CPH3145/CPH3245

Low V_{CE} (sat) Bipolar Transistor (PNP)NPN, (–)50V, (–)2A

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Features

- Adoption of MBIT Process
- Large Current Capacity
- Low Collector to Emitter Saturation Voltage
- High Speed Switching
- Ultrasmall Package Facilitates Miniaturization in End Products (mounting height : 0.9mm)
- High Allowable Power Dissipation

Typical Applications

- Relay Drivers
- Lamp Drivers
- Motor Drivers
- Flash

SPECIFICATIONS ( ) : CPH3145

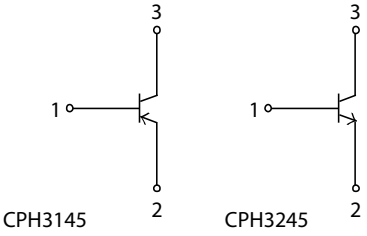
ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1)

Parameter	Symbol	Value	Unit
Collector to Base Voltage	V_{CBO}	(–50)80	V
Collector to Emitter Voltage	V_{CES}	(–50)80	V
Collector to Emitter Voltage	V_{CEO}	(–)50	V
Emitter to Base Voltage	V_{EBO}	(–)6	V
Collector Current	I_C	(–)2	A
Collector Current (Pulse)	I_{CP}	(–)4	A
Base Current	I_B	(–)400	mA
Collector Dissipation When mounted on ceramic substrate ($600mm^2 \times 0.8mm$)	P_C	0.9	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	–55 to +150	°C

Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

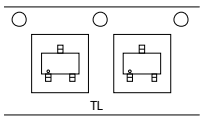
ELECTRICAL CONNECTION

PNP NPN

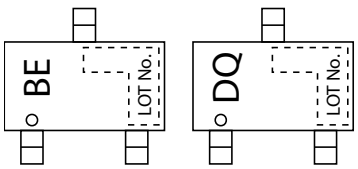


1 : Base
2 : Emitter
3 : Collector

PACKING TYPE : TL



MARKING



ORDERING INFORMATION

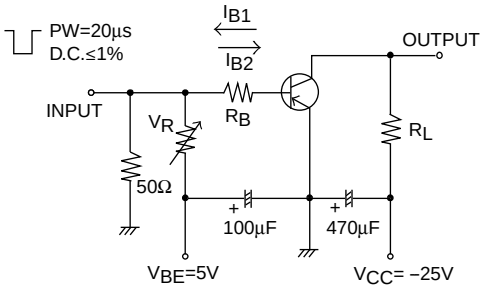
See detailed ordering and shipping information on page 5 of this data sheet.

ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 2)

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)40V, I_E=0A			(–)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0A			(–)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=(–)300mA		420		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		(16)8		pF
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C=(–)1A, I_B=(–)50mA		(–165)130	(–330)260	mV
Base to Emitter Saturation Voltage	V_{BE}(sat)			(–)0.9	(–)1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0A	(–50)80			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=(–)100μA, R_{BE}=0Ω	(–50)80			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		(35)35		ns
Storage Time	t_{stg}			(200)330		ns
Fall Time	t_f			(24)40		ns

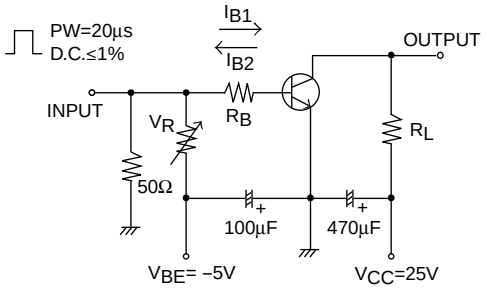
Note 2 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching Time Test Circuit



