Ordering number : EN7483A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

PNP Epitaxial Planar Silicon Transistor

12A02MH — Low-Frequency General-Purpose Amplifier Applications

Applications

- Low-frequency Amplifier, high-speed switching, small motor drive, muting circuit

Features

- Large current capacity
- Low collector-to-emitter saturation voltage (resistance) R_{CE} (sat) typ.=285mΩ [I_C=1A, I_B=50mA]
- Small ON-resistance (Ron)

Specifications

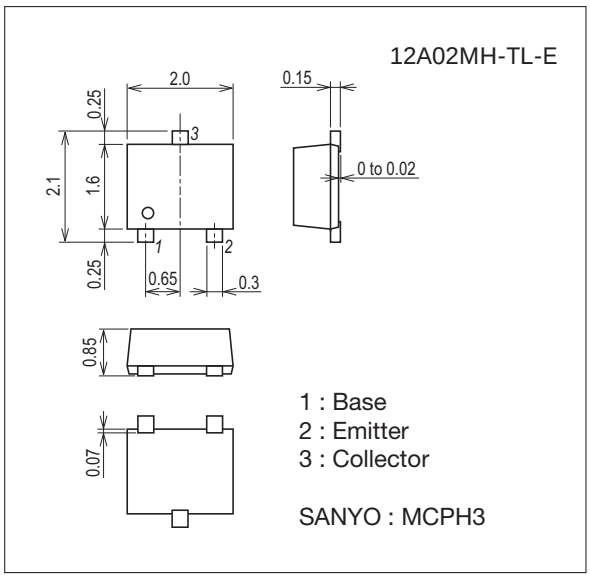
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		−15	V
Collector-to-Emitter Voltage	V_{CEO}		−12	V
Emitter-to-Base Voltage	V_{EBO}		−5	V
Collector Current	I_C		−1	A
Collector Current (Pulse)	I_{CP}		−2	A
Collector Dissipation	P_C	When mounted on ceramic substrate (600mm²×0.8mm)	600	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

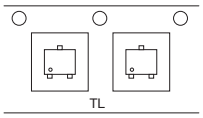
7019A-004



Product & Package Information

- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

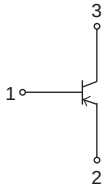
Packing Type : TL



Marking



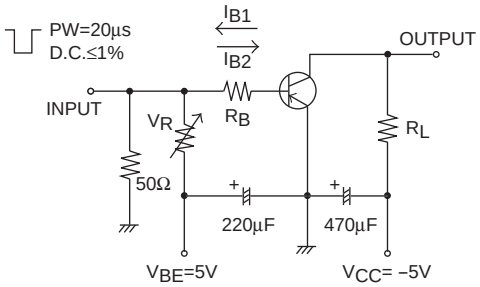
Electrical Connection



Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}= −12V, I_E=0A			−100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}= −4V, I_C=0A			−100	nA
DC Current Gain	h_{FE}	V_{CE}= −2V, I_C= −10mA	300		700	
Gain-Bandwidth Product	f_T	V_{CE}= −2V, I_C= −50mA		450		MHz
Output Capacitance	Cob	V_{CB}= −10V, f=1MHz		6		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C= −400mA, I_B= −20mA		−120	−240	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C= −400mA, I_B= −20mA		−0.9	−1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C= −10μA, I_E=0A	−15			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C= −1mA, R_{BE}=∞	−12			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E= −10μA, I_C=0A	−5			V
Turn-ON Time	t_{on}	See specified Test Circuit.		30		ns
Storage Time	t_{stg}			75		ns
Fall Time	t_f			15		ns

