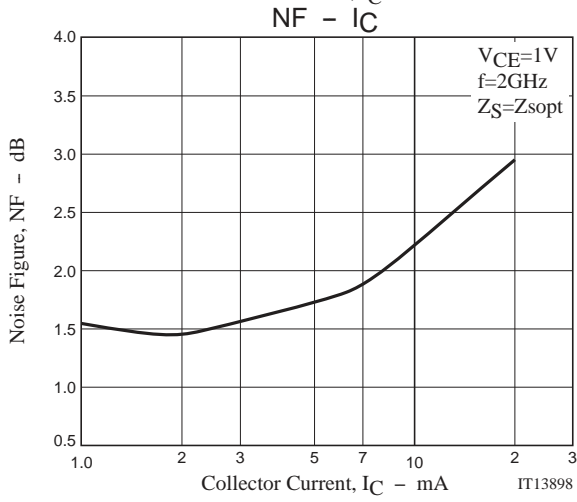
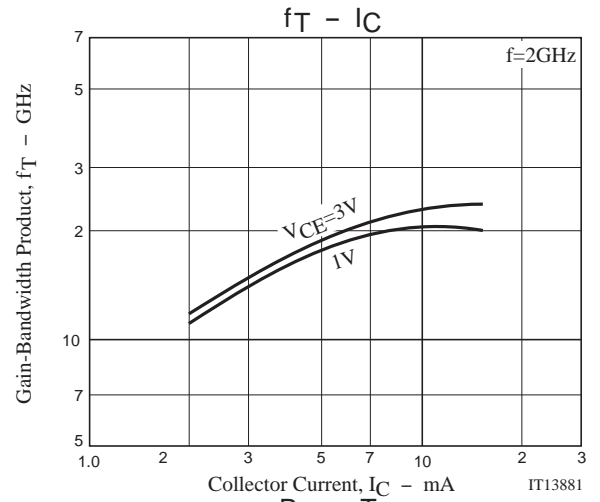
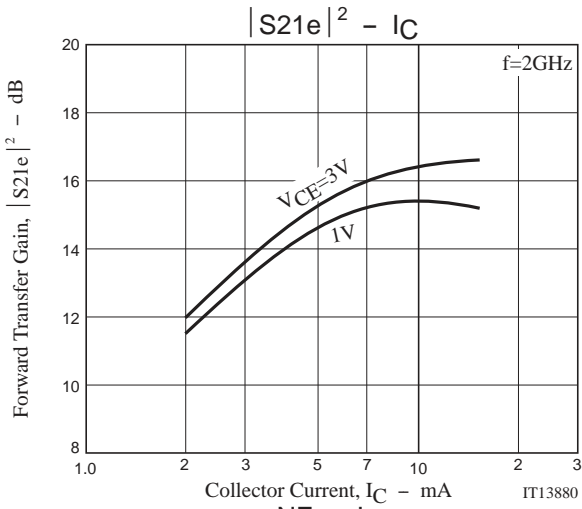
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V _{CB} =5V, I _E =0A			1.0	μA
Emitter Cutoff Current	I _{EBO}	V _{EB} =1V, I _C =0A			1.0	μA
DC Current Gain	h _{FE}	V _{CE} =1V, I _C =5mA	70		150	
Gain-Bandwidth Product	f _T	V _{CE} =3V, I _C =10mA	17	22.5		GHz
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

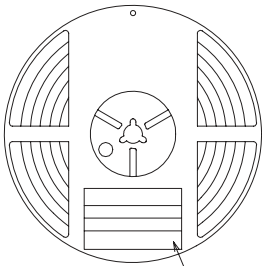
1. Packing Format

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)

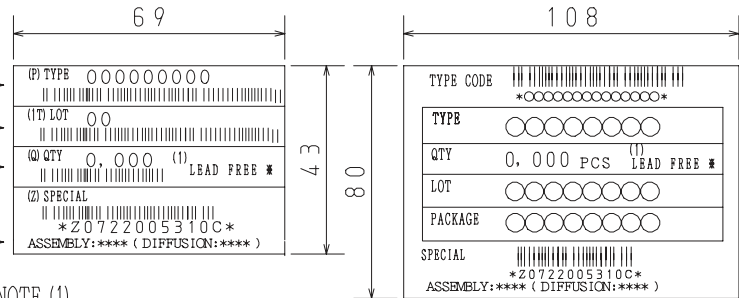
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label



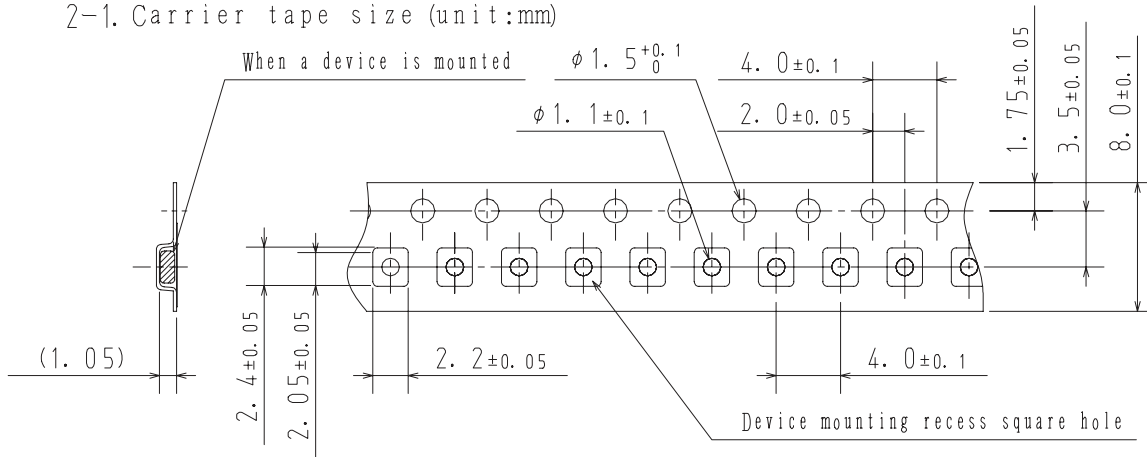
NOTE (1)

