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DMG9640M

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

For digital circuits
 DMG5640M in SSMini6 type package

■ 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: S5

■ Basic Part Number

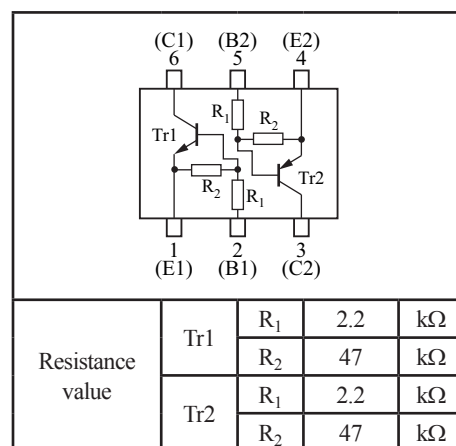
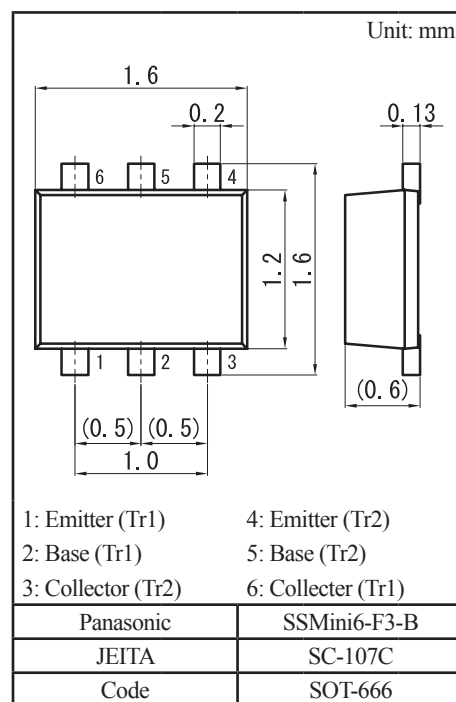
DRC2123J + DRA2123J (Individual)

■ Packaging

DMG9640M0R 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_{CBO} | $I_{\text{C}} = 10 \mu\text{A}, I_{\text{E}} = 0$ | 50 | | | V |
| Collector-emitter voltage (Base open) | V_{CEO} | $I_{\text{C}} = 2 \text{mA}, I_{\text{B}} = 0$ | 50 | | | V |
| Collector-base cutoff current (Emitter open) | I_{CBO} | $V_{\text{CB}} = 50 \text{V}, I_{\text{E}} = 0$ | | | 0.1 | μA |
| Collector-emitter cutoff current (Base open) | I_{CEO} | $V_{\text{CE}} = 50 \text{V}, I_{\text{B}} = 0$ | | | 0.5 | μA |
| Emitter-base cutoff current (Collector open) | I_{EBO} | $V_{\text{EB}} = 6 \text{V}, I_{\text{C}} = 0$ | | | 0.2 | mA |
| Forward current transfer ratio | h_{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) | $V_{\text{I(on)}}$ | $V_{\text{CE}} = 0.2 \text{V}, I_{\text{C}} = 5 \text{mA}$ | 1.2 | | | 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% | 2.2 | +30% | $\text{k}\Omega$ |
| Resistance ratio | R_1 / R_2 | | 0.037 | 0.047 | 0.057 | — |

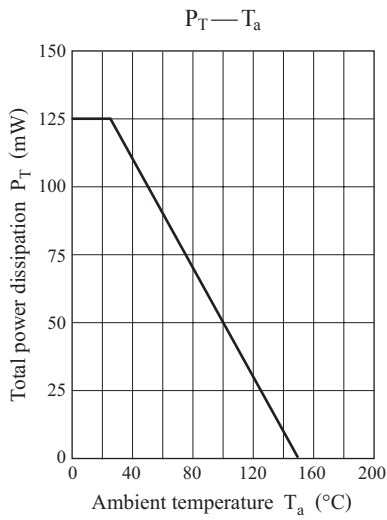
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