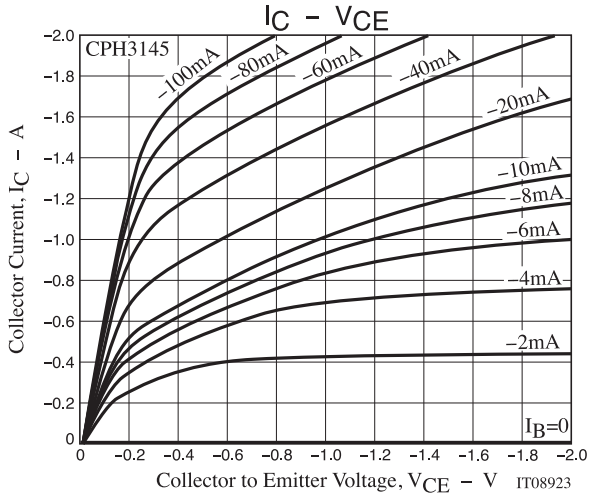
I_C= –10I_{B1}=10I_{B2}= –0.7A

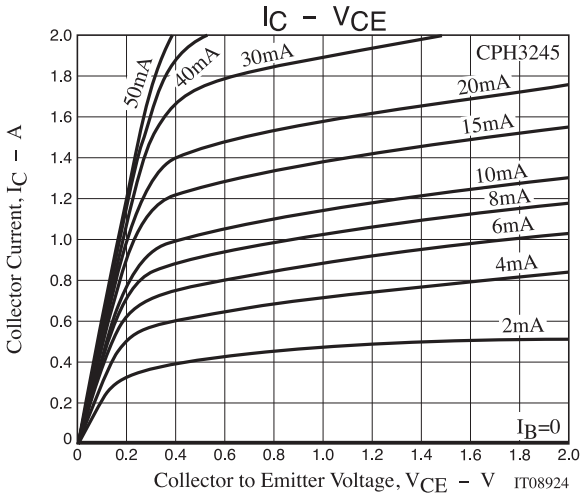
CPH3145

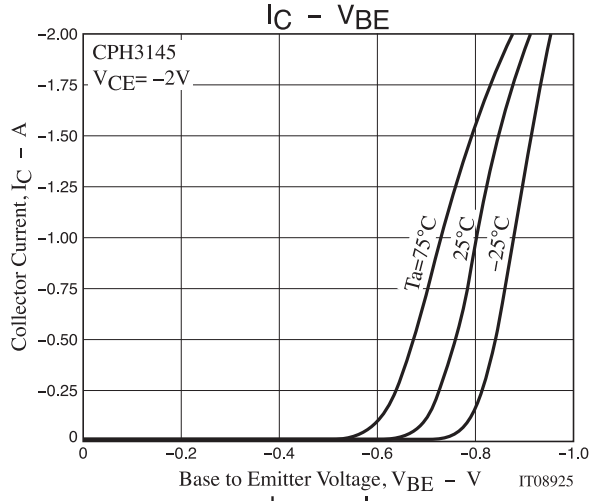


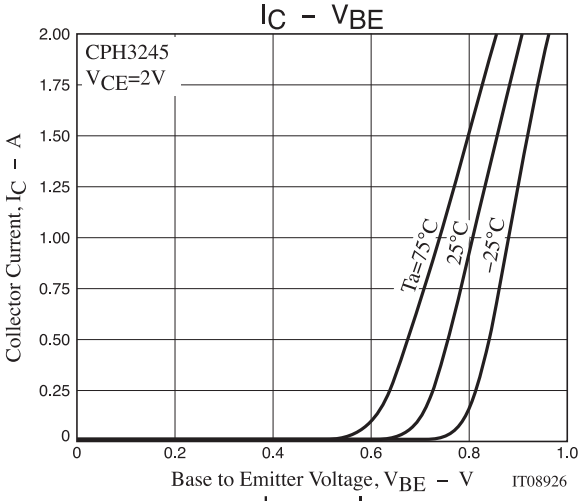
I_C=10I_{B1}= –10I_{B2}=0.7A

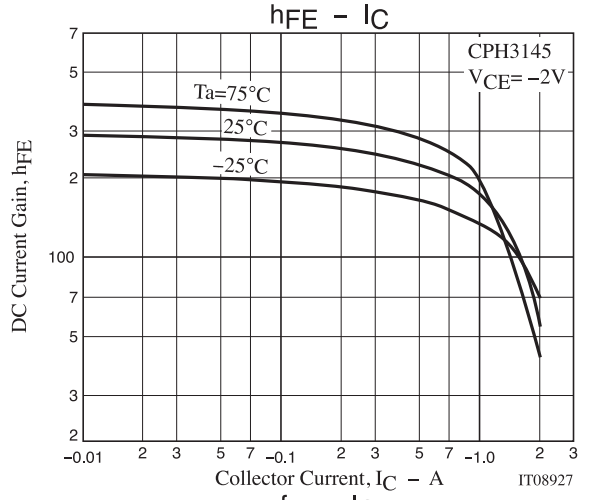
CPH3245

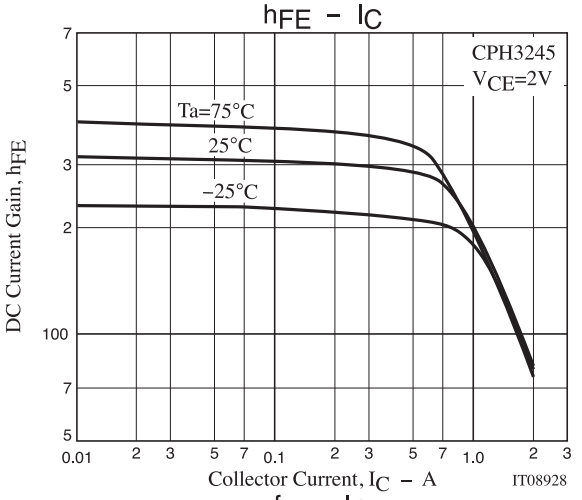


