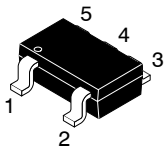
Bipolar Transistor

(–)50 V, (–)5 A, Low V_{CE}(sat), Complementary Dual CPH5

CPH5520



1: Collector (NPN TR)
2: Collector (PNP TR)
3: Base (PNP TR)
4: Emitter Common
5: Base (NPN TR)

CPH5
CASE 318BC

Features

- Composite Type with a PNP Transistor and an NPN Transistor Contained in One Package, Facilitating High–Density Mounting
- Ultrasmall Package Facilitate Miniaturization in End Products. (0.9 mm Mounting Height)
- This is a Pb–Free Device

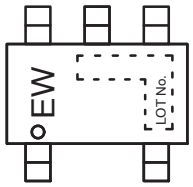
Applications

- Relay Drivers, Lamp Drivers, Motor Drivers, Gate Drivers

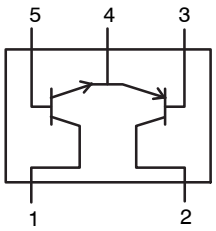
Specifications

( ): PNP

MARKING DIAGRAM



ELECTRICAL CONNECTION



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector–to–Base Voltage	V_{CBO}		(–50)80	V
Collector–to–Emitter Voltage	V_{CEO}		(–50)50	V
Emitter–to–Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)2	A
Collector Current (Pulse)	I_{CP}		(–)5	A
Base Current	I_B		(–)400	mA
Collector Dissipation	P_C	Mounted on a ceramic board (600 mm^2 × 0.8 mm) 1unit	0.9	W
Total Power Dissipation	P_T	Mounted on a ceramic board (600 mm^2 × 0.8 mm)	1.2	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		–55 to +150	°C

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.

ORDERING INFORMATION

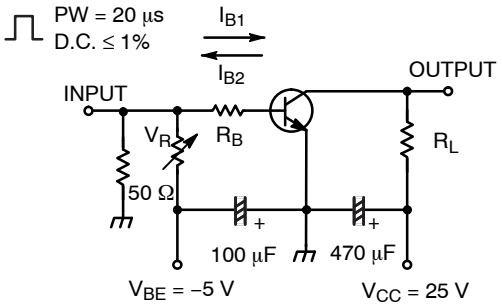
Device	Package	Shipping†
CPH5520–TL–E	CPH5 (Pb–Free)	3000 / Tape & Reel

†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.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Collector Cutoff Current	I_{CBO}	V_{CB} = (–)40 V, I_E = 0 A	–	–	(–)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = (–)4 V, I_C = 0 A	–	–	(–)1	μA
DC Current Gain	h_{FE}	V_{CE} = (–)2 V, I_C = (–)100 mA	200	–	560	
Gain–Bandwidth Product	f_T	V_{CE} = (–)10 V, I_C = (–)300 mA	–	420	–	MHz
Output Capacitance	Cob	V_{CB} = (–)10 V, f = 1 MHz	–	(16)8	–	pF
Collector–to–Emitter Saturation Voltage	V_{CE}(sat)	I_C = (–)1 A, I_B = (–)50 mA	–	(–165)130	(–330)260	mV
Base–to–Emitter Saturation Voltage	V_{BE}(sat)	I_C = (–)1 A, I_B = (–)50 mA		(–)0.9	(–)1.2	V
Collector–to–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = (–)10 μA, I_E = 0 A	(–50)80	–	–	V
Collector–to–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = (–)1 mA, R_{BE} = ∞	(–50)50	–	–	V
Emitter–to–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = (–)10 μA, I_C = 0 A	(–)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

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.



$I_C = 10I_{B1} = -10I_{B2} = 0.7$ A
For PNP, the polarity is reversed.

