



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SA2013 / 2SC5566 — PNP / NPN Epitaxial Planar Silicon Transistors DC / DC Converter Applications

Applications

- Relay drivers, lamp drivers, motor drivers, flash.

Features

- Adoption of FBET and MBIT processes.
- High current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Ultrasmall package facilitates miniaturization in end products.
- High allowable power dissipation.

Specifications () : 2SA2013

Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|------------------|--|-------------|------|
| Collector-to-Base Voltage | V _{CB0} | | (-50)100 | V |
| Collector-to-Emitter Voltage | V _{CES} | | (-50)100 | V |
| Collector-to-Emitter Voltage | V _{CEO} | | (-)50 | V |
| Emitter-to-Base Voltage | V _{EBO} | | (-)6 | V |
| Collector Current | I _C | | (-)4 | A |
| Collector Current (Pulse) | I _{CP} | | (-)7 | A |
| Base Current | I _B | | (-)600 | mA |
| Collector Dissipation | P _C | Mounted on a ceramic board (250mm ² X0.8mm) | 1.3 | W |
| | | T _c =25°C | 3.5 | W |
| Junction Temperature | T _J | | 150 | °C |
| Storage Temperature | T _{stg} | | -55 to +150 | °C |

Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------|------------------|---|---------|----------|------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | I _{CBO} | V _{CB} =(-)40V, I _E =0A | | | (-)1 | μA |
| Emitter Cutoff Current | I _{EBO} | V _{EB} =(-)4V, I _C =0A | | | (-)1 | μA |
| DC Current Gain | h _{FE} | V _{CE} =(-)2V, I _C =(-)500mA | 200 | | 560 | |
| Gain-Bandwidth Product | f _T | V _{CE} =(-)10V, I _C =(-)500mA | | (360)400 | | MHz |

Marking : 2SA2013 : AT 2SC5566 : FC

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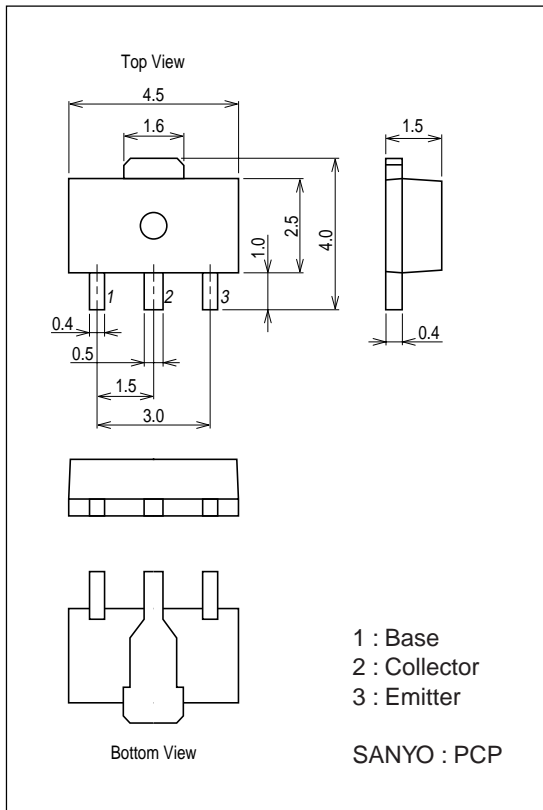
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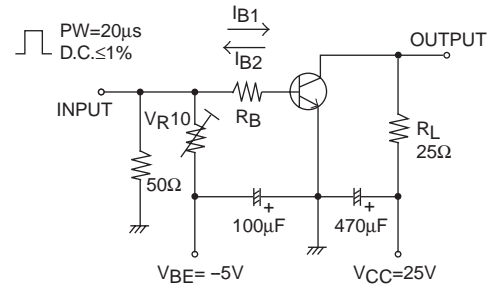
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------|---------------------------------------|----------|-----------|-----------|------|
| | | | min | typ | max | |
| Output Capacitance | Cob | $V_{CB} = (-)10V, f = 1MHz$ | | (24)15 | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)1}$ | $I_C = (-)1A, I_B = (-)50mA$ | | (-105)85 | (-180)130 | mV |
| | $V_{CE(sat)2}$ | $I_C = (-)2A, I_B = (-)100mA$ | | (-200)150 | (-340)225 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = (-)2A, I_B = (-)100mA$ | | (-)0.89 | (-)1.2 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = (-)10\mu A, I_E = 0A$ | (-50)100 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CES}$ | $I_C = (-)100\mu A, R_{BE} = 0\Omega$ | (-50)100 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = (-)1mA, R_{BE} = \infty$ | (-)50 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = (-)10\mu A, I_C = 0A$ | (-)6 | | | V |
| Turn-On Time | t_{on} | See specified Test Circuit. | | (30)35 | | ns |
| Storage Time | t_{stg} | See specified Test Circuit. | | (230)300 | | ns |
| Fall Time | t_f | See specified Test Circuit. | | (15)20 | | ns |