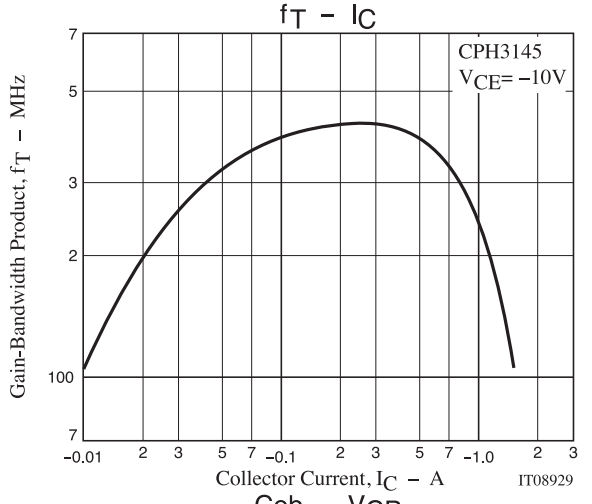


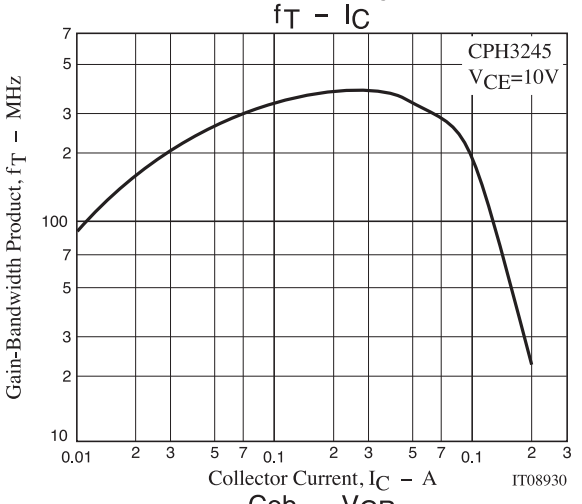

IC – VBE
CPH3145
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base to Emitter Voltage, VBE – V
IT08925

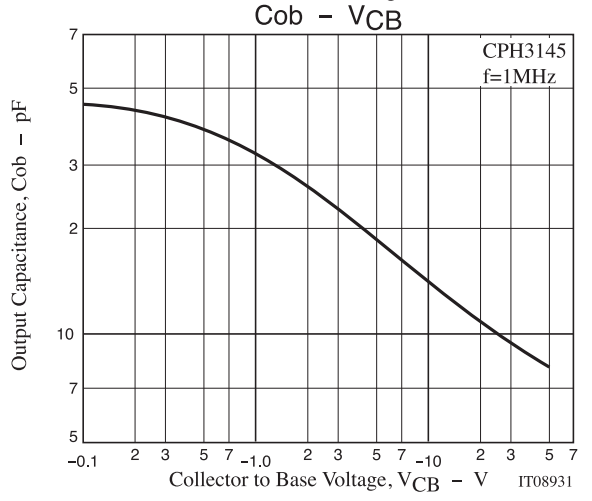

IC – VBE
CPH3245
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base to Emitter Voltage, VBE – V
IT08926

