

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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on-chip resistor NPN silicon epitaxial transistor  
For mid-speed switching

The CE2A3Q is a transistor of on-chip high hFE resistor incorporating dumper diode in collector to emitter as protect elements. This transistor is ideal for actuator drives of OA equipments and electric equipments.

FEATURES

- On-chip bias resistor:  $R_1 = 1.0 \text{ k}\Omega$ ,  $R_2 = 10 \text{ k}\Omega$
- Low power consumption during driving:  
 $V_{OL} = 0.12 \text{ V}$  @  $V_I = 5.0 \text{ V}$ ,  $I_c = 0.5 \text{ A}$
- On-chip dumper diode for reverse cable

QUALITY GRADES

- Standard

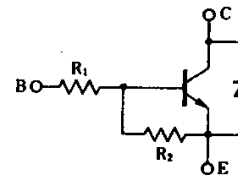
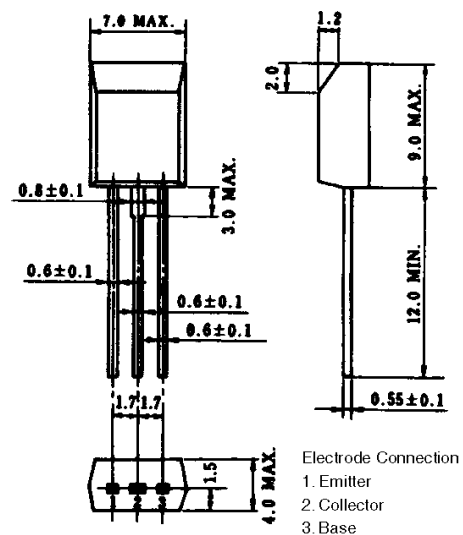
Please refer to "Quality Grades on NEC Semiconductor Devices" (Document No. C11531E) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	60	V
Collector to emitter voltage	$V_{CEO}$	60	V
Emitter to base voltage	$V_{EBO}$	15	V
Collector current (DC)	$I_{C(DC)}$	$\pm 2.0$	A
Collector current (Pulse)	$I_{C(pulse)}$ *	$\pm 3.0$	A
Base current (DC)	$I_{B(DC)}$	0.03	A
Total power dissipation	$P_T$	1.0	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*  $PW \leq 10 \text{ ms}$ , duty cycle  $\leq 50 \%$

PACKAGE DRAWING (UNIT: mm)