• Tr2

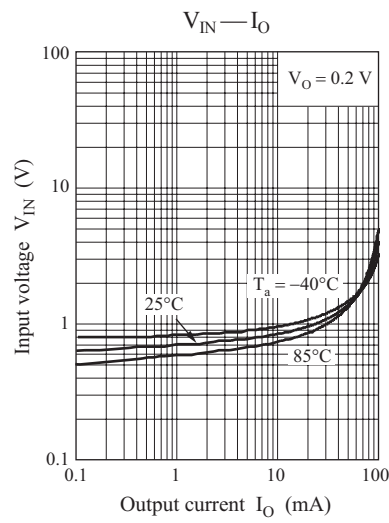
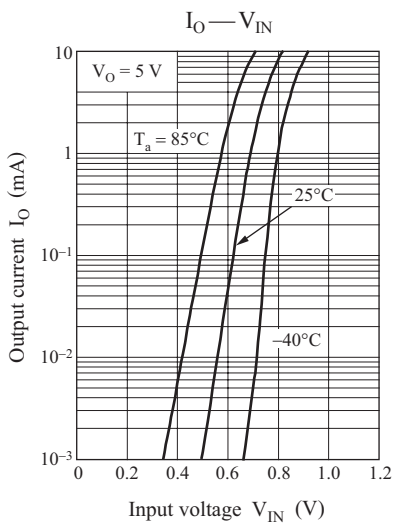
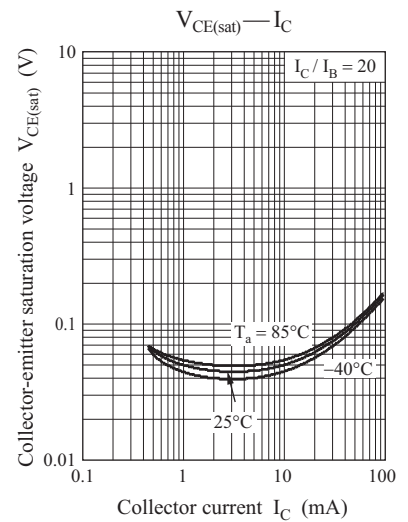
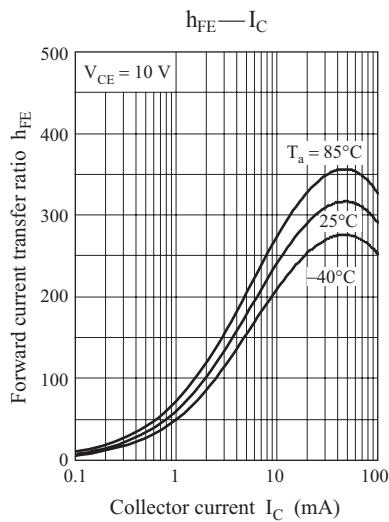
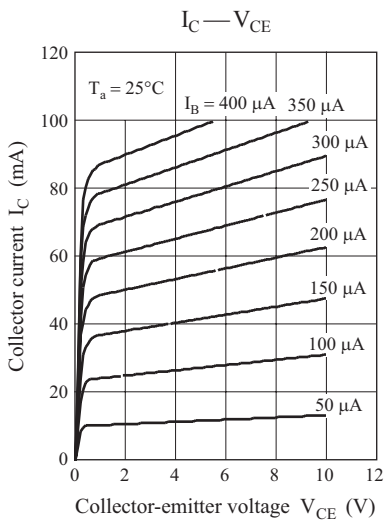
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|----------------------|--|-------|-------|-------|------------------|
| Collector-base voltage (Emitter open) | V_{CBO} | $I_{\text{C}} = -10 \mu\text{A}, I_{\text{E}} = 0$ | -50 | | | V |
| Collector-emitter voltage (Base open) | V_{CEO} | $I_{\text{C}} = -2 \text{mA}, I_{\text{B}} = 0$ | -50 | | | V |
| Collector-base cutoff current (Emitter open) | I_{CBO} | $V_{\text{CB}} = -50 \text{V}, I_{\text{E}} = 0$ | | | -0.1 | μA |
| Collector-emitter cutoff current (Base open) | I_{CEO} | $V_{\text{CE}} = -50 \text{V}, I_{\text{B}} = 0$ | | | -0.5 | μA |
| Emitter-base cutoff current (Collector open) | I_{EBO} | $V_{\text{EB}} = -6 \text{V}, I_{\text{C}} = 0$ | | | -0.2 | mA |
| Forward current transfer ratio | h_{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) | $V_{\text{I(on)}}$ | $V_{\text{CE}} = -0.2 \text{V}, I_{\text{C}} = -5 \text{mA}$ | -1.2 | | | 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% | 2.2 | +30% | $\text{k}\Omega$ |
| Resistance ratio | R_1 / R_2 | | 0.037 | 0.047 | 0.057 | — |

