

General purpose transistor (isolated transistor and diode)

QSZ4

A 2SB1706 and a 2SD2671 are housed independently in a TSMT5 package.

● Applications

DC / DC converter
Motor driver

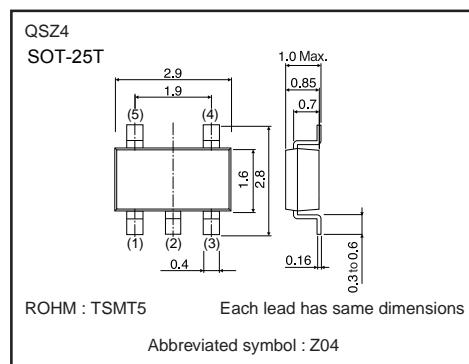
● Features

- 1) Low $V_{CE(sat)}$
- 2) Small package

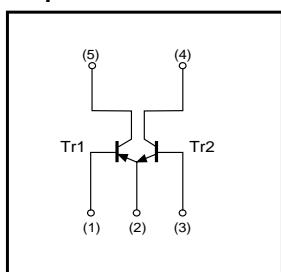
● Structure

Silicon epitaxial planar transistor

● Dimensions (Unit : mm)



● Equivalent circuit



● Packaging specifications

Type	QSZ4
Package	TSMT5
Marking	Z04
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	-2	A
	I _{CP}	-4	A *1
		500	mW/Total *2
Power dissipation	P _C	1.25	W/Total *3
		0.9	W/Element *3
Junction temperature	T _J	150	°C
Range of storage temperature	T _{STG}	-55 to +150	°C

*1 Single pulse, P_w=1ms.

*2 Each terminal mounted on a recommended land.

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

Tr 2

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	2	A
	I _{CP}	4	A *1
		500	mW/Total *2
Power dissipation	P _C	1.25	W/Total *3
		0.9	W/Element *3
Junction temperature	T _J	150	°C
Range of storage temperature	T _{STG}	-55 to +150	°C

*1 Single pulse, P_w=1ms.

*2 Each terminal mounted on a recommended land.

*3 Mounted on a 25×25× 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 _{CBO}	-	-	-100	nA	V _{CB} =-30V
Emitter cutoff current	I _{EBO}	-	-	-100	nA	V _{EB} =-6V
Collector-emitter saturation voltage	V _{CE(sat)}	-	-180	-370	mV	I _C =-1.5A, I _E =-75mA
DC current gain	h _{FE}	270	-	680	-	V _{CE} =-2V, I _C =200mA*
Transition frequency	f _T	-	280	-	MHz	V _{CE} =-2V, I _E =200mA, f=100MHz*
Collector output capacitance	C _{OB}	-	20	-	pF	V _{CB} =-10V, I _E =0A, f=1MHz

* Pulsed

Tr 2

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 _{CBO}	-	-	100	nA	V _{CB} =30V
Emitter cutoff current	I _{EBO}	-	-	100	nA	V _{EB} =-6V
Collector-emitter saturation voltage	V _{CE(sat)}	-	180	370	mV	I _C =1.5A, I _E =75mA
DC current gain	h _{FE}	270	-	680	-	V _{CE} =2V, I _C =200mA*
Transition frequency	f _T	-	280	-	MHz	V _{CE} =2V, I _E =-200mA, f=100MHz*
Collector output capacitance	C _{OB}	-	20	-	pF	V _{CB} =10V, I _E =0A, f=1MHz

* Pulsed

Transistors

●Electrical characteristic curves

Tr1(PNP)