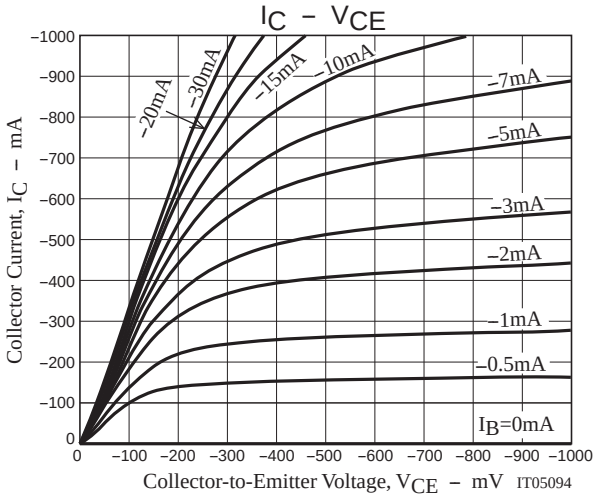
Switching Time Test Circuit

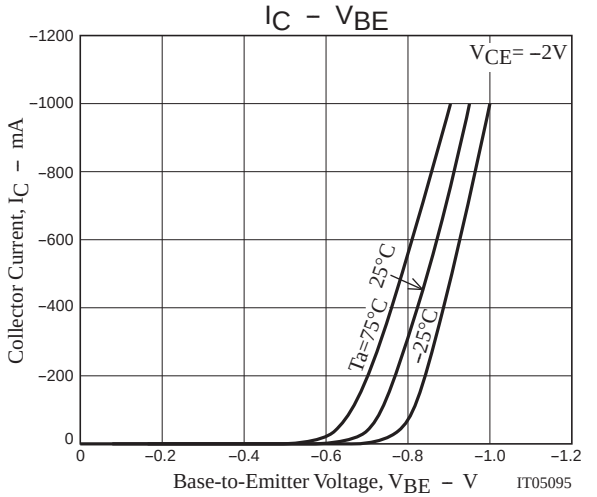


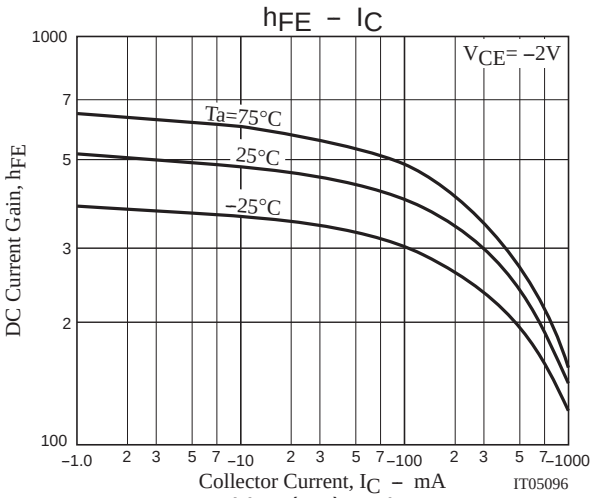
I_C=20I_{B1}= −20I_{B2}= −400mA

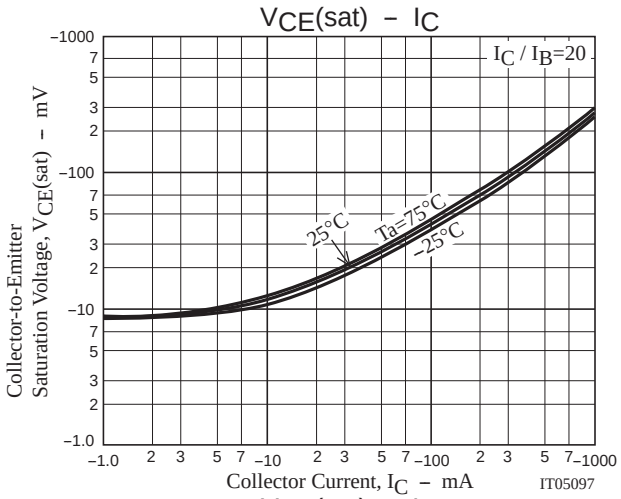
Ordering Information

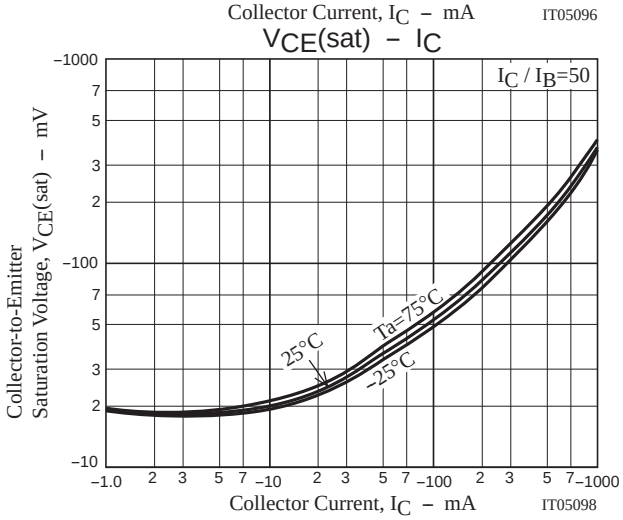
Device	Package	Shipping	memo
12A02MH-TL-E	MCPH3	3,000pcs./reel	Pb Free

