

DMG20402

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

For general amplification

■ Features

- High forward current transfer ratio h_{FE} with excellent linearity
- Low collector-emitter saturation voltage $V_{CE(sat)}$
- Halogen-free / RoHS compliant
 (EU RoHS / UL-94 V-0 / MSL: Level 1 compliant)

■ Marking Symbol: B7

■ Basic Part Number

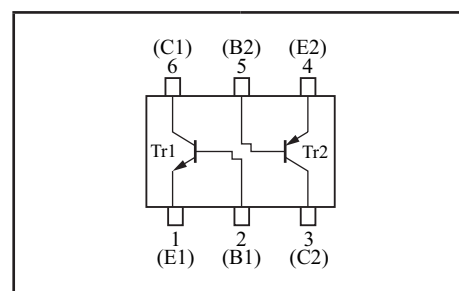
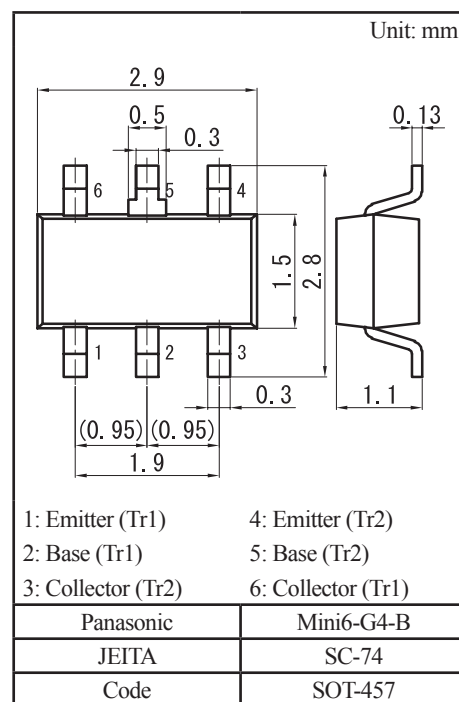
DSC2002 + DSA2002 (Individual)

■ Packaging

DMG204020R Embossed type (Thermo-compression sealing): 3 000 pcs / reel (standard)

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

	Parameter	Symbol	Rating	Unit
Tr1	Collector-base voltage (Emitter open)	V_{CBO}	60	V
	Collector-emitter voltage (Base open)	V_{CEO}	50	V
	Emitter-base voltage (Collector open)	V_{EBO}	5	V
	Collector current	I_C	500	mA
	Peak collector current	I_{CP}	1	A
Tr2	Collector-base voltage (Emitter open)	V_{CBO}	-60	V
	Collector-emitter voltage (Base open)	V_{CEO}	-50	V
	Emitter-base voltage (Collector open)	V_{EBO}	-5	V
	Collector current	I_C	-500	mA
	Peak collector current	I_{CP}	-1	A
Overall	Total power dissipation	P_T	300	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}	$I_{\text{C}} = 10 \mu\text{A}, I_{\text{E}} = 0$	60			V
Collector-emitter voltage (Base open)	V_{CEO}	$I_{\text{C}} = 2 \text{ mA}, I_{\text{B}} = 0$	50			V
Emitter-base voltage (Collector open)	V_{EBO}	$I_{\text{E}} = 10 \mu\text{A}, I_{\text{C}} = 0$	5			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{\text{CB}} = 20 \text{ V}, I_{\text{E}} = 0$			0.1	μA
Forward current transfer ratio *1	h_{FE1}	$V_{\text{CE}} = 10 \text{ V}, I_{\text{C}} = 150 \text{ mA}$	120		340	—
	h_{FE2}	$V_{\text{CE}} = 10 \text{ V}, I_{\text{C}} = 500 \text{ mA}$	40			
Collector-emitter saturation voltage *1	$V_{\text{CE(sat)}}$	$I_{\text{C}} = 300 \text{ mA}, I_{\text{B}} = 30 \text{ mA}$		0.1	0.6	V
Transition frequency	f_{T}	$V_{\text{CE}} = 10 \text{ V}, I_{\text{C}} = 50 \text{ mA}$		160		MHz
Collector output capacitance (Common base, input open circuited)	C_{ob}	$V_{\text{CB}} = 10 \text{ V}, I_{\text{E}} = 0, f = 1 \text{ MHz}$		4.8	15	pF