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

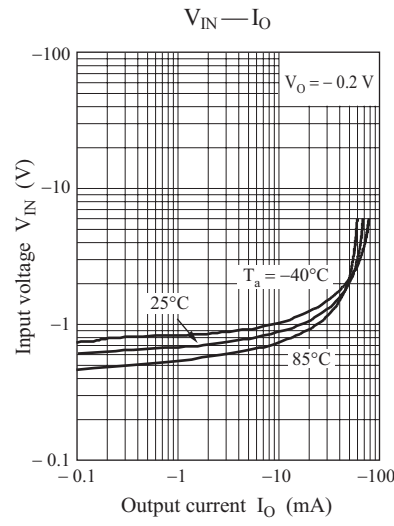
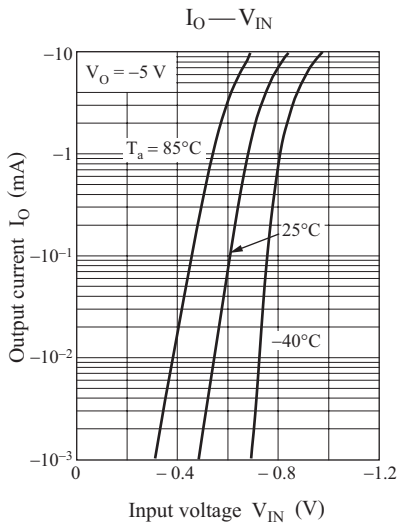
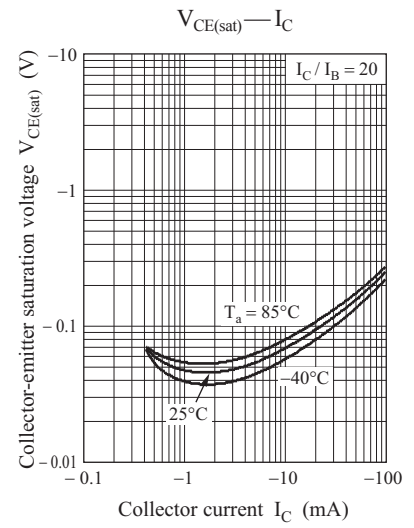
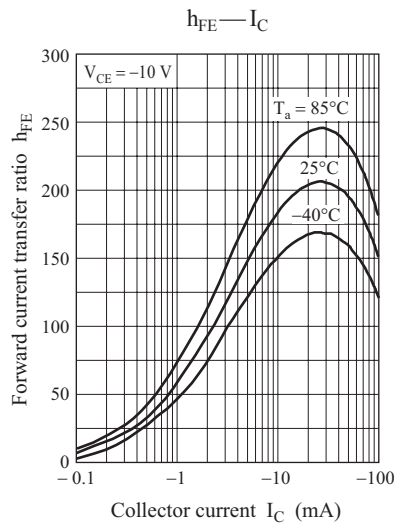
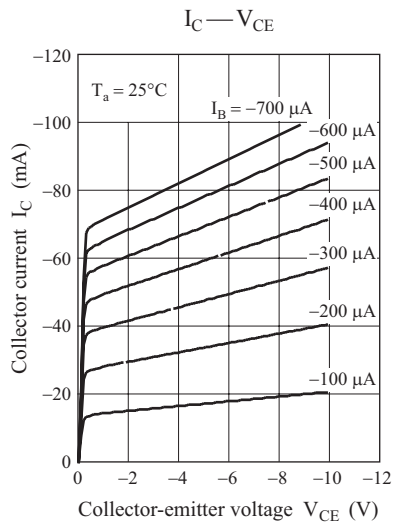
Common characteristics chart



