Ordering number : ENA1758A

ECH8502

Bipolar Transistor
(–)50V, (–)30A, Low V_{CE}(sat) Complementary Dual ECH8

ON Semiconductor®
http://onsemi.com

Features

- Composite type, facilitating high-density mounting
- Mounting height 0.9mm
- Low collector-to-emitter saturation voltage NPN : V_{CE}(sat)=0.08V(typ.)@I_C=2.5A
  PNP : V_{CE}(sat)= –0.12V(typ.)@I_C= –2.5A
- Halogen free compliance

Specifications ( ): PNP

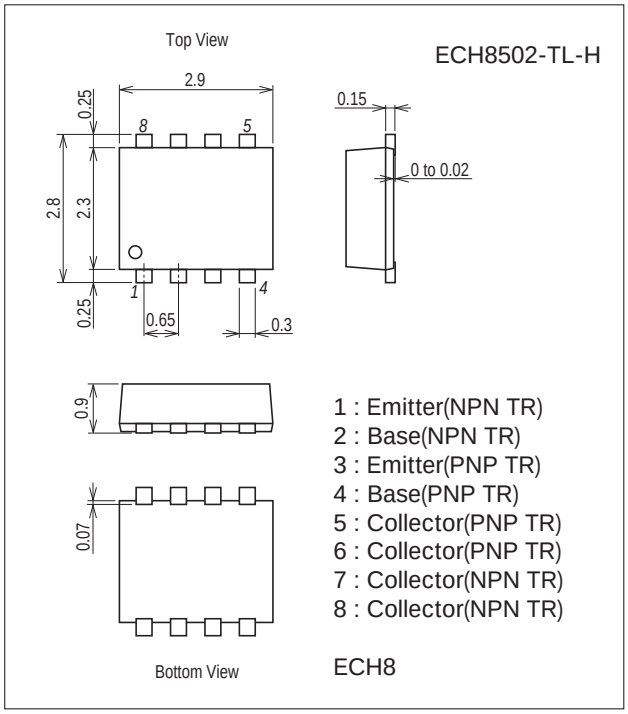
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–50)100	V
Collector-to-Emitter Voltage	V_{CEO}		(–)50	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)5	A
Collector Current (Pulse)	I_{CP}	PW≤1μs, duty cycle≤1%	(–)30	A
Base Current	I_B		(–)600	mA
Collector Dissipation	P_C	When mounted on ceramic substrate (900mm²×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm²×0.8mm)	1.6	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		–55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

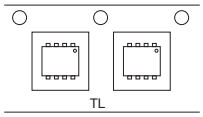
unit : mm (typ)
7011A-007



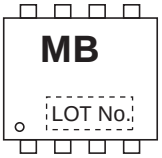
Product & Package Information

- Package : ECH8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

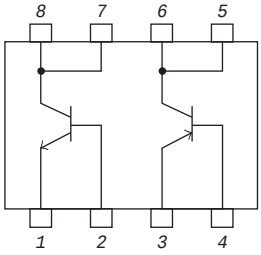
Packing Type : TL



Marking



Electrical Connection

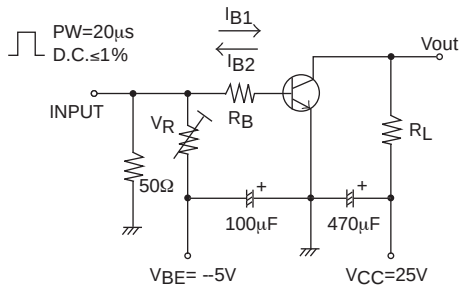


Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(−)50V, I_E=0A			(−)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(−)4V, I_C=0A			(−)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(−)2V, I_C=(−)500mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(−)10V, I_C=(−)500mA		(260)290		MHz
Output Capacitance	Cob	V_{CB}=(−)10V, f=1MHz		(45)25		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(−)2.5A, I_B=(−)125mA		(−120)80	(−200)120	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(−)2.5A, I_B=(−)125mA		(−)0.85	(−)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(−)10μA, I_E=0A	(−50)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(−)1mA, R_{BE}=∞	(−)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(−)10μA, I_C=0A	(−)6			V
Turn-On Time	t_{on}	See specified Test Circuit.		(30)30		ns
Storage Time	t_{stg}			(180)280		ns
Fall Time	t_f			(20)25		ns

Note : The specifications shown above are for each individual transistor.

