Ordering number : ENN7386

PNP / NPN Epitaxial Planar Silicon Transistors

CPH6123 / CPH6223

High-Current Switching Applications

Applications

- DC-DC converter, relay drivers, lamp drivers, motor drivers, strobe.

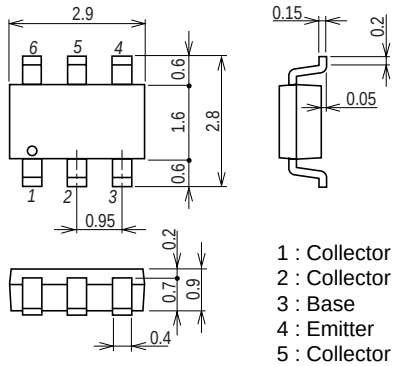
Features

- Adoption of MBIT process.
- High current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Ultrasmall package facilitates miniaturization in end products (mounting height : 0.9mm).
- High allowable power dissipation.

Package Dimensions

unit : mm
2146A

[CPH6123 / CPH6223]



1 : Collector
2 : Collector
3 : Base
4 : Emitter
5 : Collector
6 : Collector

SANYO : CPH6

Specifications ( ) : CPH6123

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_{CES}		(-50)100	V
Collector-to-Emitter Voltage	V_{CEO}		(-)50	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)3	A
Collector Current (Pulse)	I_{CP}		(-)6	A
Base Current	I_B		(-)600	mA
Collector Dissipation	P_C	Mounted on a ceramic board (600mm²×0.8mm)	1.3	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(-)40V, I_E=0			(-)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)4V, I_C=0			(-)1	μA
DC Current Gain	h_{FE}	V_{CE}=(-)2V, I_C=(-)100mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(-)10V, I_C=(-)500mA		(390)380		MHz
Output Capacitance	Cob	V_{CB}=(-)10V, f=1MHz		(24)13		pF

Marking : CPH6123 : BA, CPH6223 : DA

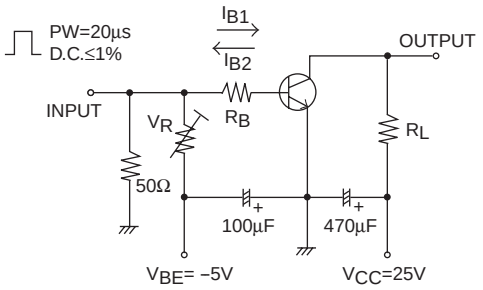
Continued on next page.

SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Continued from preceding page.

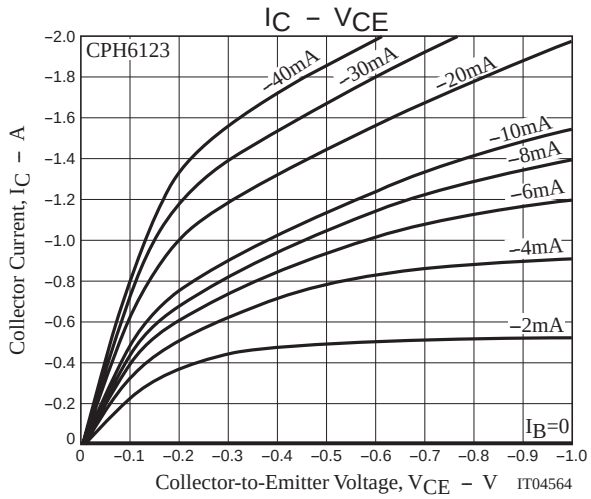
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(–)1A, I_B=(–)50mA		(–115)90	(–230)130	mV
		I_C=(–)2A, I_B=(–)100mA		(–240)160	(–650)240	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(–)2A, I_B=(–)100mA		(–)0.88	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–50)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=(–)100μA, R_{BE}=0	(–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=0	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit.		(30)35		ns
Storage Time	t_{stg}	See specified Test Circuit.		(230)300		ns
Fall Time	t_f	See specified Test Circuit.		(18)25		ns

