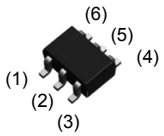
UMH33N

NPN 400mA 20V Complex Digital Transistors (Bias Resistor Built-in Transistors) For Muting. Datasheet

Parameter	Tr1 and Tr2
V_{CEO}	20V
V_{EBO}	40V
I_C	400mA
R_1	2.2kΩ

●Outline

UMT6

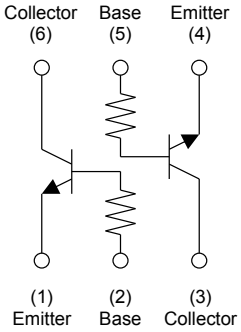


UMH33N
SOT-353 (SC-88)

●Features

1) Built-In Biasing Resistors
2) Two DTC923TUB chips in one package.
3) High Breakdown Voltage of Emitter to Base
   BV_{EBO} is Min. 40V at I_E=50μA
4) Low Output ON Resistance.
   R_{on} is Typ. 0.6Ω at V_I=5V
5) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
6) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of completely eliminating parasitic effects.
7) Lead Free/RoHS Compliant.

●Inner circuit



●Application

Muting circuit

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
UMH33N	UMT6	2021	TR	180	8	3,000	H33

●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter	Symbol	Values	Unit
Collector-base voltage	V_{CBO}	40	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	40	V
Collector current	I_C	400	mA
Power dissipation	P_D *1	150 (Total)*2	mW
Junction temperature	T_j	150	°C
Range of storage temperature	T_{stg}	−55 to +150	°C

●Electrical characteristics (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	BV_{CBO}	I_C= 50μA	40	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	I_C= 1mA	20	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	I_E= 50μA	40	-	-	V
Collector cut-off current	I_{CBO}	V_{CB} = 40V	-	-	500	nA
Emitter cut-off current	I_{EBO}	V_{EB} = 40V	-	-	500	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C / I_B= 30mA / 3mA	-	30	100	mV
DC current gain	h_{FE}	V_{CE}= 5V, I_C= 10mA	820	-	2700	-
Input resistance	R_1	-	1.54	2.2	2.86	kΩ
Transition frequency	f_T *3	V_{CE} = 6V, I_E = −4mA, f = 10MHz	-	35	-	MHz
Output ON Resistance	R_{on}	V_I = 5V, R_L = 1kΩ, f = 1kHz	-	0.6	-	Ω

*1 Each terminal mounted on a reference footprint

*2 120mW per element must not be exceeded.

*3 Characteristics of built-in transistor

●**Electrical characteristic curves**(Ta = 25°C)