Figure 1. Switching Time Test Circuit

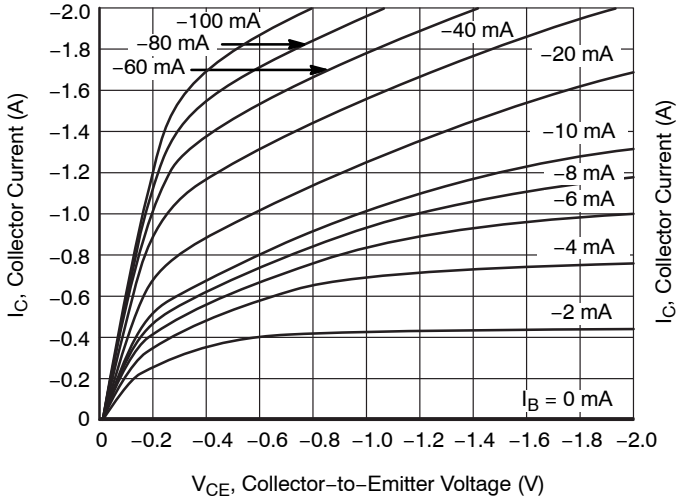


Figure 2. I_C – V_{CE} (PNP)

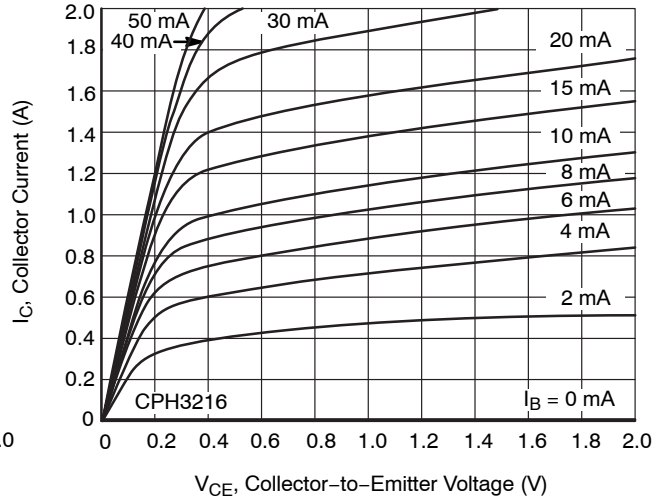


Figure 3. I_C – V_{CE} (NPN)

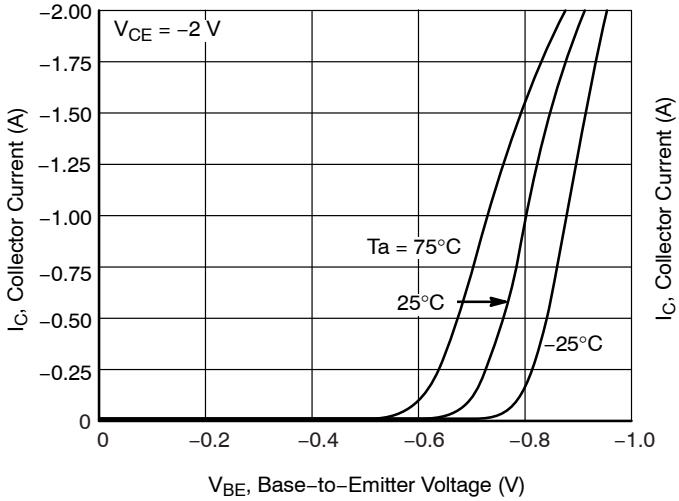


Figure 4. I_C – V_{BE} (PNP)

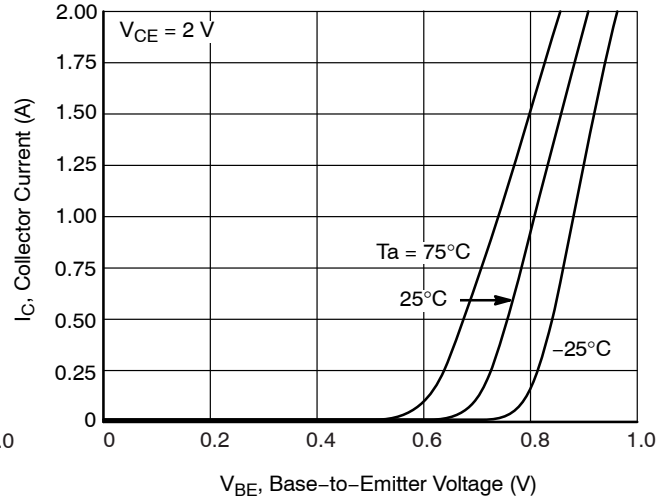


Figure 5. I_C – V_{BE} (NPN)

