

# DMG96303

Silicon NPN epitaxial planar type (Tr1)  
Silicon PNP epitaxial planar type (Tr2)

For digital circuits

■ Features

- Low collector-emitter saturation voltage  $V_{CE(sat)}$
- Halogen-free / RoHS compliant  
(EU RoHS / UL-94 V-0 / MSL: Level 1 compliant)

■ Marking Symbol: GA

■ Basic Part Number

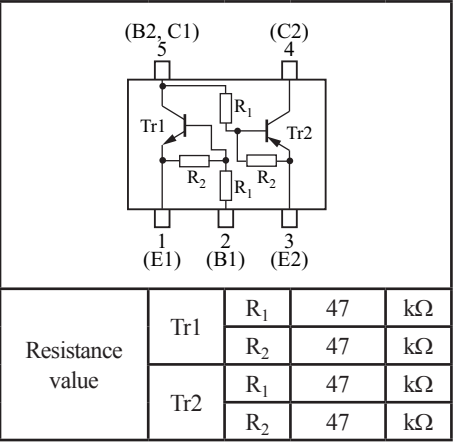
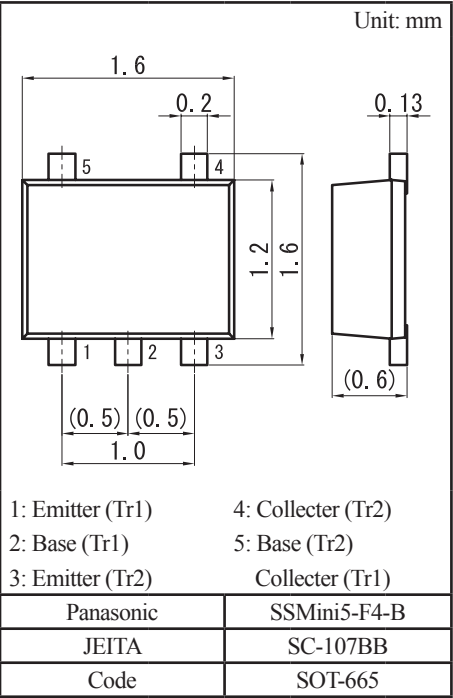
DRC2144E + DRA2144E (Collector-base connection)

■ Packaging

DMG963030R Embossed type (Thermo-compression sealing): 8 000 pcs / reel (standard)

■ Absolute Maximum Ratings  $T_a = 25^{\circ}\text{C}$

| Parameter |                                       | Symbol    | Rating      | Unit               |
|-----------|---------------------------------------|-----------|-------------|--------------------|
| Tr1       | Collector-base voltage (Emitter open) | $V_{CBO}$ | 50          | V                  |
|           | Collector-emitter voltage (Base open) | $V_{CEO}$ | 50          | V                  |
|           | Collector current                     | $I_C$     | 100         | mA                 |
| Tr2       | Collector-base voltage (Emitter open) | $V_{CBO}$ | -50         | V                  |
|           | Collector-emitter voltage (Base open) | $V_{CEO}$ | -50         | V                  |
|           | Collector current                     | $I_C$     | -100        | mA                 |
| Overall   | Total power dissipation               | $P_T$     | 125         | mW                 |
|           | Junction temperature                  | $T_j$     | 150         | $^{\circ}\text{C}$ |
|           | Operating ambient temperature         | $T_{opr}$ | -40 to +85  | $^{\circ}\text{C}$ |
|           | Storage temperature                   | $T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |



■ Electrical Characteristics  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