Fig.1 Grounded emitter propagation characteristics

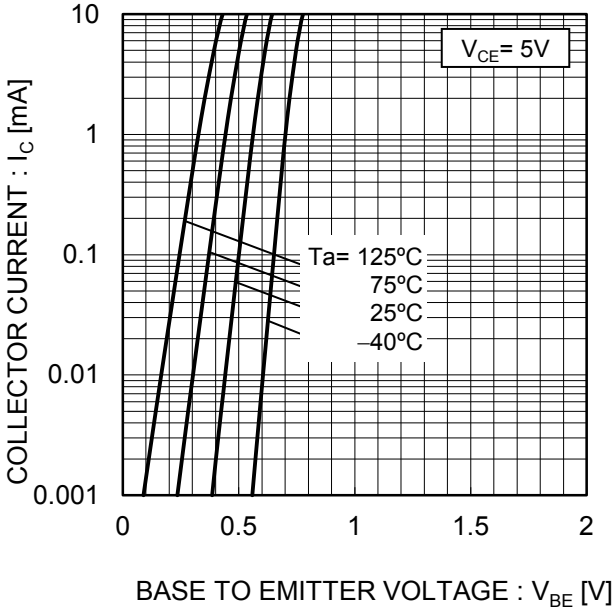


Fig.2 Grounded emitter output characteristics

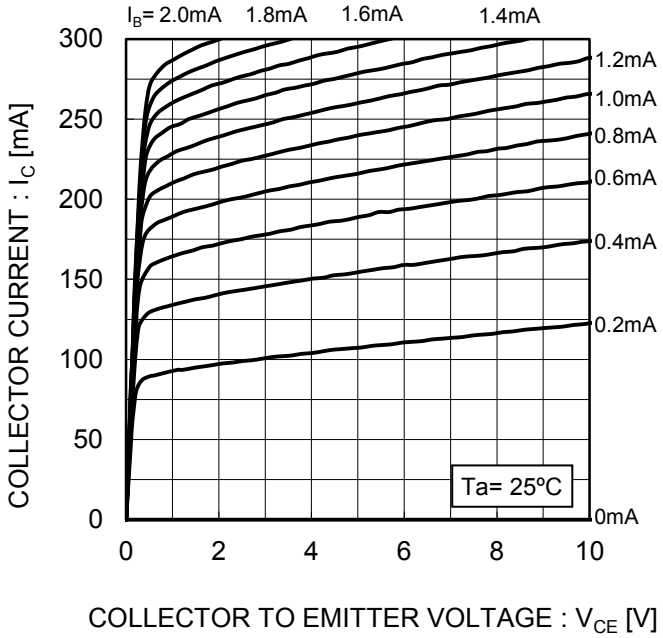


Fig.3 DC Current gain vs. Collector Current

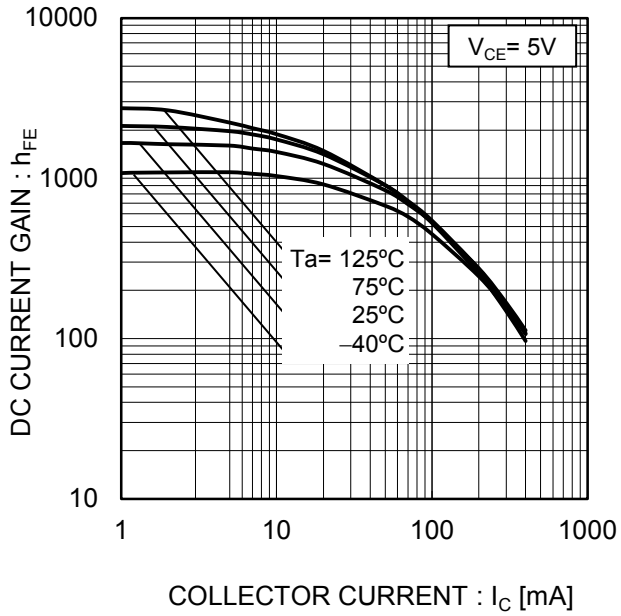
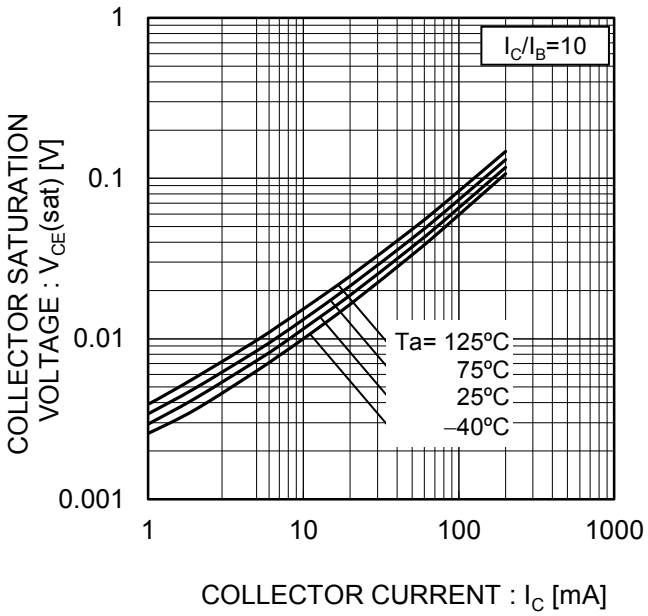


Fig.4 Collector-emitter saturation voltage vs. Collector Current



●**Electrical characteristic curves**(Ta = 25°C)

