

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

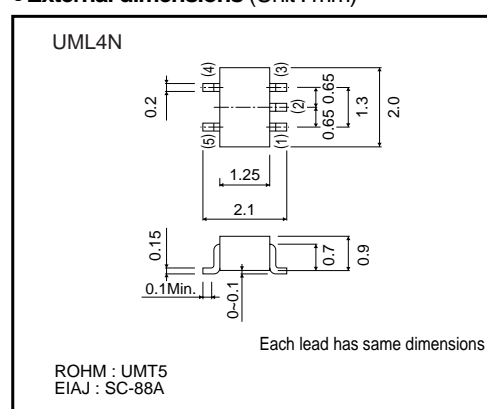
●Features

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

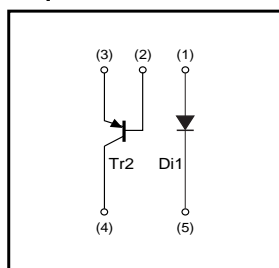
●Structure

Silicon epitaxial planar transistor
Schottky barrier diode

●External dimensions (Unit : 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 to +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 to +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	$I_F=200\text{mA}$
Reverse current	I_R	—	4.0	30	μA	$V_R=10\text{V}$

Tr2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	-12	—	—	V	$I_C=-1\text{mA}$
Collector-base breakdown voltage	BV_{CBO}	-15	—	—	V	$I_C=-10\mu\text{A}$
Emitter-base breakdown voltage	BV_{EBO}	-6	—	—	V	$I_E=-10\mu\text{A}$
Collector cut-off current	I_{CBO}	—	—	-100	nA	$V_{CB}=-15\text{V}$
Emitter cut-off current	I_{EBO}	—	—	-100	nA	$V_{EB}=-6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	-100	-250	mV	$I_C=-200\text{mA}$, $I_B=-10\text{mA}$
DC current gain	h_{FE}	270	—	680	—	$V_{CE}=-2\text{V}$, $I_C=-10\text{mA}$
Transition frequency	f_T	—	260	—	MHz	$V_{CE}=-2\text{V}$, $I_E=10\text{mA}$, $f=100\text{MHz}$
Collector output capacitance	C_{ob}	—	6.5	—	pF	$V_{CB}=-10\text{V}$, $I_E=0\text{mA}$, $f=1\text{MHz}$