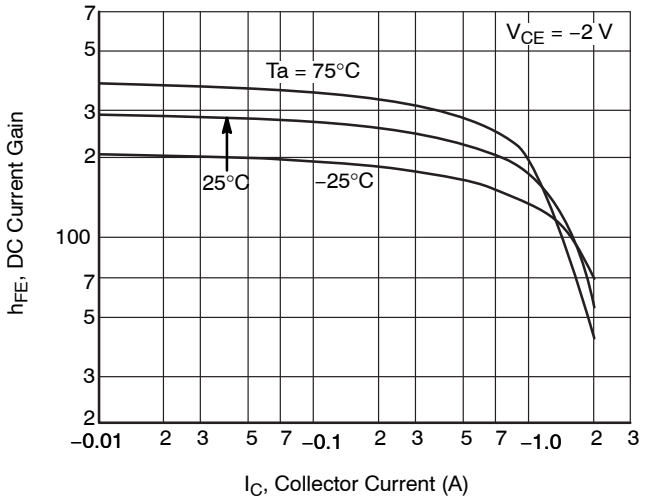


Figure 6. h_{FE} – I_C (PNP)

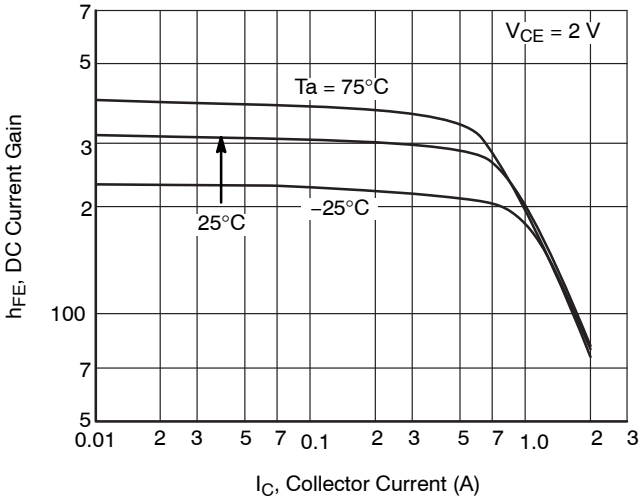


Figure 7. h_{FE} – I_C (NPN)

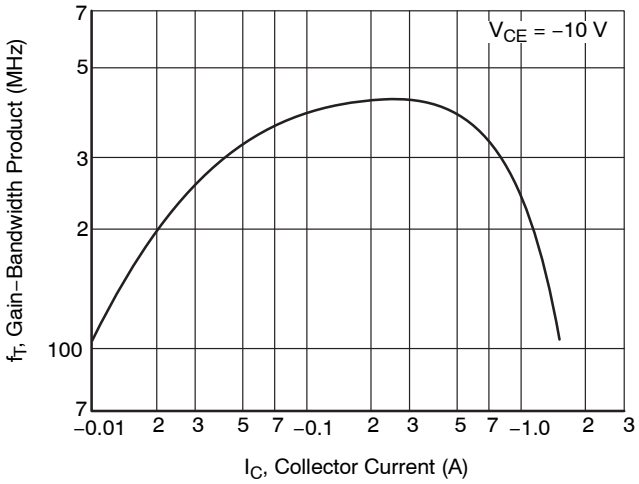


Figure 8. f_T – I_C (PNP)

