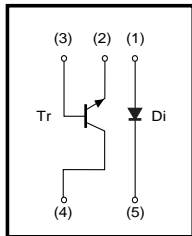


# Low-frequency transistor (isolated transistor and diode) UML2N

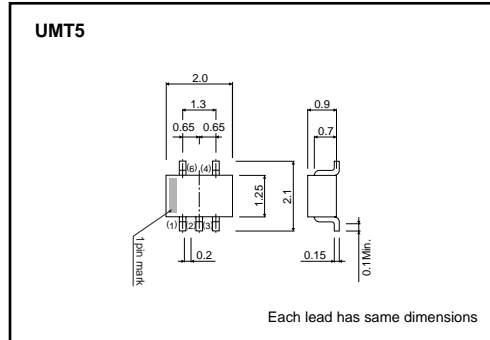
●Features

1) The 2SC2412K and a diode are housed independently in a UMT package.

●Equivalent circuit



●External dimensions (Unit : mm)



●Packaging specifications

Part No.	UML2N
Package	UMT5
Marking	L2
Code	TR
Basic ordering unit (pieces)	3000

●Absolute maximum ratings (Ta=25°C)

Tr

Parameter	Symbol	Limits	Unit
Collector-base voltage	V <sub>CB0</sub>	60	V
Collector-emitter voltage	V <sub>CE0</sub>	50	V
Emitter-base voltage	V <sub>EB0</sub>	6	V
Collector current	I <sub>c</sub>	0.15	A
Collector power dissipation	P <sub>c</sub>	0.15	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Di

Parameter	Symbol	Limits	Unit
DC reverse voltage	V <sub>R</sub>	80	V
Peak reverse voltage	V <sub>RM</sub>	80	V
Mean rectifying current	I <sub>o</sub>	0.1	A
Peak forward voltage	I <sub>FM</sub>	0.3	A
Surge current	I <sub>surge</sub>	4	A
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C
Specified I/O frequencies	f	100	MHz

Transistors

●Electrical characteristics (Ta=25°C)

Tr

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	50	–	–	V	I <sub>C</sub> =1mA
Collector-base breakdown voltage	BV <sub>CBO</sub>	60	–	–	V	I <sub>C</sub> =50μA
Emitter-base breakdown voltage	BV <sub>EBO</sub>	6	–	–	V	I <sub>E</sub> =50μA
Collector cutoff current	I <sub>CBO</sub>	–	–	0.1	μA	V <sub>CB</sub> =60V
Emitter cutoff current	I <sub>EBO</sub>	–	–	0.1	μA	V <sub>EB</sub> =5V
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	–	–	0.4	V	I <sub>C</sub> /I <sub>B</sub> =50mA/5mA
DC current transfer ratio	h <sub>FE</sub>	120	–	560	–	V <sub>CE</sub> =6V, I <sub>C</sub> =1mA
Transition frequency	f <sub>T</sub>	–	180	–	MHz	V <sub>CE</sub> =12V, I <sub>E</sub> =–2mA, f=100MHz
Output capacitance	C <sub>ob</sub>	–	2	3.5	pF	V <sub>CB</sub> =12V, I <sub>E</sub> =0A, f=1MHz

Di

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>F</sub>	–	–	1.2	V	I <sub>F</sub> =100mA
Reverse current	I <sub>R</sub>	–	–	0.1	μA	V <sub>R</sub> =70V
Capacitance between terminals	C <sub>T</sub>	–	–	3.5	pF	V <sub>R</sub> =6V, f=1MHz
Reverse recovery time	t <sub>rr</sub>	–	–	4	ns	V <sub>R</sub> =6V, I <sub>F</sub> =5mA, R <sub>L</sub> =50Ω