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. *1: Pulse measurement

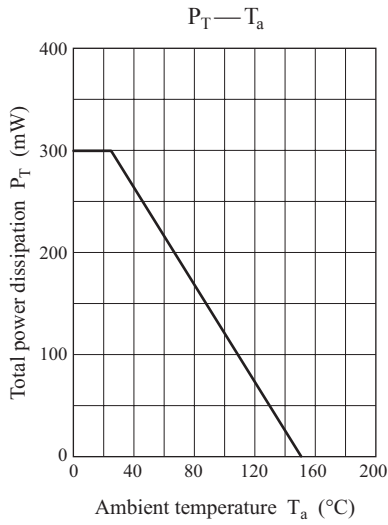
• Tr2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	V_{CBO}	$I_{\text{C}} = -10 \mu\text{A}, I_{\text{E}} = 0$	-60			V
Collector-emitter voltage (Base open)	V_{CEO}	$I_{\text{C}} = -2 \text{ mA}, I_{\text{B}} = 0$	-50			V
Emitter-base voltage (Collector open)	V_{EBO}	$I_{\text{E}} = -10 \mu\text{A}, I_{\text{C}} = 0$	-5			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{\text{CB}} = -20 \text{ V}, I_{\text{E}} = 0$			-0.1	μA
Forward current transfer ratio *1	h_{FE1}	$V_{\text{CE}} = -10 \text{ V}, I_{\text{C}} = -150 \text{ mA}$	120		340	—
	h_{FE1}	$V_{\text{CE}} = -10 \text{ V}, I_{\text{C}} = -500 \text{ mA}$	40			
Collector-emitter saturation voltage *1	$V_{\text{CE(sat)}}$	$I_{\text{C}} = -300 \text{ mA}, I_{\text{B}} = -30 \text{ mA}$		-0.2	-0.6	V
Base-emitter saturation voltage *1	$V_{\text{BE(sat)}}$	$I_{\text{C}} = -300 \text{ mA}, I_{\text{B}} = -30 \text{ mA}$		-0.9	-1.5	V
Transition frequency	f_{T}	$V_{\text{CE}} = -10 \text{ V}, I_{\text{C}} = -50 \text{ mA}$		130		MHz
Collector output capacitance (Common base, input open circuited)	C_{ob}	$V_{\text{CB}} = -10 \text{ V}, I_{\text{E}} = 0, f = 1 \text{ MHz}$		7.3	15	pF

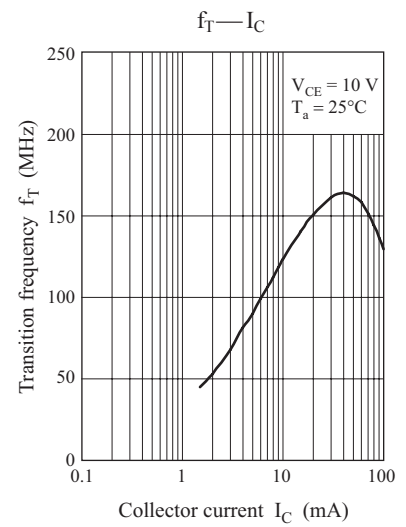
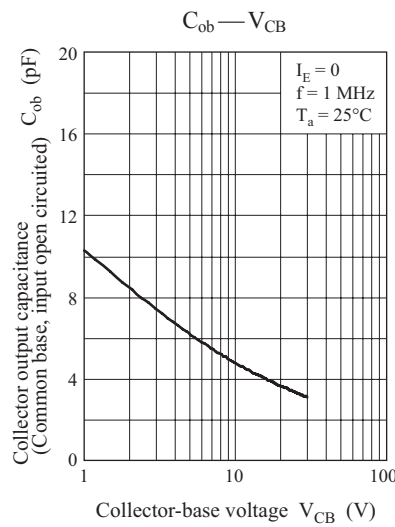
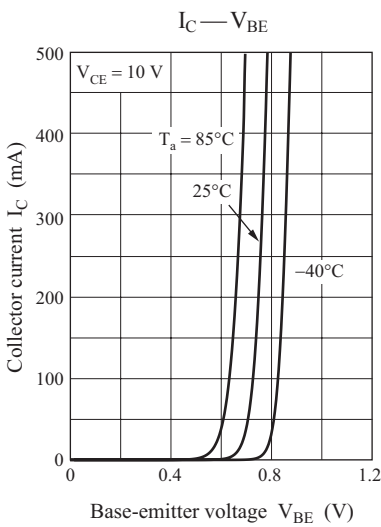
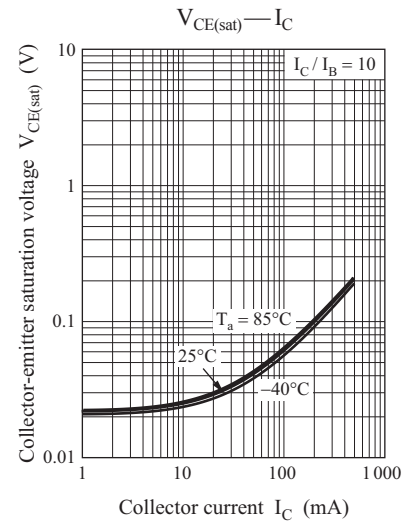
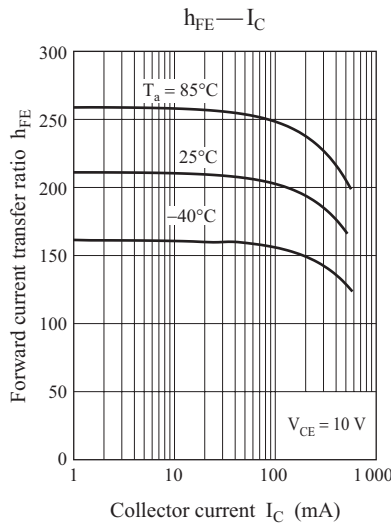
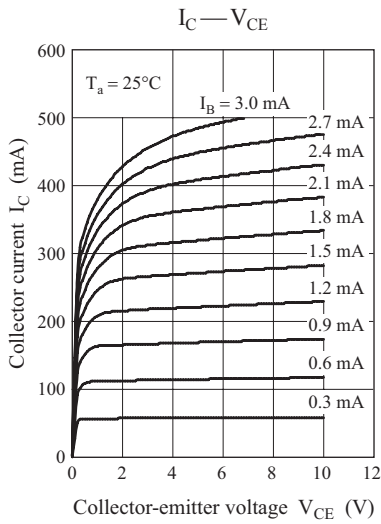
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