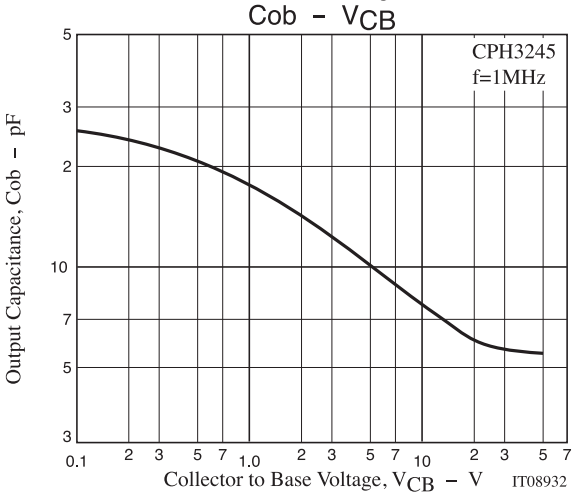

hFE – IC
CPH3145
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT08927

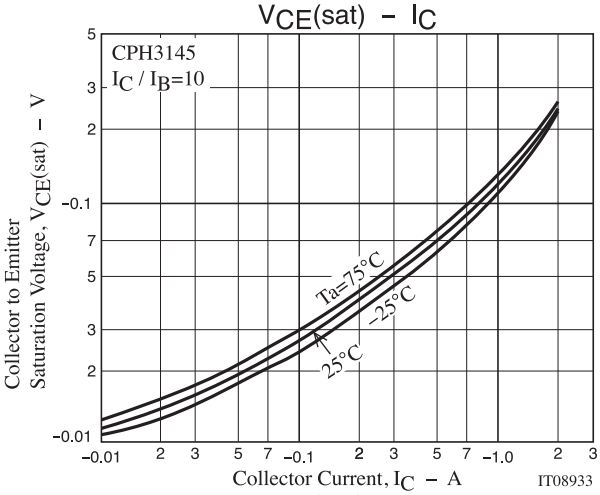

hFE – IC
CPH3245
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT08928

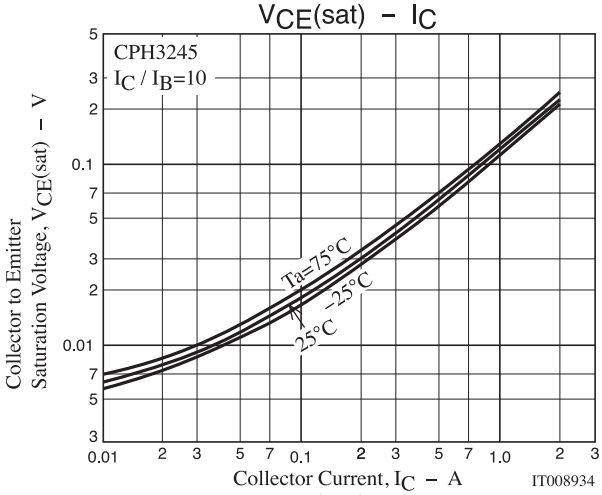

fT – IC
CPH3145
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT08929

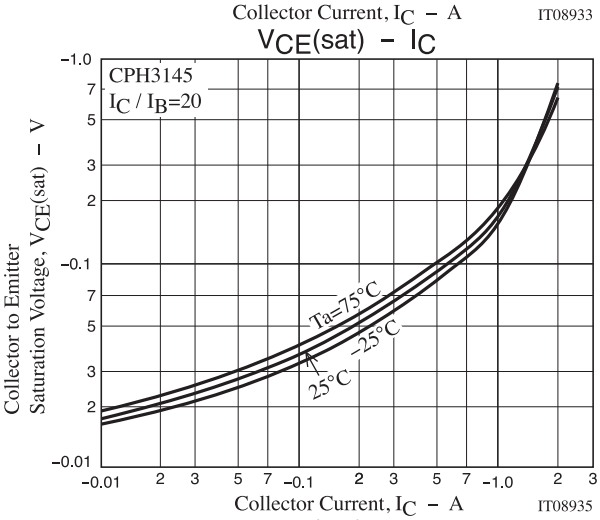

fT – IC
CPH3245
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT08930

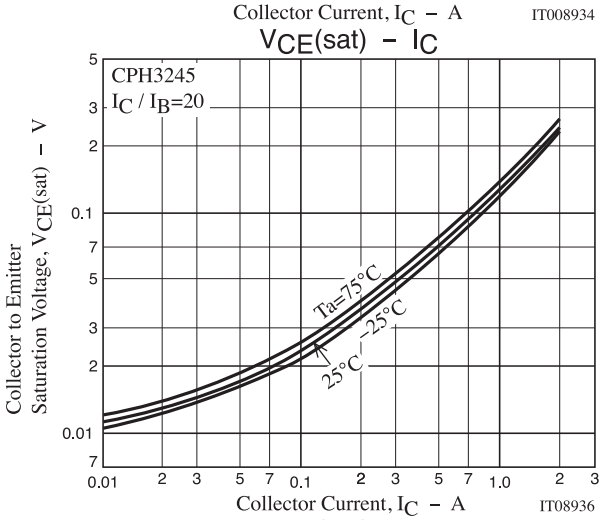

Cob – VCB
CPH3145
