

# DMG963HE

Silicon NPN epitaxial planar type (Tr1)

Silicon PNP epitaxial planar type (Tr2)

For digital circuits

## ■ Features

- Low collector-emitter saturation voltage  $V_{CE(sat)}$
- Contributes to miniaturization of sets, reduction of component count.
- Eco-friendly Halogen-free package

## ■ Basic Part Number

DRC2114E + DRA2L14Y (collector-base connection)

## ■ Packaging

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)	$V_{CBO}$	-30	V
	Collector-emitter voltage (Base open)	$V_{CEO}$	-30	V
	Collector current	$I_C$	-100	mA
Overall	Total power dissipation	$P_T$	125	mW
	Junction temperature	$T_j$	150	$^\circ\text{C}$
	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)	$V_{CBO}$	$I_C = 10\ \mu\text{A}$ , $I_E = 0$	50			V
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = 2\ \text{mA}$ , $I_B = 0$	50			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = 50\ \text{V}$ , $I_E = 0$			0.1	$\mu\text{A}$
Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = 50\ \text{V}$ , $I_B = 0$			0.5	$\mu\text{A}$
Emitter-base cutoff current (Collector open)	$I_{EBO}$	$V_{EB} = 6\ \text{V}$ , $I_C = 0$			0.5	mA
Forward current transfer ratio	$h_{FE}$	$V_{CE} = 10\ \text{V}$ , $I_C = 5\ \text{mA}$	35			—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10\ \text{mA}$ , $I_B = 0.5\ \text{mA}$			0.25	V
Input voltage (ON)	$V_{I(on)}$	$V_{CE} = 0.2\ \text{V}$ , $I_C = 5\ \text{mA}$	2.1			V
Input voltage (OFF)	$V_{I(off)}$	$V_{CE} = 5\ \text{V}$ , $I_C = 100\ \mu\text{A}$			0.8	V
Input resistance	$R_1$		-30%	10	+30%	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.

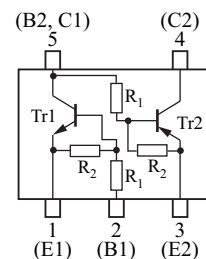
## ■ Package

- Code  
SSMini5-F4-B
- Pin Name
 

1: Emitter (Tr1)	4: Collector (Tr2)
2: Base (Tr1)	5: Base (Tr2)
3: Emitter (Tr2)	Collector (Tr1)

## ■ Marking Symbol: V2

## ■ Internal Connection



Resistance value	Tr1	$R_1$	10	k $\Omega$
		$R_2$	10	
	Tr2	$R_1$	10	k $\Omega$
		$R_2$	47	

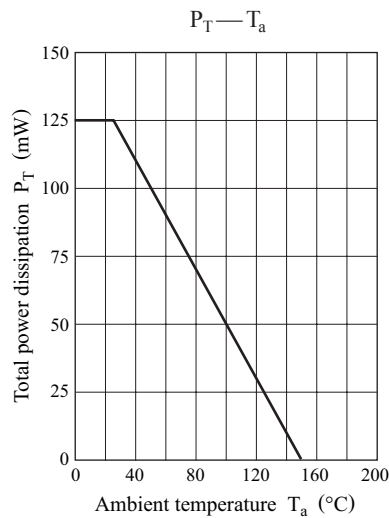
# ■ Electrical Characteristics (Continued) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

