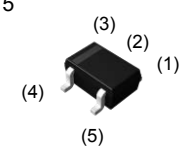
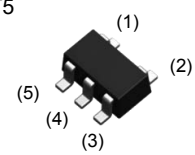
UMA9N / FMA9A

PNP -100mA -50V Complex Digital Transistors (Bias Resistor Built-in Transistors) Datasheet

Parameter	Tr1 and Tr2
V_{CC}	−50V
$I_{C(MAX.)}$	−100mA
R_1	10kΩ
R_2	10kΩ

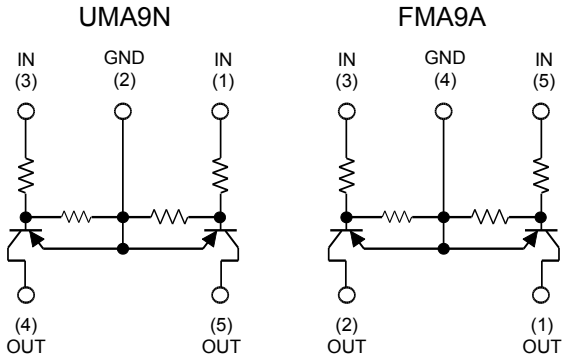
●Outline

UMT5	SMT5
	
UMA9N SOT-353 (SC-88A)	FMA9A (SC-74A)

●Features

1) Built-In Biasing Resistors, R_1 = R_2 = 10kΩ.
2) Two DTA114E chips in one package.
3) Emitter(GND)-common type
4) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
5) 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.
6) Only the on/off conditions need to be set for operation, making the circuit design easy.
7) Lead Free/RoHS Compliant.

●Inner circuit



●Application

Interface circuit, Driver circuit

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
UMA9N	UMT5	2021	TR	180	8	3,000	A9
FMA9A	SMT5	2928	T148	180	8	3,000	A9

●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

Parameter		Symbol	Values	Unit
Supply voltage		V_{CC}	−50	V
Input voltage		V_{IN}	−40 to +10	V
Output current		I_O	−50	mA
Collector current		$I_{C(MAX.)}$ *1	−100	mA
Power dissipation	UMA9N	P_D *2	150 (Total) *3	mW
	FMA9A		300 (Total) *4	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
Input voltage	$V_{I(off)}$	V_{CC} = −5V, I_O = −100μA	-	-	−0.5	V
	$V_{I(on)}$	V_O = −0.3V, I_O = −10mA	−3	-	-	
Output voltage	$V_{O(on)}$	I_O / I_I = −10mA / −0.5mA	-	−0.1	−0.3	V
Input current	I_I	V_I = −5V	-	-	−0.88	mA
Output current	$I_{O(off)}$	V_{CC} = −50V, V_I = 0V	-	-	−0.5	μA
DC current gain	G_I	V_O = −5V, I_O = −5mA	20	-	-	-
Input resistance	R_1	-	7	10	13	kΩ
Resistance ratio	R_2/R_1	-	0.8	1	1.2	-
Transition frequency	f_T *1	V_{CE} = −10V, I_E = 5mA, f = 100MHz	-	250	-	MHz

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference footprint

*3 120mW per element must not be exceeded.

*4 200mW per element must not be exceeded.

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

Fig.1 Input voltage vs. output current (ON characteristics)

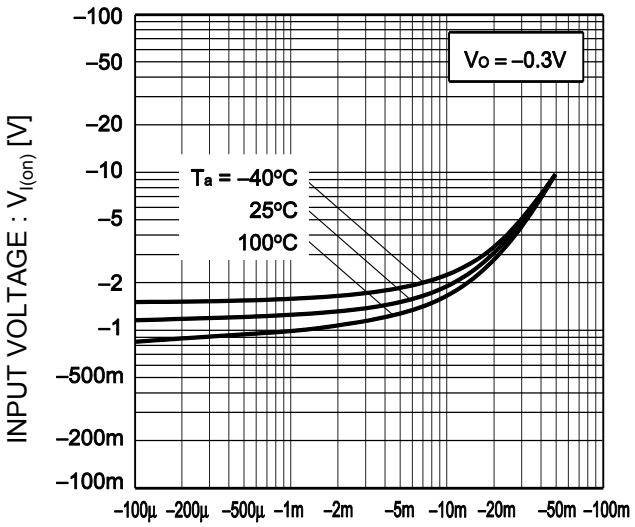


Fig.2 Output current vs. input voltage (OFF characteristics)