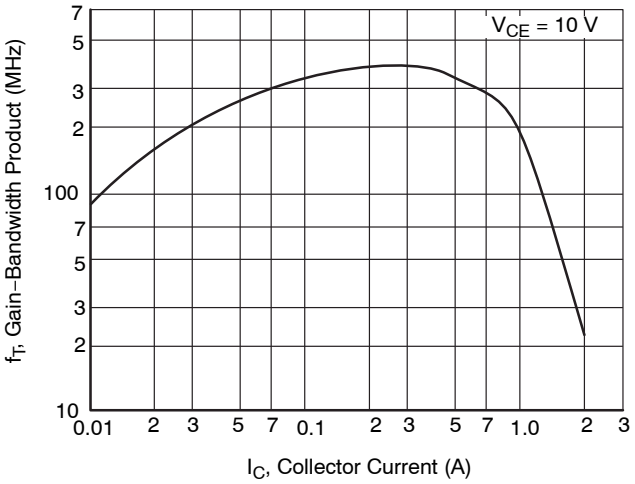


Figure 9. f_T – I_C (NPN)

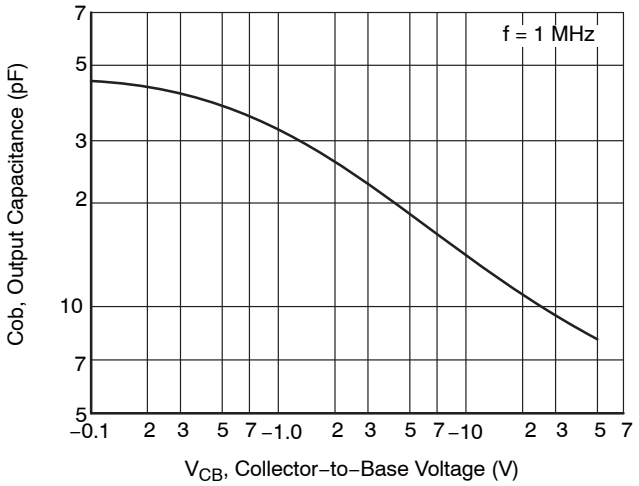


Figure 10. Cob – V_{CB} (PNP)

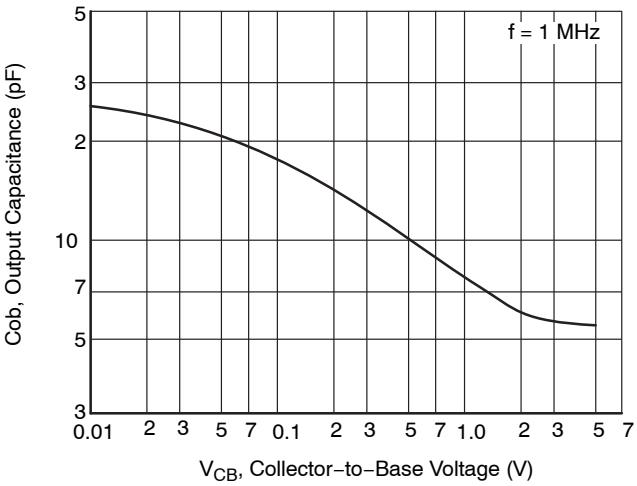


Figure 11. Cob – V_{CB} (NPN)

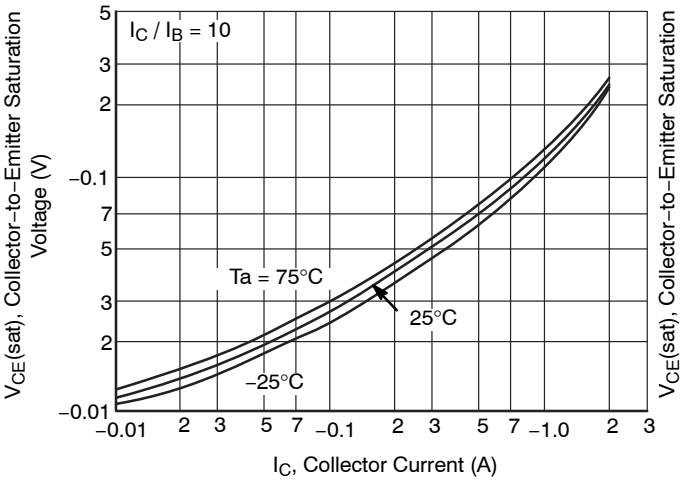


Figure 12. V_{CE}(sat) – I_C (PNP)