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

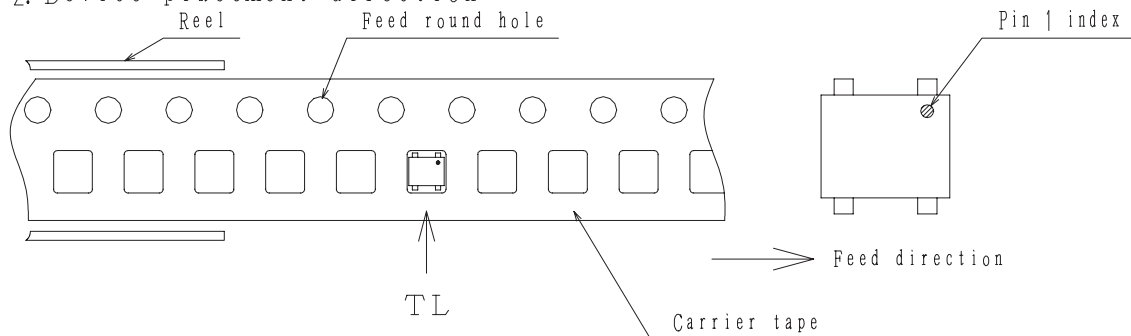
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



2-2. Device placement direction

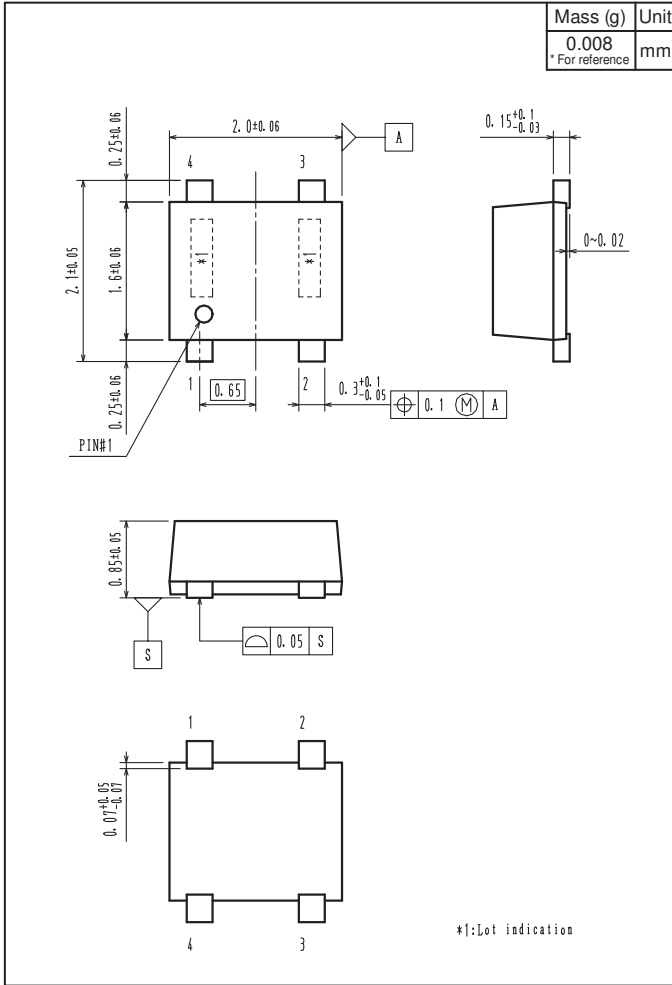


Those with pin 1 index on the feed hole side.....TL

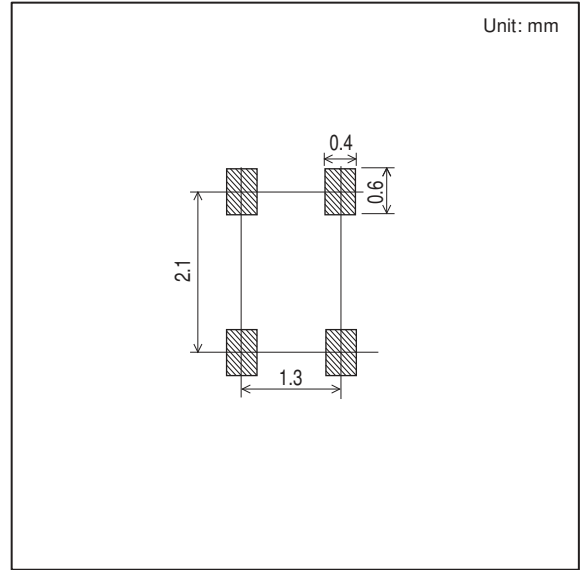
MCH4013

Outline Drawing

MCH4013-TL-E



Land Pattern Example



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