Absolute Maximum Ratings

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Rating	Unit
Collector to Base Voltage	V_{CBO}		−150	V
Collector to Emitter Voltage	V_{CEO}		−150	V
Emitter to Base Voltage	V_{EBO}		−5	V
Collector Current	I_C		−10	A
Base Current	I_B		−2	A
Collector Power Dissipation	P_C	T_C = 25 °C	100	W
Operating Junction Temperature	T_J		150	°C
Storage Temperature	T_{STG}		−55 to 150	°C

Thermal Characteristics

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Thermal Resistance (Junction to Case)	$R_{\theta JC}$		—	—	1.25	°C/W
Thermal Resistance (Junction to Ambient)	$R_{\theta JA}$		—	—	35.7	°C/W

Electrical Characteristics

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector Cut-off Current	I_{CBO}	V_{CB} = −150 V, I_E = 0 A	—	—	−100	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = −5 V, I_C = 0 A	—	—	−100	μA
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = −25 mA	−150	—	—	V
DC Current Gain	h_{FE}	V_{CE} = −4 V, I_C = −3 A	50	—	180	—
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = −5 A, I_B = −0.5 A	—	—	−2.0	V
Transition Frequency	f_T	V_{CE} = −12 V, I_E = 1 A	—	60	—	MHz
Collector Output Capacitance	C_{OB}	V_{CB} = −80 V, I_E = 0 A, f = 1 MHz	—	110	—	pF

h_{FE} Rank

For the marking area of the rank, see the Marking Diagram.

Rank	O	P	Y
h_{FE}	50 to 100	70 to 140	90 to 180

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Rating and Characteristic Curves

