

# DMG963HC

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: V0

## ■ Basic Part Number

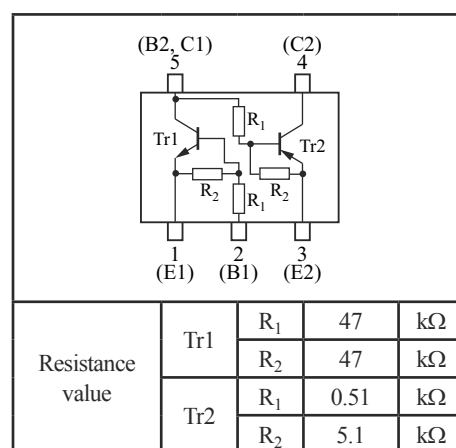
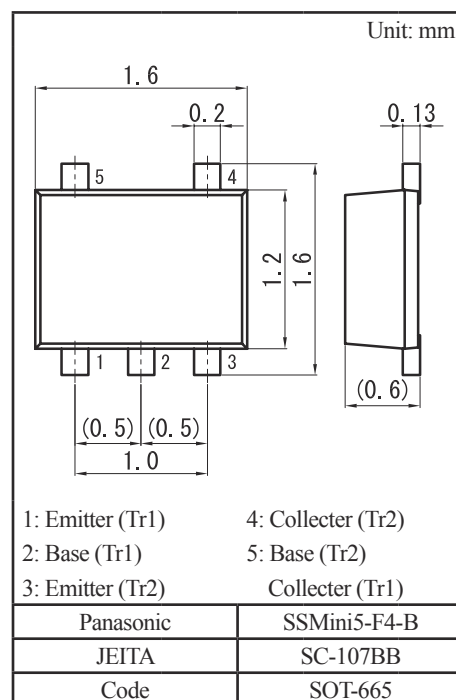
DRC2144E+DRA2152Z (Collector-base connection)

## ■ Packaging

DMG963HC0R Embossed type (Thermo-compression sealing): 8000 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                             | $R_1$                |  | -30% | 47  | +30% | $\text{k}\Omega$ |
| Resistance ratio                             | $R_1 / R_2$          |  | 0.8  | 1.0 | 1.2  | —                |

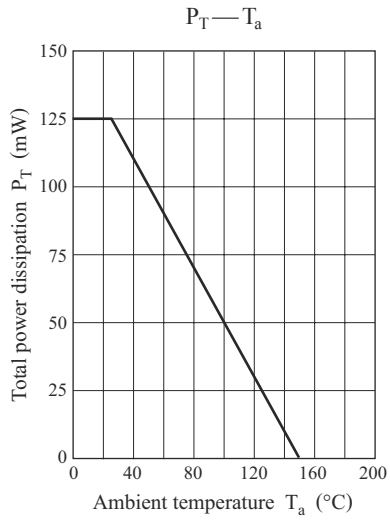
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