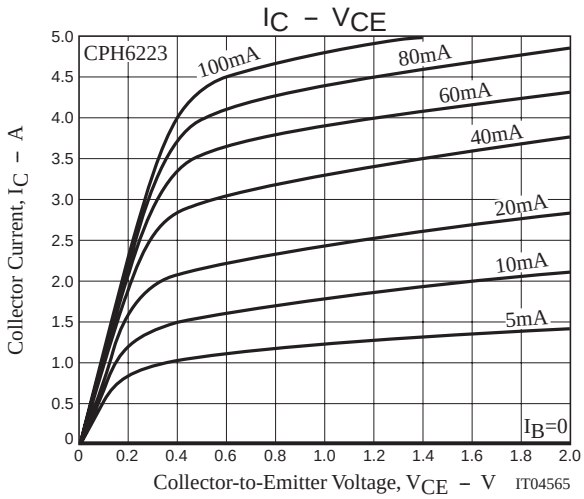
Switching Time Test Circuit

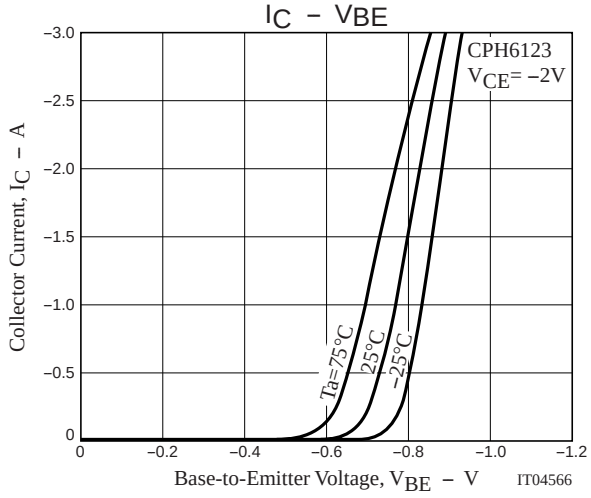


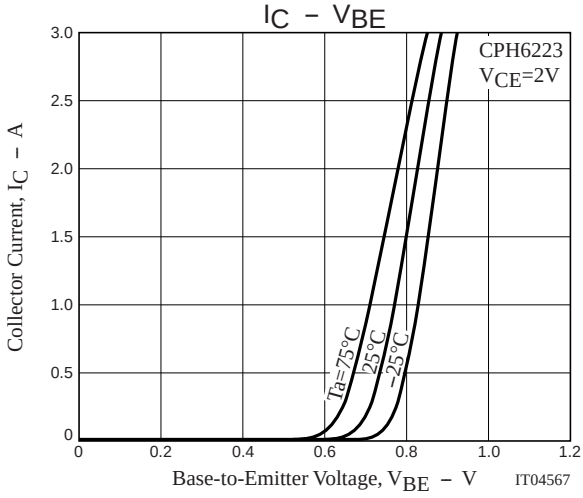
I_C=10I_{B1}= –10I_{B2}=1A

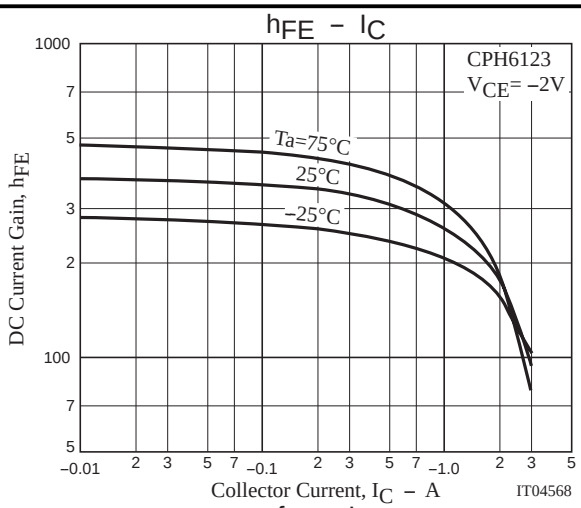
For PNP, the polarity is reversed.