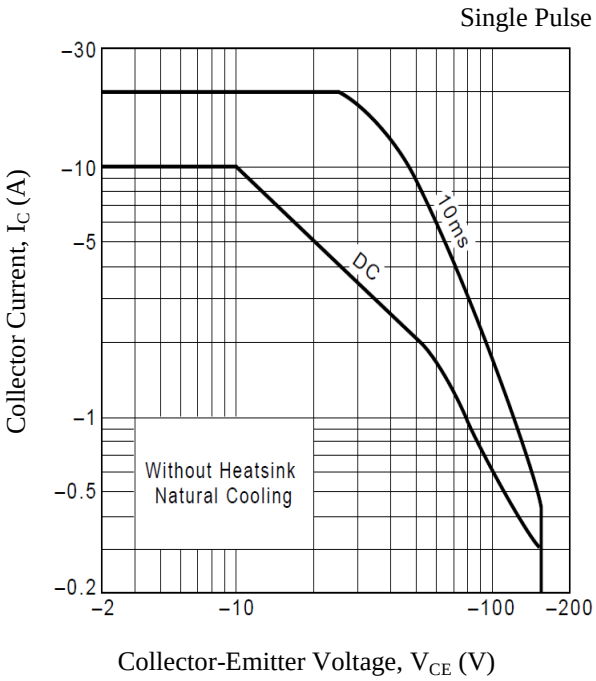

Figure 1. Safe Operating Area

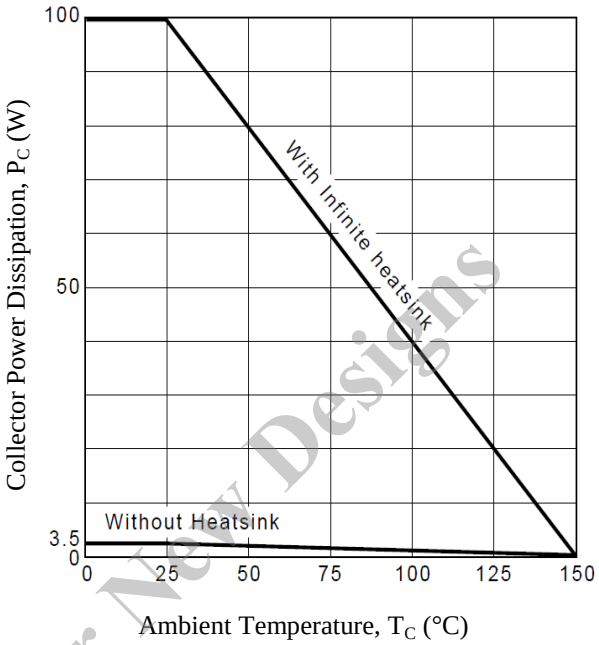

Figure 2. Power Dissipation vs. Ambient Temperature

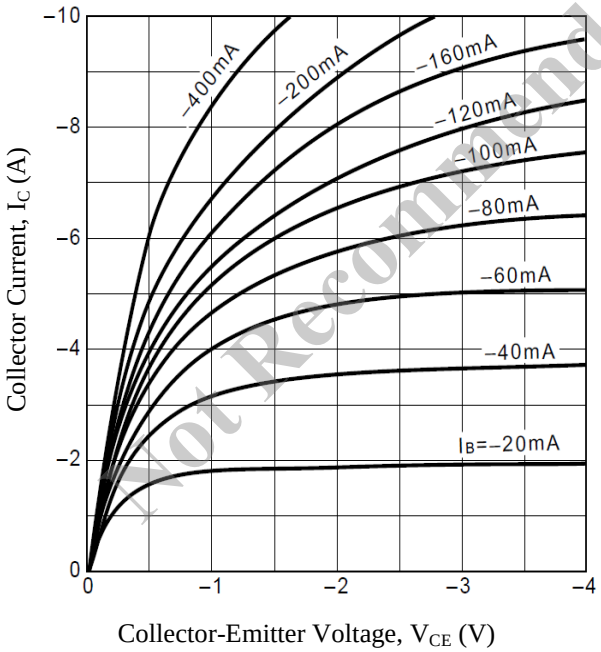

