

General purpose transistor (isolated transistor and diode)

US5L12

A 2SD2675 and a RB461F are housed independently in a TUMT5 package.

●Applications

DC / DC converter
Motor driver

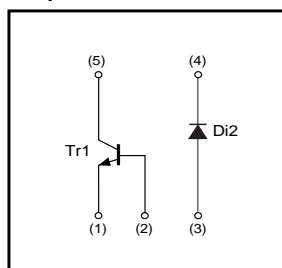
●Features

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

●Structure

Silicon epitaxial planar transistor
Schottky barrier diode

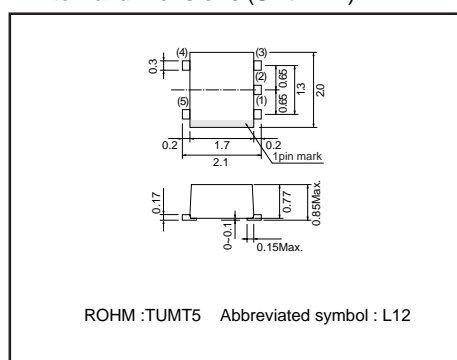
●Equivalent circuit



●Packaging specifications

Type	US5L12
Package	TUMT5
Marking	L12
Code	TR
Basic ordering unit(pieces)	3000

●External dimensions (Unit : mm)



Transistors

●Absolute maximum ratings (Ta=25°C)

Tr1

Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CB0}	30	V
Collector-emitter voltage	V _{CEO}	30	V
Emitter-base voltage	V _{EB0}	6	V
Collector current	I _c	1	A
	I _{CP}	2	A *1
Power dissipation	P _C	0.7	W/ELEMENT *2
Junction temperature	T _j	150	°C
Range of storage temperature	T _{stg}	-40 to +125	°C

*1 Single pulse, Pw=1ms.

*2 Mounted on a 25mm×25mm×1.0.8mm 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	0.5	W/ELEMENT *
Junction temperature	T _j	125	°C
Range of storage temperature	T _{stg}	-40 to +125	°C

* Mounted on a 25mm×25mm×1.0.8mm ceramic substrate

Tr1 & Di2

Parameter	Symbol	Limits	Unit
Total power dissipation	P _D	0.4	W/TOTAL *1
		1.0	W/TOTAL *2

*1 Each terminal mounted on a recommended land

*2 Mounted on a 25mm×25mm×1.0.8mm 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 _{CEO}	30	–	–	V	I _c =1mA
Emitter-base breakdown voltage	BV _{EB0}	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)}	–	120	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

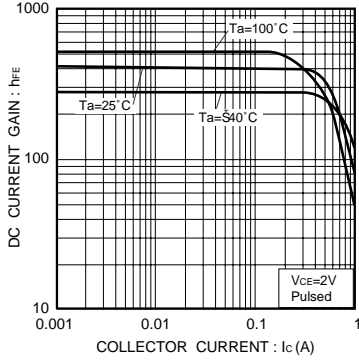


Fig.1 DC current gain vs. collector current

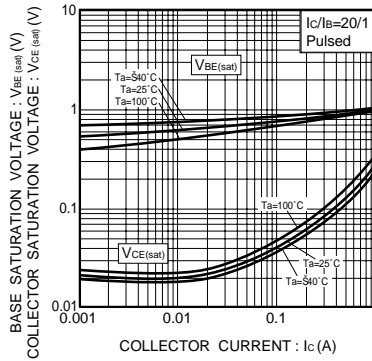


Fig.2 Collector-emitter saturation voltage base-emitter saturation voltage vs. collector current

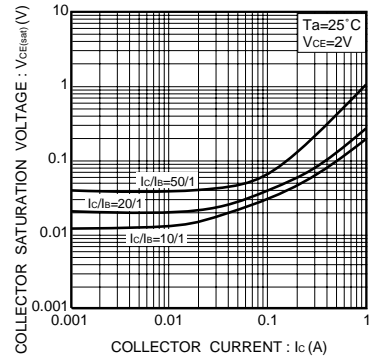


Fig.3 Collector-emitter saturation voltage vs. collector current

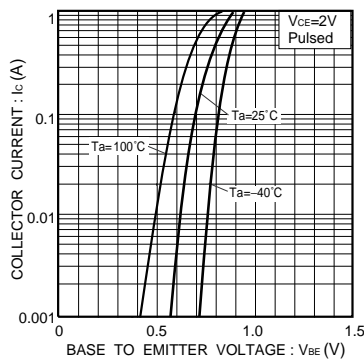


Fig.4 Grounded emitter propagation characteristics

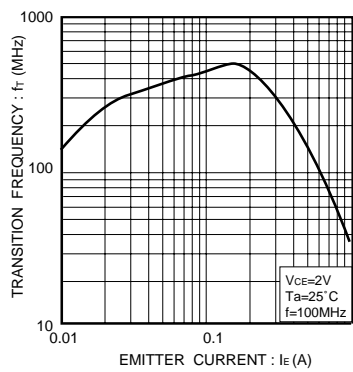


Fig.5 Gain bandwidth product vs. emitter current

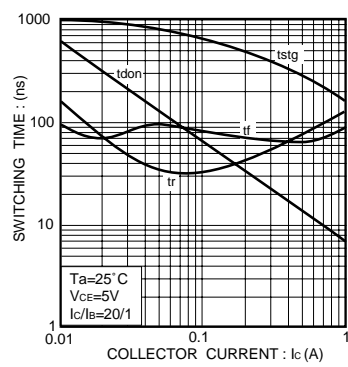


Fig.6 Switching time

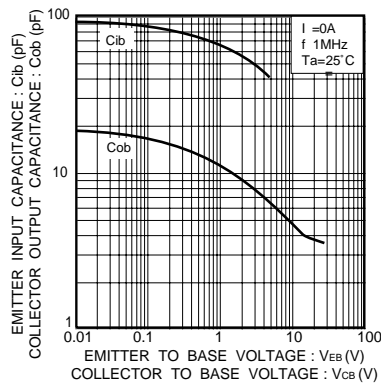


Fig.7 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

Transistors

Di2

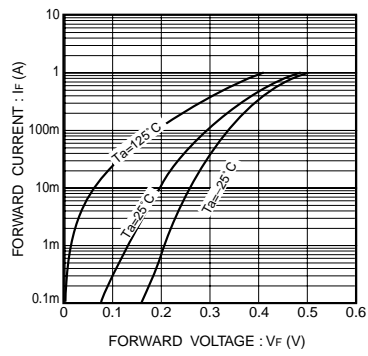


Fig.8 Forward characteristics

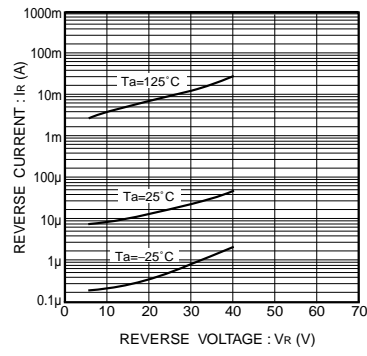


Fig.9 Reverse characteristics

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