

# General purpose (dual digital transistors)

## EMD4 / UMD4N

### ●Features

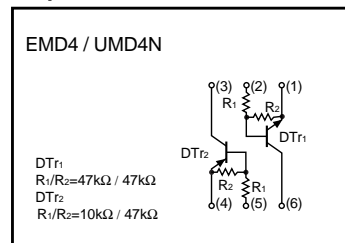
- 1) Both the DTA114Y chip and DTC144E chip in an EMT6 or UMT6 package.
- 2) Mounting possible with EMT3 or UMT3 automatic mounting machines.
- 3) Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

### ●Structure

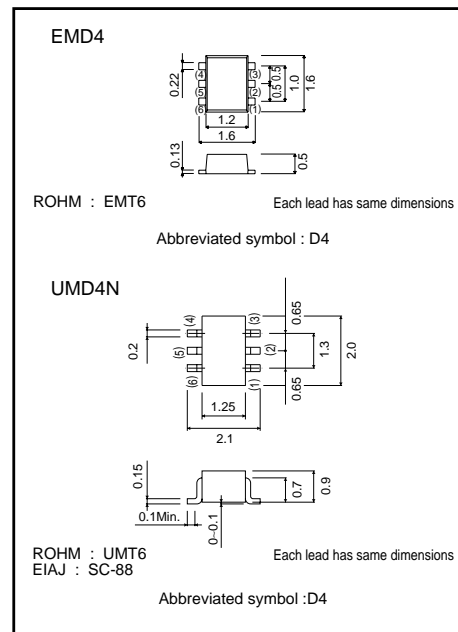
A PNP and NPN digital transistor  
(each with a single built in resistor)

The following characteristics apply to both the DT<sub>r1</sub> and DT<sub>r2</sub>, however, the “-” sign on DT<sub>r2</sub> values for the PNP type have been omitted.

### ●Equivalent circuit



### ●External dimensions (Unit : mm)



### ●Packaging specifications

Type	Package	Taping	
	Code	T2R	TR
	Basic ordering unit (pieces)	8000	3000
EMD4		○	—
UMD4N		—	○

## Transistors

## ●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits		Unit
		DTr1(DTC144E)	DTr2(DTA114Y)	
Supply voltage	V <sub>CC</sub>	50	-50	V
Input voltage	V <sub>IN</sub>	-10 to +40	-40 to +6	V
Output current	I <sub>o</sub>	30	-70	mA
	I <sub>o(Max.)</sub>	100	-100	
Power dissipation	P <sub>d</sub>	150(TOTAL)	120(ELEMENT)	mW
Junction temperature	T <sub>j</sub>	150		°C
Storage temperature	T <sub>stg</sub>	-55 to +150		°C

## ●Electrical characteristics (Ta = 25°C)

## DTr 1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>	-	-	0.5	V	V <sub>CC</sub> =5V, I <sub>o</sub> =100μA
	V <sub>I(on)</sub>	3	-	-		V <sub>o</sub> =0.3V, I <sub>o</sub> =2mA
Output voltage	V <sub>O(on)</sub>	-	0.1	0.3	V	I <sub>o</sub> /I <sub>i</sub> =10mA/0.5mA
Input current	I <sub>i</sub>	-	-	0.18	mA	V <sub>i</sub> =5V
Output current	I <sub>O(off)</sub>	-	-	0.5	μA	V <sub>CC</sub> =50V, V <sub>i</sub> =0V
DC current gain	G <sub>i</sub>	68	-	-	-	V <sub>o</sub> =5V, I <sub>o</sub> =5mA
Input resistance	R <sub>i</sub>	32.9	47	61.1	kΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	-	-
Transition frequency	f <sub>r</sub>	-	250	-	MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =-5mA, f=100MHz *

\* Transition frequency of the device

## DTr 2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>	-	-	-0.3	V	V <sub>CC</sub> = -5V, I <sub>o</sub> = -100μA
	V <sub>I(on)</sub>	-1.4	-	-		V <sub>o</sub> = -0.3V, I <sub>o</sub> = -1mA
Output voltage	V <sub>O(on)</sub>	-	-0.1	-0.3	V	I <sub>o</sub> /I <sub>i</sub> = -5mA / -0.25mA
Input current	I <sub>i</sub>	-	-	-0.88	mA	V <sub>i</sub> = -5V
Output current	I <sub>O(off)</sub>	-	-	-0.5	μA	V <sub>CC</sub> = -50V, V <sub>i</sub> =0V
DC current gain	G <sub>i</sub>	68	-	-	-	V <sub>o</sub> = -5V, I <sub>o</sub> = -5mA
Input resistance	R <sub>i</sub>	7	10	13	kΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	3.7	4.7	5.7	-	-
Transition frequency	f <sub>r</sub>	-	250	-	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> =5mA, f=100MHz *