• Tr1

| Parameter                                    | Symbol                        | Conditions                                                    | Min  | Typ | Max  | Unit             |
|----------------------------------------------|-------------------------------|---------------------------------------------------------------|------|-----|------|------------------|
| Collector-base voltage (Emitter open)        | $V_{\text{CBO}}$              | $I_{\text{C}} = 10 \mu\text{A}, I_{\text{E}} = 0$             | 50   |     |      | V                |
| Collector-emitter voltage (Base open)        | $V_{\text{CEO}}$              | $I_{\text{C}} = 2 \text{ mA}, I_{\text{B}} = 0$               | 50   |     |      | V                |
| Collector-base cutoff current (Emitter open) | $I_{\text{CBO}}$              | $V_{\text{CB}} = 50 \text{ V}, I_{\text{E}} = 0$              |      |     | 0.1  | $\mu\text{A}$    |
| Collector-emitter cutoff current (Base open) | $I_{\text{CEO}}$              | $V_{\text{CE}} = 50 \text{ V}, I_{\text{B}} = 0$              |      |     | 0.5  | $\mu\text{A}$    |
| Emitter-base cutoff current (Collector open) | $I_{\text{EBO}}$              | $V_{\text{EB}} = 6 \text{ V}, I_{\text{C}} = 0$               |      |     | 0.1  | mA               |
| Forward current transfer ratio               | $h_{\text{FE}}$               | $V_{\text{CE}} = 10 \text{ V}, I_{\text{C}} = 5 \text{ mA}$   | 80   |     |      | —                |
| Collector-emitter saturation voltage         | $V_{\text{CE(sat)}}$          | $I_{\text{C}} = 10 \text{ mA}, I_{\text{B}} = 0.5 \text{ mA}$ |      |     | 0.25 | V                |
| Input voltage (ON)                           | $V_{\text{I(on)}}$            | $V_{\text{CE}} = 0.2 \text{ V}, I_{\text{C}} = 5 \text{ mA}$  | 3.6  |     |      | V                |
| Input voltage (OFF)                          | $V_{\text{I(off)}}$           | $V_{\text{CE}} = 5 \text{ V}, I_{\text{C}} = 100 \mu\text{A}$ |      |     | 0.8  | V                |
| Input resistance                             | $R_{\text{I}}$                |                                                               | -30% | 47  | +30% | $\text{k}\Omega$ |
| Resistance ratio                             | $R_{\text{I}} / R_{\text{2}}$ |                                                               | 0.8  | 1.0 | 1.2  | —                |

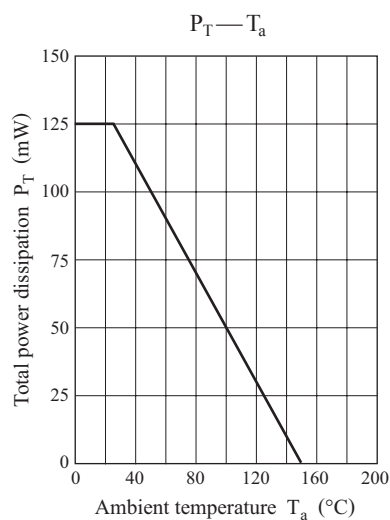
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