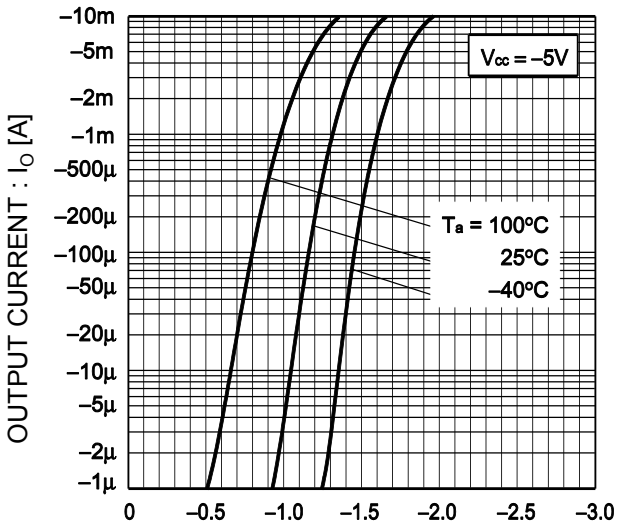


Fig.3 Output current vs. output voltage

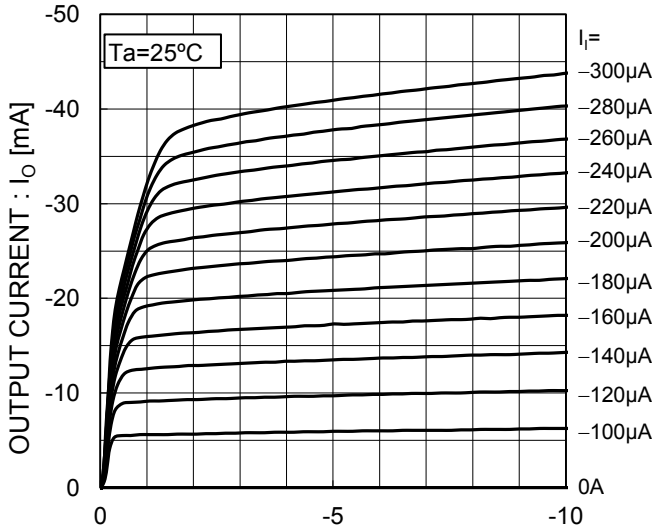
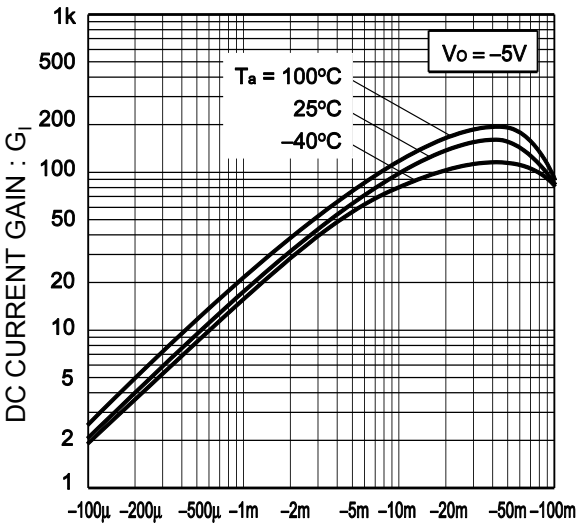
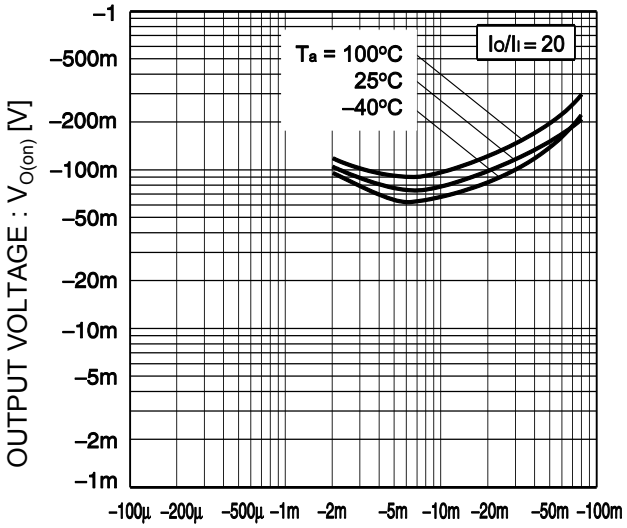