Package Dimensions

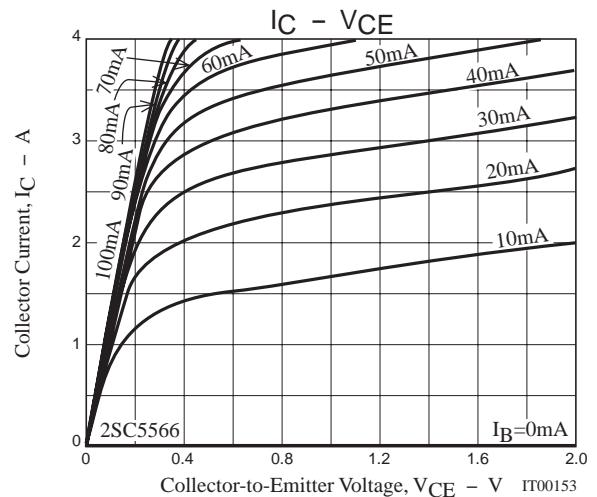
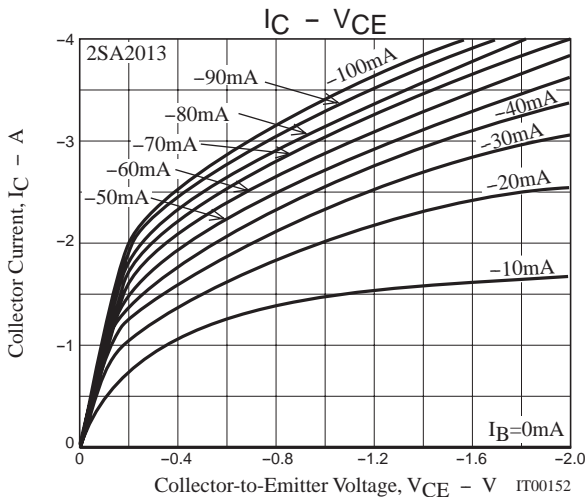
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