f=1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, VCB – V
IT08931

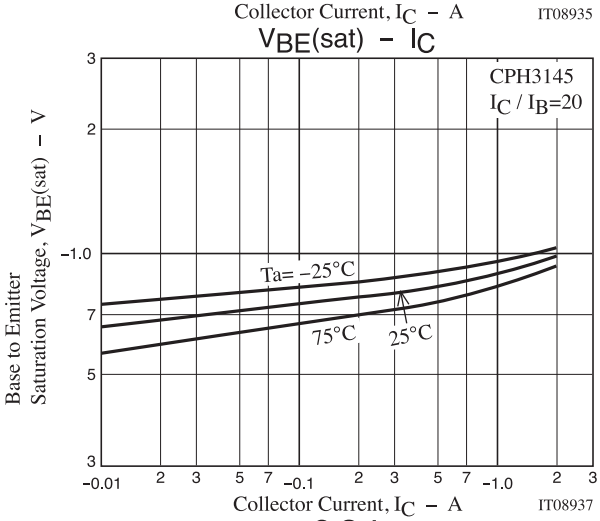

Cob – VCB
CPH3245
f=1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, VCB – V
IT08932

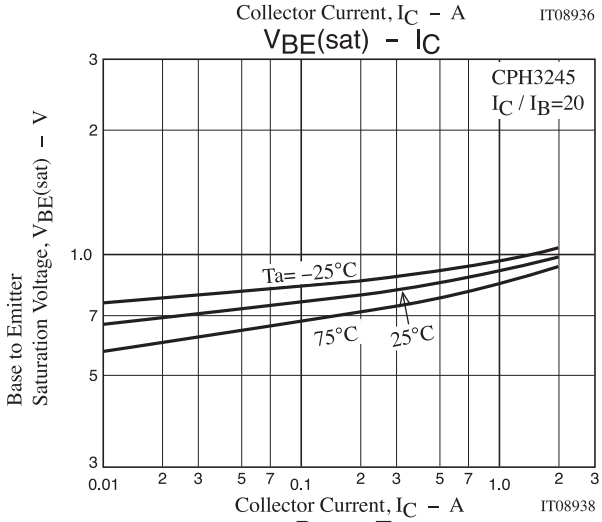

VCE(sat) – IC
CPH3145
IC / IB=10
Ta=75°C
–25°C
25°C
Collector to Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT08933

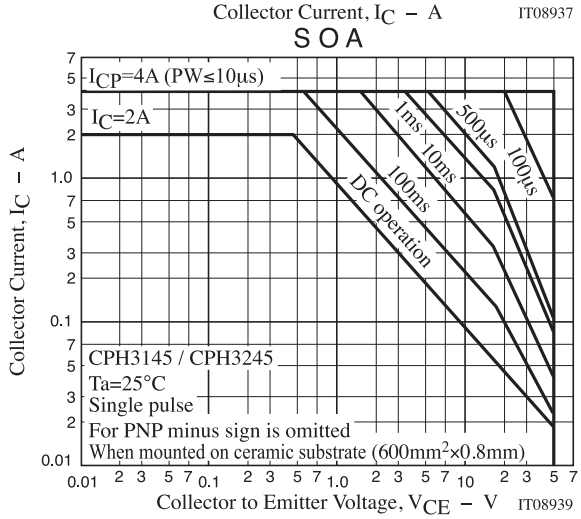

VCE(sat) – IC
CPH3245
IC / IB=10
Ta=75°C
–25°C
25°C
Collector to Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT008934