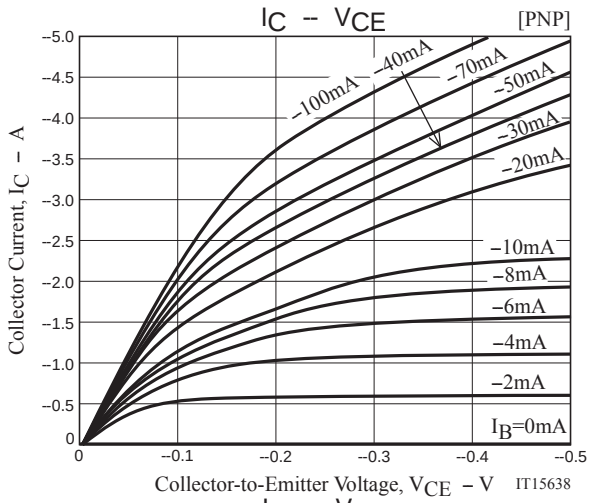
Switching Time Test Circuit

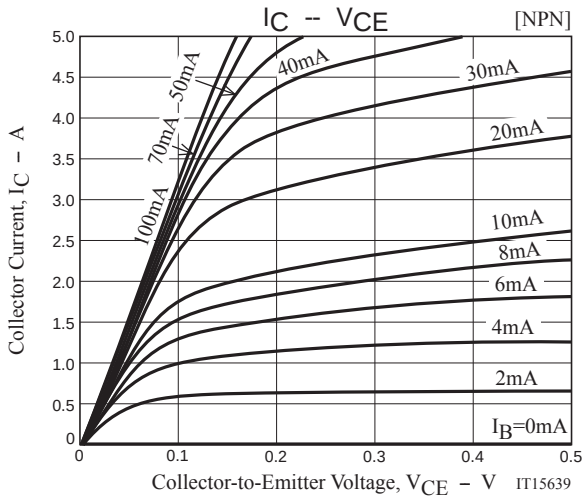


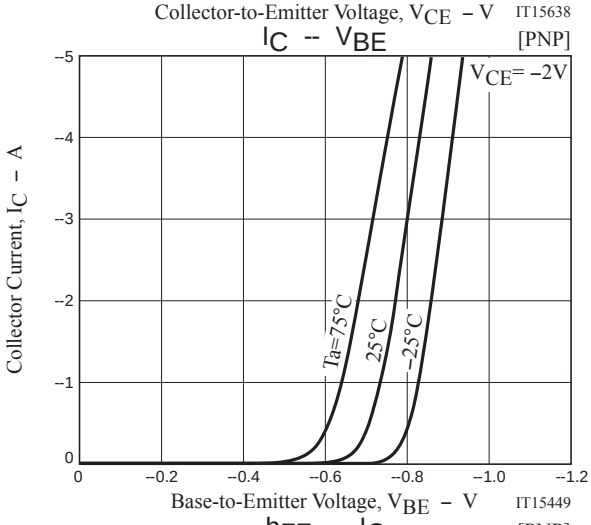
I_C=20I_{B1}= −20I_{B2}=2.5A
(For PNP, the polarity is reversed.)