Characteristics charts of Tr1

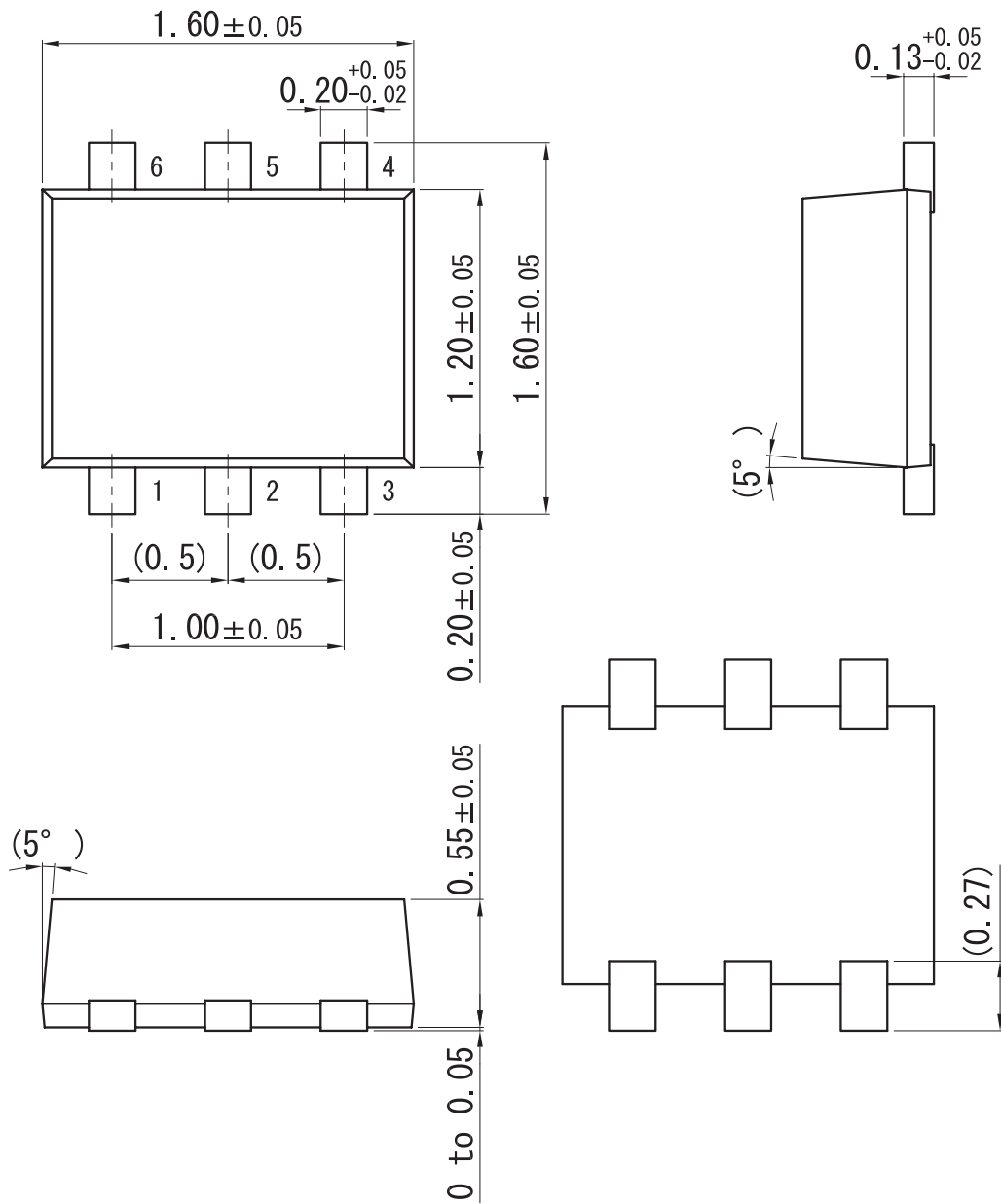


Characteristics charts of Tr2

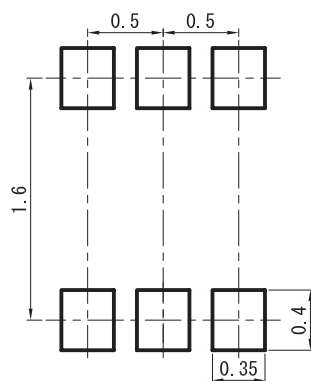


SSMini6-F3-B

Unit: mm



■ Land Pattern (Reference) (Unit: mm)



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