●Electrical characteristic curves

Di1

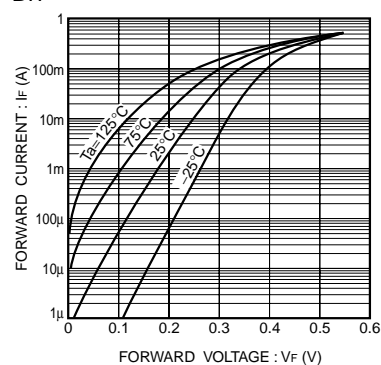


Fig.1 Forward characteristics

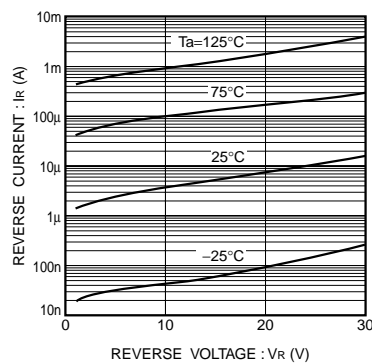


Fig.2 Reverse characteristics

Transistors

Tr2

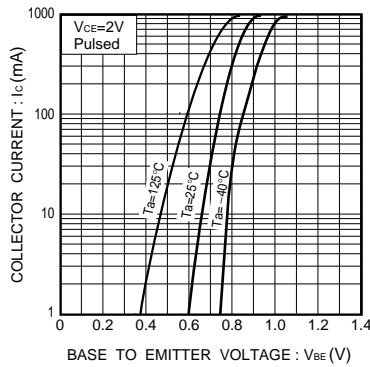


Fig.3 Grounded emitter propagation characteristics

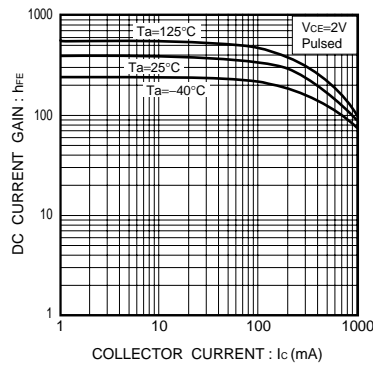


Fig.4 DC current gain vs. collector current

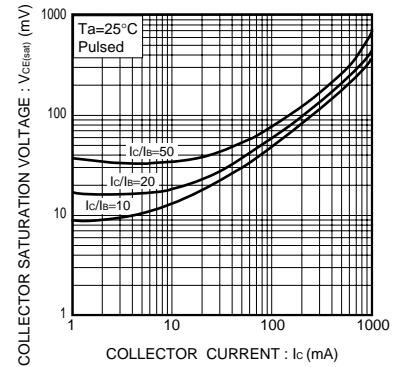


Fig.5 Collector-emitter saturation voltage vs. collector current (I)

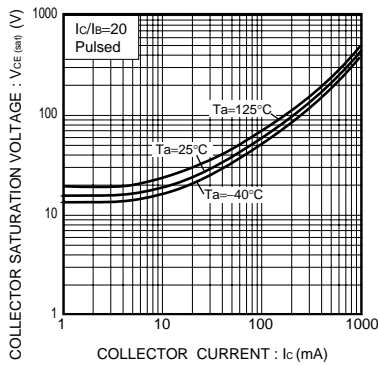


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

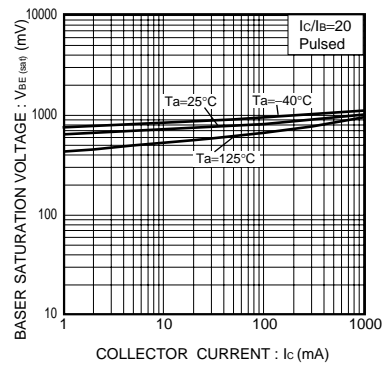


Fig.7 Base-emitter saturation voltage vs. collector current

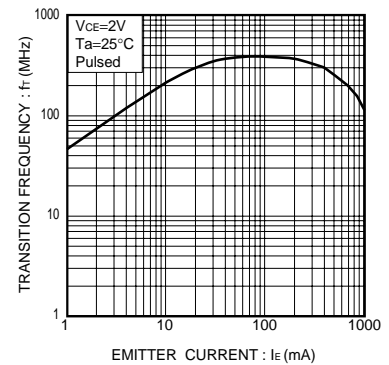


Fig.8 Gain bandwidth product vs. emitter current

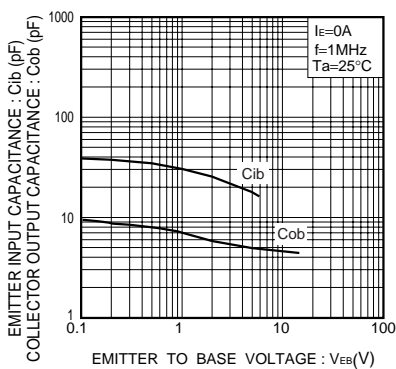
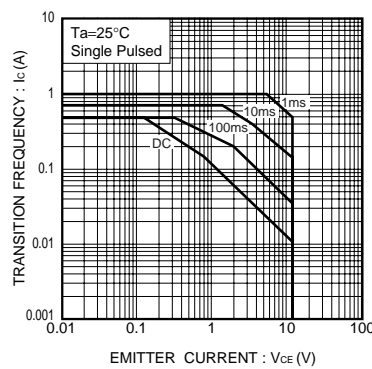
Fig.9 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

Fig.10 Safe operation area

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