• Tr2

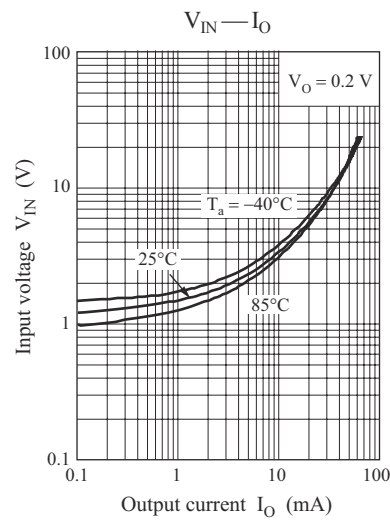
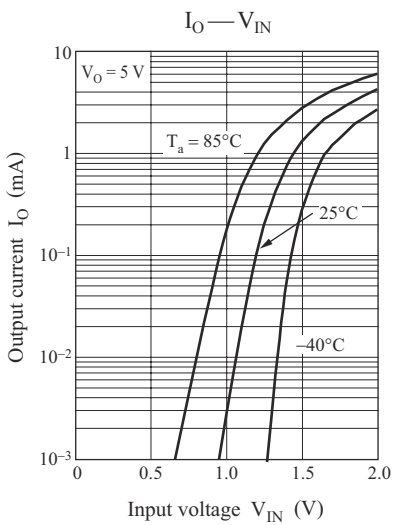
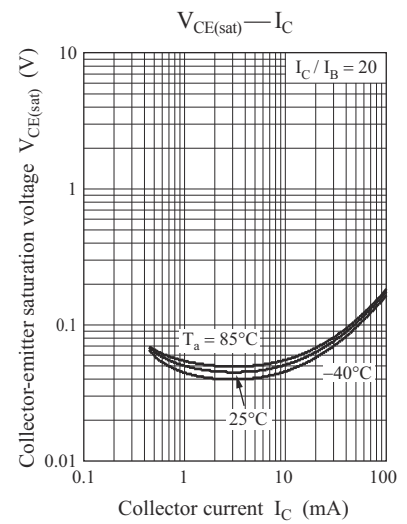
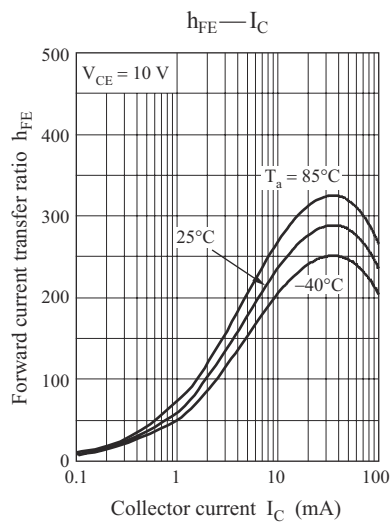
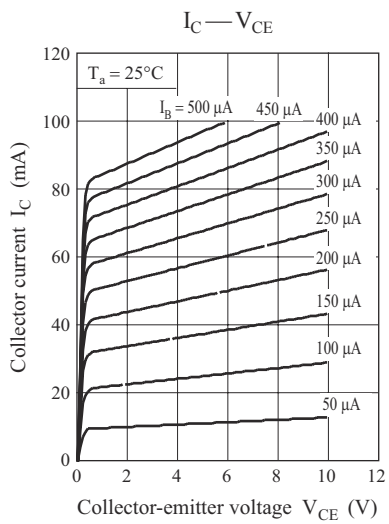
| Parameter                                    | Symbol               | Conditions   | Min  | Typ  | Max   | Unit             |
|--|----------------------|--|------|------|-------|------------------|
| Collector-base voltage (Emitter open)        | $V_{\text{CBO}}$     | $I_{\text{C}} = -10 \mu\text{A}, I_{\text{E}} = 0$             | -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) | $I_{\text{EBO}}$     | $V_{\text{EB}} = -6 \text{V}, I_{\text{C}} = 0$                |      |      | -2.0  | mA               |
| Forward current transfer ratio               | $h_{\text{FE}}$      | $V_{\text{CE}} = -10 \text{V}, I_{\text{C}} = -5 \text{mA}$    | 20   |      |       | —                |
| 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)                           | $V_{\text{I(on)}}$   | $V_{\text{CE}} = -0.2 \text{V}, I_{\text{C}} = -5 \text{mA}$   | -1.0 |      |       | V                |
| Input voltage (OFF)                          | $V_{\text{I(off)}}$  | $V_{\text{CE}} = -5 \text{V}, I_{\text{C}} = -100 \mu\text{A}$ |      |      | -0.4  | V                |
| Input resistance                             | $R_1$                |  | -30% | 0.51 | +30%  | $\text{k}\Omega$ |
| Resistance ratio                             | $R_1 / R_2$          |  | 0.08 | 0.10 | 0.12  | —                |