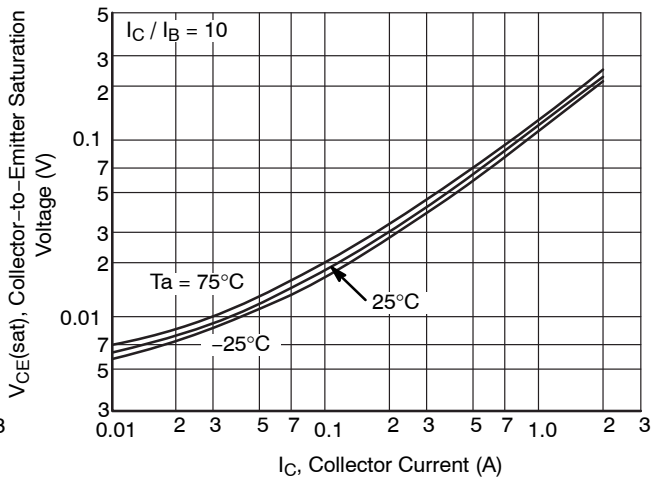


Figure 13. V_{CE}(sat) – I_C (NPN)

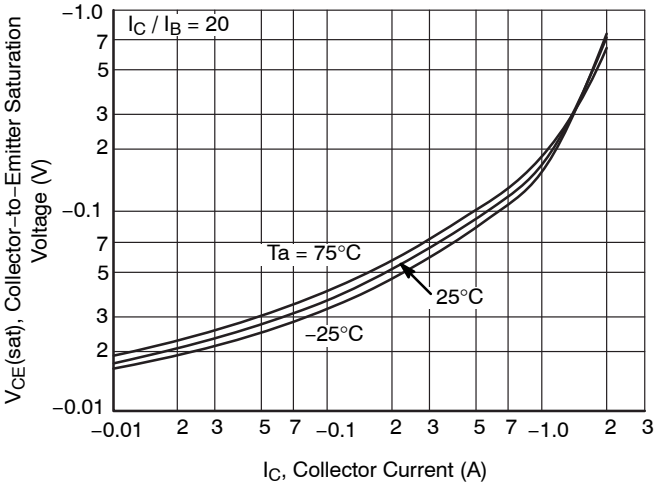


Figure 14. V_{CE}(sat) − I_C (PNP)

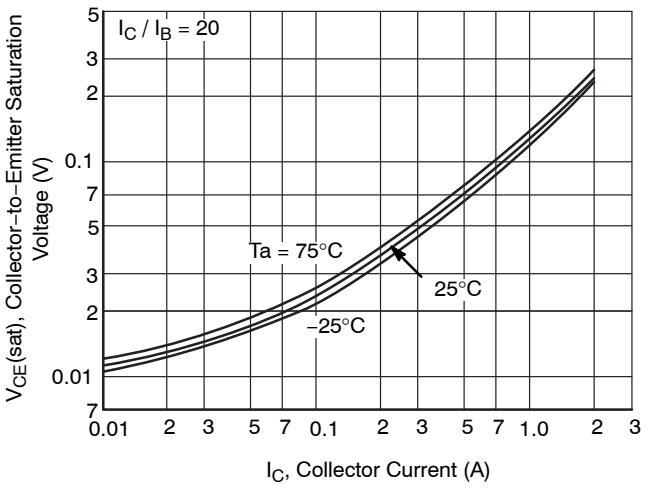


Figure 15. V_{CE}(sat) − I_C (NPC)

