

General purpose transistor (isolated transistor and diode)

QSL11

A 2SB1710 and a RB461F are housed independently in a TSMT5 package.

●Applications

DC / DC converter
Motor driver

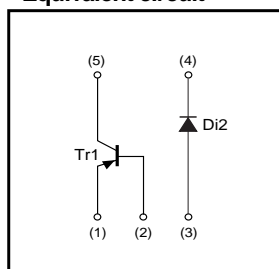
●Features

- 1) Tr : Low $V_{CE(sat)}$
Di : Low V_f
- 2) Small package

●Structure

Silicon epitaxial planar transistor
Schottky barrier diode

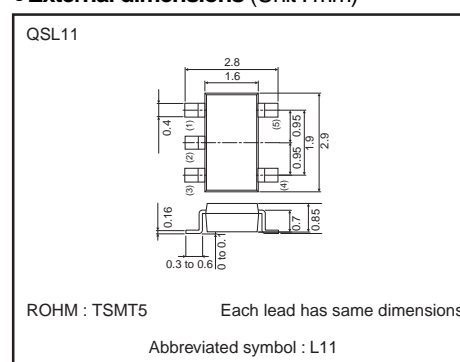
●Equivalent circuit



●Packaging specifications

| | |
|-----------------------------|-------|
| Type | QSL11 |
| Package | TSMT5 |
| Marking | L11 |
| Code | TR |
| Basic ordering unit(pieces) | 3000 |

●External dimensions (Unit : mm)



Transistors

●Absolute maximum ratings (Ta=25°C)

Tr1

| Parameter | Symbol | Limits | Unit |
|------------------------------|------------------|-------------|---------------|
| Collector-base voltage | V _{CB0} | -30 | V |
| Collector-emitter voltage | V _{CEO} | -30 | V |
| Emitter-base voltage | V _{EBO} | -6 | V |
| Collector current | I _C | -1 | A |
| | I _{CP} | -2 | A *1 |
| Power dissipation | P _C | 0.9 | W/ ELEMENT *2 |
| Junction temperature | T _J | 150 | °C |
| Range of storage temperature | T _{stg} | -40 to +125 | °C |

*1 Single pulse, P_w=1ms

*2 Mounted on a 25mm×25mm×0.8mm ceramic substrate

Di2

| Parameter | Symbol | Limits | Unit |
|---------------------------------------|------------------|-------------|--------------|
| Peak reverse voltage | V _{RM} | 25 | V |
| Reverse voltage (DC) | V _R | 20 | V |
| Average rectified forward current | I _F | 700 | mA |
| Forward current surge peak (60Hz, 1∞) | I _{FSM} | 3 | A |
| Power dissipation | P _D | 0.7 | W/ ELEMENT * |
| Junction temperature | T _J | 125 | °C |
| Range of storage temperature | T _{stg} | -40 to +125 | °C |

* Mounted on a 25mm×25mm×0.8mm ceramic substrate

Tr1&Di2

| Parameter | Symbol | Limits | Unit |
|-------------------------|----------------|--------|-------------|
| Total power dissipation | P _D | 0.5 | W/ TOTAL *1 |
| | | 1.25 | W/ TOTAL *2 |

*1 Each terminal mounted on a recommended land

*2 Mounted on a 25mm×25mm×0.8mm ceramic substrate

●Electrical characteristics (Ta=25°C)

Tr1

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------------------|----------------------|------|------|------|------|---|
| Collector-base breakdown voltage | BV _{CB0} | -30 | - | - | V | I _C =-10μA |
| Collector-emitter breakdown voltage | BV _{CEO} | -30 | - | - | V | I _C =-1mA |
| Emitter-base breakdown voltage | BV _{EBO} | -6 | - | - | V | I _E =-10μA |
| Collector cutoff current | I _{CB0} | - | - | -100 | nA | V _{CB} =-30V |
| Emitter cutoff current | I _{EBO} | - | - | -100 | nA | V _{EB} =-6V |
| Collector-emitter saturation voltage | V _{CE(sat)} | - | -150 | -350 | mV | I _C =-500mA, I _B =-25mA |
| DC current gain | h _{FE} | 270 | - | 680 | - | V _{CE} =-2V, I _C =-100mA * |
| Transition frequency | f _T | - | 320 | - | MHz | V _{CE} =-2V, I _E =100mA, f=100MHz * |
| Collector output capacitance | C _{ob} | - | 7 | - | pF | V _{CB} =-10V, I _E =0A, f=1MHz |

* Pulsed

Di2

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-----------------------|-----------------|------|------|------|------|---|
| Forward voltage | V _F | - | 450 | 490 | mV | I _F =700mA |
| Reverse current | I _R | - | - | 200 | μA | V _R =20V |
| Reverse recovery time | t _{rr} | - | 9 | - | ns | I _F =I _R =100mA, I _{rr} =0.1I _R |