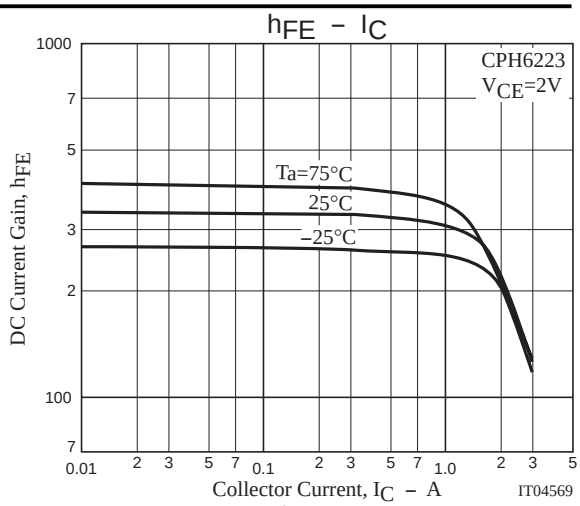


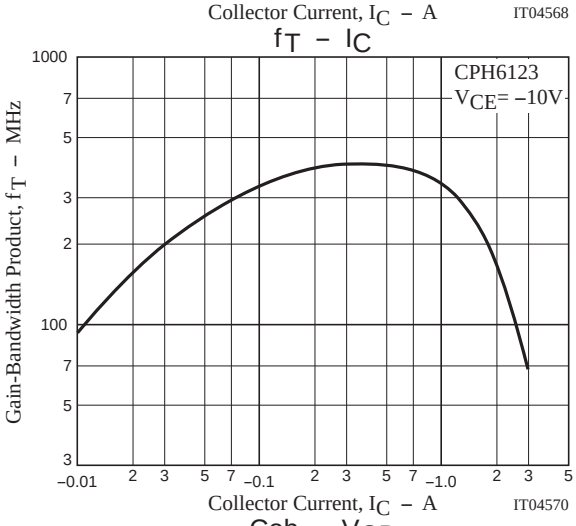


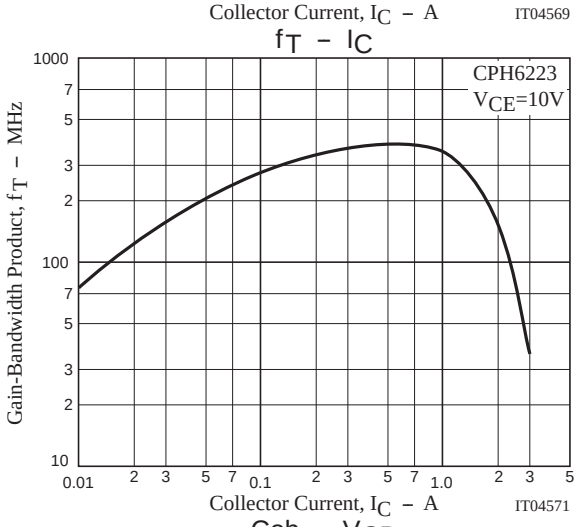


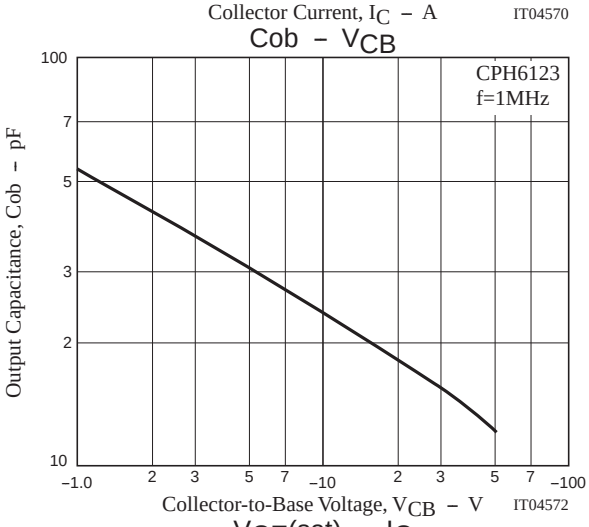


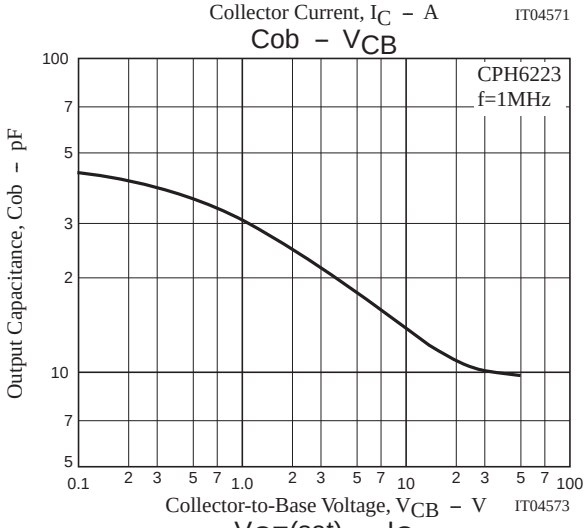

hFE – IC
CPH6123
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT04568

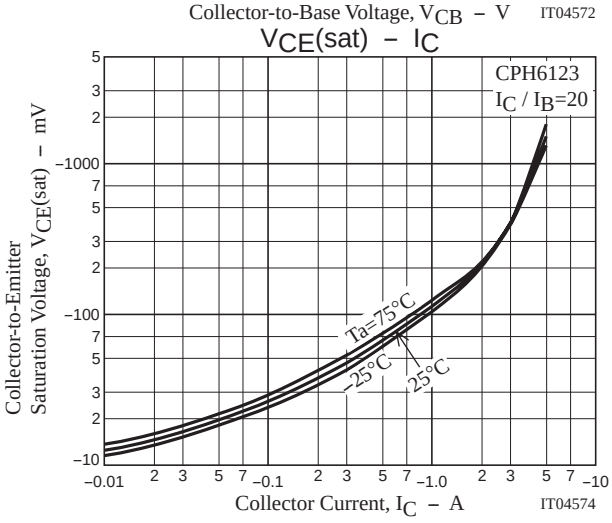