• Tr2

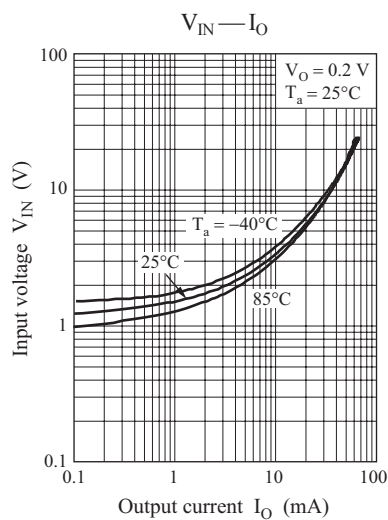
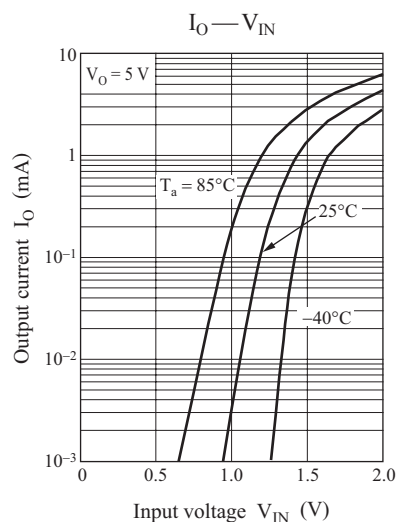
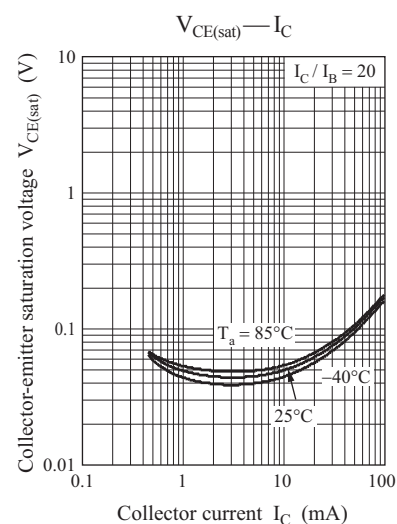
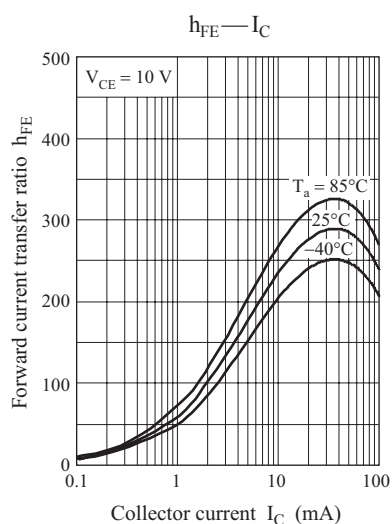
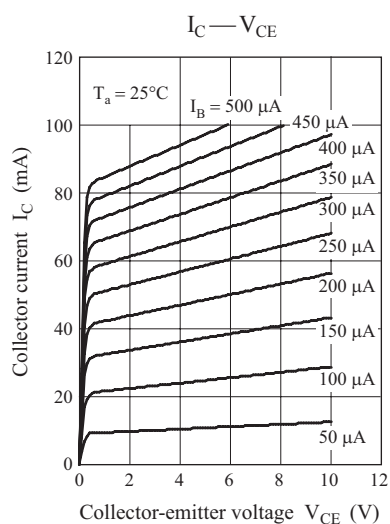
| Parameter                                    | Symbol                        | Conditions                                                      | Min  | Typ | Max   | Unit             |
|----------------------------------------------|-------------------------------|-----------------------------------------------------------------|------|-----|-------|------------------|
| Collector-base voltage (Emitter open)        | $V_{\text{CBO}}$              | $I_{\text{C}} = -10 \mu\text{A}, I_{\text{E}} = 0$              | -50  |     |       | V                |
| Collector-emitter voltage (Base open)        | $V_{\text{CEO}}$              | $I_{\text{C}} = -2 \text{ mA}, I_{\text{B}} = 0$                | -50  |     |       | V                |
| Collector-base cutoff current (Emitter open) | $I_{\text{CBO}}$              | $V_{\text{CB}} = -50 \text{ V}, I_{\text{E}} = 0$               |      |     | -0.1  | $\mu\text{A}$    |
| Collector-emitter cutoff current (Base open) | $I_{\text{CEO}}$              | $V_{\text{CE}} = -50 \text{ V}, I_{\text{B}} = 0$               |      |     | -0.5  | $\mu\text{A}$    |
| Emitter-base cutoff current (Collector open) | $I_{\text{EBO}}$              | $V_{\text{EB}} = -6 \text{ V}, I_{\text{C}} = 0$                |      |     | -0.1  | mA               |
| Forward current transfer ratio               | $h_{\text{FE}}$               | $V_{\text{CE}} = -10 \text{ V}, I_{\text{C}} = -5 \text{ mA}$   | 80   |     |       | —                |
| Collector-emitter saturation voltage         | $V_{\text{CE(sat)}}$          | $I_{\text{C}} = -10 \text{ mA}, I_{\text{B}} = -0.5 \text{ mA}$ |      |     | -0.25 | V                |
| Input voltage (ON)                           | $V_{\text{I(on)}}$            | $V_{\text{CE}} = -0.2 \text{ V}, I_{\text{C}} = -5 \text{ mA}$  | -3.6 |     |       | V                |
| Input voltage (OFF)                          | $V_{\text{I(off)}}$           | $V_{\text{CE}} = -5 \text{ V}, I_{\text{C}} = -100 \mu\text{A}$ |      |     | -0.8  | V                |
| Input resistance                             | $R_{\text{I}}$                |                                                                 | -30% | 47  | +30%  | $\text{k}\Omega$ |
| Resistance ratio                             | $R_{\text{I}} / R_{\text{2}}$ |                                                                 | 0.8  | 1.0 | 1.2   | —                |