●Electrical characteristic curves

Tr

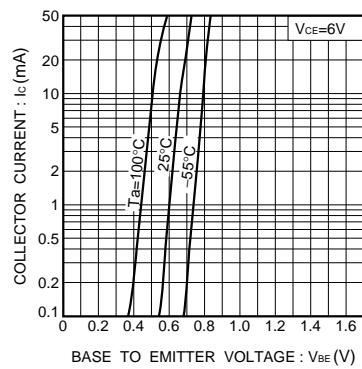


Fig.1 Grounded emitter propagation characteristics

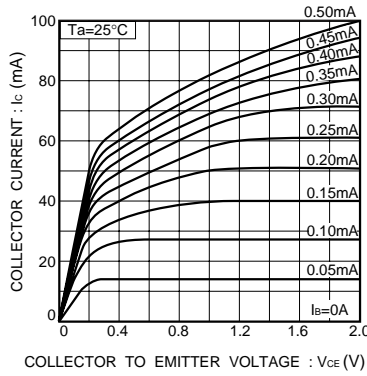


Fig.2 Grounded emitter output characteristics ( I )

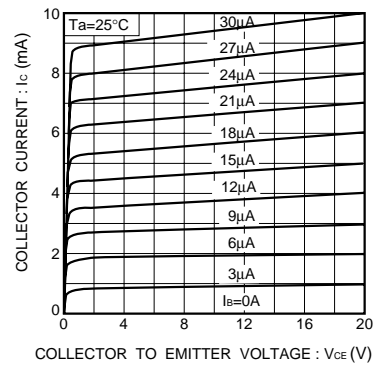


Fig.3 Grounded emitter output characteristics ( II )

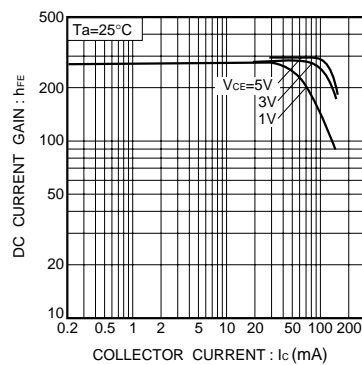


Fig.4 DC current gain vs. collector current ( I )

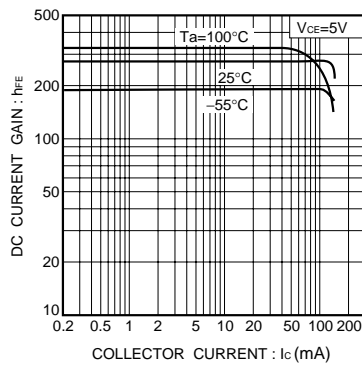


Fig.5 DC current gain vs. collector current ( II )

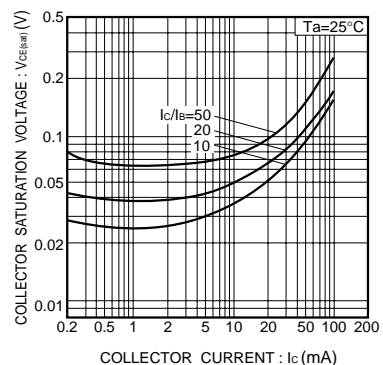


Fig.6 Collector-emitter saturation voltage vs. collector current

Transistors

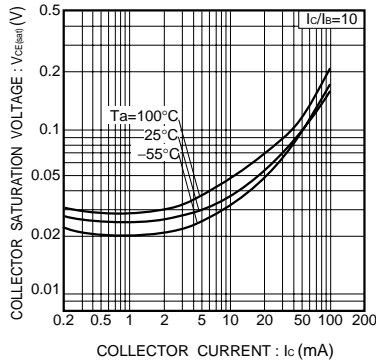


Fig.7 Collector-emitter saturation voltage vs. collector current ( I )

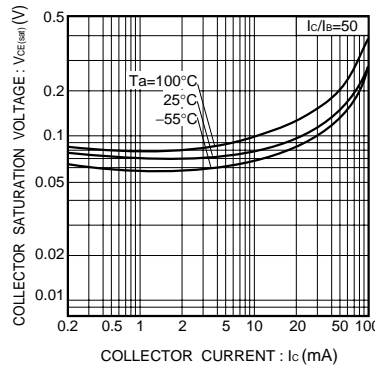


Fig.8 Collector-emitter saturation voltage vs. collector current (II)