• Tr2

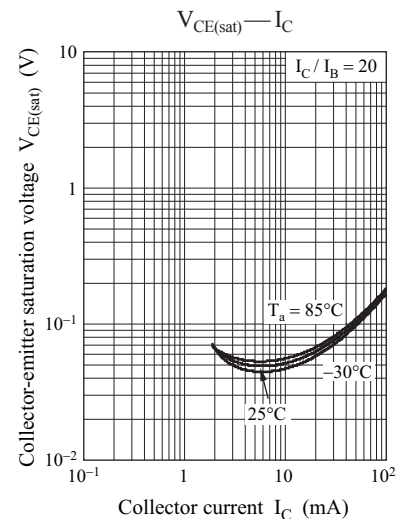
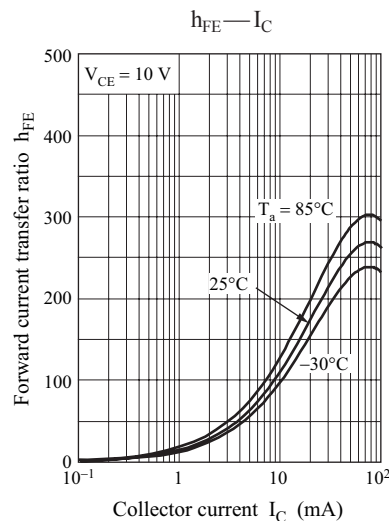
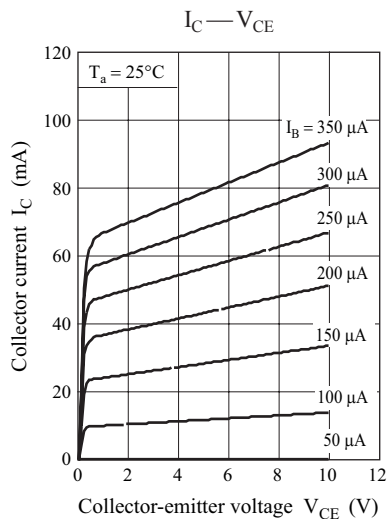
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{\text{CBO}}$	$I_{\text{C}} = -10 \mu\text{A}$ , $I_{\text{E}} = 0$	-30			V
Collector-emitter voltage (Base open)	$V_{\text{CEO}}$	$I_{\text{C}} = -2 \text{ mA}$ , $I_{\text{B}} = 0$	-30			V
Collector-base cutoff current (Emitter open)	$I_{\text{CBO}}$	$V_{\text{CB}} = -30 \text{ V}$ , $I_{\text{E}} = 0$			-0.1	$\mu\text{A}$
Collector-emitter cutoff current (Base open)	$I_{\text{CEO}}$	$V_{\text{CE}} = -30 \text{ V}$ , $I_{\text{B}} = 0$			-0.5	$\mu\text{A}$
Emitter-base cutoff current (Collector open)	$I_{\text{EBO}}$	$V_{\text{EB}} = -3 \text{ V}$ , $I_{\text{C}} = 0$			-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	$V_{\text{CE(sat)}}$	$I_{\text{C}} = -50 \text{ mA}$ , $I_{\text{B}} = -0.33 \text{ mA}$		-0.6	-1.2	V
Input voltage (ON)	$V_{\text{I(on)}}$	$V_{\text{CE}} = -0.2 \text{ V}$ , $I_{\text{C}} = -5 \text{ mA}$	-1.5			V
Input voltage (OFF)	$V_{\text{I(off)}}$	$V_{\text{CE}} = -5 \text{ V}$ , $I_{\text{C}} = -100 \mu\text{A}$			-0.5	V
Input resistance	$R_{\text{I}}$		-30%	10	+30%	$\text{k}\Omega$
Resistance ratio	$R_{\text{I}} / R_{\text{2}}$		0.16	0.213	0.27	—