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

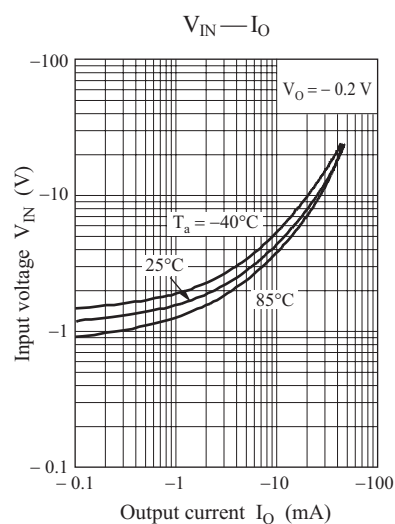
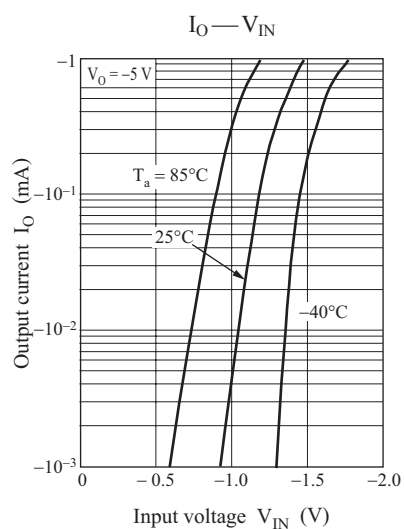
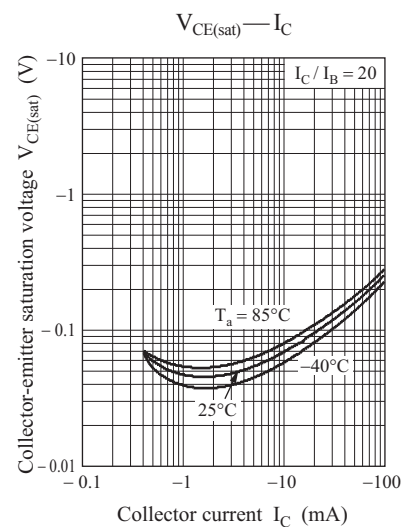
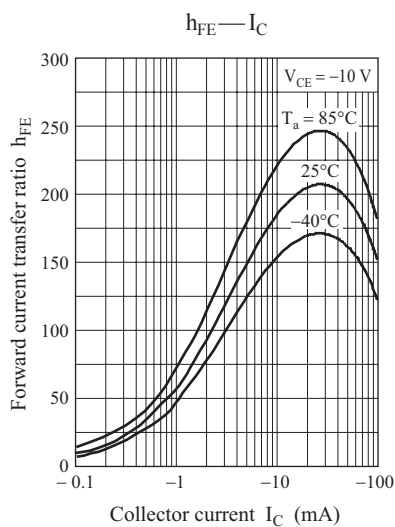
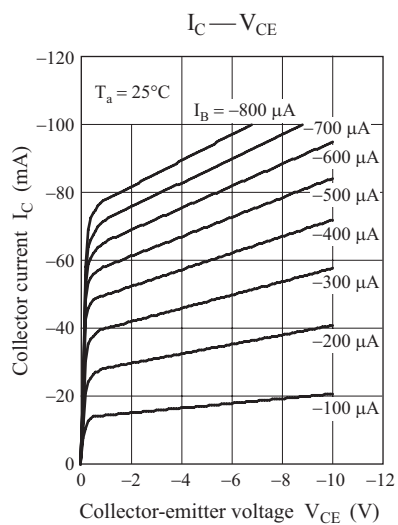
Common characteristics chart