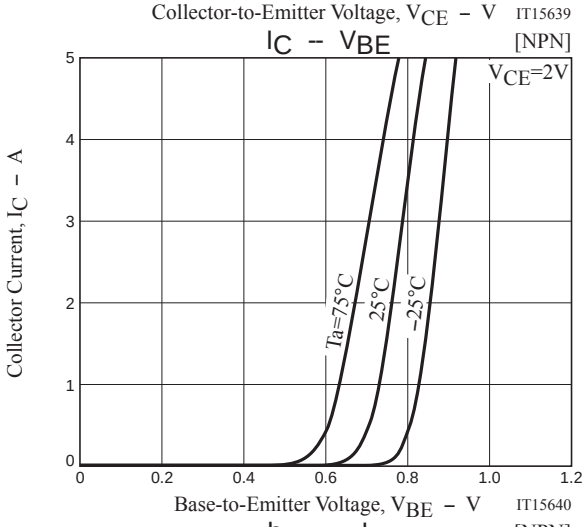
Ordering Information

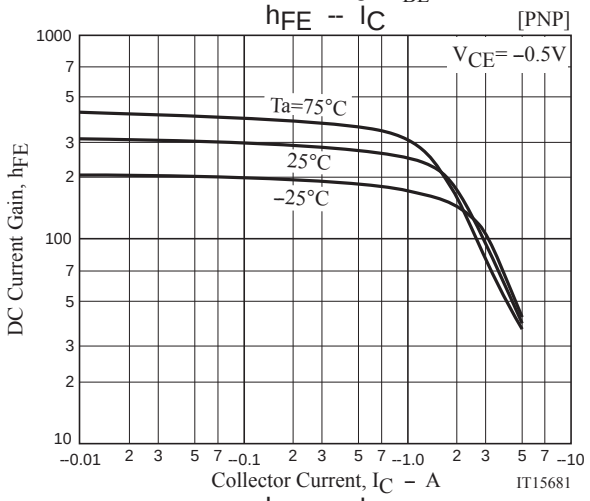
Device	Package	Shipping	memo
ECH8502-TL-H	ECH8	3,000pcs./reel	Pb Free and Halogen Free

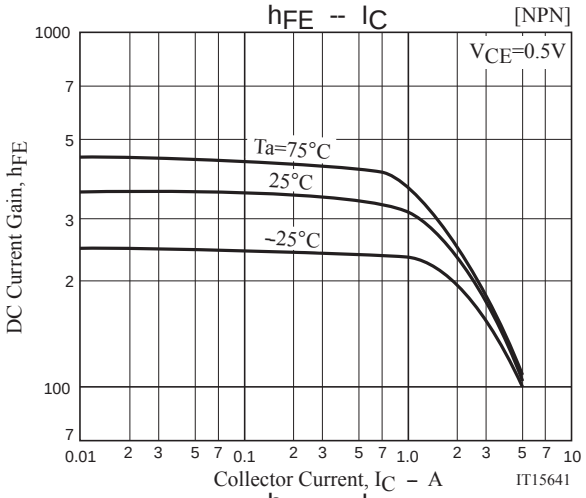

IC -- VCE
[PNP]
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT15638
–100mA
–40mA
–70mA
–50mA
–30mA
–20mA
–10mA
–8mA
–6mA
–4mA
–2mA
IB=0mA

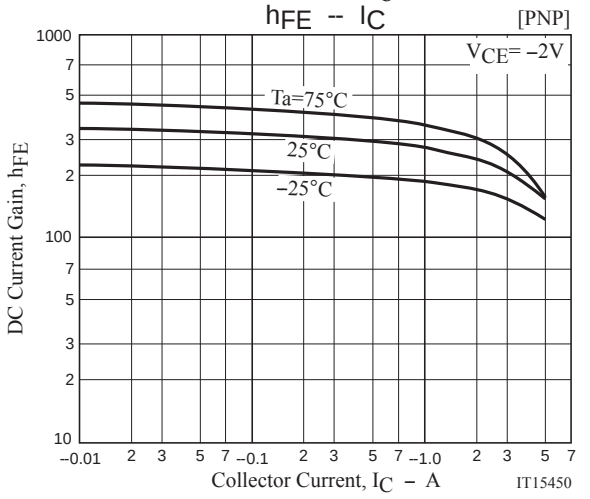

IC -- VCE
[NPN]
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT15639
100mA
70mA
50mA
40mA
30mA
20mA
10mA
8mA
6mA
4mA
2mA
IB=0mA

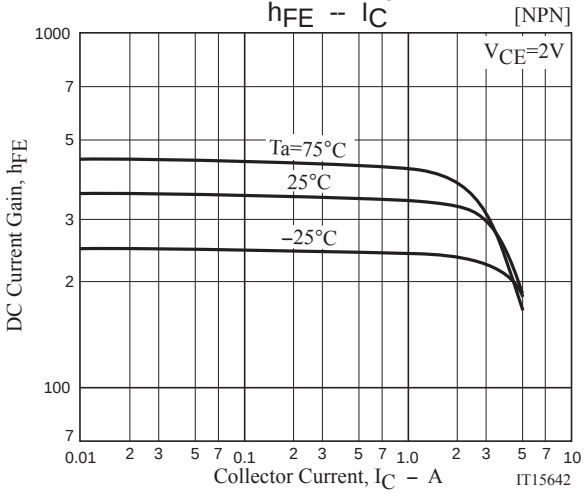

IC -- VBE
[PNP]
VCE= –2V
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT15449
Ta=75°C
25°C
–25°C