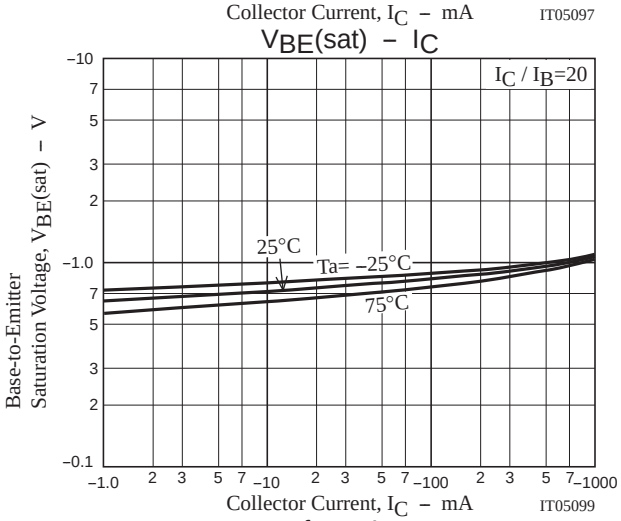


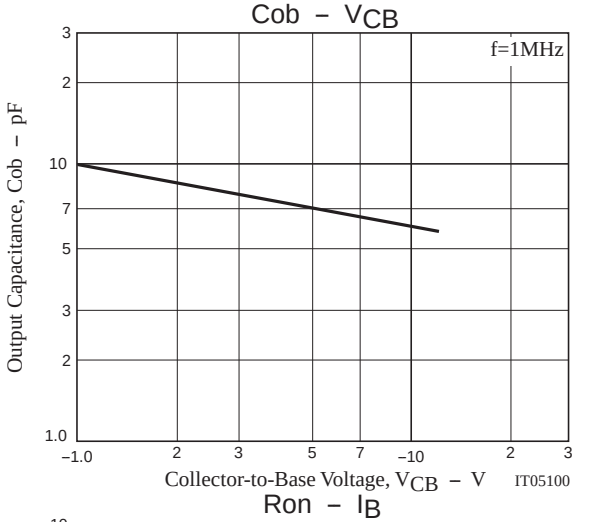


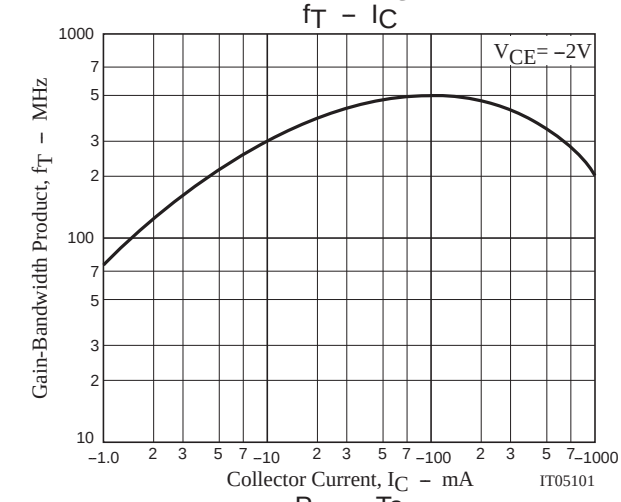

hFE – IC
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – mA
IT05096

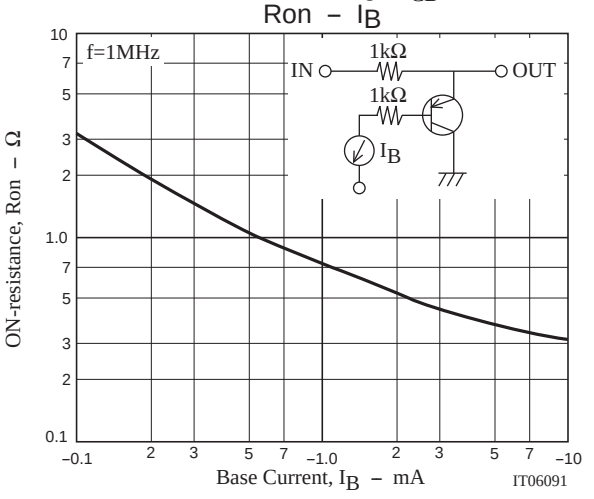

VCE(sat) – IC
IC / IB=20
25°C
Ta=75°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA
IT05097