Fig.4 DC current gain vs. output current



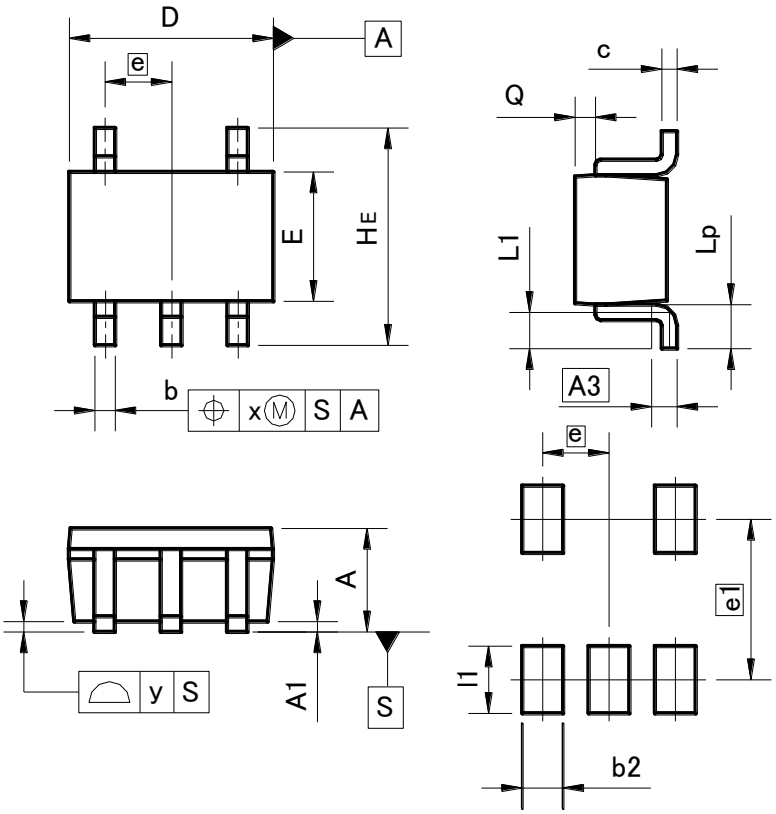
●**Electrical characteristic curves**(Ta = 25°C)

Fig.5 Output voltage vs. output current



●**Dimensions** (Unit : mm)

UMT5



Patterm of terminal position areas

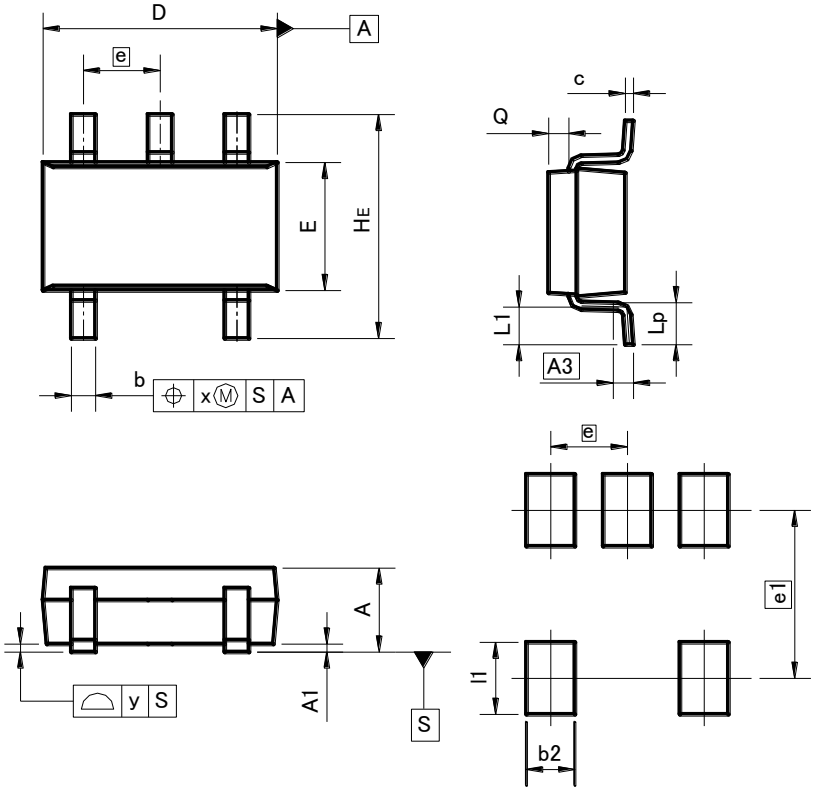
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0	0.004
A3	0.25		0.01	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.03	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.02
Lp	0.25	0.55	0.01	0.022
Q	0.10	0.30	0.004	0.012
x	−	0.10	−	0.004
y	−	0.10	−	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	1.55		0.06	
b2	−	0.40	−	0.016
l1	−	0.65	−	0.026

Dimension in mm/inches

●**Dimensions** (Unit : mm)

SMT5



Patterm of terminal position areas

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	–	0.051
A1	0.00	0.10	0	0.004
A3	0.25		0.01	
b	0.25	0.40	0.01	0.016
c	0.09	0.25	0.004	0.01
D	2.80	3.00	0.11	0.118
E	1.50	1.80	0.059	0.071
e	0.95		0.04	
HE	2.60	3.00	0.102	0.118
L1	0.30	0.60	0.012	0.024
Lp	0.40	0.70	0.016	0.028
Q	0.20	0.30	0.008	0.012
x	–	0.20	–	0.008
y	–	0.10	–	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	2.10		0.08	
b2		0.60	–	0.024
l1	–	0.90	–	0.035

Dimension in mm/inches

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