\* Transition frequency of the device

Transistors

●Electrical characteristic curves

DTr1 (NPN)

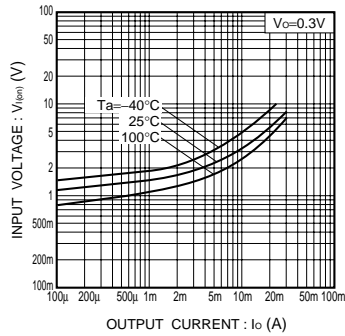


Fig.1 Input voltage vs. output current (ON characteristics)

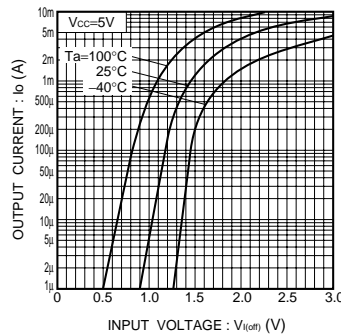


Fig.2 Output current vs. input voltage (OFF characteristics)

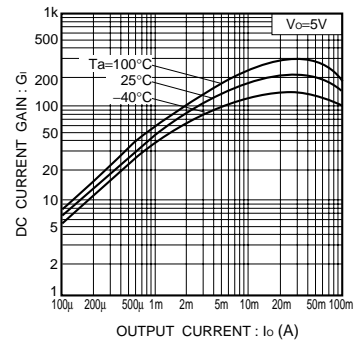


Fig.3 DC current gain vs. output current

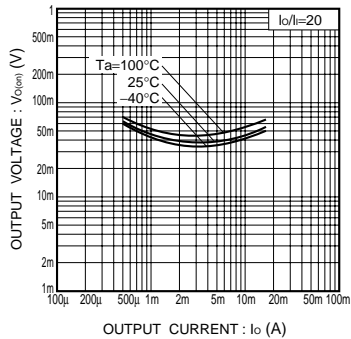


Fig.4 Output voltage vs. output current

DTr2 (NPN)

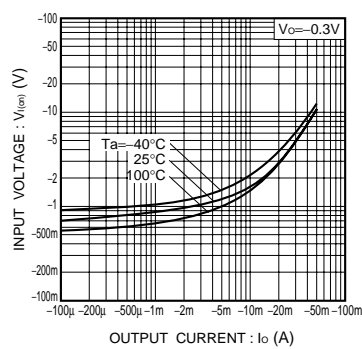


Fig.5 Input voltage vs. output current (ON characteristics)

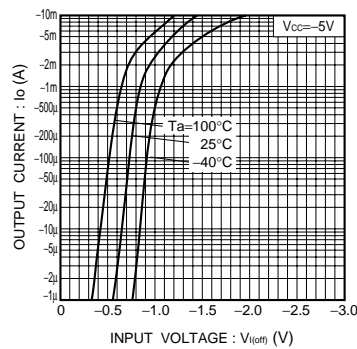


Fig.6 Output current vs. input voltage (OFF characteristics)

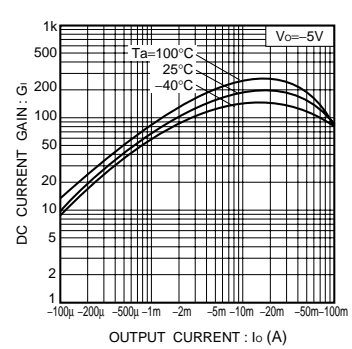


Fig.7 DC current gain vs. output current

## Transistors

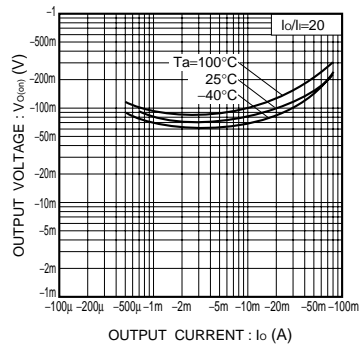


Fig.8 Output voltage vs. output current

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