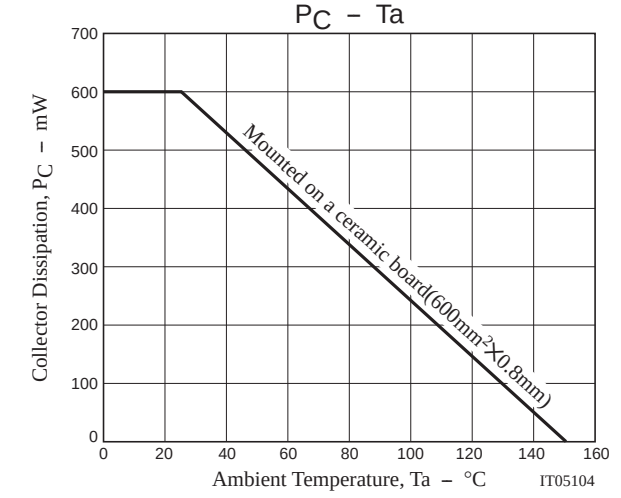

VCE(sat) – IC
IC / IB=50
25°C
Ta=75°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA
IT05098


VBE(sat) – IC
IC / IB=20
25°C
Ta= –25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – mA
IT05099


Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT05100


fT – IC
VCE= –2V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
IT05101


Ron – IB
f=1MHz
IN
1kΩ
1kΩ
OUT
IB
ON-resistance, Ron – Ω
Base Current, IB – mA
IT06091


PC – Ta
Mounted on a ceramic board(600mm2×0.8mm)
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
IT05104

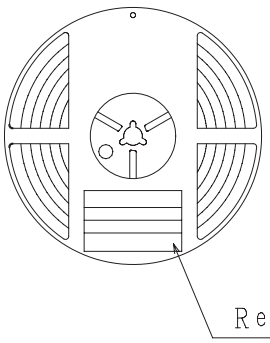
Embossed Taping Specification

12A02MH-TL-E

1. Packing Format

Package Name	Carrier Tape Type	Maximun Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
MCPH3	MCPH3	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

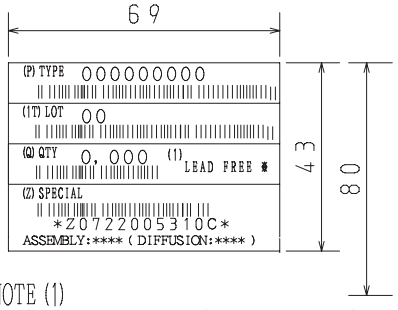
Packing method



Reel label

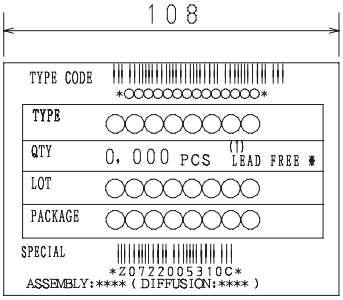
Reel label, Inner box label

(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.



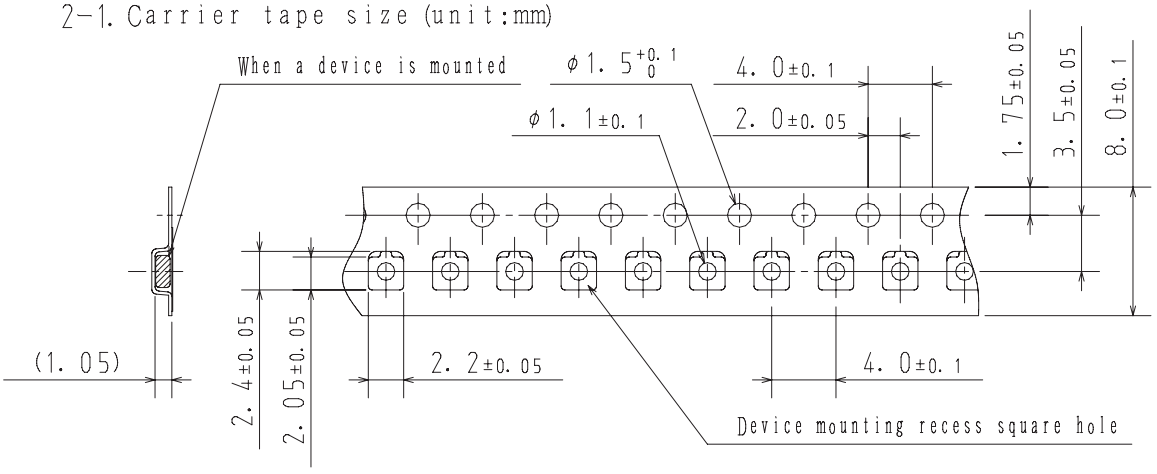
NOTE (1)