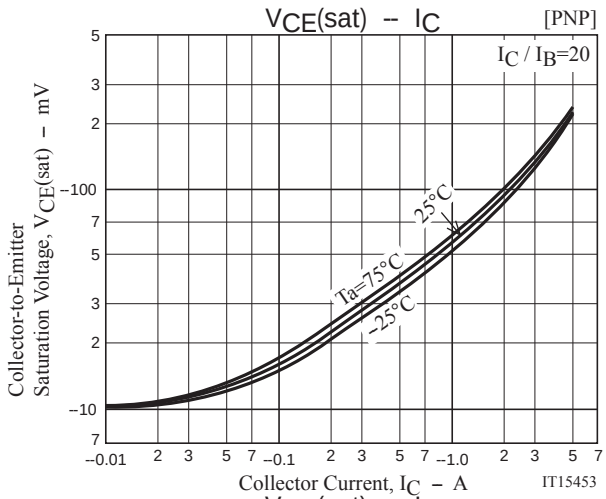

IC -- VBE
[NPN]
VCE=2V
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT15640
Ta=75°C
25°C
–25°C

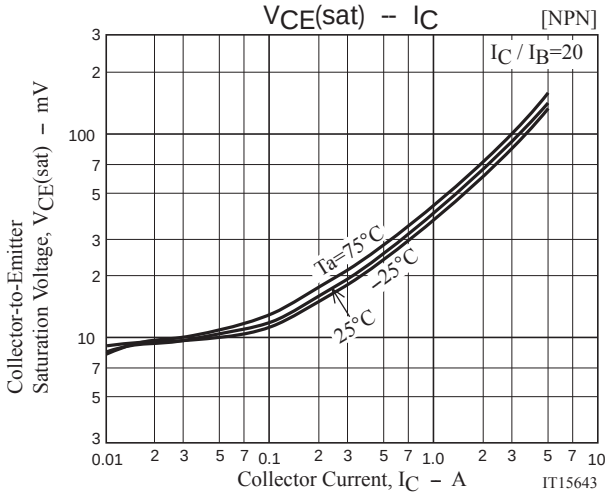

hFE -- IC
[PNP]
VCE= –0.5V
DC Current Gain, hFE
Collector Current, IC – A
IT15681
Ta=75°C
25°C
–25°C

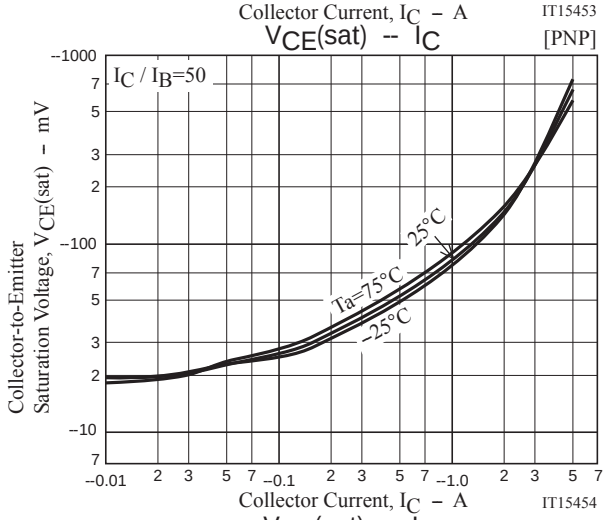

hFE -- IC
[NPN]
VCE=0.5V
DC Current Gain, hFE
Collector Current, IC – A
IT15641
Ta=75°C
25°C
–25°C

