

Medium Power Transistors (-50V / -2A)

2SAR553P

● **Structure**

PNP Silicon epitaxial planar transistor

● **Features**

- 1) Low saturation voltage, typically
 $V_{CE(sat)} = -0.4V$ (Max.) ($I_C / I_B = -700mA / -35mA$)
- 2) High speed switching

● **Applications**

Driver

● **Packaging specifications**

| | | |
|----------|------------------------------|--------|
| Type | Package | Taping |
| | Code | T100 |
| | Basic ordering unit (pieces) | 1000 |
| 2SAR553P | | ○ |

● **Absolute maximum ratings (Ta = 25°C)**

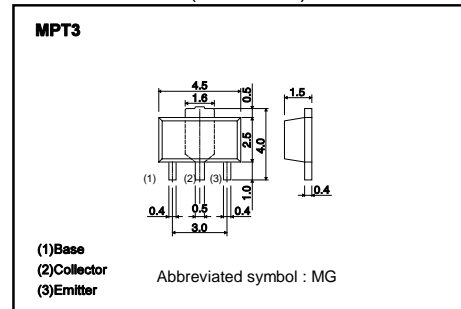
| Parameter | Symbol | Limits | Unit | |
|------------------------------|-----------|---------------|------|---|
| Collector-base voltage | V_{CBO} | -50 | V | |
| Collector-emitter voltage | V_{CEO} | -50 | V | |
| Emitter-base voltage | V_{EBO} | -6 | V | |
| Collector current | DC | I_C | -2 | A |
| | Pulsed | I_{CP}^{*1} | -4 | A |
| Power dissipation | | P_D^{*2} | 0.5 | W |
| | | P_D^{*3} | 2 | W |
| Junction temperature | T_j | 150 | °C | |
| Range of storage temperature | T_{stg} | -55 to 150 | °C | |

*1 Pw=10ms, Single Pulse

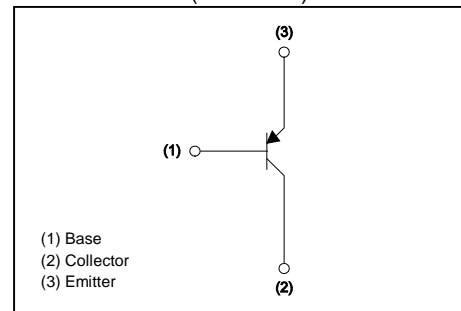
*2 Each terminal mounted on a recommended land.

*3 Mounted on a ceramic board. (40x40x0.7mm³)

● **Dimensions (Unit : mm)**



● **Inner circuit (Unit : mm)**



●Electrical characteristic (Ta = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------------------|--------------------|------|------|------|---------------|---|
| Collector-emitter breakdown voltage | BV_{CEO} | -50 | - | - | V | $I_C = -1\text{mA}$ |
| Collector-base breakdown voltage | BV_{CBO} | -50 | - | - | V | $I_C = -100\mu\text{A}$ |
| Emitter-base breakdown voltage | BV_{EBO} | -6 | - | - | V | $I_E = -100\mu\text{A}$ |
| Collector cut-off current | I_{CBO} | - | - | -1 | μA | $V_{CB} = -50\text{V}$ |
| Emitter cut-off current | I_{EBO} | - | - | -1 | μA | $V_{EB} = -4\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(sat)}^{*1}$ | - | -200 | -400 | mV | $I_C = -700\text{mA}$, $I_B = -35\text{mA}$ |
| DC current gain | h_{FE} | 180 | - | 450 | - | $V_{CE} = -2\text{V}$, $I_C = -50\text{mA}$ |
| Transition frequency | f_T^{*1} | - | 320 | - | MHz | $V_{CE} = -10\text{V}$ $I_E = 300\text{mA}$, $f = 100\text{MHz}$ |
| Collector output capacitance | C_{ob} | - | 22 | - | pF | $V_{CB} = -10\text{V}$, $I_E = 0\text{A}$ $f = 1\text{MHz}$ |
| Turn-on time | t_{on}^{*2} | - | 45 | - | ns | $I_C = -1\text{A}$, $I_{B1} = -100\text{mA}$, $I_{B2} = 100\text{mA}$, $V_{CC} \approx -10\text{V}$ |
| Storage time | t_{stg}^{*2} | - | 220 | - | ns | |
| Fall time | t_f^{*2} | - | 35 | - | ns | |