Figure 3. Collector Current vs. Collector-Emitter Voltage

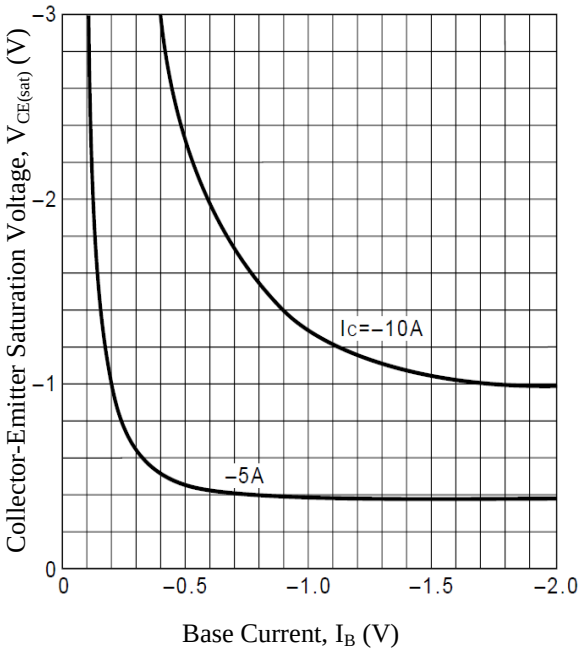

Figure 4. Collector-Emitter Saturation Voltage vs. Base Current

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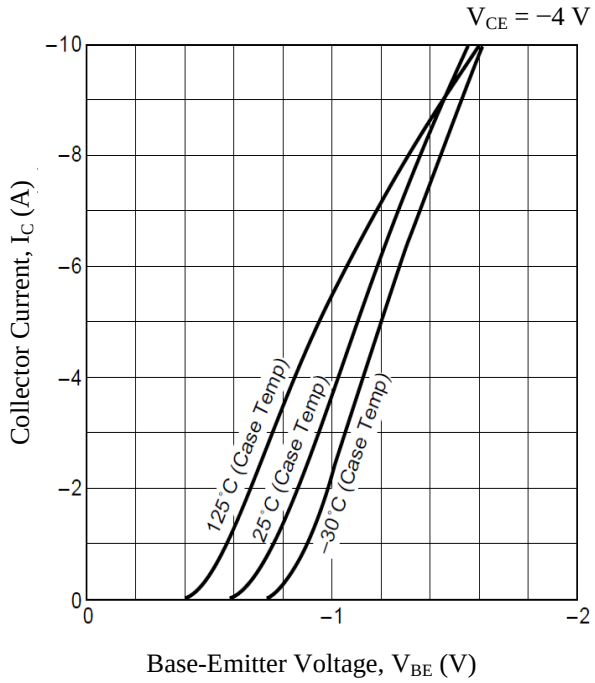