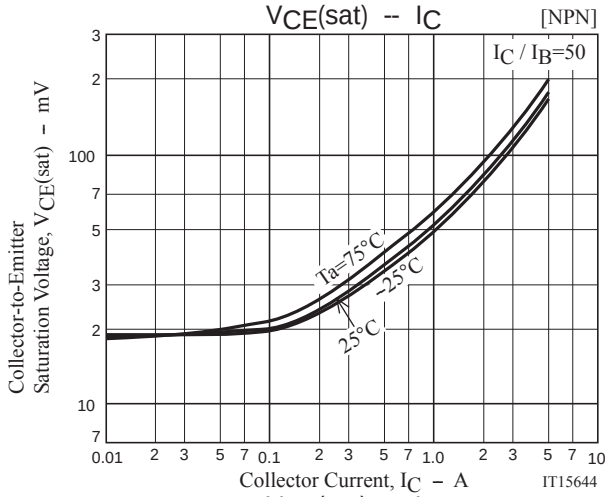

hFE -- IC
[PNP]
VCE= –2V
DC Current Gain, hFE
Collector Current, IC – A
IT15450
Ta=75°C
25°C
–25°C

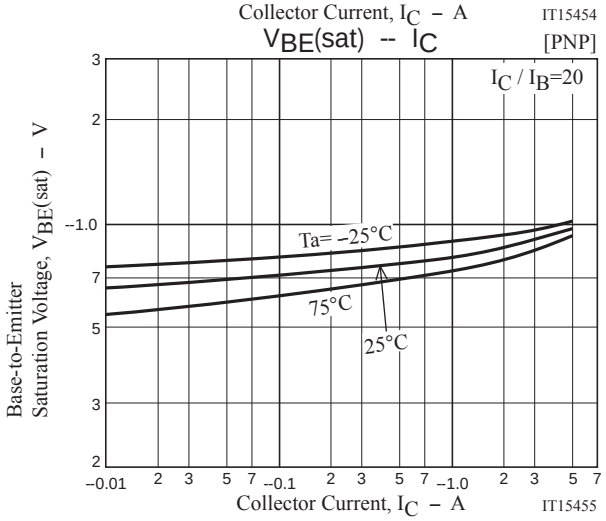

hFE -- IC
[NPN]
VCE=2V
DC Current Gain, hFE
Collector Current, IC – A
IT15642
Ta=75°C
25°C
–25°C

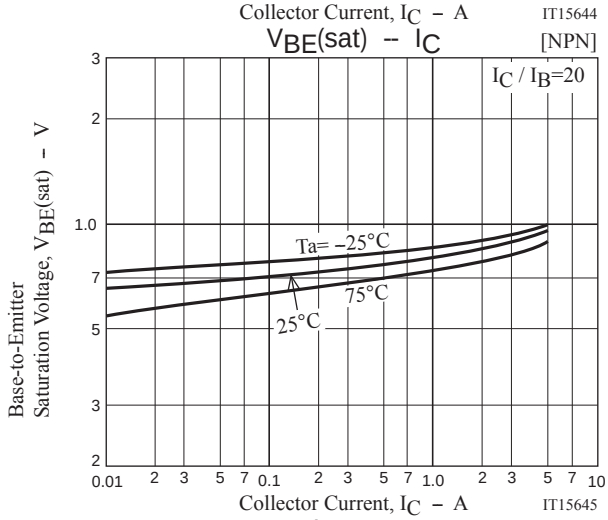

VCE(sat) -- IC
[PNP]
IC / IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT15453