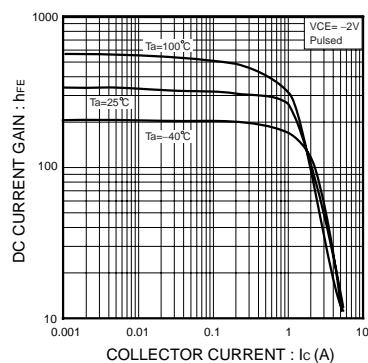


Fig.1 DV current gain vs. collector current

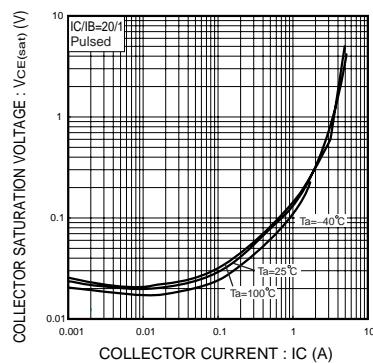


Fig.2 Collector-emitter saturation voltage vs. collector current

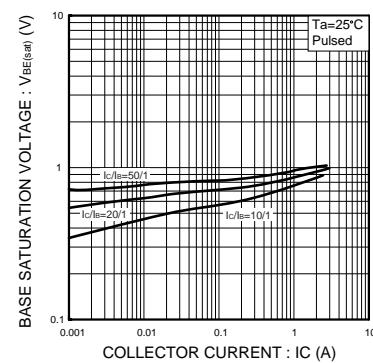


Fig.3 Base-emitter saturation voltage vs. collector current

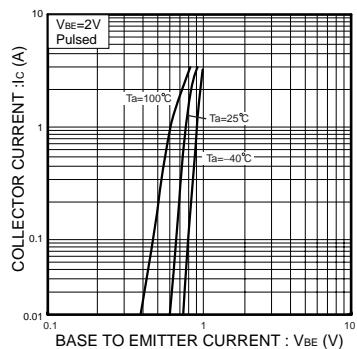


Fig.4 Grounded emitter propagation characteristics

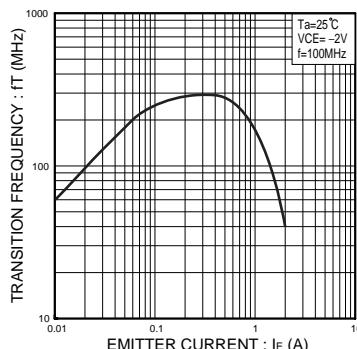


Fig.5 Gain bandwidth product vs. emitter current

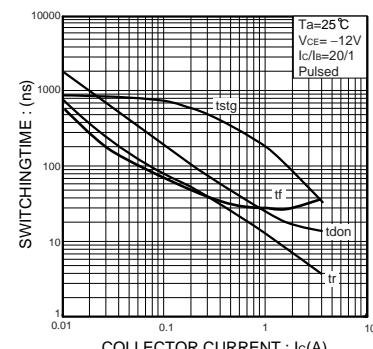
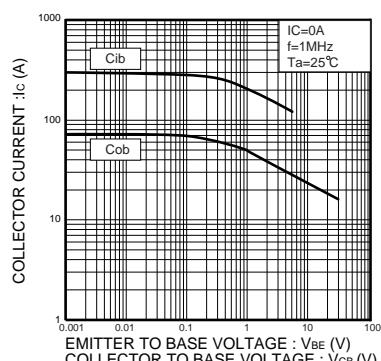


Fig.6 Switching time

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

Transistors

Tr2(NPN)

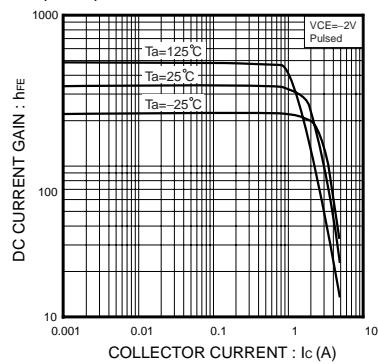


Fig.8 DC current gain vs. collector current

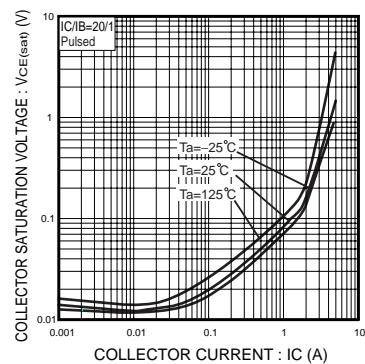


Fig.9 Collector-emitter saturation voltage vs. collector current

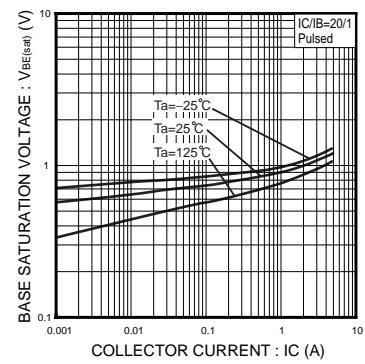


Fig.10 Base-emitter saturation voltage vs. collector current

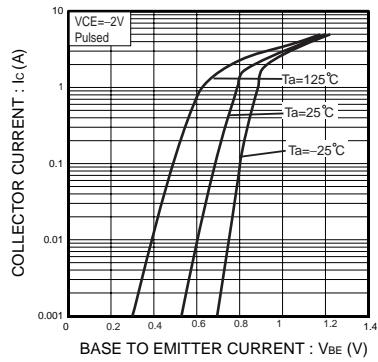


Fig.11 Grounded emitter propagation characteristics

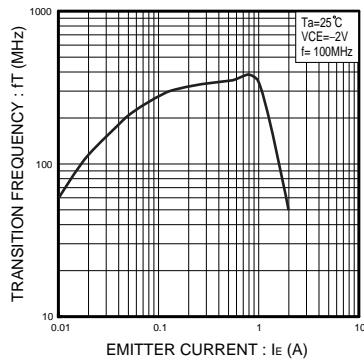
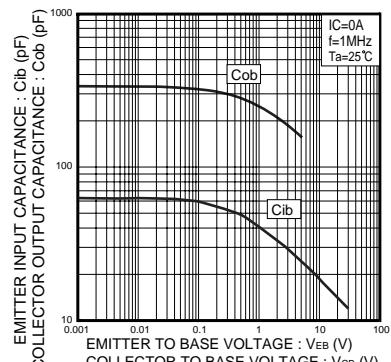


Fig.12 Gain bandwidth product vs. emitter current

Fig.13 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

Appendix

Notes

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