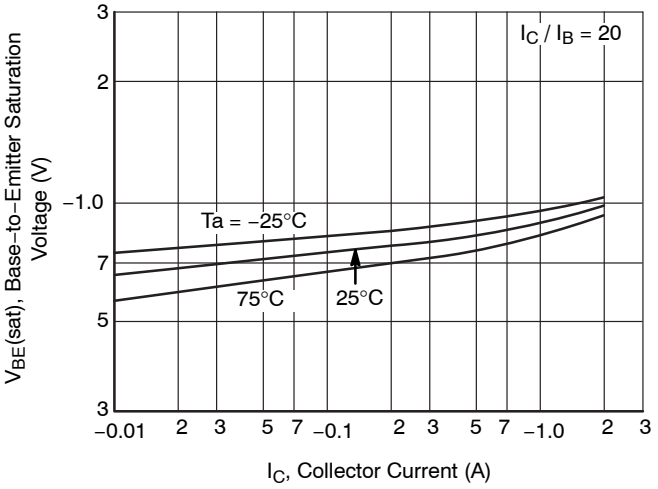


Figure 16. V_{BE}(sat) − I_C (PNP)

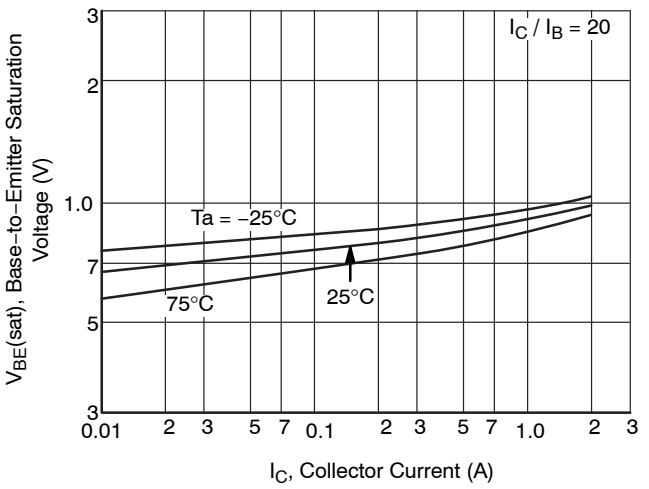


Figure 17. V_{BE}(sat) − I_C (NPC)

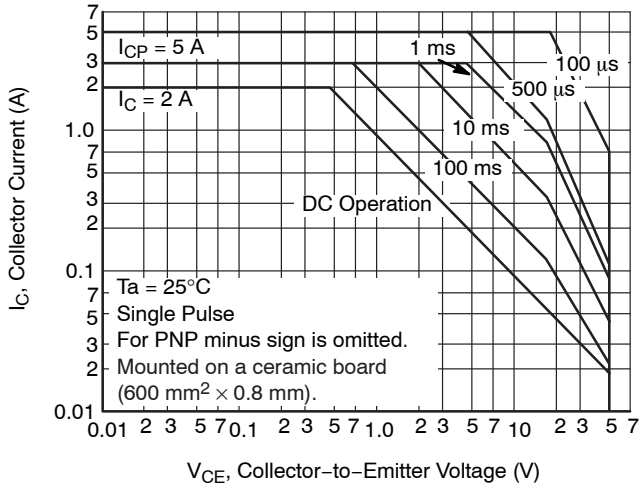


Figure 18. ASO (PNP/NPC)

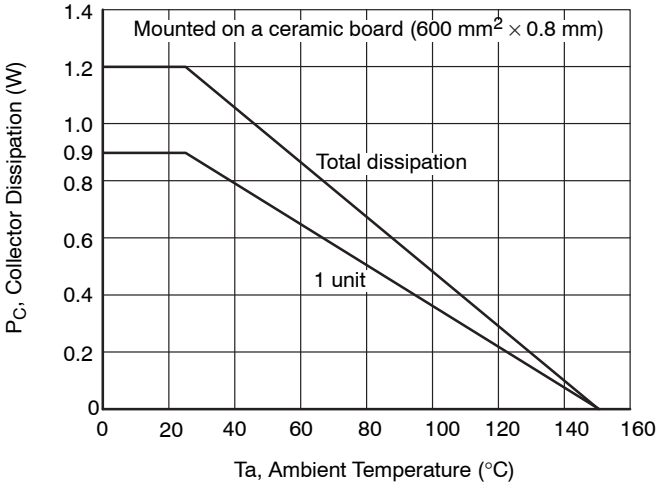


Figure 19. P_C − Ta (PNP/NPC)