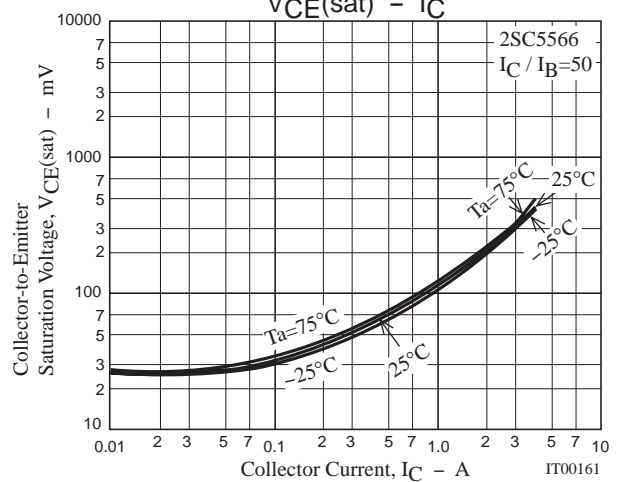
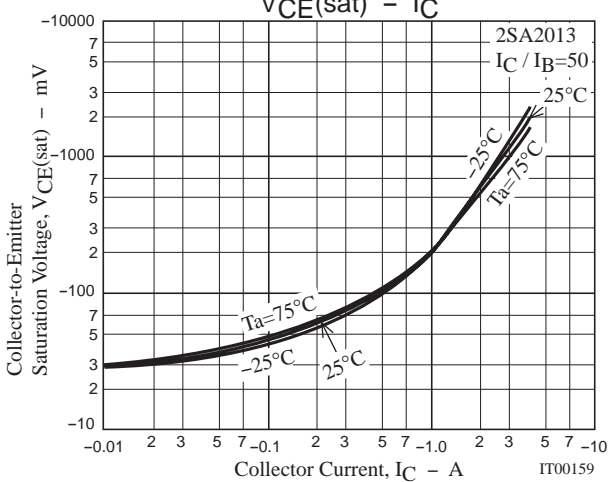
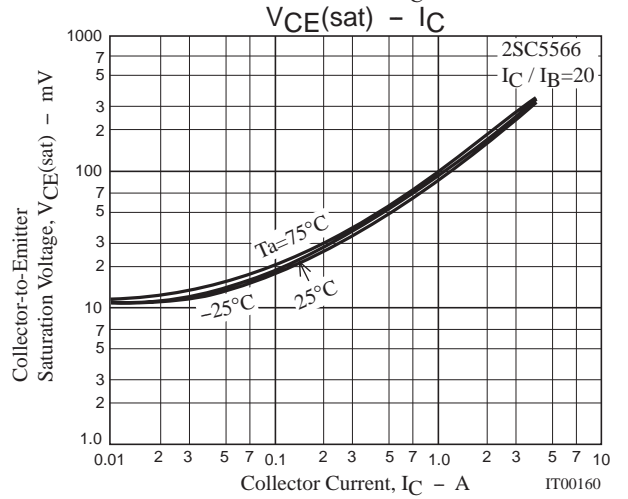
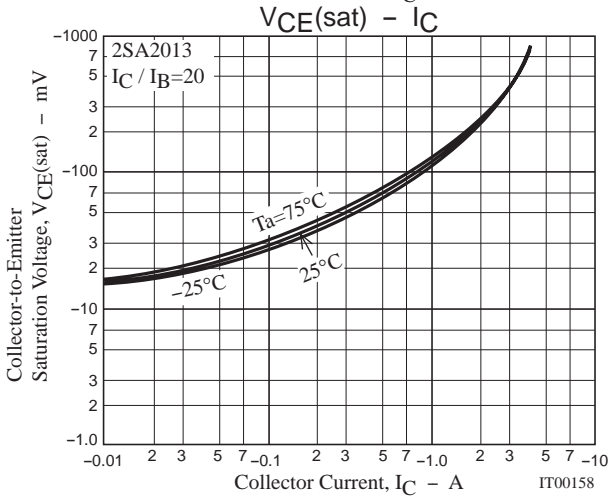
