

General purpose transistor (isolated transistor and diode)

QSL9

A 2SB1709 and a RB461F are housed independently in a TSMT5 package.

●Applications

DC / DC converter
Motor driver

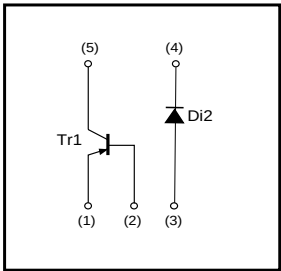
●Features

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

●Structure

Silicon epitaxial planar transistor
Schottky barrier diode

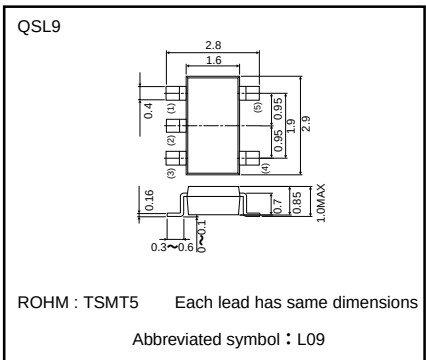
●Equivalent circuit



●Packaging specifications

Type	QSL9
Package	TSMT5
Marking	L09
Code	TR
Basic ordering unit(pieces)	3000

●External dimensions (Units : mm)



Transistors

●Absolute maximum ratings (Ta=25°C)

Tr1

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	-1.5	A
	I _{CP}	-3	A *1
Power dissipation	P _C	500	mW *2
Junction temperature	T _j	150	°C
Range of storage temperature	T _{stg}	-40~+125	°C

*1 Single pulse, Pw=1ms.

*2 Each terminal mounted on a recommended land.

Di2

Parameter	Symbol	Limits	Unit
Average rectified forward current	I _F	700	mA
Forward current surge peak (60Hz, 1∞)	I _{FSM}	3	A
Reverse voltage (DC)	V _R	20	V
Junction temperature	T _j	125	°C
Range of storage temperature	T _{stg}	-40~+125	°C

●Electrical characteristics (Ta=25°C)

Tr1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV _{CEO}	-12	—	—	V	I _C =-1mA
Collector-base breakdown voltage	BV _{CBO}	-15	—	—	V	I _C =-10μA
Emitter-base breakdown voltage	BV _{EBO}	-6	—	—	V	I _E =-10μA
Collector cut-off current	I _{CBO}	—	—	-100	nA	V _{CB} =-15V
Emitter cut-off current	I _{EBO}	—	—	-100	nA	V _{EB} =-6V
Collector-emitter saturation voltage	V _{CE(sat)}	—	-110	-200	mV	I _C =-500mA, I _E =-25mA
DC current gain	h _{FE}	270	—	680	—	V _{CE} =-2V, I _C =-200mA
Transition frequency	f _T	—	400	—	MHz	V _{CE} =-2V, I _E =200mA, f=100MHz
Collector output capacitance	C _{ob}	—	12	—	pF	V _{CB} =-10V, I _E =0mA, f=1MHz

Di2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V _F	—	—	490	mV	I _F =700mA
Reverse current	I _R	—	—	200	μA	V _R =20V

Transistors

●Electrical characteristic curves

Tr1

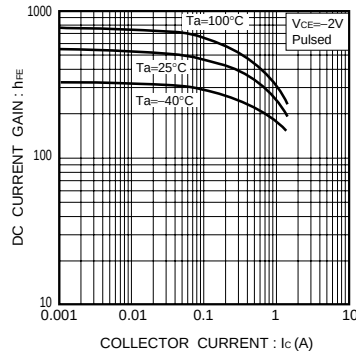


Fig.1 DC current gain vs. collector current

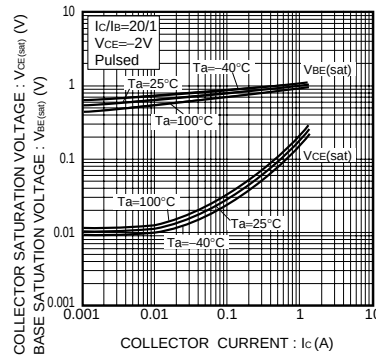


Fig.2 Base-emitter saturation voltage vs. collector current

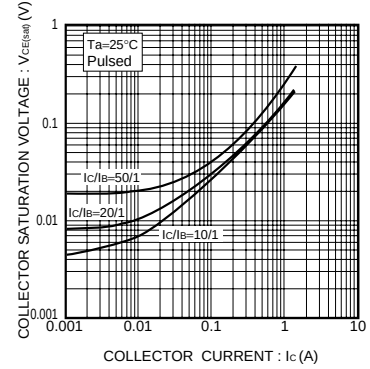


Fig.3 Collector-emitter saturation voltage vs. collector current

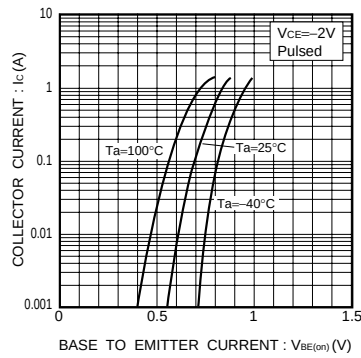


Fig.4 Grounded emitter propagation characteristics

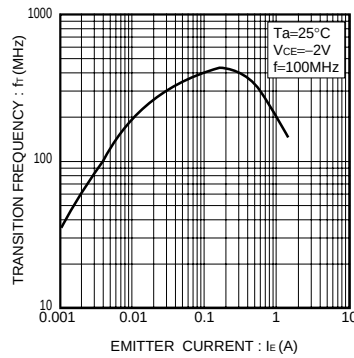


Fig.5 Gain bandwidth product vs. emitter current

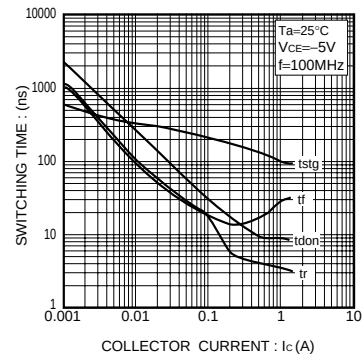


Fig.6 Switching time

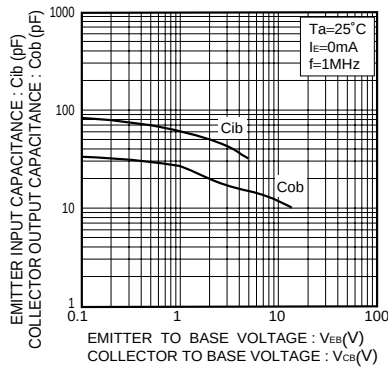


Fig.7 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

Transistors

Di2

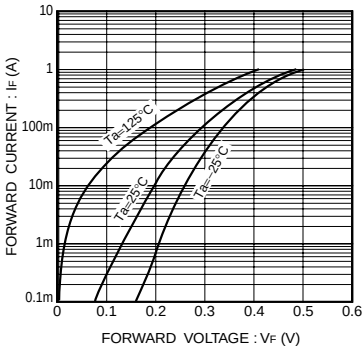


Fig.9 Forward characteristics

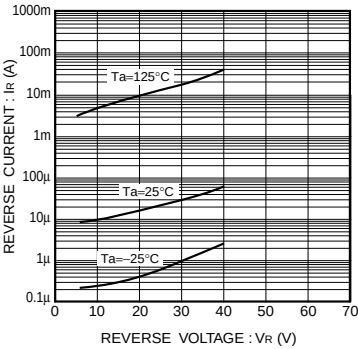


Fig.10 Reverse characteristics