# NPN Silicon Epitaxial Planar Transistors

## Features

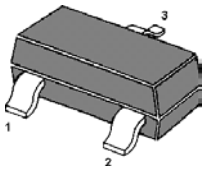
● These transistors are subdivided into three groups -16, -25 and -40, according to their current gain. As complementary types the NPN transistors ABC817 and ABC818 are recommended.

● Halogen and Antimony Free(HAF), RoHS compliant

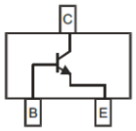
● AEC-Q101 Qualified

● For switching, AF driver and amplifier applications

RoHS COMPLIANT




1.Base 2. Emitter 3. Collector




## Mechanical Data

● SOT-23 Plastic Package

● Mounting position: Any

## Absolute Maximum Ratings ($T_A$=25°C unless otherwise noted)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Collector Base Voltage | ABC817<br>ABC818 | $V_{CBO}$ | 50<br>30 | V |
| Collector Emitter Voltage | ABC817<br>ABC818 | $V_{CEO}$ | 45<br>25 | V |
| Emitter Base Voltage | | $V_{EBO}$ | 5 | V |
| Collector Current | | $I_C$ | 500 | mA |
| Power Dissipation[1)] | | $P_D$ | 300 | mW |
| Operating Junction Temperature Range | | $T_J$ | 150 | ℃ |
| Storage Temperature Range | | $T_{stg}$ | - 55 to + 150 | ℃ |

## Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance Junction to Ambient[1)] | $R_{thJA}$ | 417 | °C/W |

[1)] Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

## Electrical Characteristics ($T_A$ =25°C unless otherwise noted)

| Parameter | | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| DC Current Gain<br>at $V_{CE}$ = 1 V, $I_C$ = 100 mA | -16 | $h_{FE}$ | 100 | - | 250 | - |
| | -25 | $h_{FE}$ | 160 | - | 400 | - |
| | -40 | $h_{FE}$ | 250 | - | 600 | - |
| at $V_{CE}$ = 1 V, $I_C$ = 500 mA | | $h_{FE}$ | 40 | - | - | - |
| Collector Base Cutoff Current<br>at $V_{CB}$ = 20 V | | $I_{CBO}$ | - | - | 100 | nA |
| Emitter Base Cutoff Current<br>at $V_{EB}$ = 5 V | | $I_{EBO}$ | - | - | 100 | nA |
| Collector Base Breakdown Voltage<br>at $I_C$ = 10 μA | ABC817<br>ABC818 | $V_{(BR)CBO}$ | 50<br>30 | - | - | V |
| Collector Emitter Breakdown Voltage<br>at $I_C$ = 10 mA | ABC817<br>ABC818 | $V_{(BR)CEO}$ | 45<br>25 | - | - | V |
| Emitter Base Breakdown Voltage<br>at $I_E$ = 10 μA | | $V_{(BR)EBO}$ | 5 | - | - | V |
| Collector Emitter Saturation Voltage<br>at $I_C$ = 500 mA, $I_B$ = 50 mA | | $V_{CE(sat)}$ | - | - | 0.7 | V |
| Base Emitter On Voltage<br>at $I_C$ = 500 mA, $V_{CE}$ = 1 V | | $V_{BE(on)}$ | - | - | 1.2 | V |
| Transition Frequency<br>at $V_{CE}$ = 5 V, $I_C$ = 10 mA, f = 100 MHz | | $f_T$ | 100 | - | - | MHz |
| Collector Output Capacitance<br>at $V_{CB}$ = 10 V, f = 1 MHz | | $C_{ob}$ | - | 5 | - | pF |