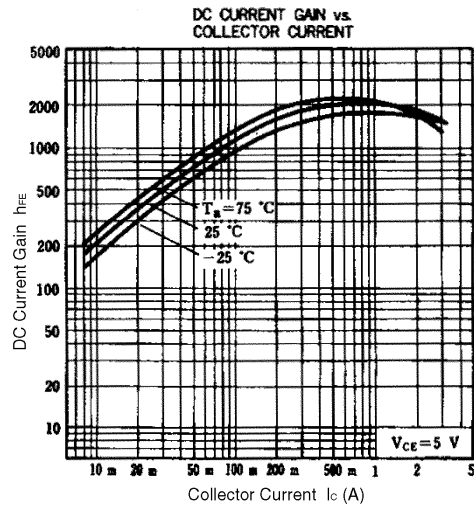
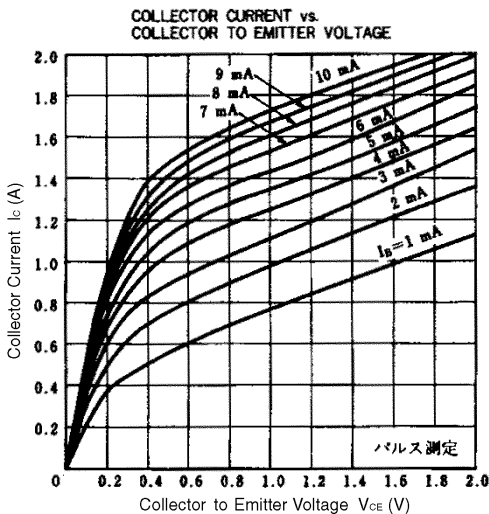
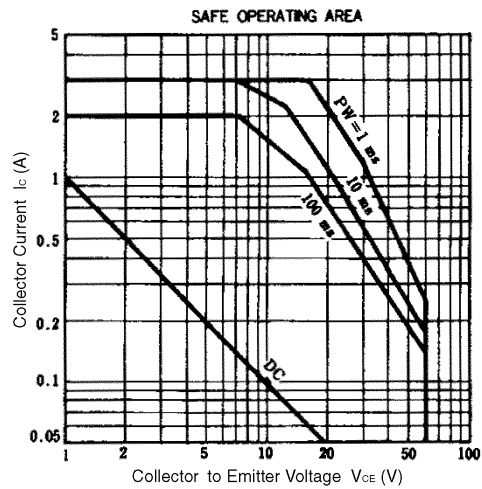
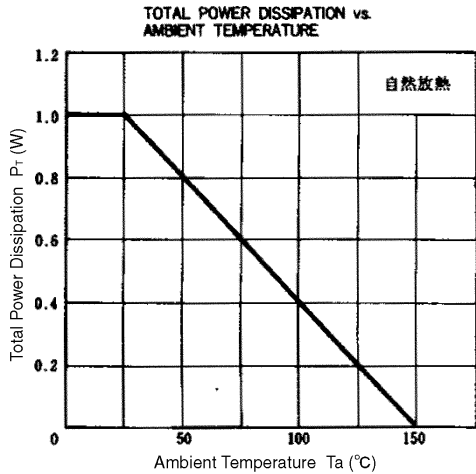
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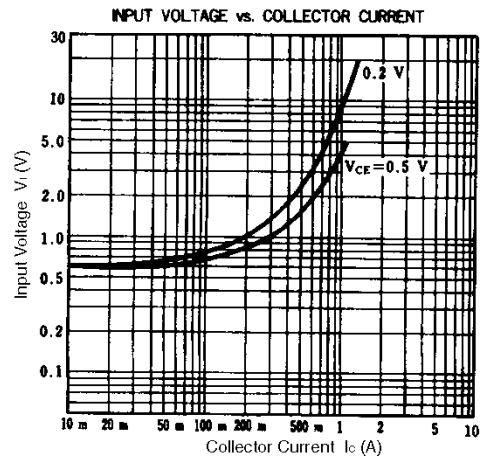
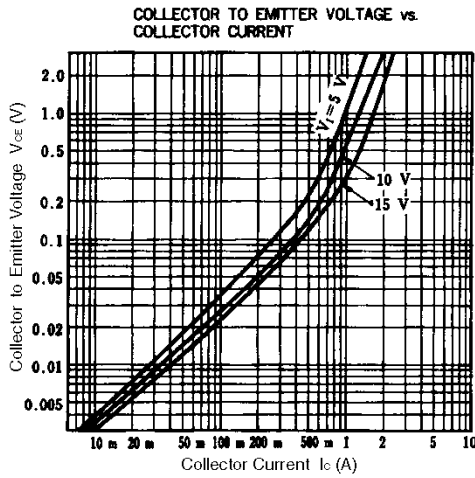
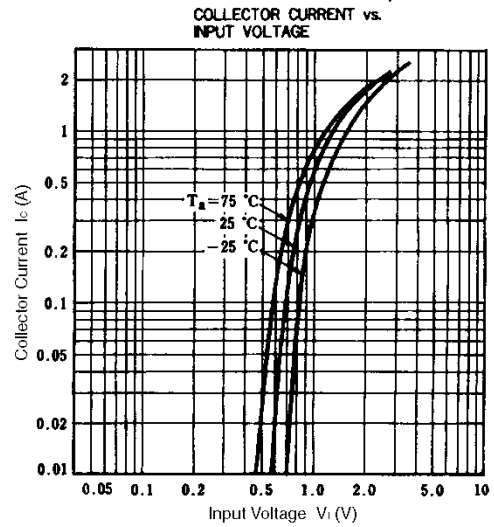
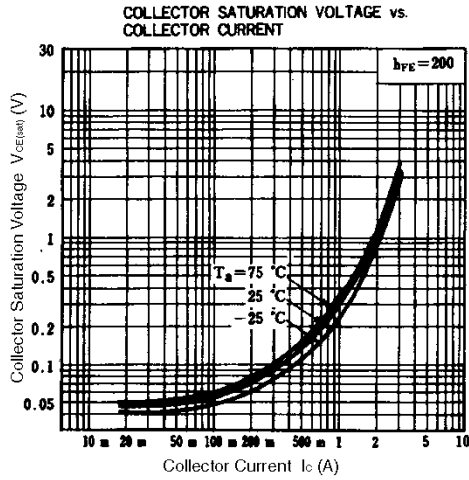
**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 50\text{ V}, I_E = 0$			100	nA
DC current gain	$h_{FE1}^{**}$	$V_{CE} = 50\text{ V}, I_C = 0.2\text{ A}$	700	1300		—
DC current gain	$h_{FE2}^{**}$	$V_{CE} = 5.0\text{ V}, I_C = 1.0\text{ A}$	1000	1700	3000	—
DC current gain	$h_{FE3}^{**}$	$V_{CE} = 5.0\text{ V}, I_C = 2.0\text{ A}$	500	1300		—
Low level output voltage	$V_{OL}^{**}$	$V_I = 5.0\text{ V}, I_C = 0.5\text{ A}$		0.12	0.3	V
Low level input voltage	$V_{IL}^{**}$	$V_{CE} = 12\text{ V}, I_C = 100\text{ }\mu\text{A}$		0.46	0.4	V
Input resistance 1	$R_1$		0.7	1.0	1.3	k $\Omega$
Input resistance 2	$R_2$		7.0	10.0	13.0	k $\Omega$
Turn-on time	$t_{on}$	$I_C = 1.0\text{ A}$		0.4		$\mu\text{s}$
Storage time	$t_{stg}$	$I_{B1} = -I_{B2} = 10\text{ mA}$		1.4		$\mu\text{s}$
Fall time	$t_f$	$V_{CC} = 20\text{ V}, R_L = 20\text{ }\Omega$		0.5		$\mu\text{s}$

\*\* Pulse test PW ≤ 350 μs, duty cycle ≤ 2 %

**TYPICAL CHARACTERISTICS (Ta = 25°C)**





**RECOMMENDED SOLDERING CONDITIONS**

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