Figure 5. Collector Current vs. Base-Emitter Voltage

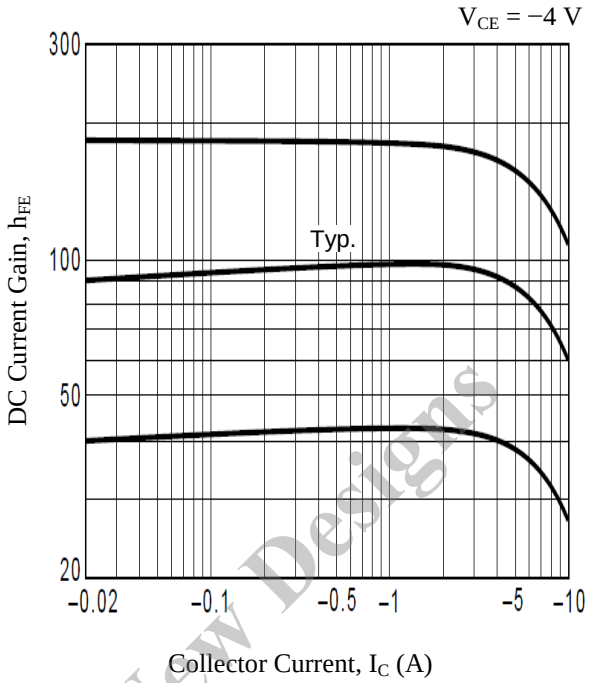

Figure 6. DC Current Gain Variation vs. Collector Current

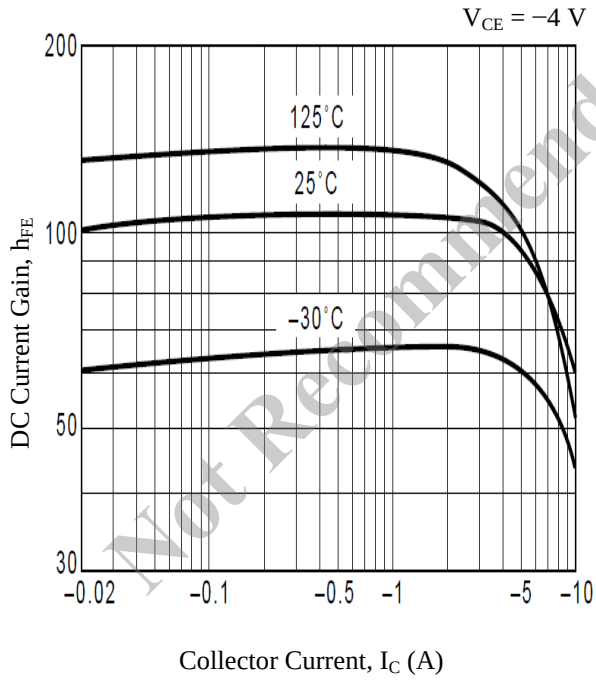

Figure 7. DC Current Gain vs. Collector Current

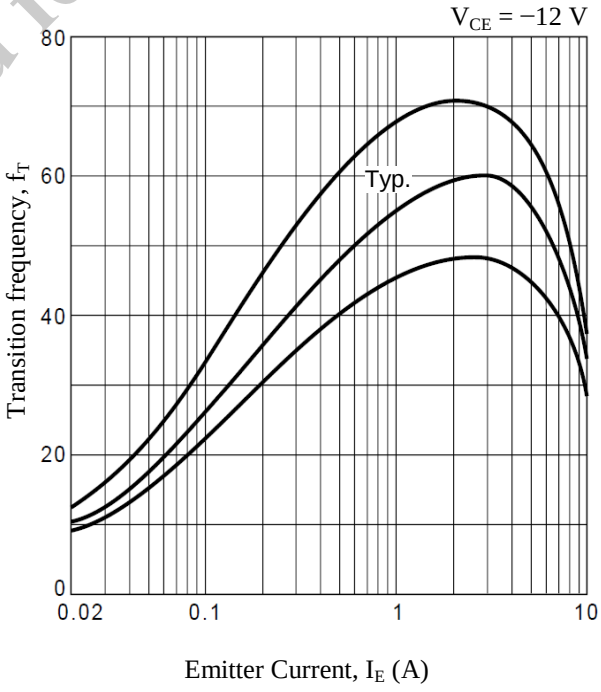

Figure 8. Transition Frequency vs. Emitter Current

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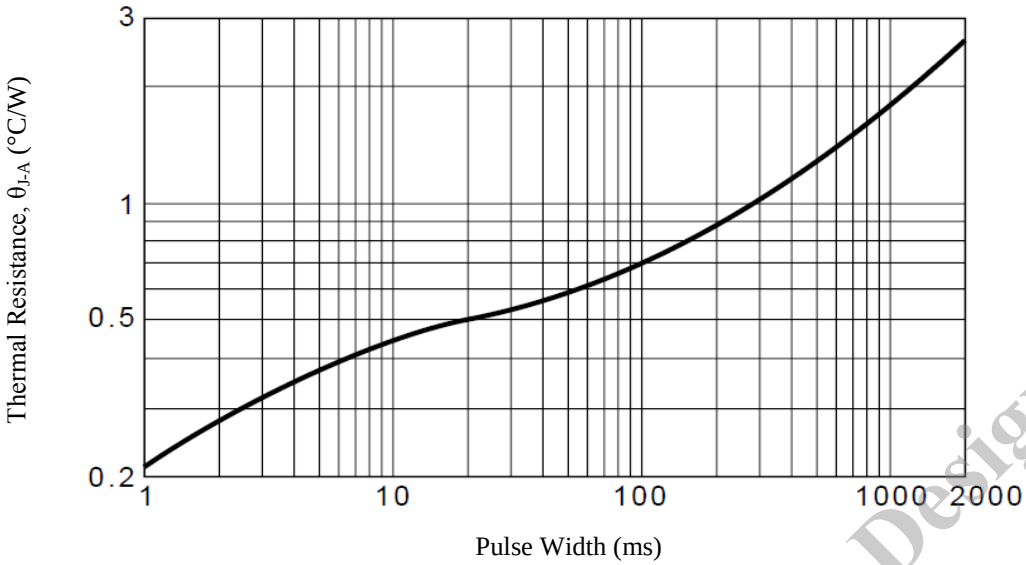

