

General purpose transistor (isolated transistor and diode)

UML4N

A 2SA2018 and a RB521S-30 are housed independently in a UMT package.

●Applications

DC / DC converter
Motor driver

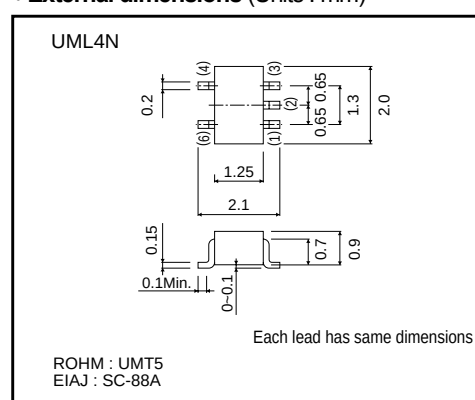
●Features

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

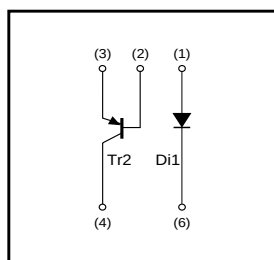
●Structure

Silicon epitaxial planar transistor
Schottky barrier diode

●External dimensions (Units : mm)



●Equivalent circuit



●Packaging specifications

Type	UML4N
Package	UMT5
Marking	L4
Code	TR
Basic ordering unit(pieces)	3000

Transistors

●Absolute maximum ratings (Ta=25°C)

Di1

Parameter	Symbol	Limits	Unit
Average rectified forward current	I _O	200	mA
Forward current surge peak (60Hz, 1∞)	I _{FSM}	1	A
Reverse voltage (DC)	V _R	30	V
Junction temperature	T _j	125	°C
Range of storage temperature	T _{stg}	-55~+125	°C

Tr2

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	-500	mA
	I _{CP}	-1	A
Power dissipation	P _d	120	mW *
Junction temperature	T _j	150	°C
Range of storage temperature	T _{stg}	-55~+125	°C

* Each terminal mounted on a recommended land.

●Electrical characteristics (Ta=25°C)

Di1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V _R	—	0.40	0.50	V	I _F =200mA
Reverse current	I _R	—	4.0	30	μA	V _R =10V

Tr2

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)}	—	-100	-250	mV	I _C =-200mA, I _B =-10mA
DC current gain	h _{FE}	270	—	680	—	V _{CE} =-2V, I _C =-10mA
Transition frequency	f _T	—	260	—	MHz	V _{CE} =-2V, I _E =10mA, f=100MHz
Collector output capacitance	C _{ob}	—	6.5	—	pF	V _{CB} =-10V, I _E =0mA, f=1MHz