hFE – IC
CPH6223
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT04569

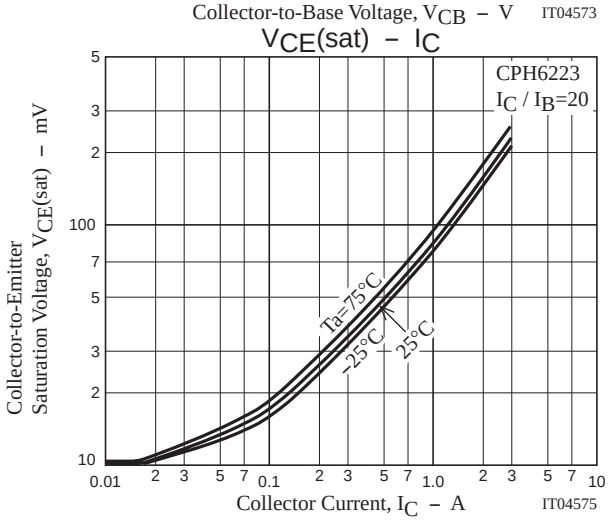

fT – IC
CPH6123
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT04570

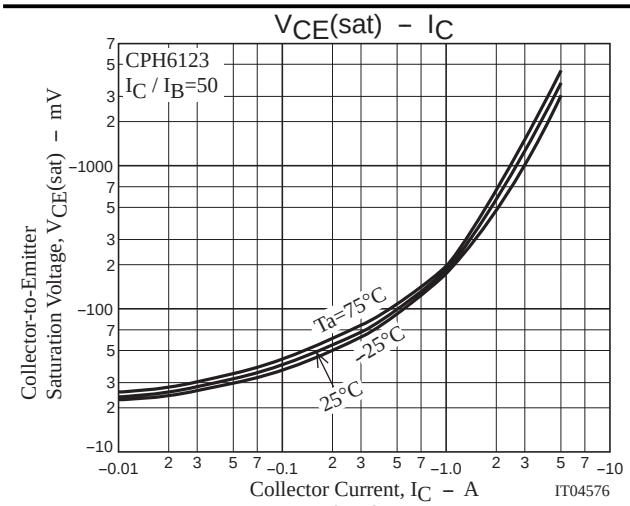

fT – IC
CPH6223
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT04571

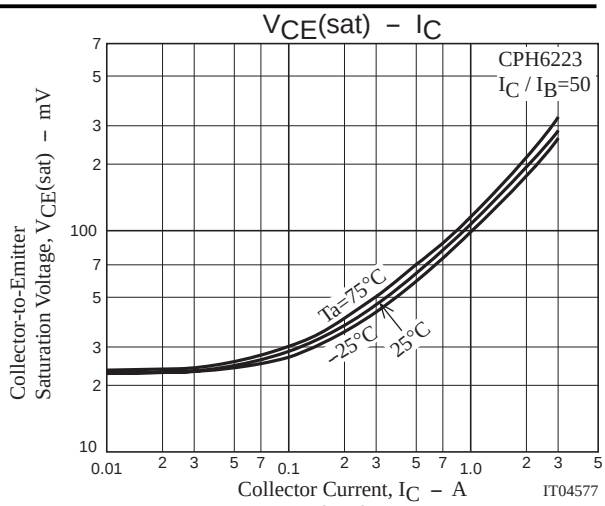