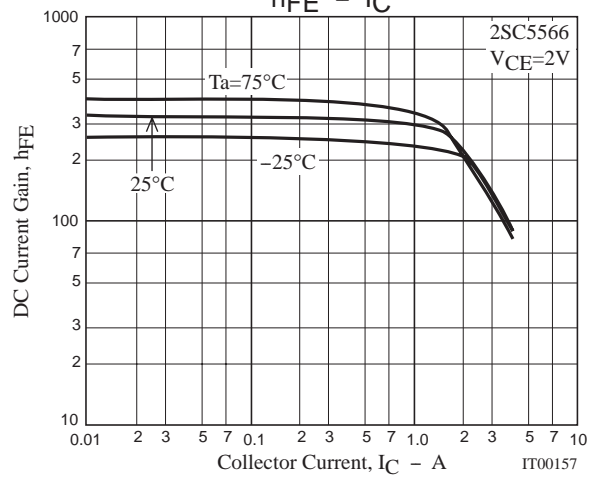
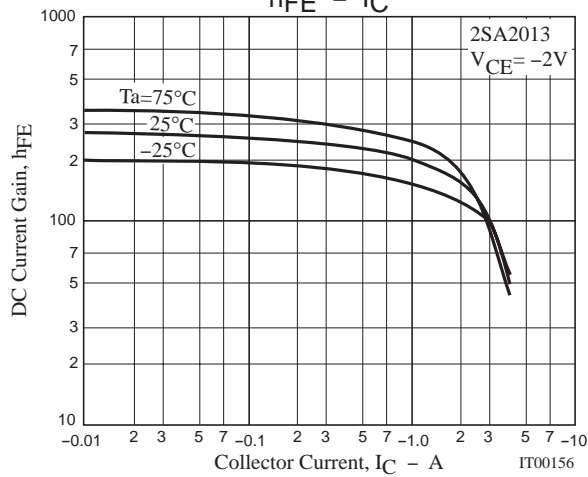
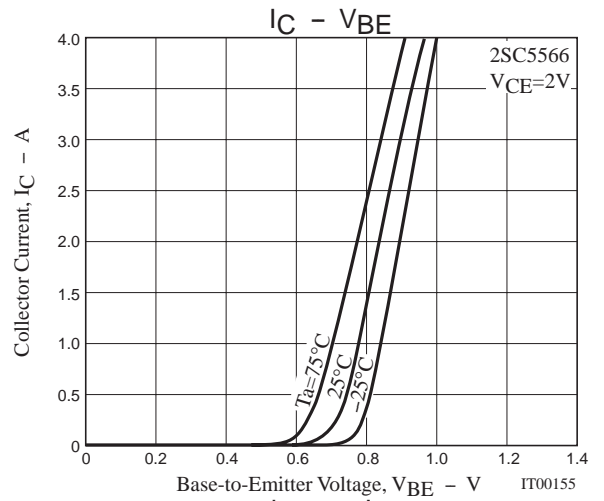
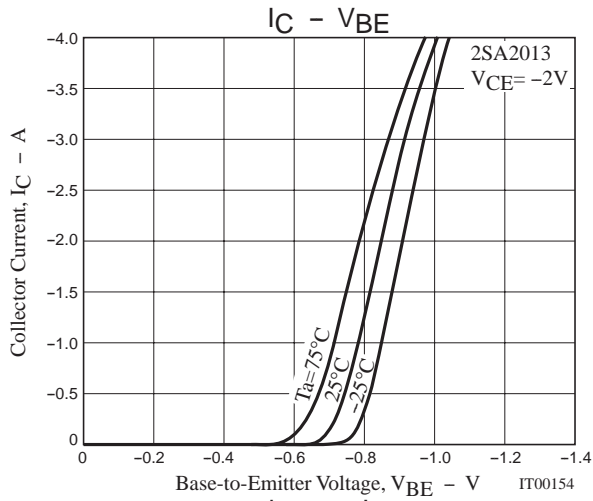


