

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

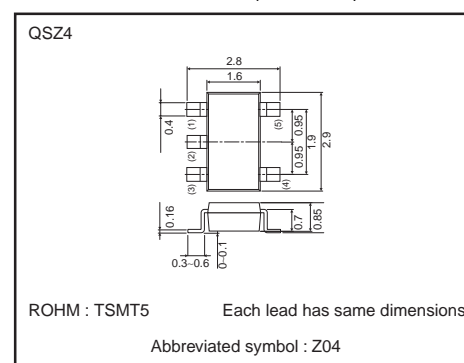
●Features

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

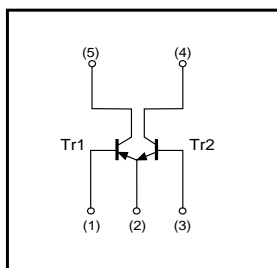
●Structure

Silicon epitaxial planar transistor

●External 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
Power dissipation	P _C	500	mW/Total *2
		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 25×25×¹0.8mm 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
Power dissipation	P _C	500	mW/Total *2
		1.25	W/Total *3
		0.9	W/Element *3
Junction temperature	T _j	150	°C
Range of storage temperature	T _{stg}	−50 to +150	°C

*1 Single pulse, P_w=1ms.

*2 Each terminal mounted on a recommended land.

*3 Mounted on a 25×25×¹0.8mm 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 _B =−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 _B =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)