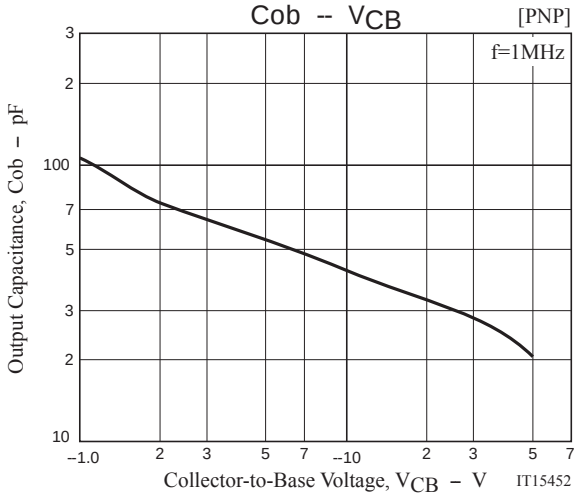

VCE(sat) -- IC
[NPN]
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT15643

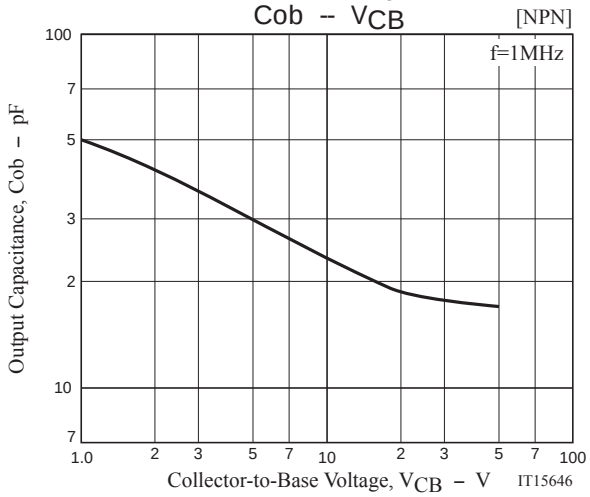

VCE(sat) -- IC
[PNP]
IC / IB=50
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT15454

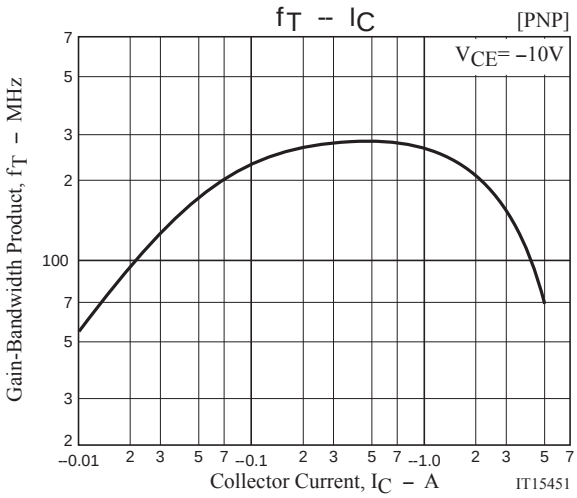

VCE(sat) -- IC
[NPN]
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT15644

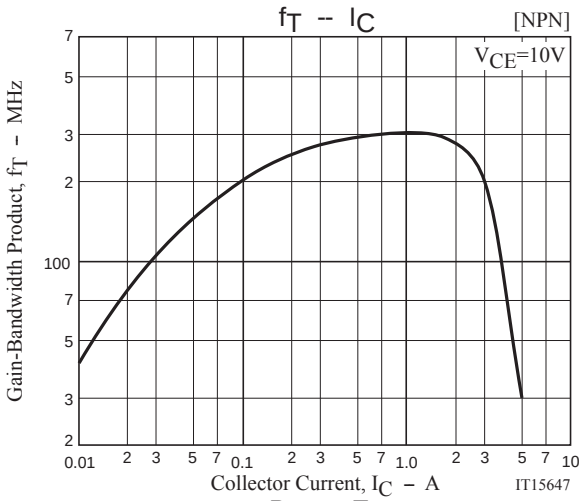

VBE(sat) -- IC
[PNP]
IC / IB=20
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT15455

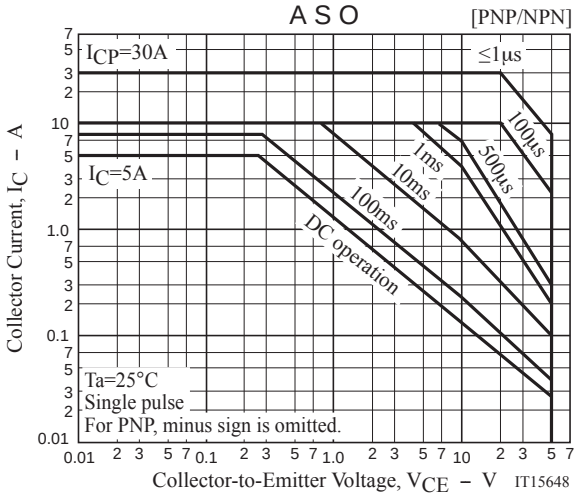

VBE(sat) -- IC
[NPN]
IC / IB=20
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT15645