Fig.5 Output ON resistance vs. input voltage

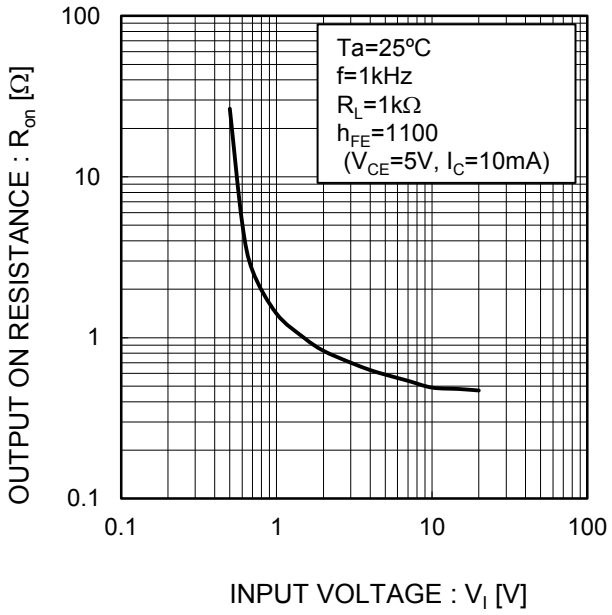
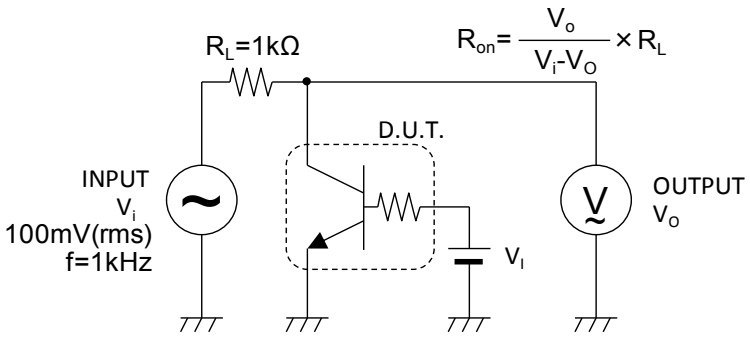
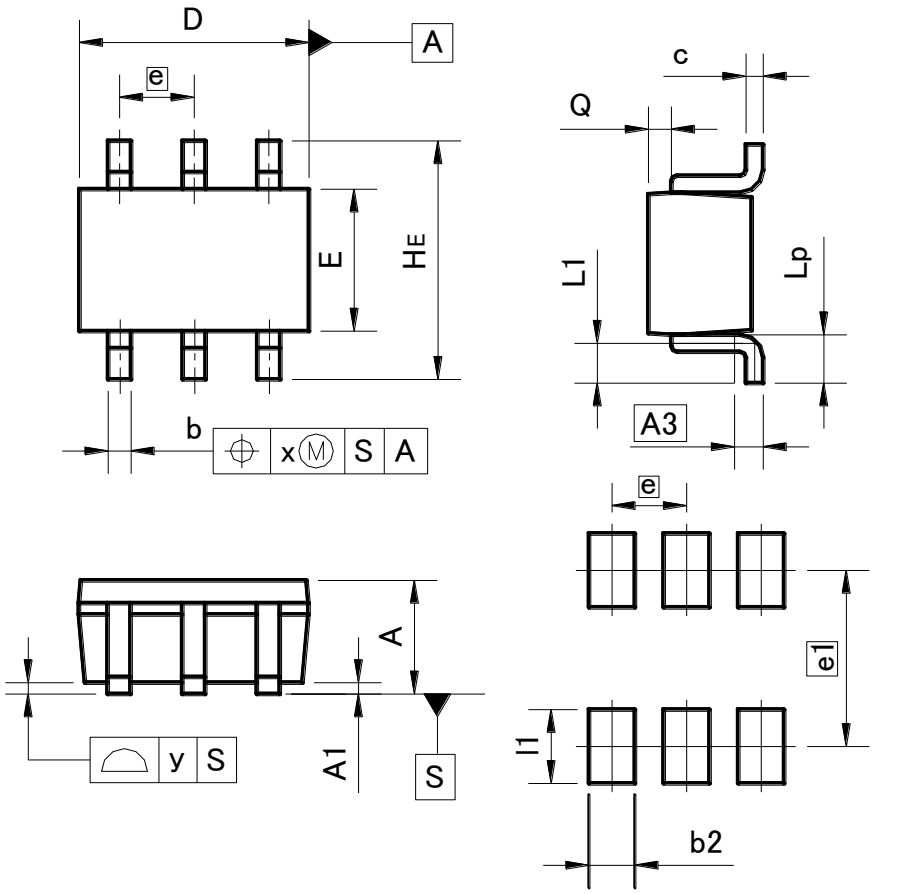


Fig.6 Ron measurement circuit.



●**Dimensions** (Unit : mm)

UMT6



Pattern of terminal position areas
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
x	−	0.10	−	0.004
y	−	0.10	−	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	−	0.40	−	0.016
e1	1.55		0.061	
l1	−	0.65	−	0.026

Dimension in mm / inches

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