

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

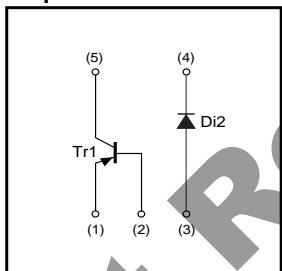
● Features

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

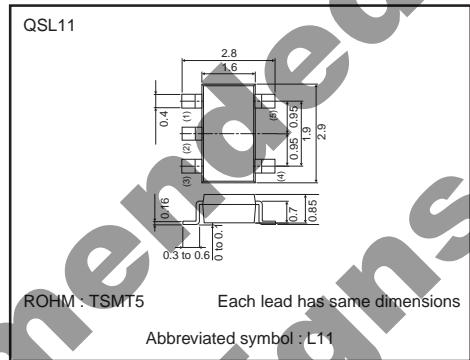
● Structure

Silicon epitaxial planar transistor
Schottky barrier diode

● Equivalent circuit



● **External dimensions** (Unit : mm)



●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 _{CBO}	-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 _{CBO}	-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 _{EB0}	-	-	-100	nA	V _{EB} =-6V
Collector-emitter saturation voltage	V _{CE(sat)}	-	-150	-350	mV	I _C =-500mA, I _E =-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

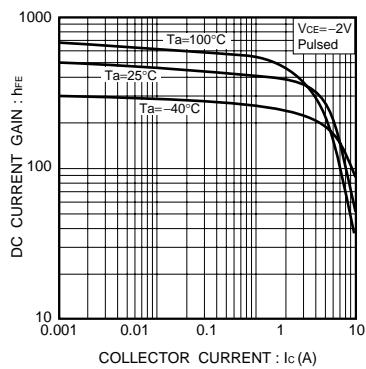


Fig.1 DC current gain vs. collector current

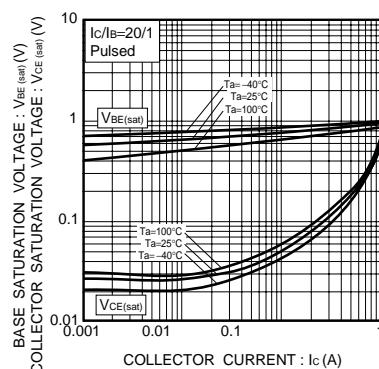


Fig.2 Collector-emitter saturation voltage base-emitter saturation voltage vs. collector current

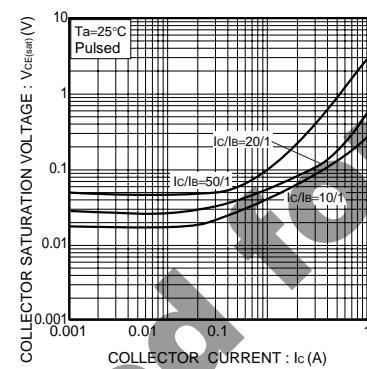


Fig.3 Collector-emitter saturation voltage vs. collector current

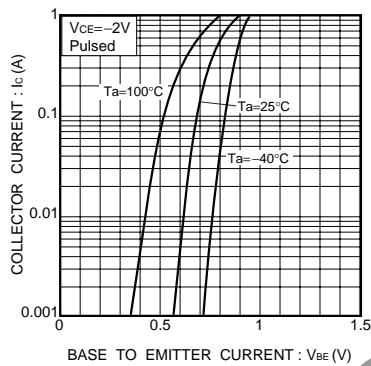


Fig.4 Grounded emitter propagation characteristics

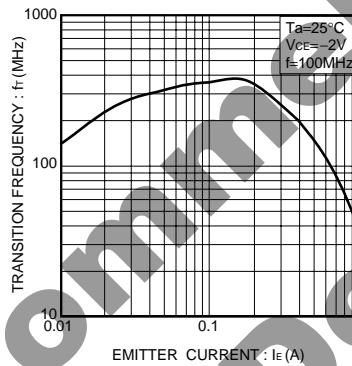


Fig.5 Gain bandwidth product vs. emitter current

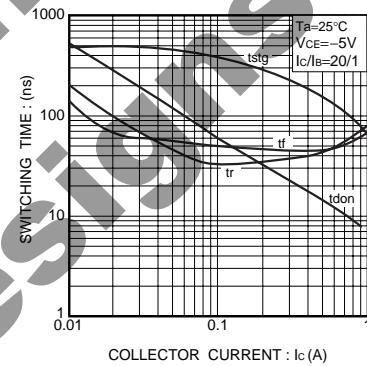
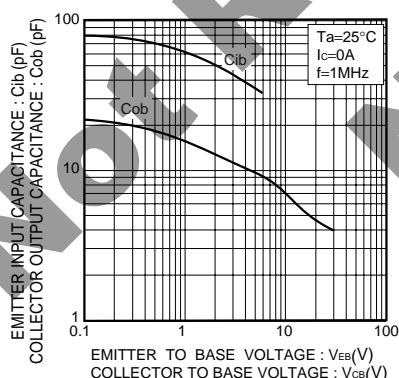


Fig.6 Switching time

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

Transistors

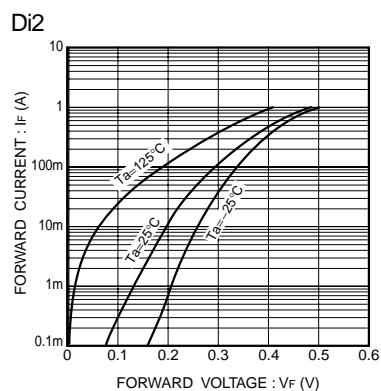


Fig.9 Forward characteristics

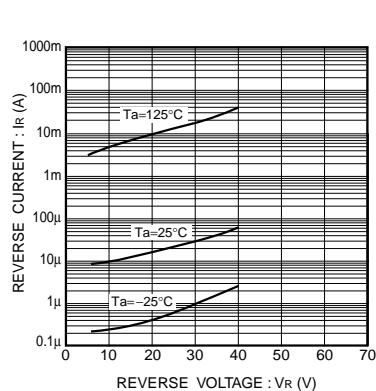


Fig.10 Reverse characteristics

Not Recommended for
New Designs

Appendix

Notes

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