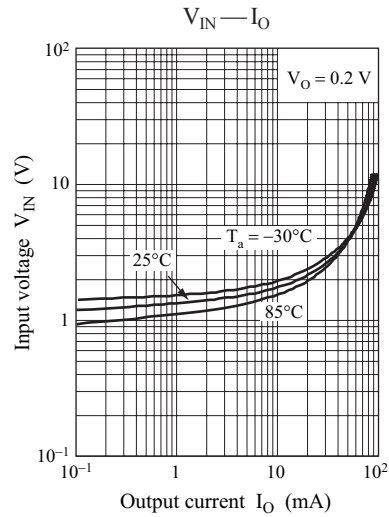
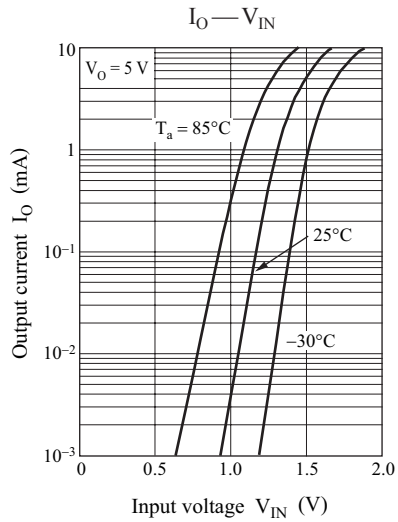
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

## Common characteristics chart

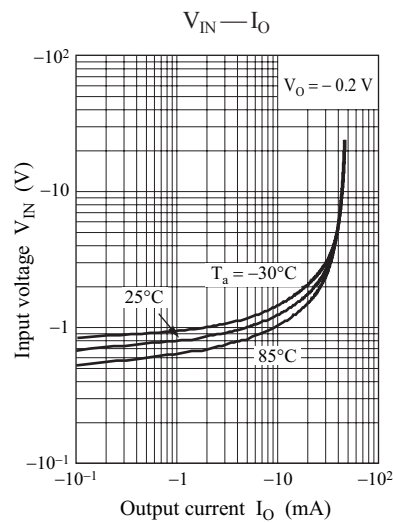
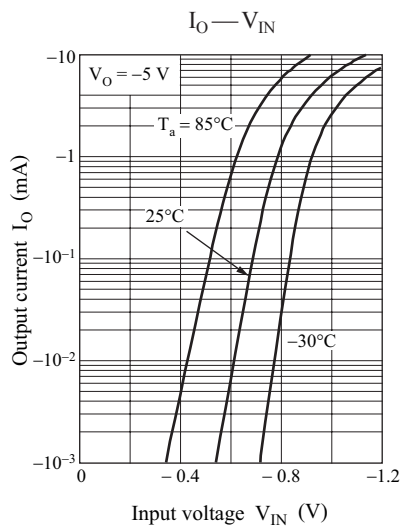
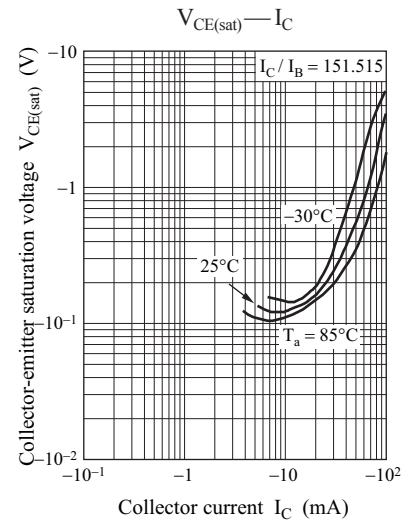
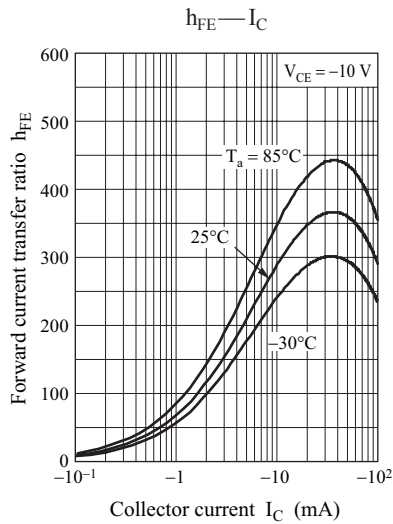
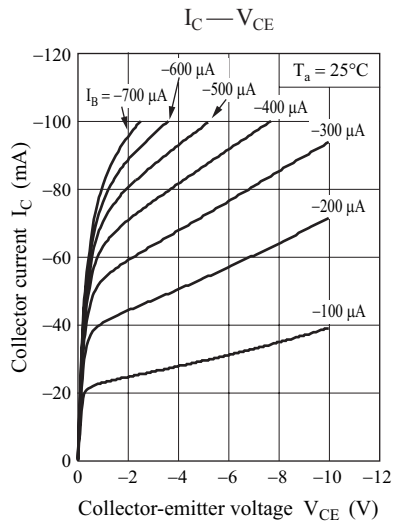