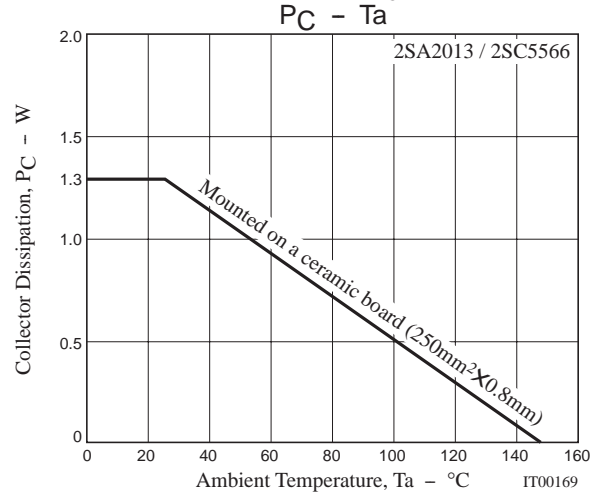
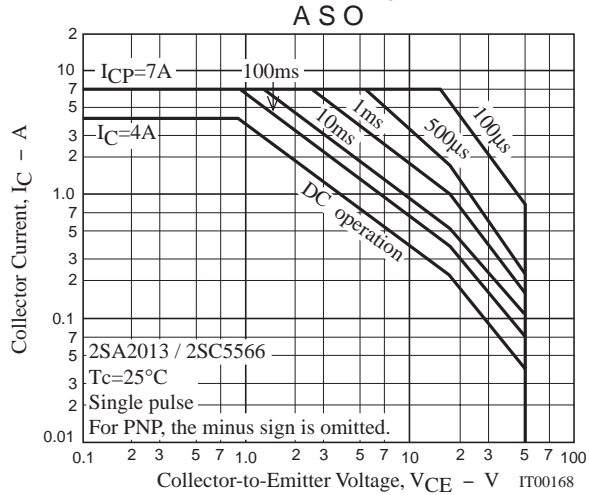
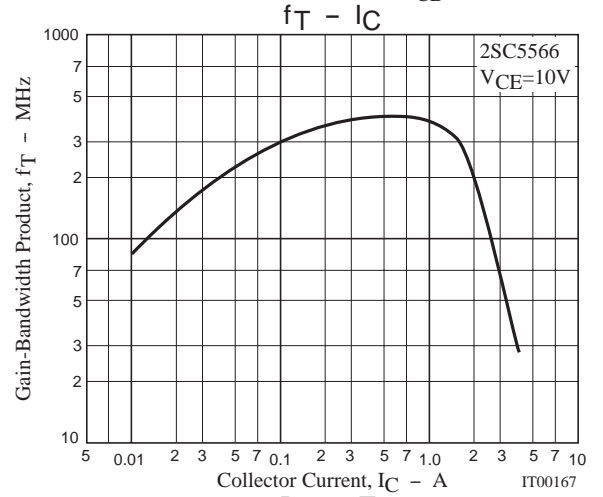
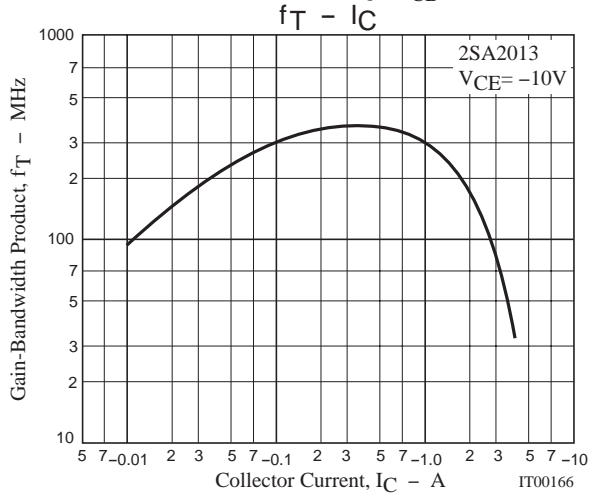
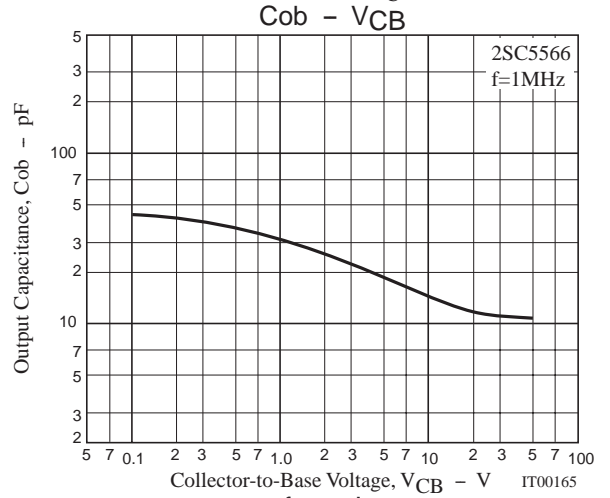
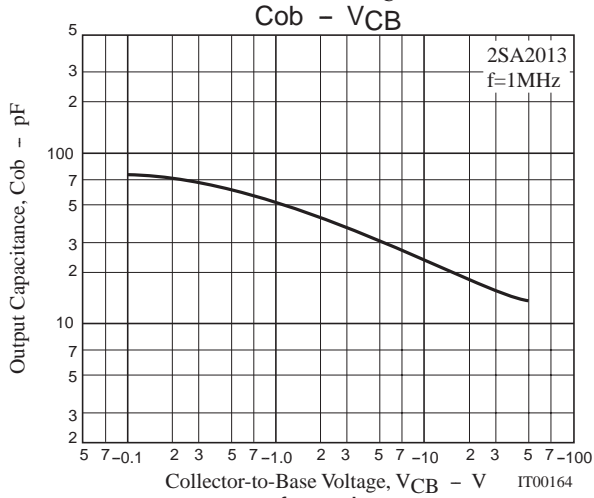