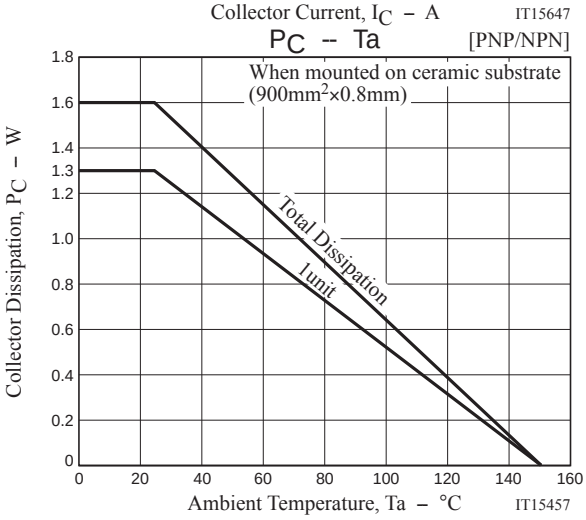

Cob -- VCB
[PNP]
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT15452


Cob -- VCB
[NPN]
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT15646


fT -- IC
[PNP]
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT15451


fT -- IC
[NPN]
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT15647


A S O
[PNP/NPN]
ICP=30A
≤1μs
100μs
500μs
1ms
10ms
100ms
DC operation
IC=5A
Ta=25°C
Single pulse
For PNP, minus sign is omitted.
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT15648


PC -- Ta
[PNP/NPN]
When mounted on ceramic substrate
(900mm2×0.8mm)
Total Dissipation
1unit
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT15457

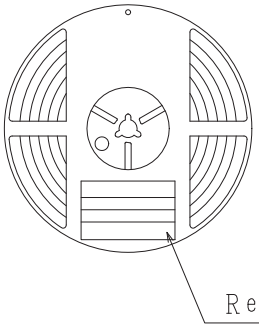
Embossed Taping Specification

ECH8502-TL-H

1. Packing Format

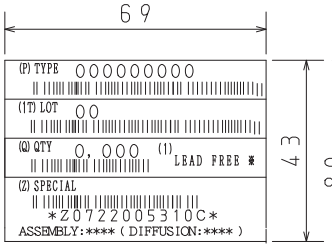
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
ECH8	CPH6	3,000	15,000	90,000	5 reels contained Dimensions:mm(external) 183×72×185	6 inner boxes contained Dimensions:mm(external) 440×195×210

Packing method



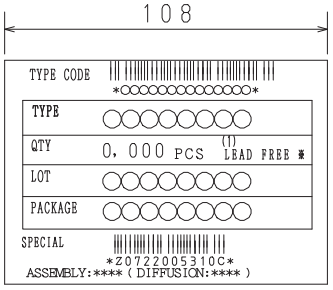
Reel label, Inner box label

(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.



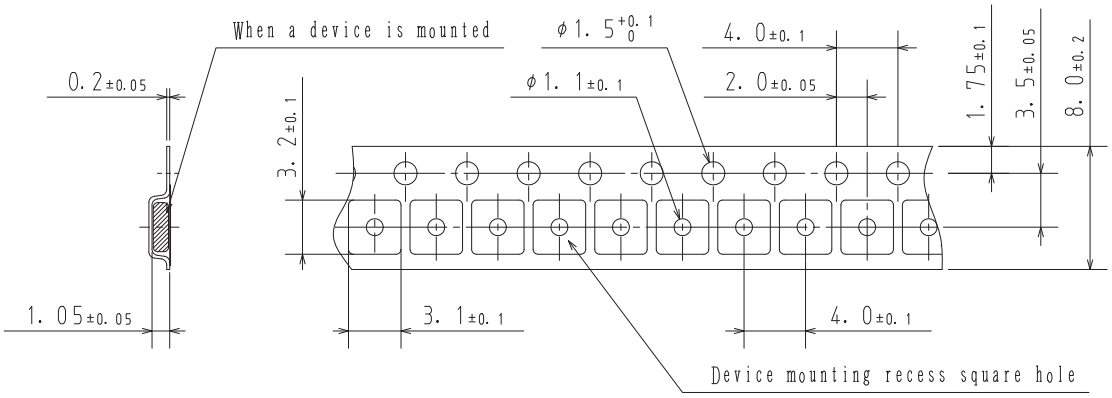
NOTE (1)