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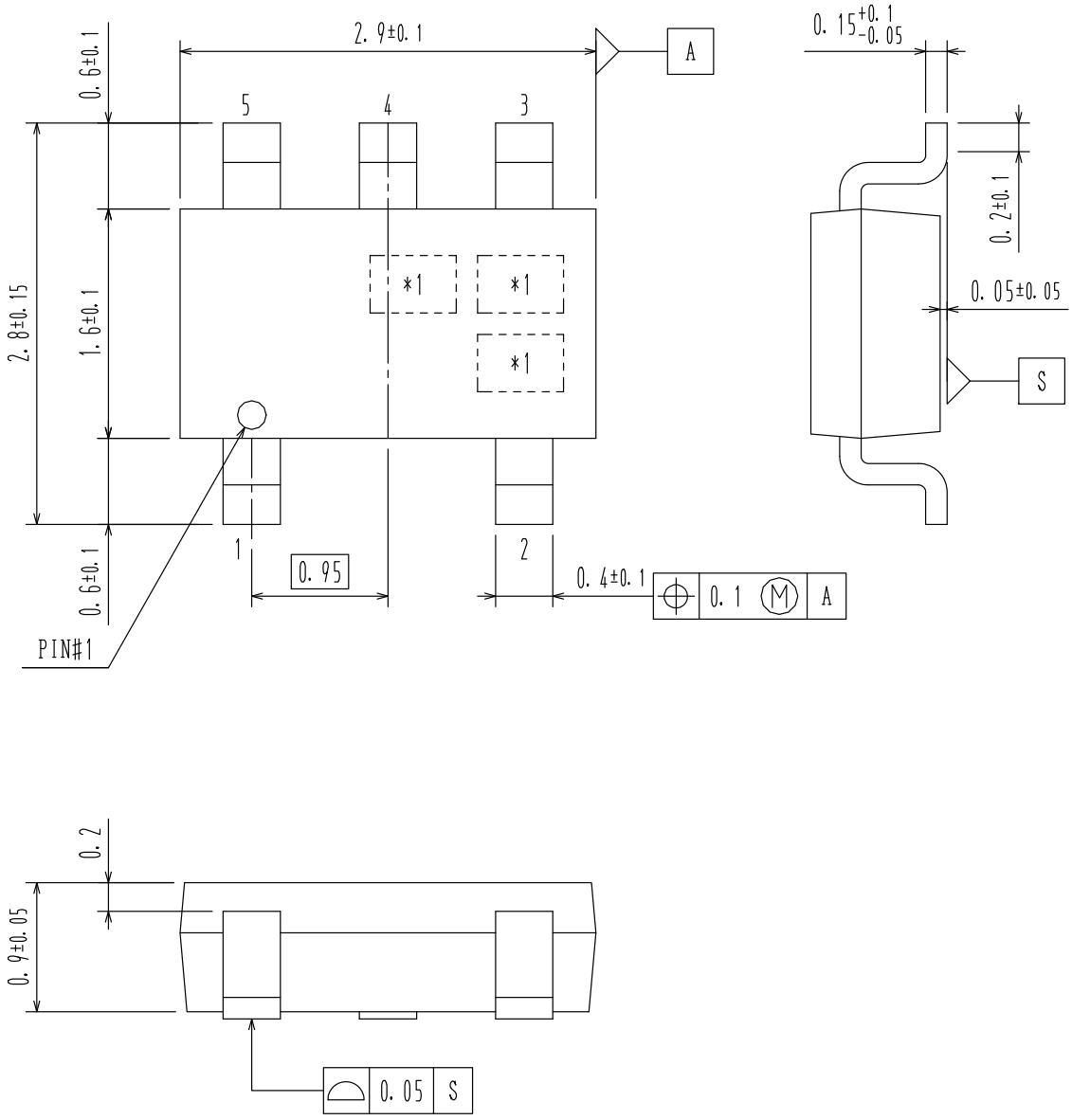

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