## Typical Characteristics Curves

Fig. 1 Output Characteristics Curve

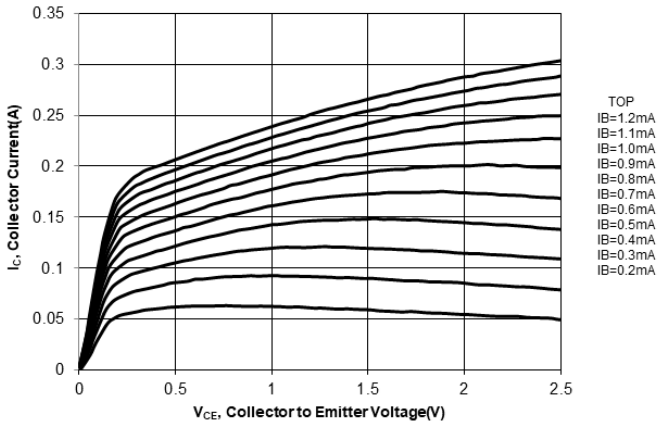



Fig. 2 Collector Current vs. Base to Emitter Voltage

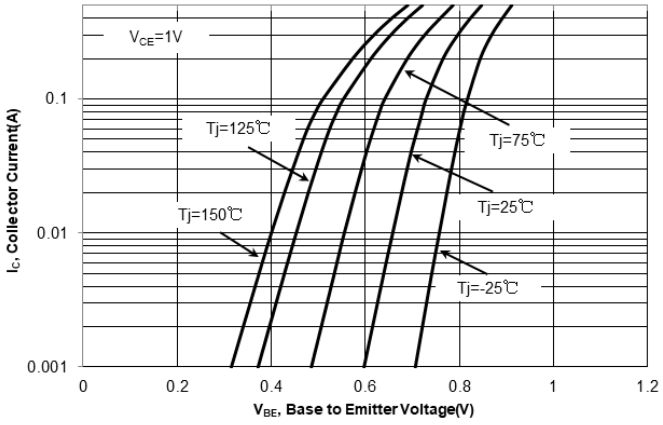



Fig. 3 DC Current Gain vs. Collector Current

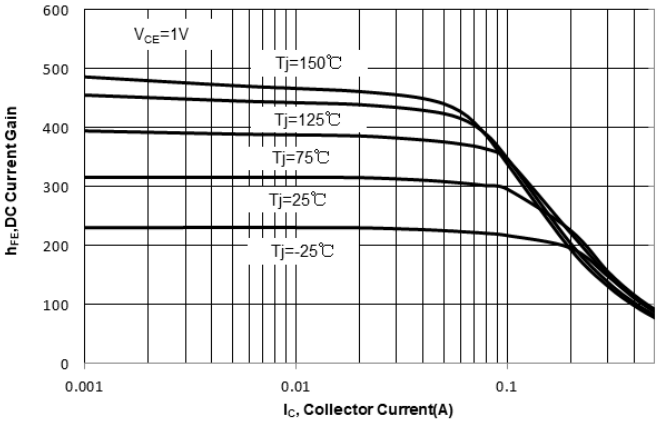



Fig. 4 $V_{BE(sat)}$ vs. Collector Current

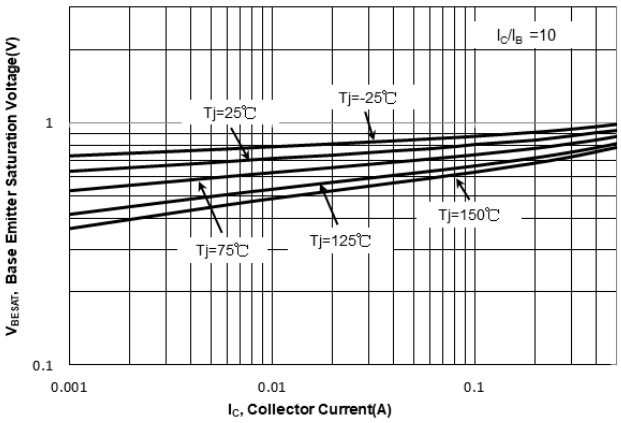



Fig. 5 $V_{CE(sat)}$ vs. Collector Current

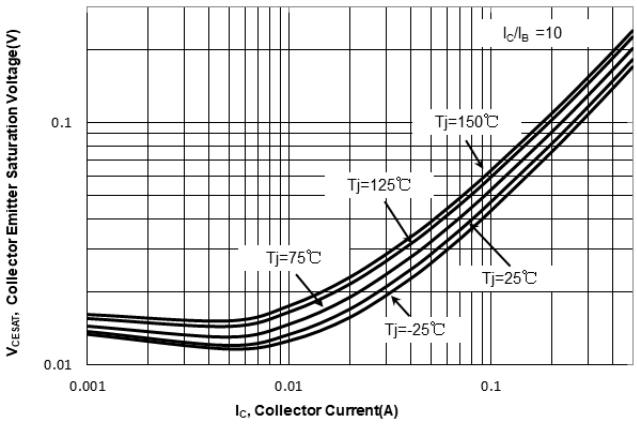



Fig. 6 Output Capacitance

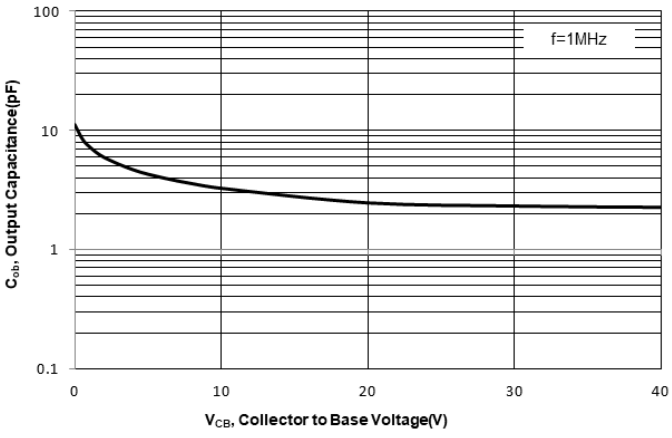
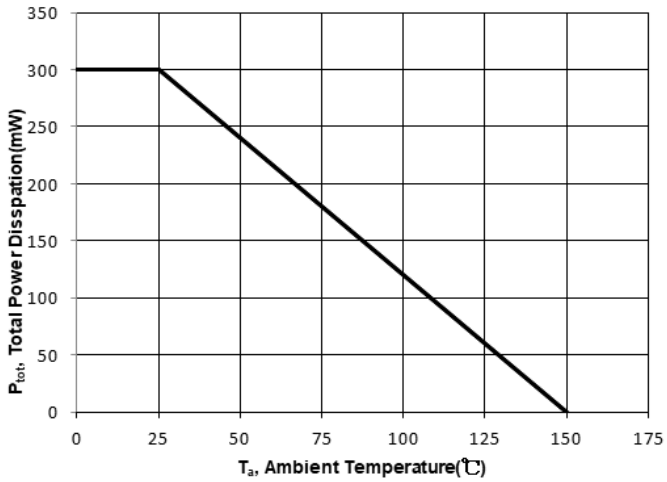
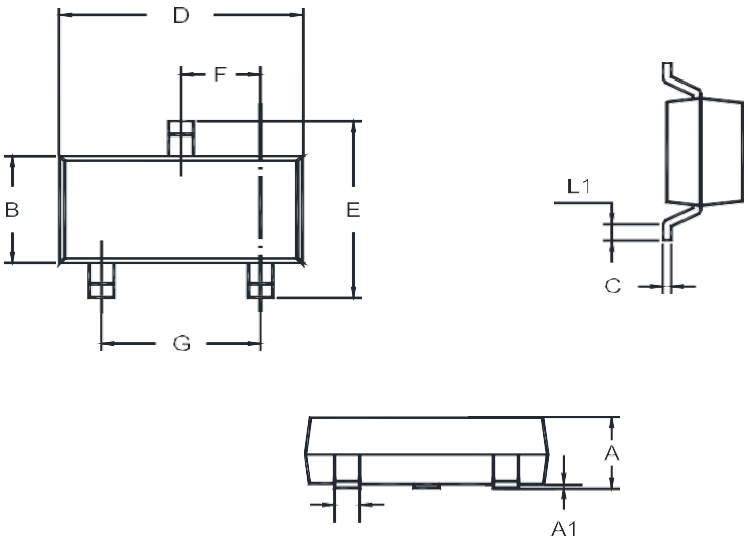


Fig. 7 Power Derating Curve



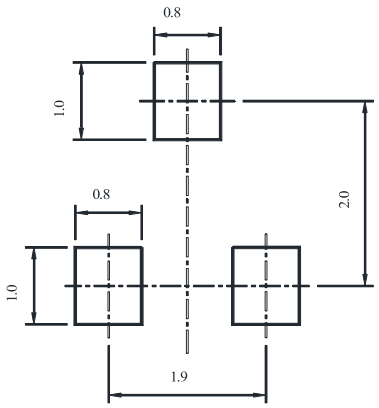

## Package Outline Dimensions (Unit: millimeters)

### SOT-23




| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | TYP | MAX |
| A | 0.89 | / | 1.2 |
| A1 | 0.013 | / | 0.1 |
| B | 1.2 | / | 1.4 |
| C | 0.08 | / | 0.19 |
| D | 2.8 | / | 3.04 |
| E | 2.2 | / | 2.6 |
| F | 0.89 | / | 1.02 |
| G | 1.78 | / | 2.04 |
| L | 0.37 | / | 0.51 |
| L1 | / | / | 0.2 |

## Recommended Soldering Footprint (Unit: millimeters)



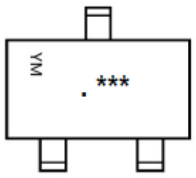

## Packing Information

| Package | Tape Width | Pitch | | Reel Size | | Per Reel Packing Quantity |
|---|---|---|---|---|---|---|
| SOT-23 | mm | mm | inch | mm | inch | |
| | 8 | 4±0.1 | 0.157±0.004 | 178 | 7 | 3000 |

## Marking information

| Part No. | Marking Code |
|---|---|
| ABC817-16 & ABC818-16 | 6CR |
| ABC817-25 & ABC818-25 | 6CS |
| ABC817-40 & ABC818-40 | 6CT |

" *** " = See table of Marking information
" YM " = Date Code Marking
" • " = Automotive-grade material
Font type: Arial




## Revision History

| Version | Date | Major Changes |
|---|---|---|
| Rev.A | 2025.01.19 | Official Release |
| | | |
| | | |

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