

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

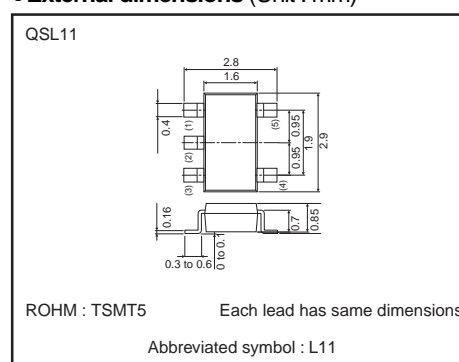
●Features

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

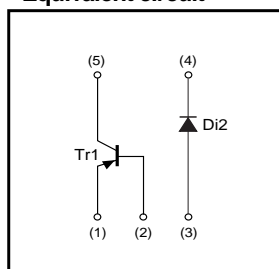
●Structure

Silicon epitaxial planar transistor
Schottky barrier diode

●External dimensions (Unit : mm)



●Equivalent circuit



●Packaging specifications

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

Transistors

●Absolute maximum ratings (Ta=25°C)

Tr1

Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CB0}	−30	V
Collector-emitter voltage	V _{CE0}	−30	V
Emitter-base voltage	V _{EB0}	−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 _{CE0}	−30	−	−	V	I _C =−1mA
Emitter-base breakdown voltage	BV _{EB0}	−6	−	−	V	I _E =−10μA
Collector cutoff current	I _{CBO}	−	−	−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

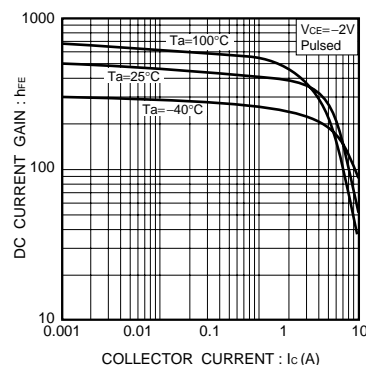


Fig.1 DC current gain
vs. collector current

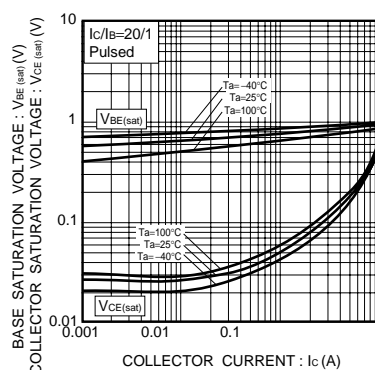


Fig.2 Collector-emitter saturation voltage
base-emitter saturation voltage
vs. collector current

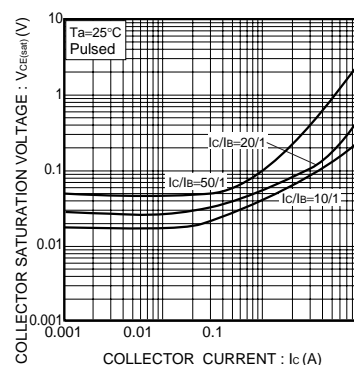


Fig.3 Collector-emitter saturation voltage
vs. collector current

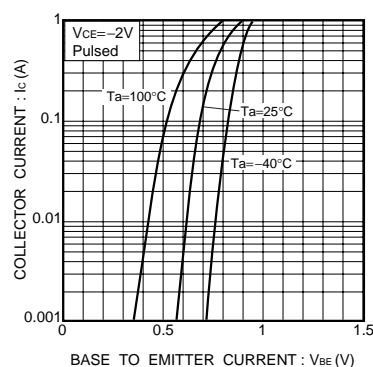


Fig.4 Grounded emitter propagation
characteristics

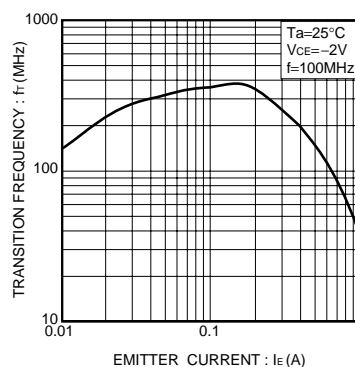


Fig.5 Gain bandwidth product
vs. emitter current

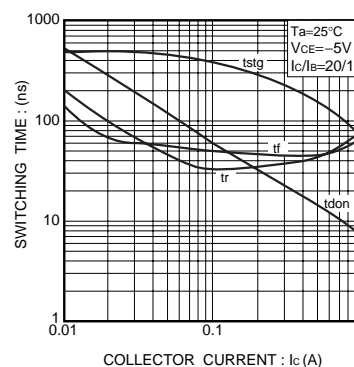


Fig.6 Switching time

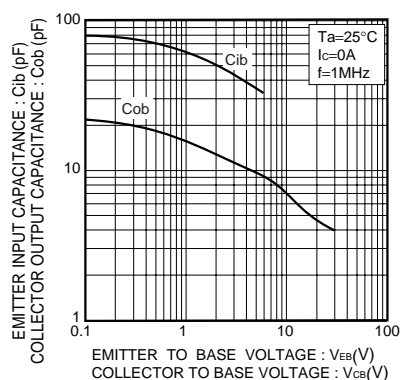


Fig.7 Collector output capacitance
vs. collector-base voltage
Emitter input capacitance
vs. emitter-base voltage

Transistors

Di2

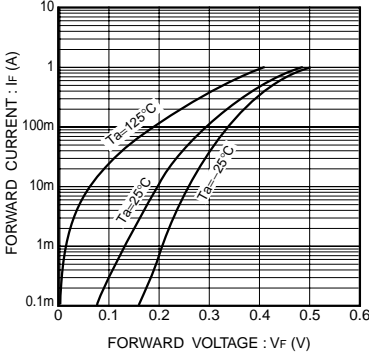


Fig.9 Forward characteristics

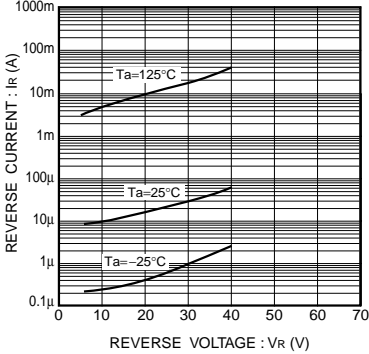


Fig.10 Reverse characteristics

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