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

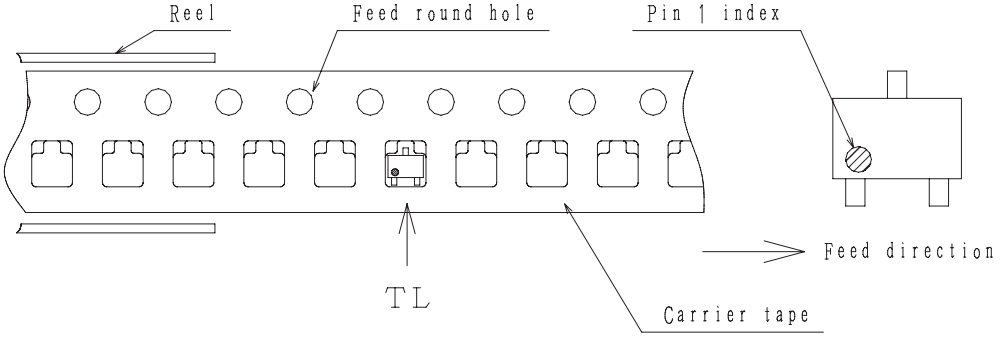
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



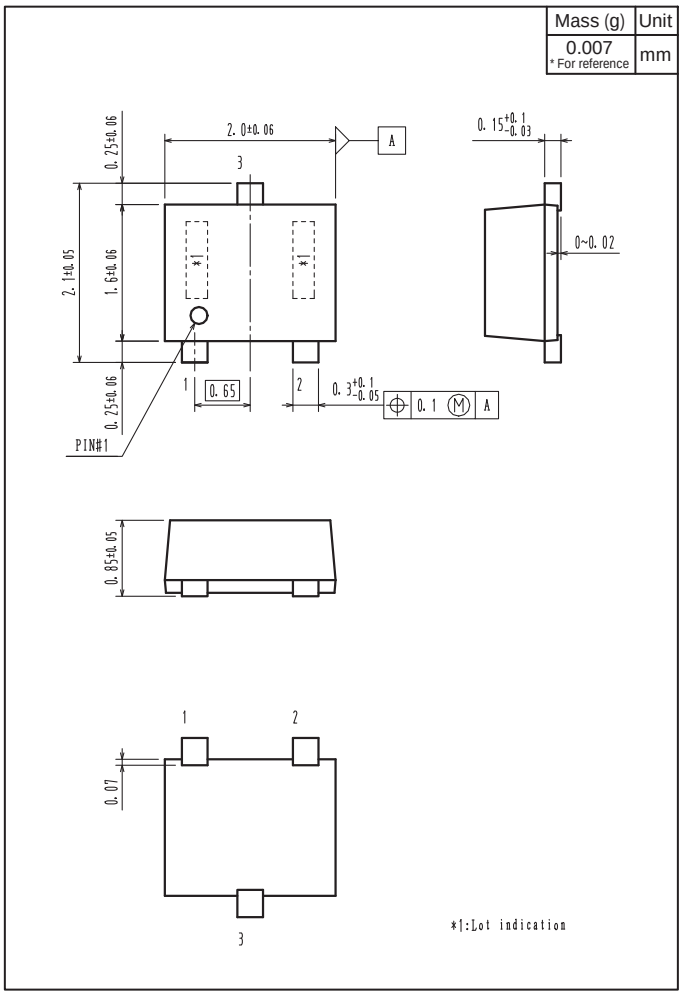
2-2. Device placement direction



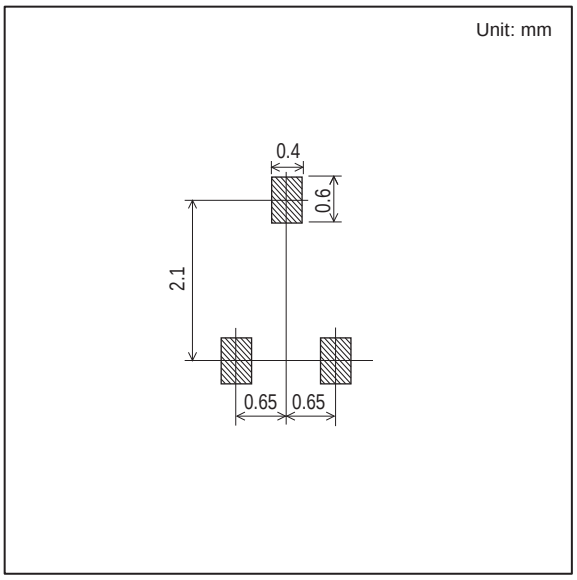
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

12A02MH-TL-E



Land Pattern Example



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