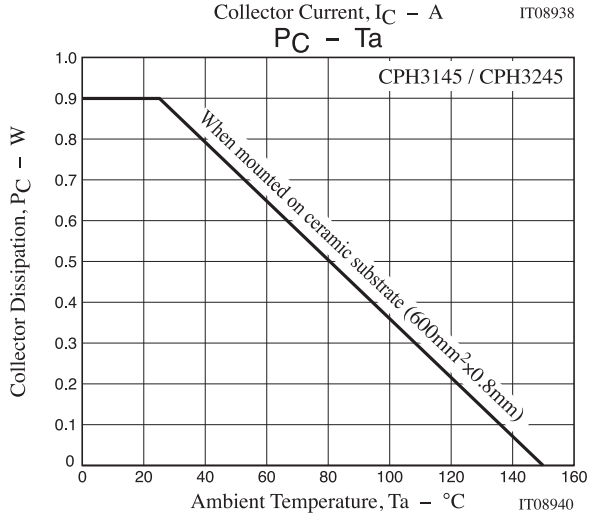

VCE(sat) – IC
CPH3145
IC / IB=20
Ta=75°C
–25°C
25°C
Collector to Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT08935


VCE(sat) – IC
CPH3245
IC / IB=20
Ta=75°C
–25°C
25°C
Collector to Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT08936


VBE(sat) – IC
CPH3145
IC / IB=20
Ta= –25°C
75°C
25°C
Base to Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT08937


VBE(sat) – IC
CPH3245
IC / IB=20
Ta= –25°C
75°C
25°C
Base to Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT08938

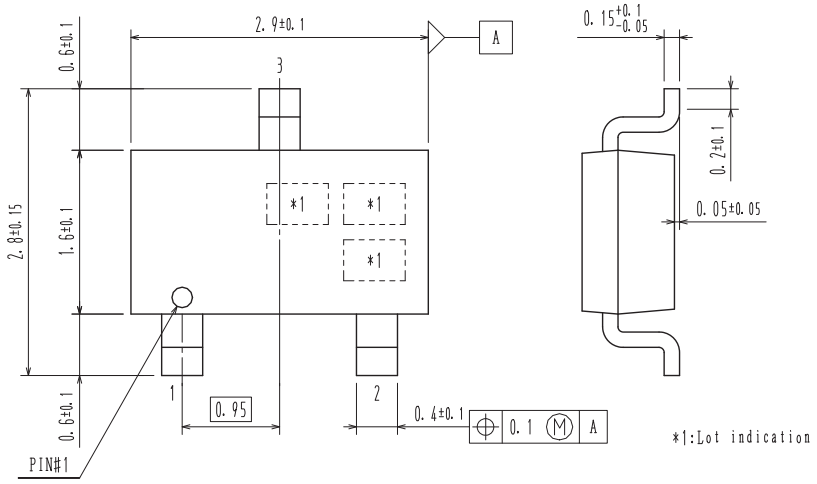

S O A
ICP=4A (PW≤10μs)
IC=2A
1ms
10ms
100ms
DC operation
500μs
100μs
CPH3145 / CPH3245
Ta=25°C
Single pulse
For PNP minus sign is omitted
When mounted on ceramic substrate (600mm2×0.8mm)
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V
IT08939

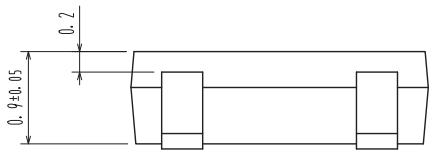

PC – Ta
CPH3145 / CPH3245
When mounted on ceramic substrate (600mm2×0.8mm)
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT08940

PACKAGE DIMENSIONS

unit : mm

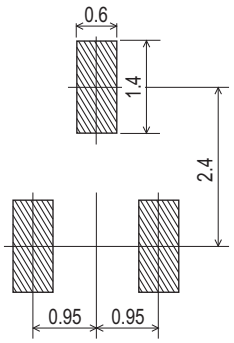
CPH3
CASE 318BA
ISSUE O





1 : Base
2 : Emitter
3 : Collector

Recommended Soldering Footprint



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
CPH3145-TL-E	BE	CPH3 SC-59, SOT-23, TO-236 (Pb-Free)	3,000 / Tape & Reel
CPH3245-TL-E	DQ		

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

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