Cob – VCB
CPH6123
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04572

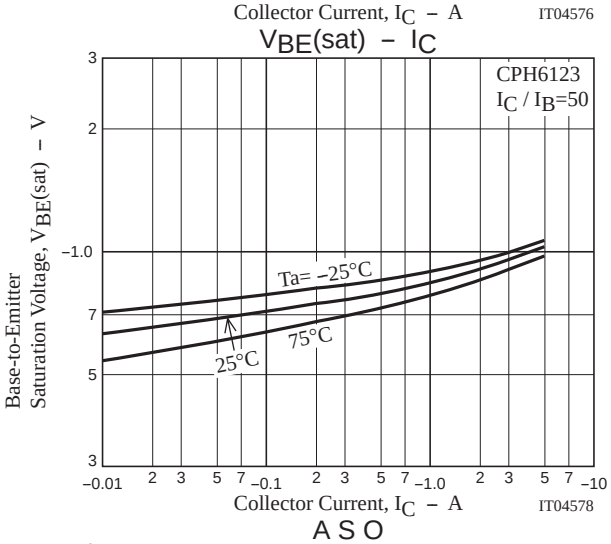

Cob – VCB
CPH6223
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04573

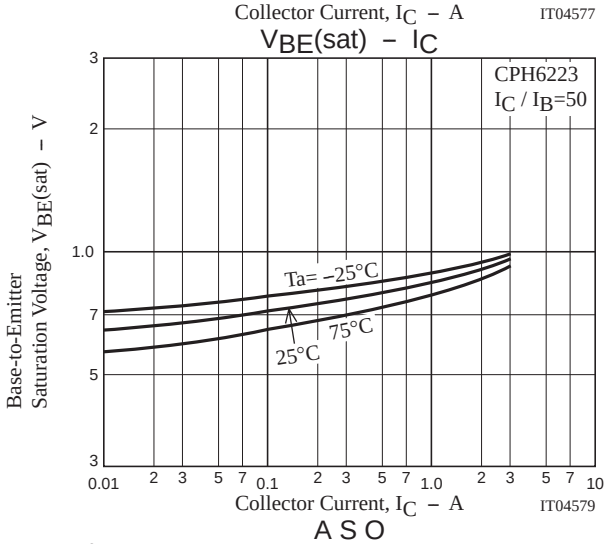

VCE(sat) – IC
CPH6123
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT04574