Transistors

●Electrical characteristic curves

Tr1

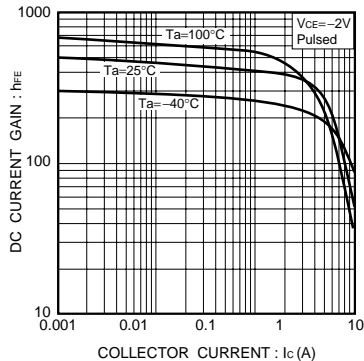


Fig.1 DC current gain vs. collector current

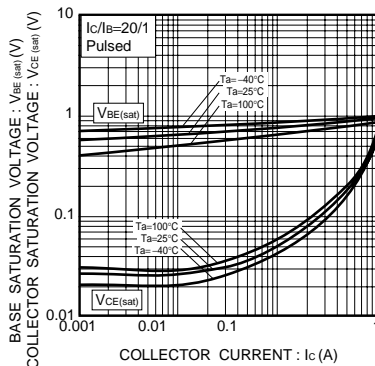


Fig.2 Collector-emitter saturation voltage base-emitter saturation voltage vs. collector current

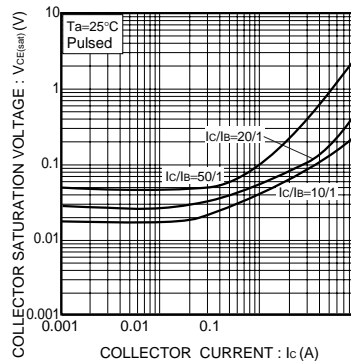


Fig.3 Collector-emitter saturation voltage vs. collector current

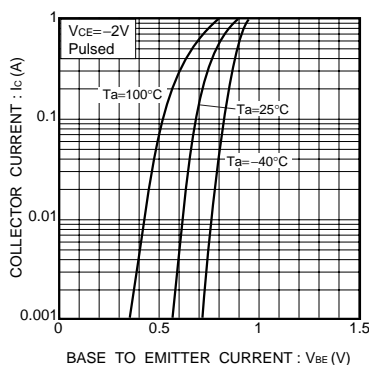


Fig.4 Grounded emitter propagation characteristics

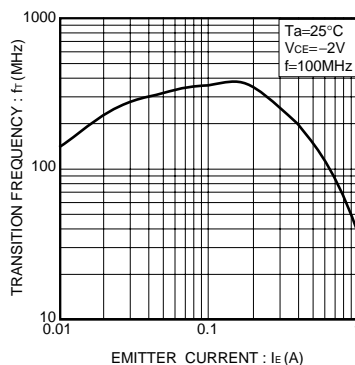


Fig.5 Gain bandwidth product vs. emitter current

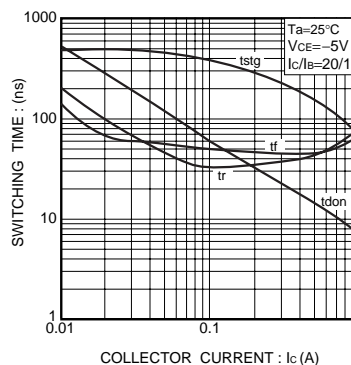


Fig.6 Switching time

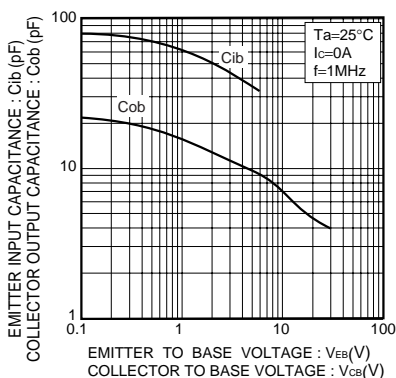


Fig.7 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

Transistors

Di2

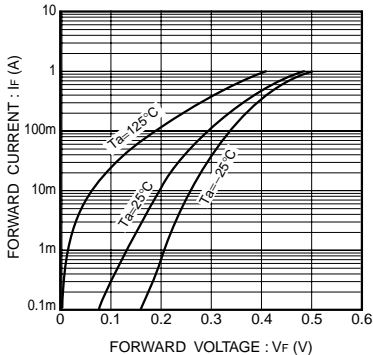


Fig.9 Forward characteristics

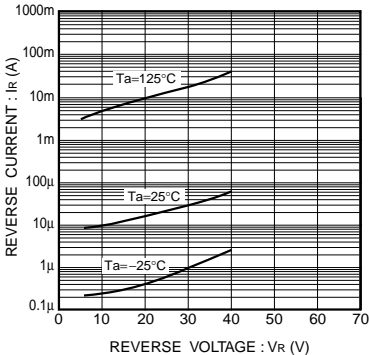


Fig.10 Reverse characteristics

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