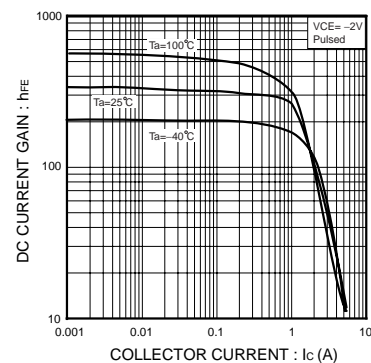


Fig.1 DV current gain vs. collector current

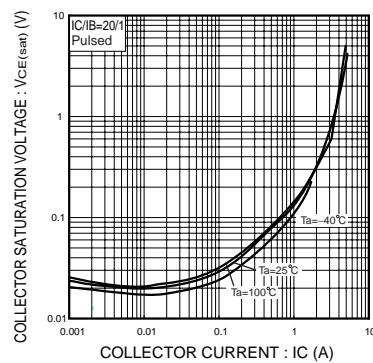


Fig.2 Collector-emitter saturation voltage vs. collector current

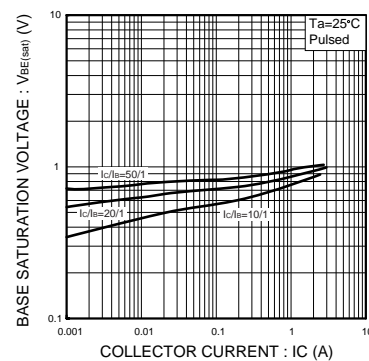


Fig.3 Base-emitter saturation voltage vs. collector current

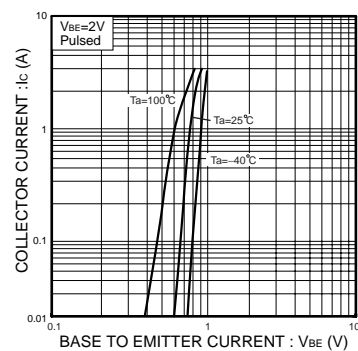


Fig.4 Grounded emitter propagation characteristics

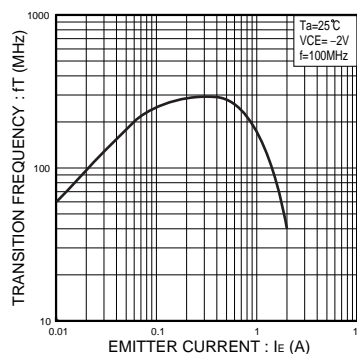


Fig.5 Gain bandwidth product vs. emitter current

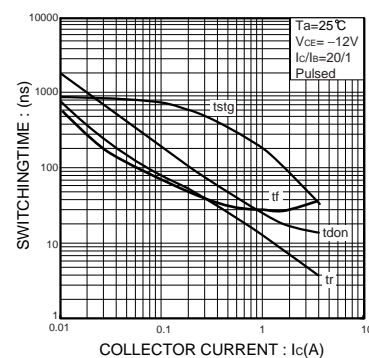


Fig.6 Switching time

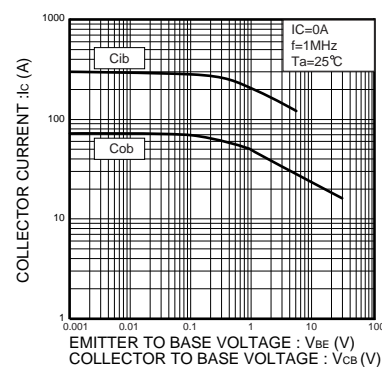


Fig.7 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

Transistors

Tr2(NPN)

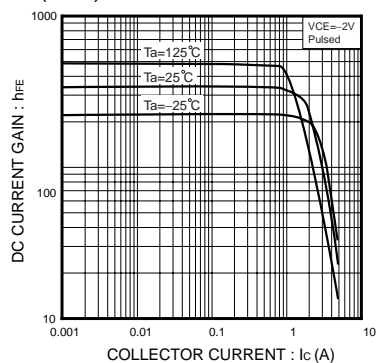


Fig.8 DC current gain vs. collector current

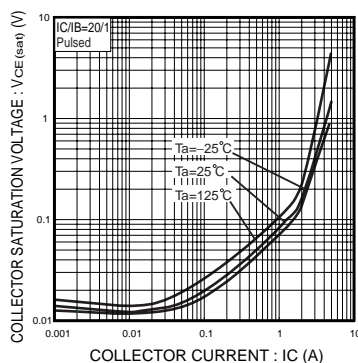


Fig.9 Collector-emitter saturation voltage base-emitter saturation voltage vs. collector current

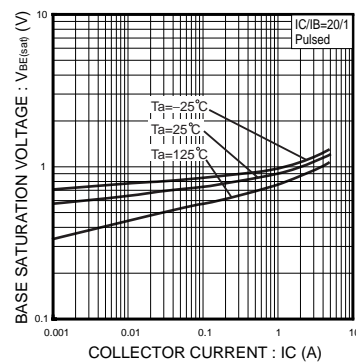


Fig.10 Base-emitter saturation voltage vs. collector current

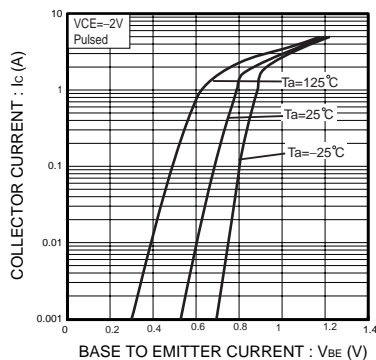


Fig.11 Grounded emitter propagation characteristics

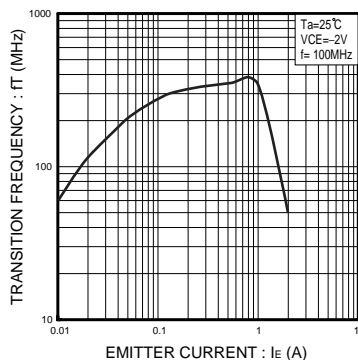


Fig.12 Gain bandwidth product vs. emitter current

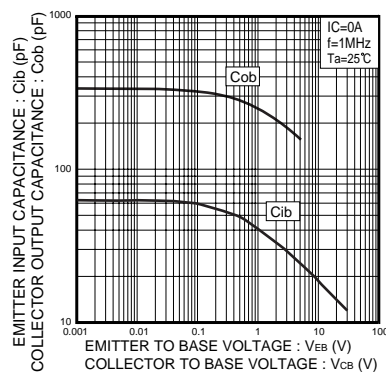


Fig.13 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

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