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

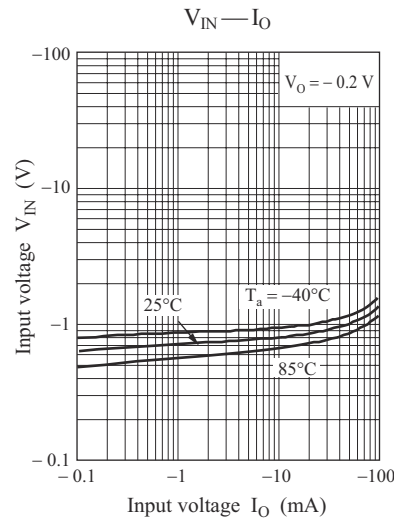
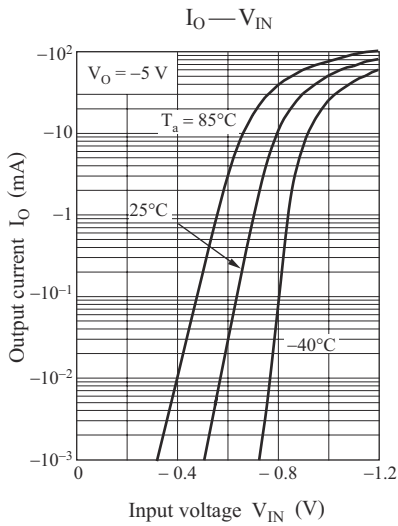
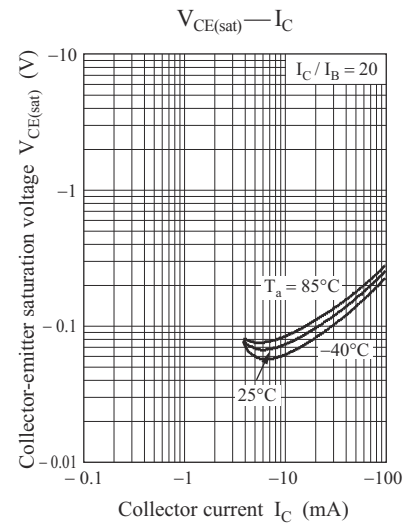
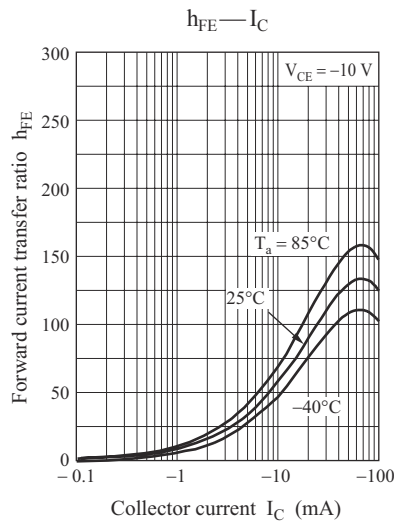
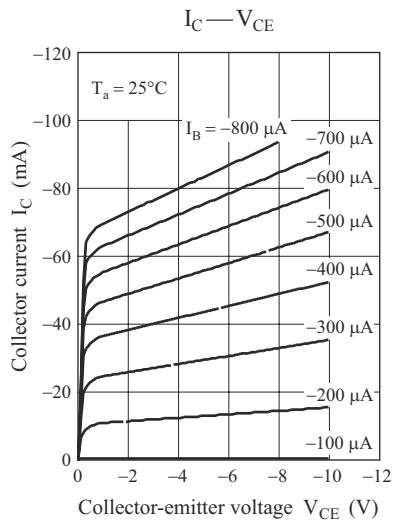
Common characteristics chart