## Characteristics charts of Tr1



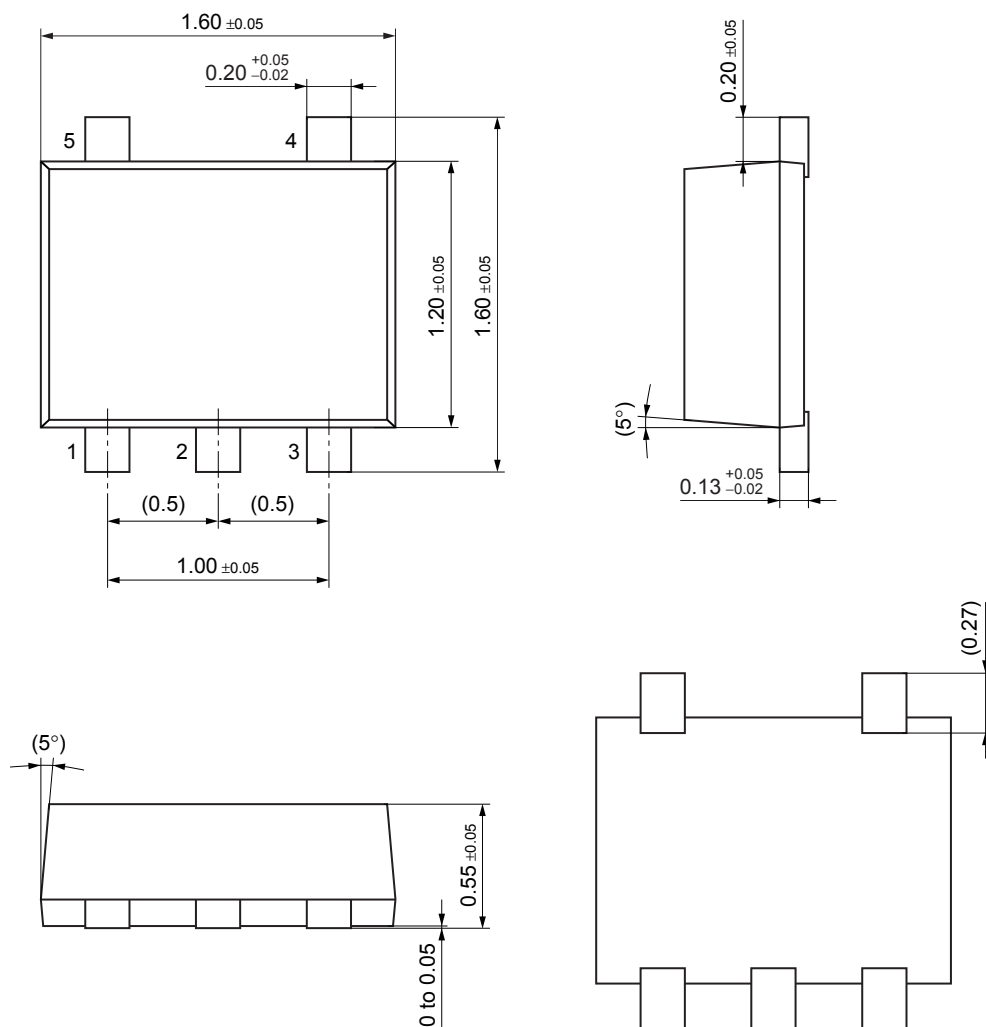


Characteristics charts of Tr2



## SSMini5-F4-B

Unit: mm



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