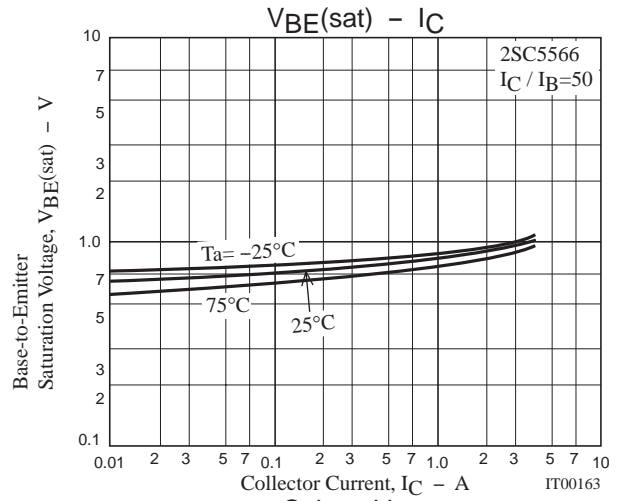
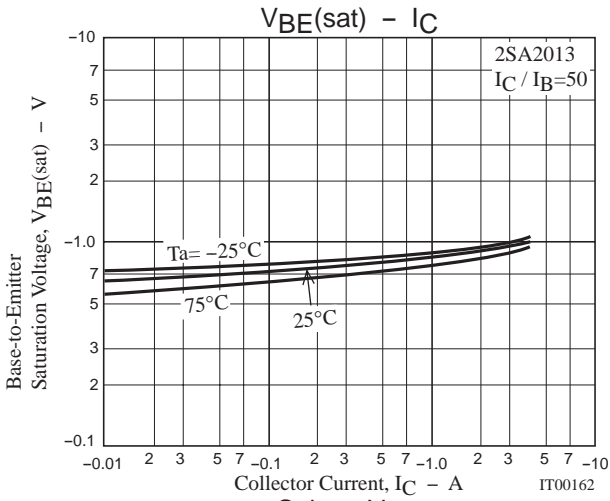
Switching Time Test Circuit

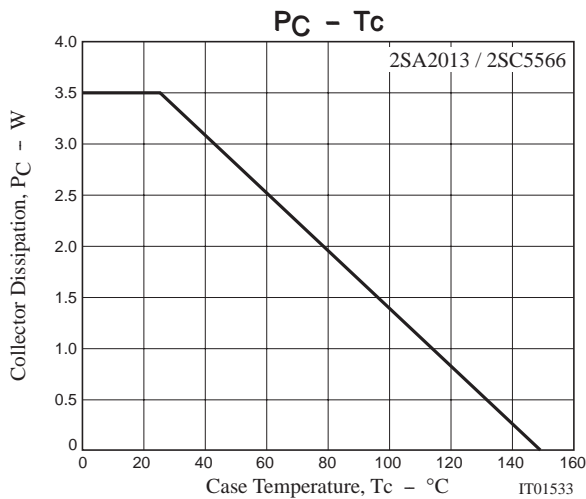


$I_C = 10I_B, I_1 = -10I_2 = 1A$
For PNP, the polarity is reversed.









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