Characteristics charts of Tr1

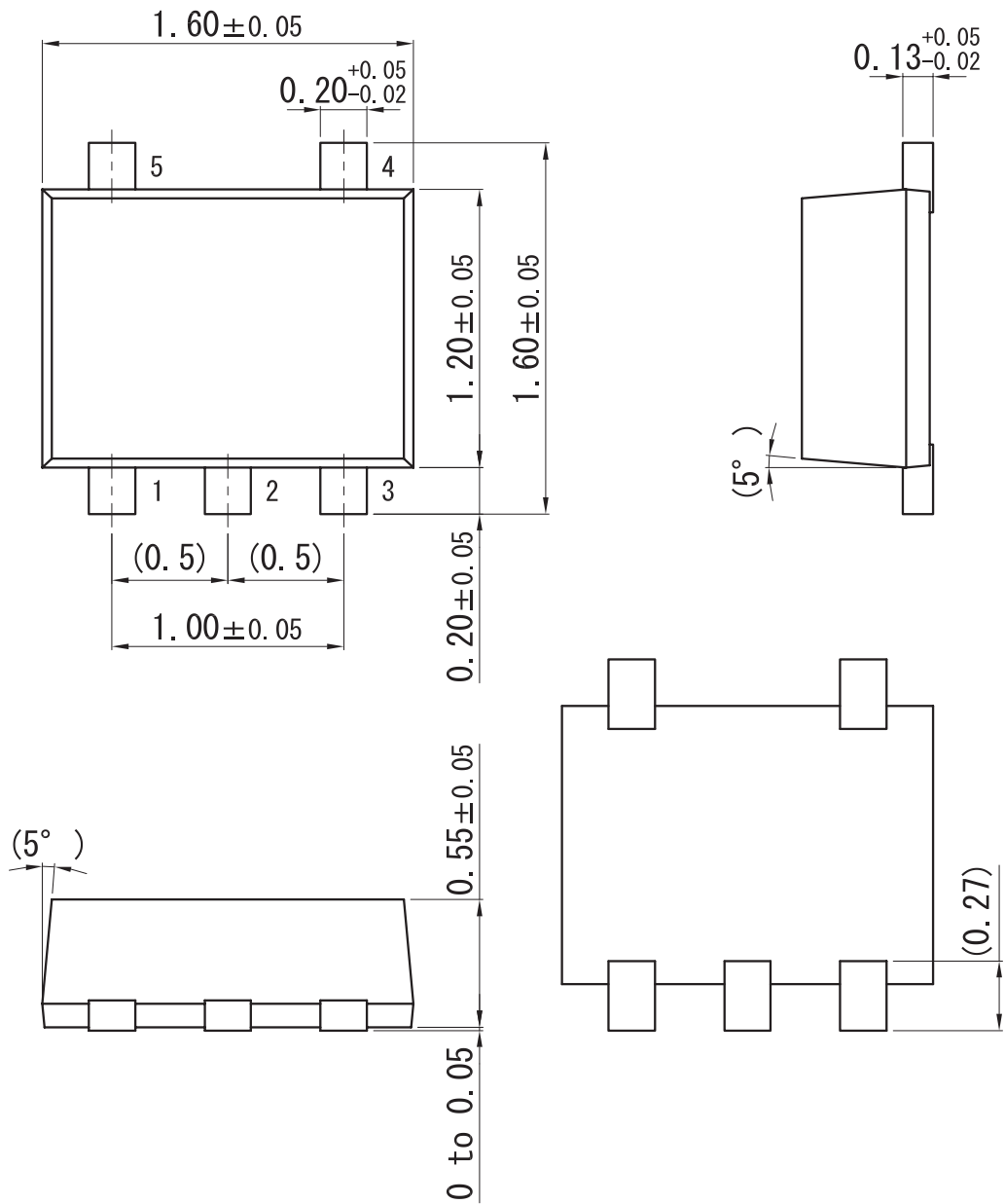


Characteristics charts of Tr2

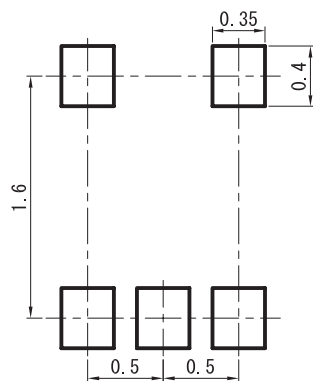


SSMini5-F4-B

Unit: mm



■ Land Pattern (Reference) (Unit: mm)



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