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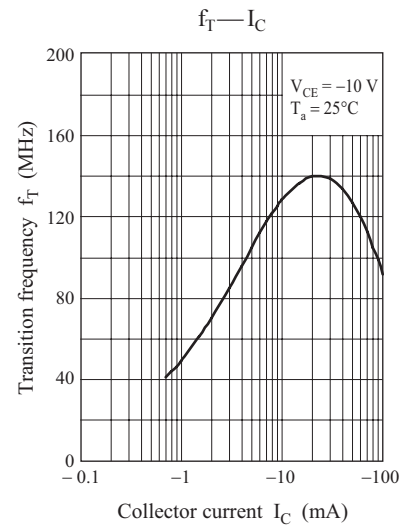
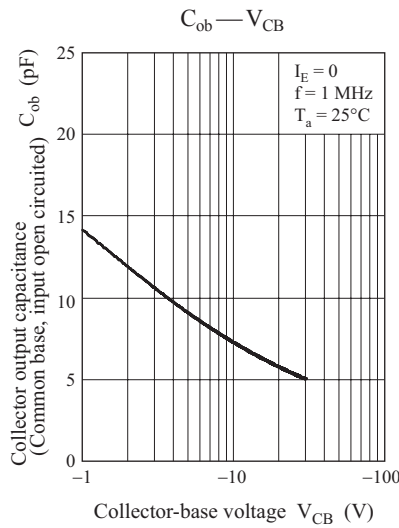
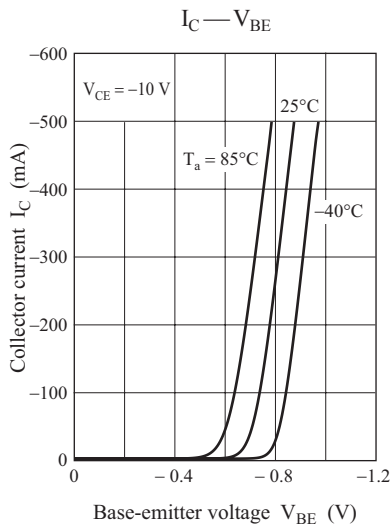
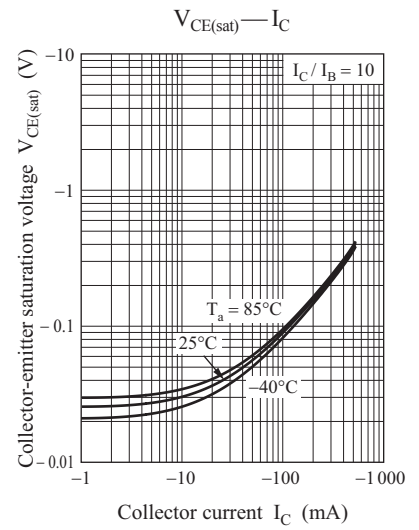
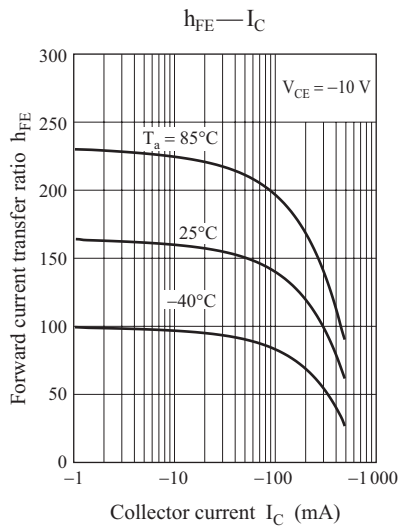
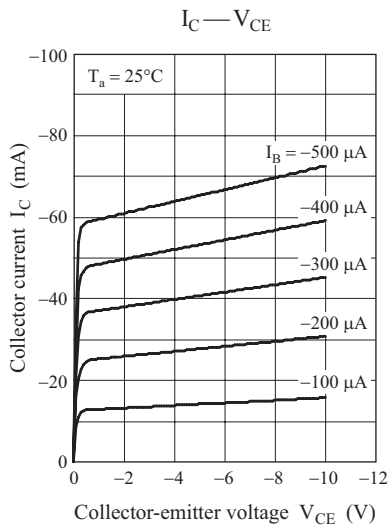
Common characteristics chart