*1 Pulsed

*2 See switching time test circuit

●Electrical characteristic curves

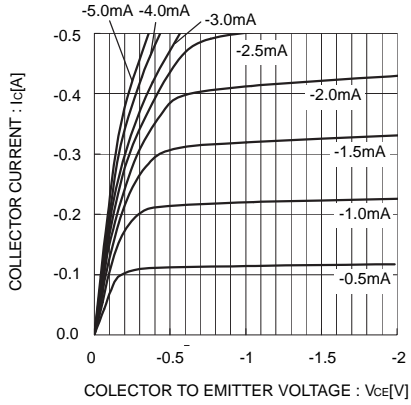


Fig.1 Typical Output Characteristics

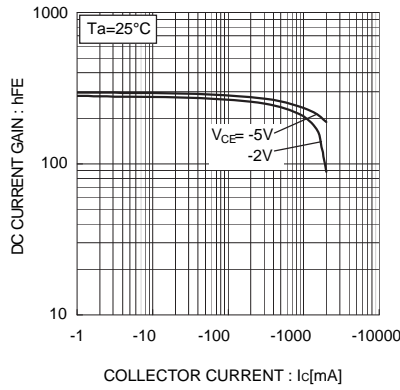


Fig.2 DC Current Gain vs. Collector Current (I)

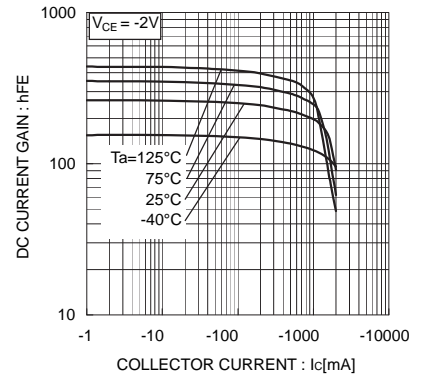


Fig.3 DC Current Gain vs. Collector Current (II)

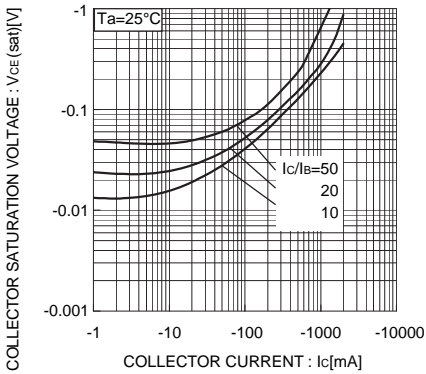


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current (I)

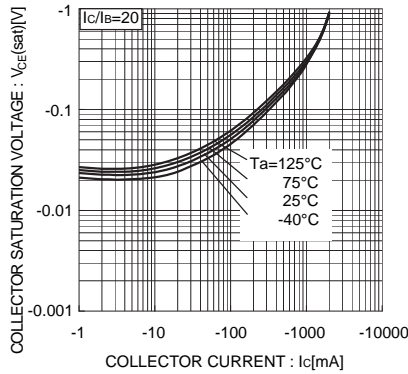


Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current (II)

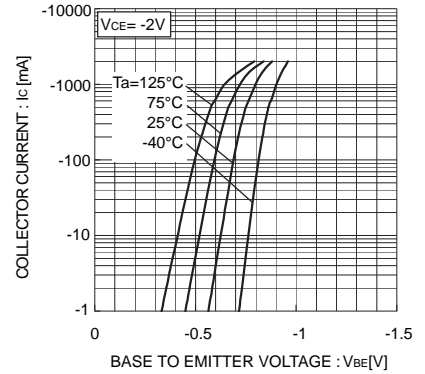


Fig.6 Ground Emitter Propagation Characteristics

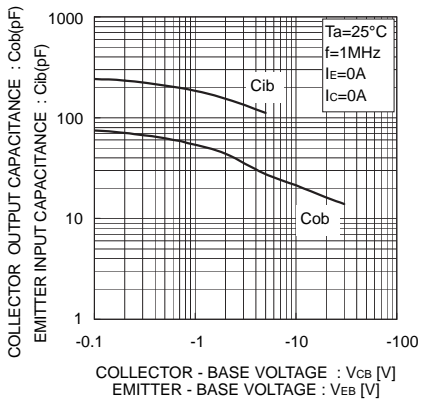


Fig.7 Emitter Input Capacitance vs. Emitter-Base Voltage
Collector Output Capacitance vs. Collector-Base Voltage

