

### Transistors

# Low frequency amplifier

## QSX5

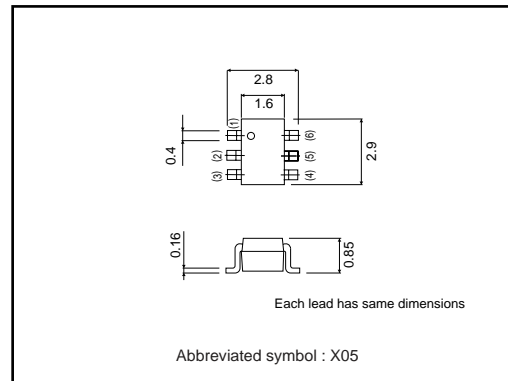
### ●Application

Low frequency amplifier  
Driver

### ●Features

- 1) A collector current is large.
- 2)  $V_{CE(sat)} \leq 180\text{mV}$   
At  $I_c = 1\text{A} / I_B = 50\text{mA}$

### ●External dimensions (Unit : mm)



### ●Absolute maximum ratings (Ta=25°C)

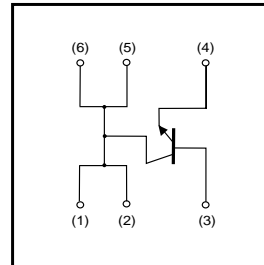
| Parameter                    | Symbol    | Limits      | Unit  |
|------------------------------|-----------|-------------|-------|
| Collector-base voltage       | $V_{CBO}$ | 15          | V     |
| Collector-emitter voltage    | $V_{CEO}$ | 12          | V     |
| Emitter-base voltage         | $V_{EBO}$ | 6           | V     |
| Collector current            | $I_c$     | 2           | A     |
|                              | $I_{cP}$  | 4           | A *1  |
| Power dissipation            | $P_c$     | 500         | mW *2 |
|                              |           | 1.25        | W *3  |
| Junction temperature         | $T_j$     | 150         | °C    |
| Range of storage temperature | $T_{stg}$ | -55 to +150 | °C    |

\*1 Single pulse,  $P_w=1\text{ms}$

\*2 Each Terminal Mounted on a Recommended

\*3 Mounted on a 25mm×25mm×1.0.8mm Ceramic substrate

### ●Equivalent circuit



### ●Electrical characteristics (Ta=25°C)

| Parameter                            | Symbol        | Min. | Typ. | Max. | Unit | Conditions   |
|--------------------------------------|---------------|------|------|------|------|--|
| Collector-base breakdown voltage     | $BV_{CBO}$    | 15   | -    | -    | V    | $I_c=10\mu\text{A}$                                      |
| Collector-emitter breakdown voltage  | $BV_{CEO}$    | 12   | -    | -    | V    | $I_c=1\text{mA}$   |
| Emitter-base breakdown voltage       | $BV_{EBO}$    | 6    | -    | -    | V    | $I_E=10\mu\text{A}$                                      |
| Collector cutoff current             | $I_{cBO}$     | -    | -    | 100  | nA   | $V_{CB}=15\text{V}$                                      |
| Emitter cutoff current               | $I_{EBO}$     | -    | -    | 100  | nA   | $V_{EB}=6\text{V}$                                       |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | -    | 90   | 180  | mV   | $I_c=1\text{A}, I_B=50\text{mA}$                         |
| DC current gain                      | $h_{FE}$      | 270  | -    | 680  | -    | $V_{CE}=2\text{V}, I_c=200\text{mA}^*$                   |
| Transition frequency                 | $f_T$         | -    | 360  | -    | MHz  | $V_{CE}=2\text{V}, I_E=-200\text{mA}, f=100\text{MHz}^*$ |
| Collector output capacitance         | $C_{ob}$      | -    | 20   | -    | pF   | $V_{CB}=10\text{V}, I_E=0\text{A}, f=1\text{MHz}$        |

\* Pulsed

Transistors

●Packaging specifications

| Type | Package                      | Taping |
|------|------------------------------|--------|
|      | Code                         | TR     |
|      | Basic ordering unit (pieces) | 3000   |
| QXS5 |                              | ○      |

●Electrical characteristic curves

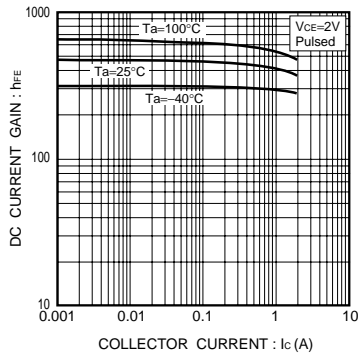


Fig.1 DC current gain vs. collector current

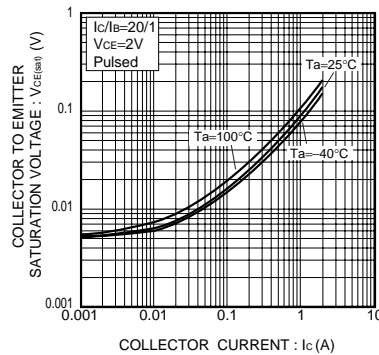


Fig.2 Base-emitter saturation voltage vs. collector current

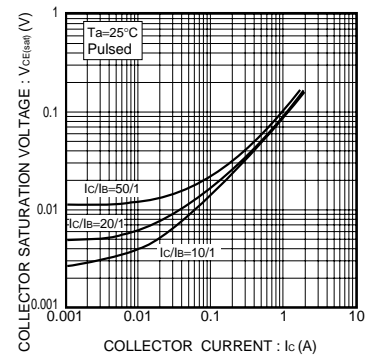


Fig.3 Collector-emitter saturation voltage vs. collector current

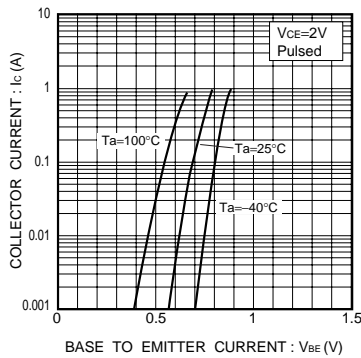


Fig.4 Grounded emitter propagation characteristics

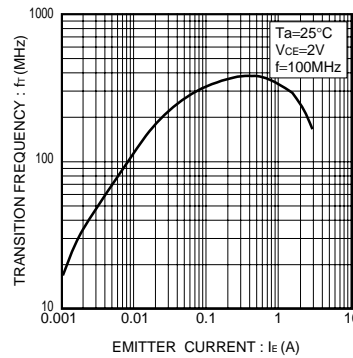


Fig.5 Gain bandwidth product vs. emitter current

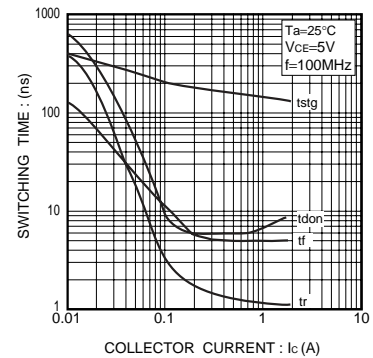


Fig.6 Switching time

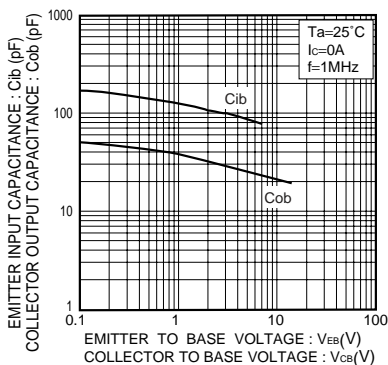


Fig.7 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

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