Characteristics charts of Tr1

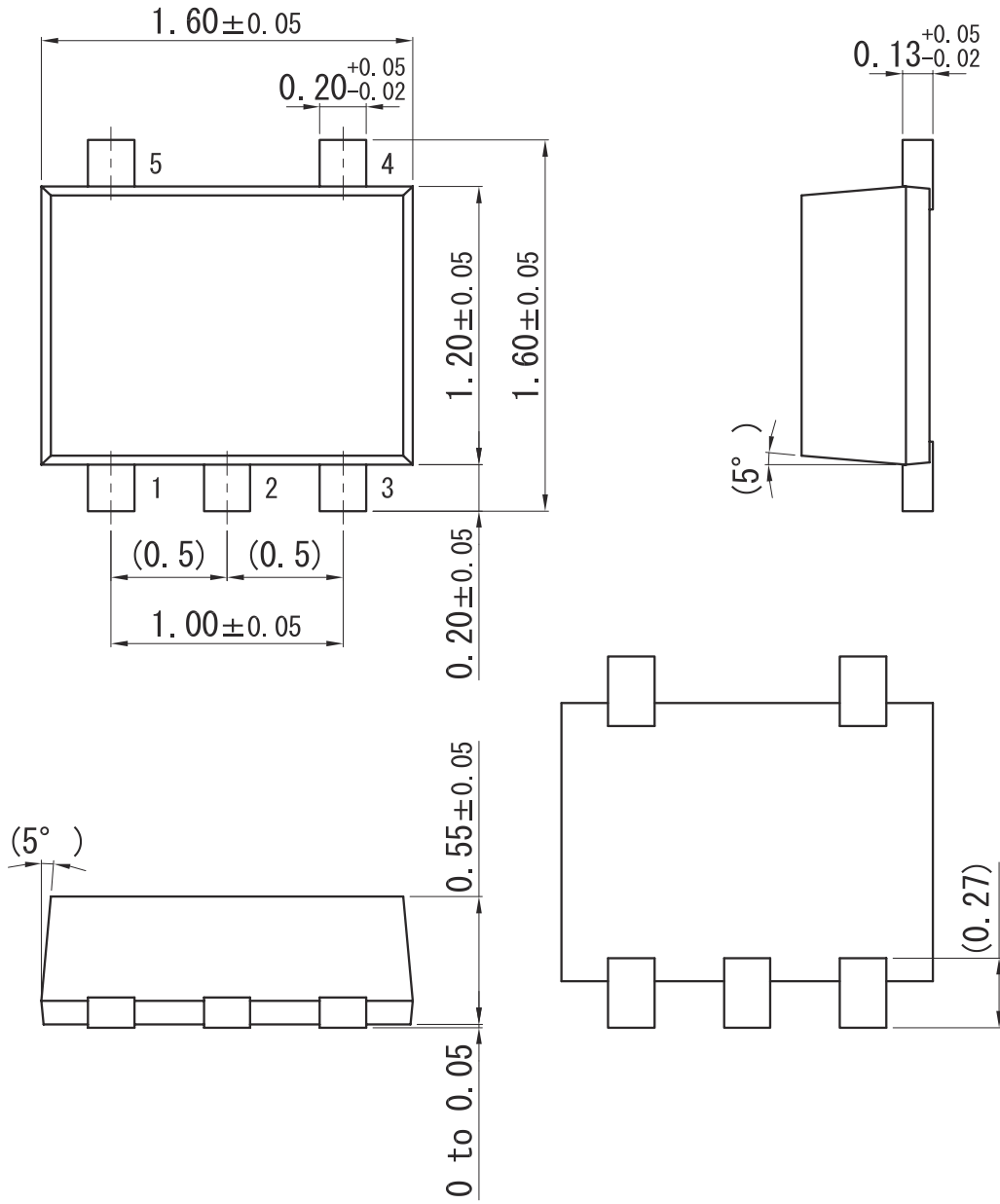


Characteristics charts of Tr2

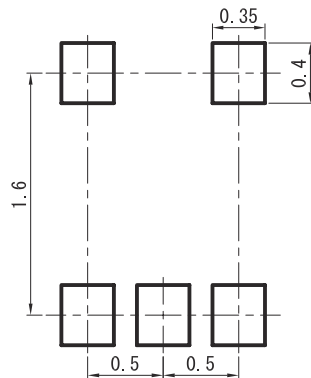


SSMini5-F4-B

Unit: mm



■ Land Pattern (Reference) (Unit: mm)



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