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

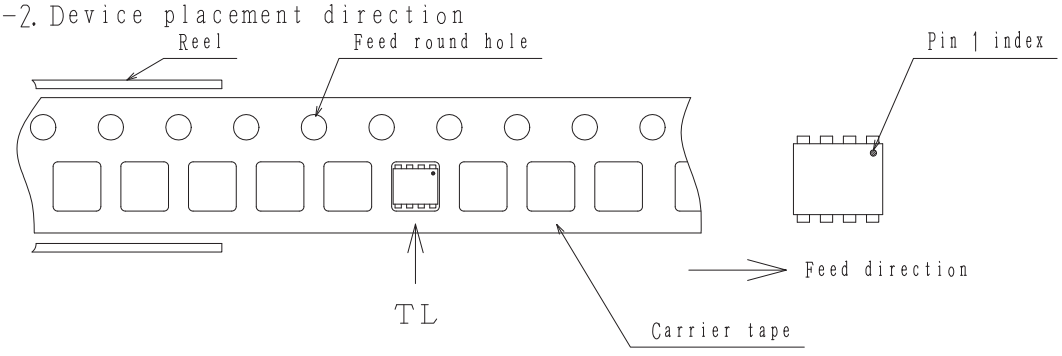
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



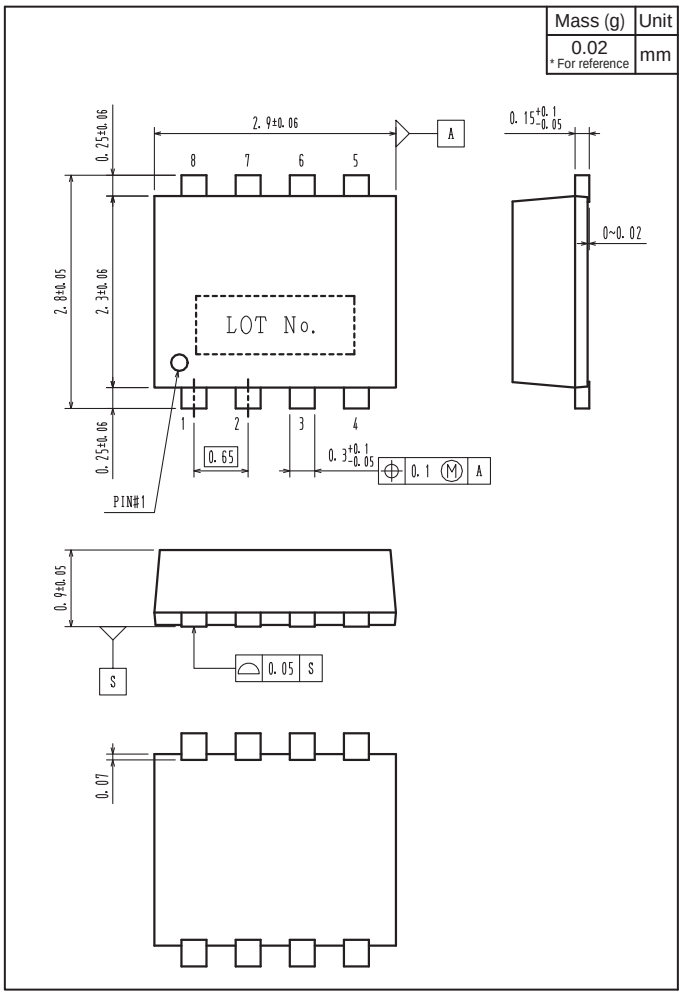
2-2. Device placement direction



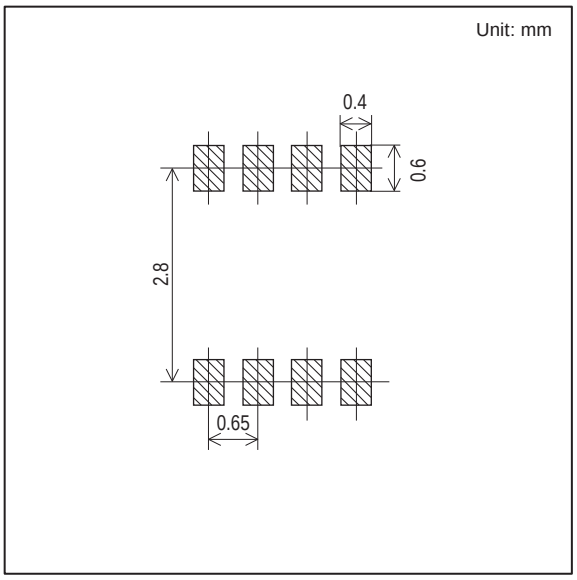
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

ECH8502-TL-H



Land Pattern Example



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