Characteristics charts of Tr1

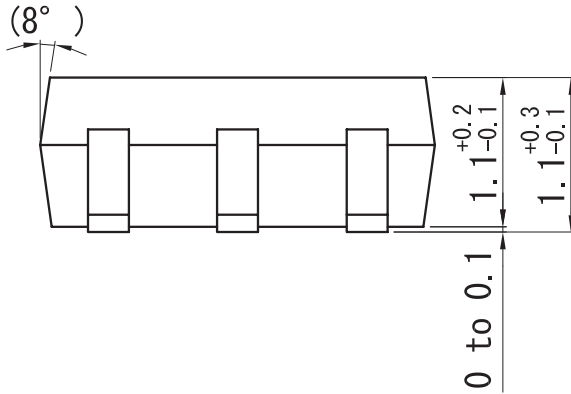
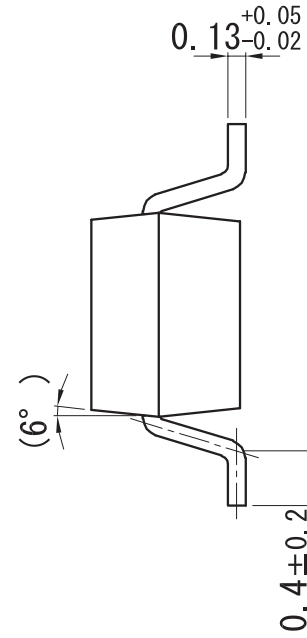
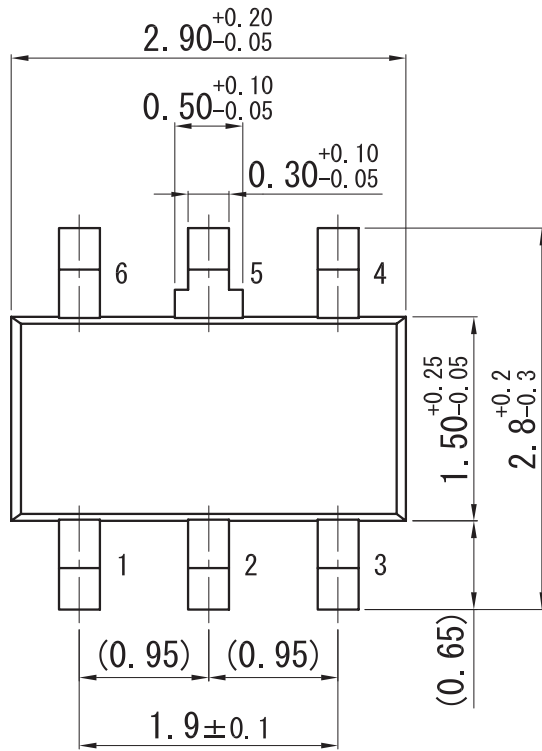


Characteristics charts of Tr2

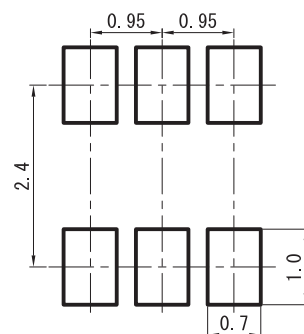


Mini6-G4-B

Unit: mm



■ Land Pattern (Reference) (Unit: mm)



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