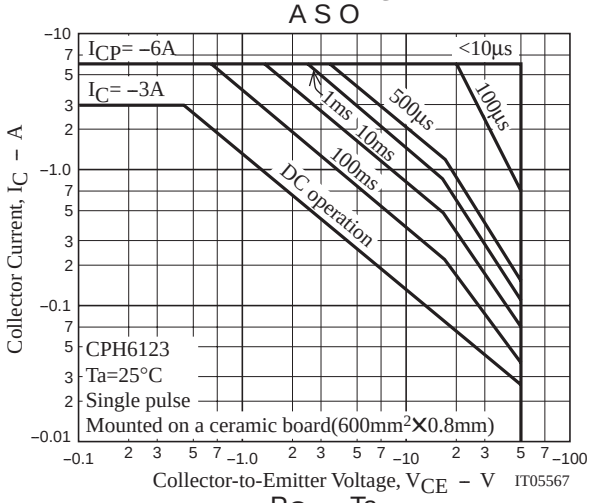

VCE(sat) – IC
CPH6223
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT04575

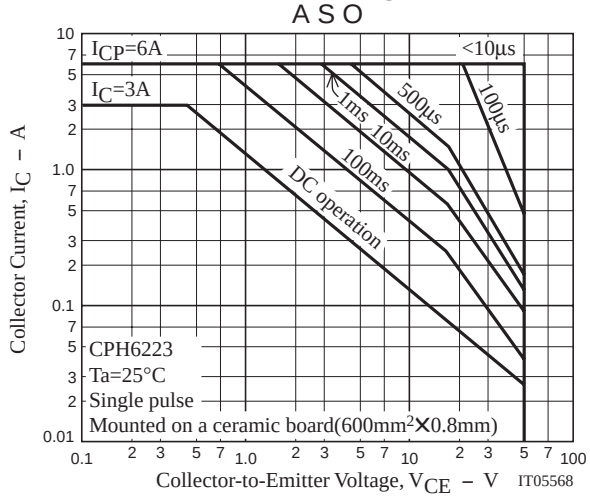

VCE(sat) – IC
CPH6123
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT04576

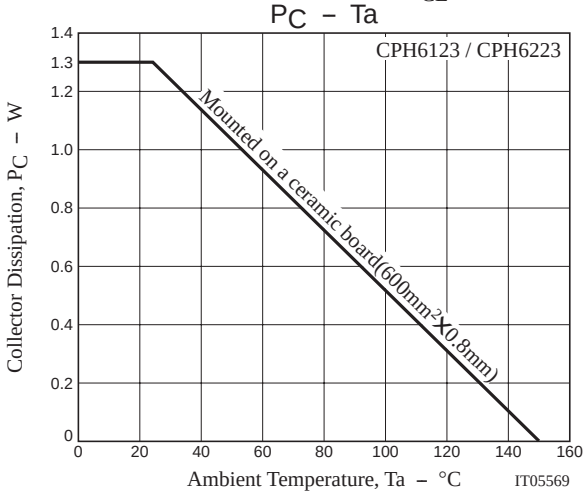

VCE(sat) – IC
CPH6223
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT04577


VBE(sat) – IC
CPH6123
IC / IB=50
Ta= –25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT04578


VBE(sat) – IC
CPH6223
IC / IB=50
Ta= –25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT04579


A S O
ICP= –6A
IC= –3A
<10µs
100µs
500µs
1ms
10ms
100ms
DC operation
CPH6123
Ta=25°C
Single pulse
Mounted on a ceramic board(600mm2×0.8mm)
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT05567


A S O
ICP=6A
IC=3A
<10µs
100µs
500µs
1ms
10ms
100ms
DC operation
CPH6223
Ta=25°C
Single pulse
Mounted on a ceramic board(600mm2×0.8mm)
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT05568


PC – Ta
CPH6123 / CPH6223
Mounted on a ceramic board(600mm2×0.8mm)
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT05569