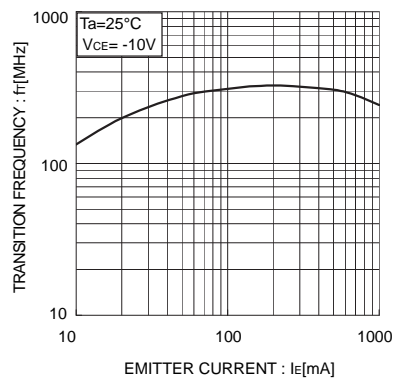


Fig.8 Gain Bandwidth Product vs. Emitter Current

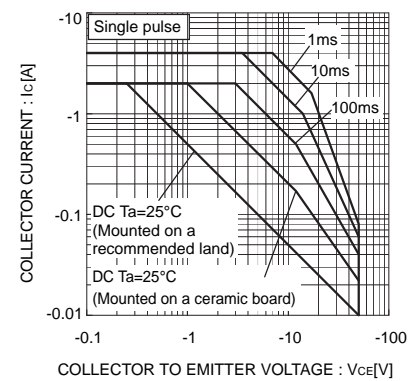
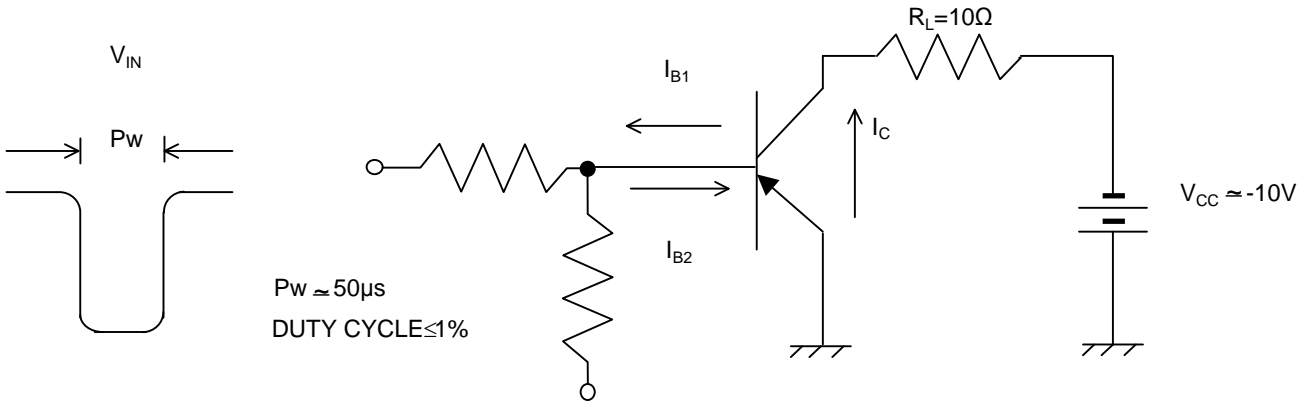
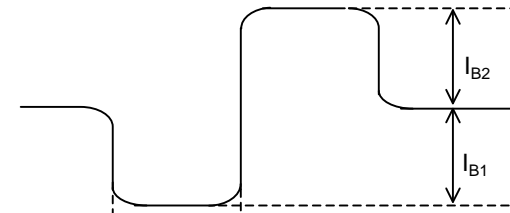


Fig.9 Safe Operating Area

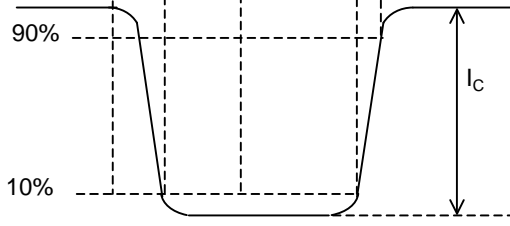
●Switching time test circuit



BASE CURRENT WAVEFORM



COLLECTOR CURRENT WAVEFORM



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