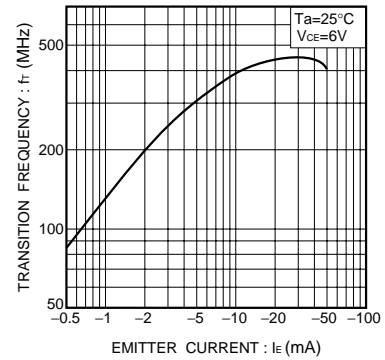


Fig.9 Gain bandwidth product vs. emitter current

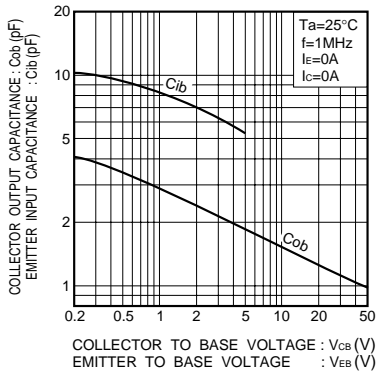


Fig.10 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

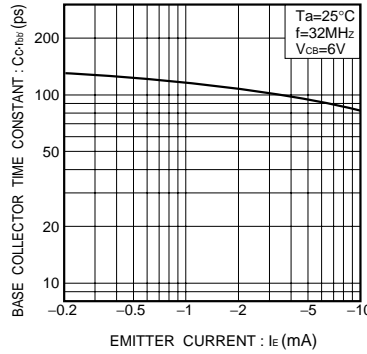


Fig.11 Base-collector time constant vs. emitter current

Di

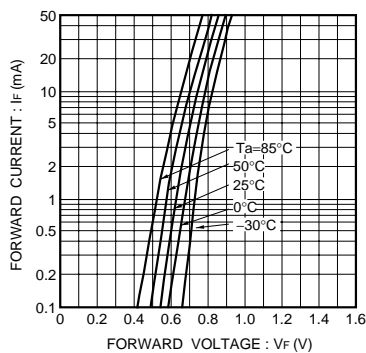


Fig.12 Forward characteristics

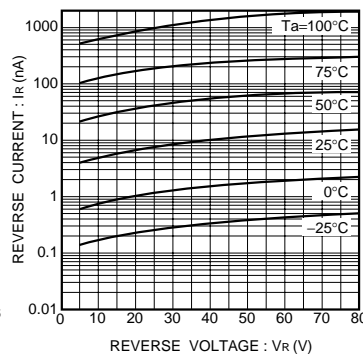


Fig.13 Reverse characteristics

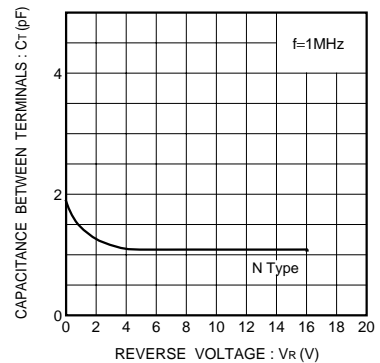


Fig.14 Capacitance between terminals characteristics

Transistors

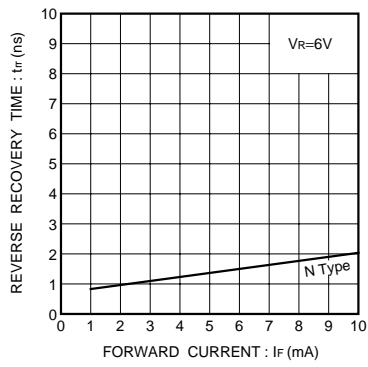


Fig.15 Reverse recovery time

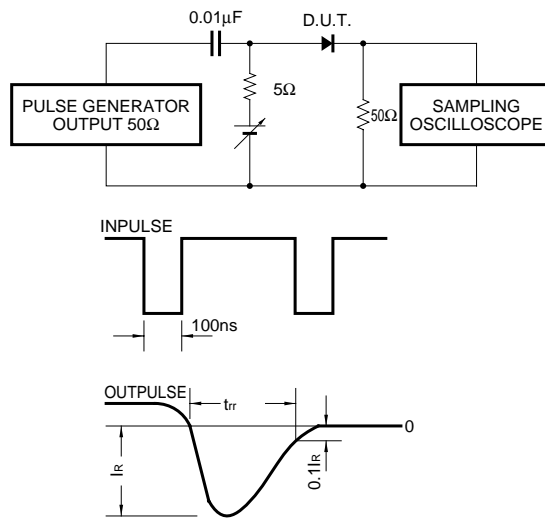


Fig.16 Reverse recovery time ( $t_{rr}$ ) measurement circuit

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