●Electrical characteristic curves

Di1

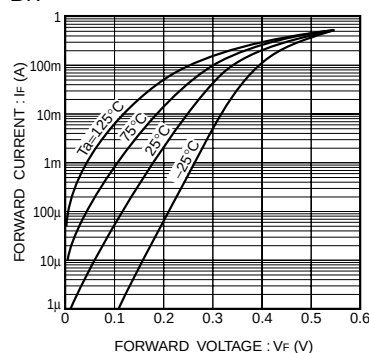


Fig.1 Forward characteristics

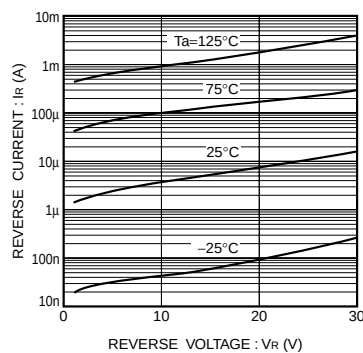


Fig.2 Reverse characteristics

Transistors

Tr2

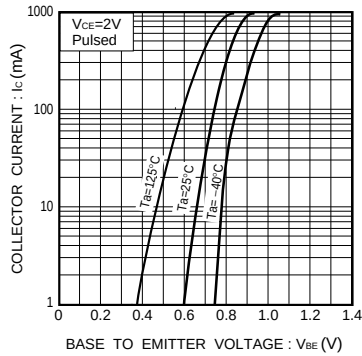


Fig.3 Grounded emitter propagation characteristics

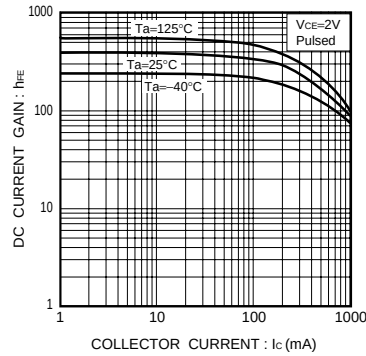


Fig.4 DC current gain vs. collector current

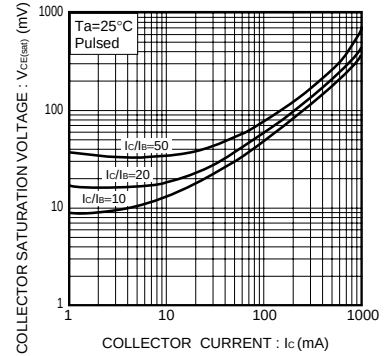
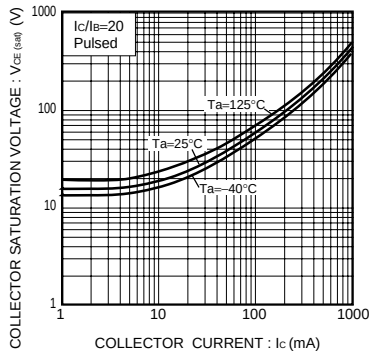
Fig.5 Collector-emitter saturation voltage vs. collector current (I)

Fig.6 Collector-emitter saturation voltage vs. collector current (II)

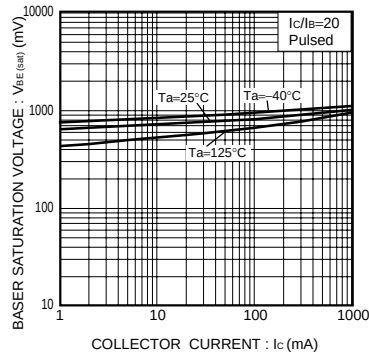


Fig.7 Base-emitter saturation voltage vs. collector current

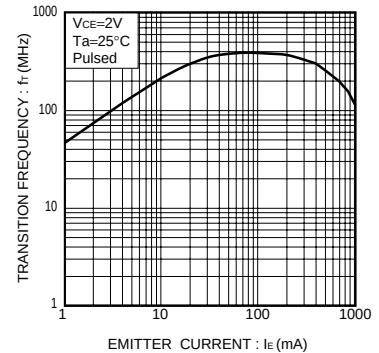


Fig.8 Gain bandwidth product vs. emitter current

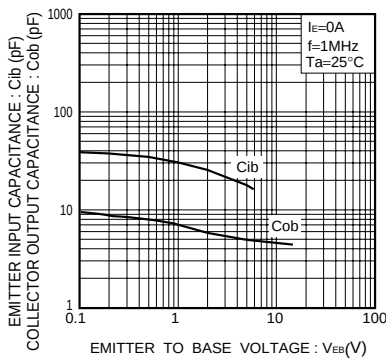
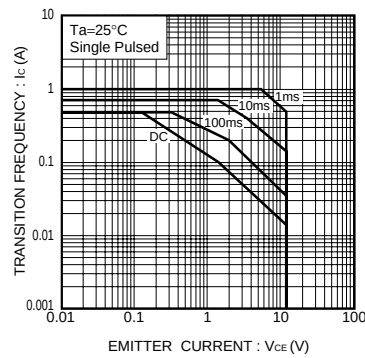
Fig.9 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

Fig.10 Safe operation area