Figure 9. Transient Thermal Resistance

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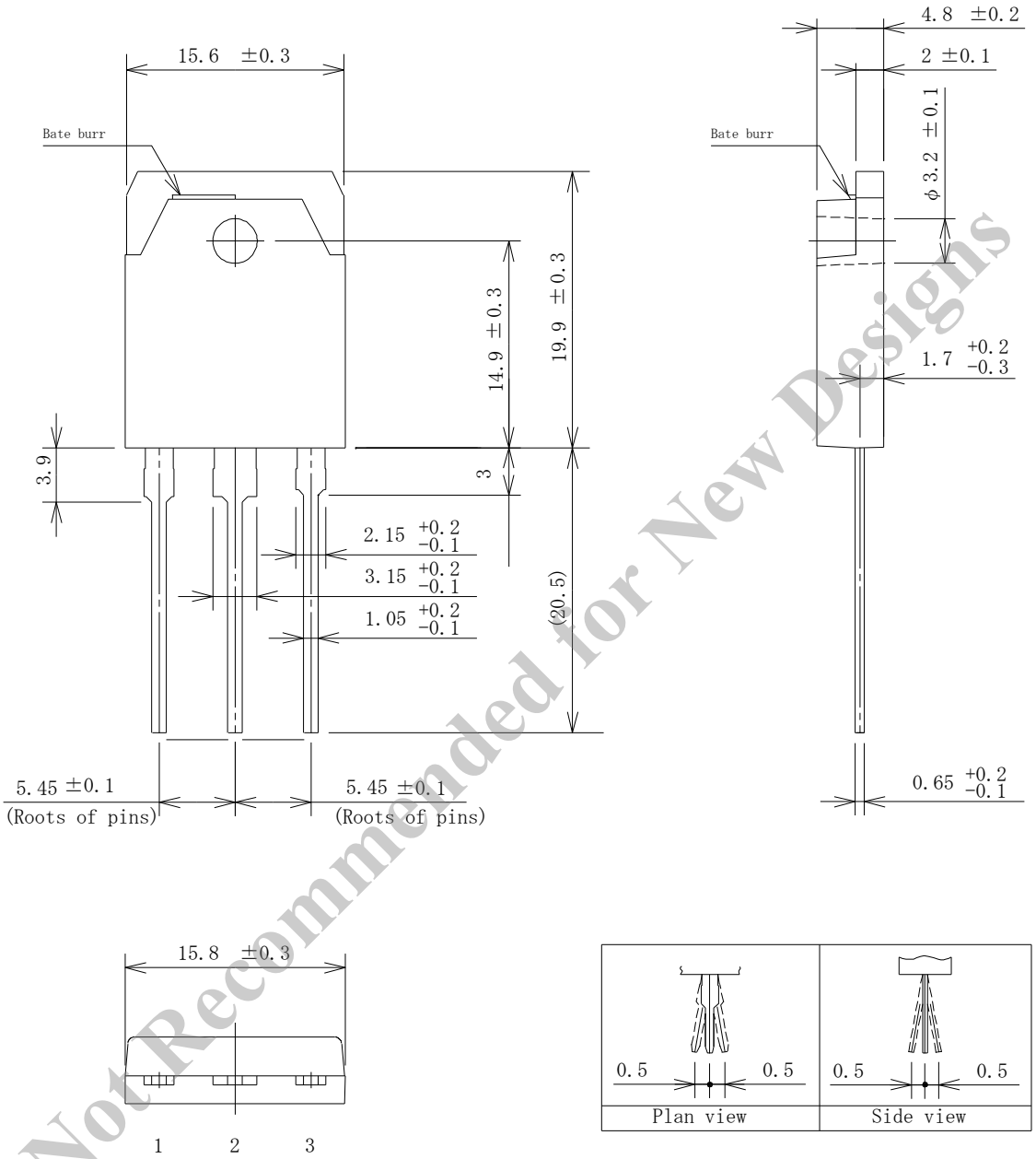
Physical Dimensions

● **TO3P-3L**



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NOTES:

- Gate burr: 0.3 mm (max.)
- All dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the product, be sure to minimize the working time within the following limits:

  260 ± 5 °C 10 ± 1 s, 2 times (flow)
  380 ± 10 °C 3.5 ± 0.5 s, 1 time (soldering iron)

- Soldering should be at a distance of at least 1.5 mm from the body of the product.
- The recommended screw torque for TO3P: 0.686 N·m to 0.882 N·m (7 kgf·cm to 9 kgf·cm)

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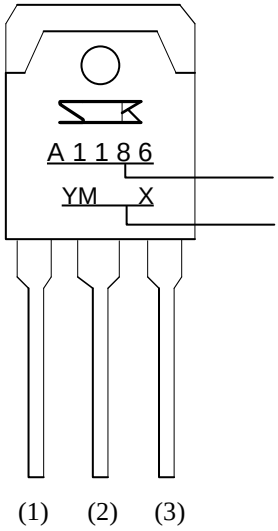
Marking Diagram



Specific Device Code (See Table 1)

Lot Number

Y is the last digit of the year of manufacture (0 to 9)

M is the month of the year (1 to 9, O, N, or D)

X is the h_{FE} rank

Table 1. Specific Device Code

Specific Device Code	Part Number
A1186	2SA1186

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