

# Power management (dual digital transistors)

## EMC3 / UMC3N / FMC3A

**●Features**

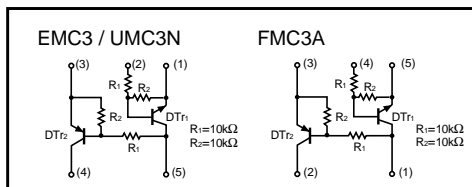
- 1) Both the DTA114E chip and DTC114E chip in a EMT or UMT or SMT package.
- 2) Ideal for power switch circuits.
- 3) Mounting cost and area can be cut in half.

**●Structure**

Epitaxial planar type  
NPN / PNP silicon transistor (Built-in resistor type.)

The following characteristics apply to both 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.

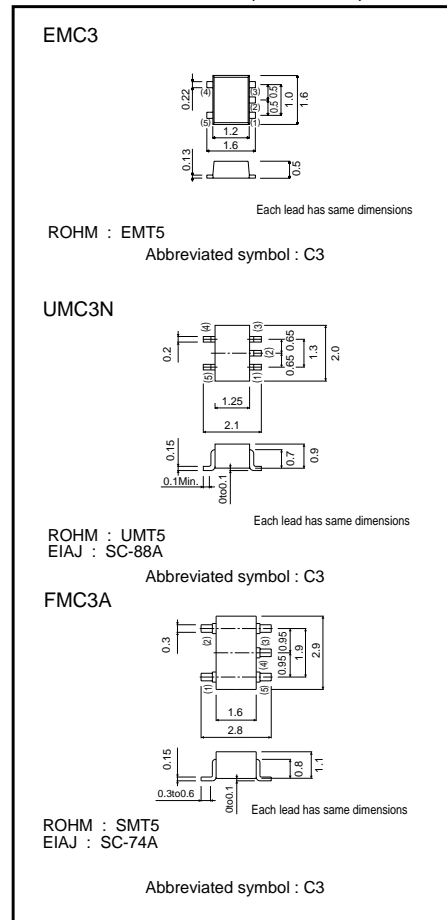
**●Equivalent circuit**



**●Packaging specifications**

Type	Package	Taping		
	Code	T2R	TR	T148
	Basic ordering unit (pieces)	8000	3000	3000
EMC3	○	—	—	—
UMC3N	—	○	—	—
FMC3A	—	—	—	○

**●External dimensions (Units : mm)**



Transistors

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V <sub>CC</sub>	50	V
Input voltage	V <sub>IN</sub>	40	V
		-10	
Output current	I <sub>o</sub>	50	mA
	I <sub>C (Max.)</sub>	100	
Power dissipation	EMC3, UMC3N	150 (TOTAL)	mW
	FMC3A	300 (TOTAL)	
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55~+150	°C

\*1 120mW per element must not be exceeded.  
 \*2 200mW per element must not be exceeded.

●Electrical characteristics (Ta = 25°C)

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> =10mA
Output voltage	V <sub>O (on)</sub>	-	0.1	0.3	V	I <sub>o</sub> =10mA, I <sub>i</sub> =0.5mA
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>	30	-	-	-	V <sub>O</sub> =5V, I <sub>o</sub> =5mA
Transition frequency	f <sub>T</sub>	-	250	-	MHz	V <sub>CE</sub> =10mA, I <sub>E</sub> =-5mA, f=100MHz *
Input resistance	R <sub>1</sub>	7	10	13	kΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	-	-

\* Transition frequency of the device

●Electrical characteristic curves

DTr1 (NPN)

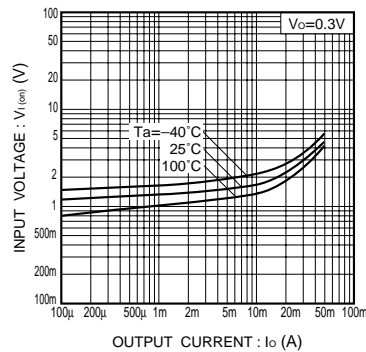


Fig.1 Input voltage vs. output current (ON characteristics)

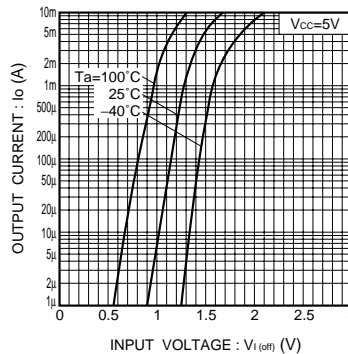


Fig.2 Output current vs. input voltage (OFF characteristics)

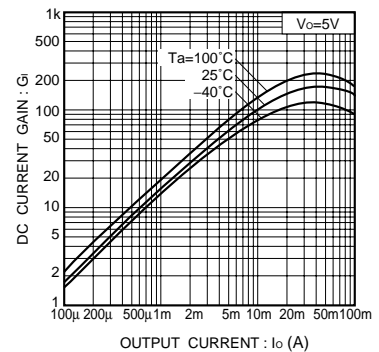


Fig.3 DC current gain vs. output current

Transistors

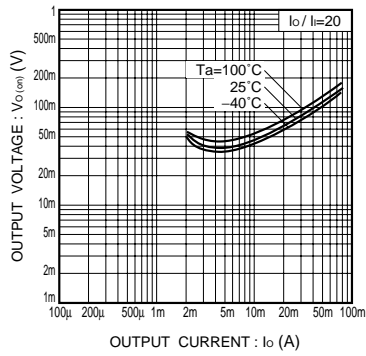


Fig.4 Output voltage vs. output current

DT12 (PNP)

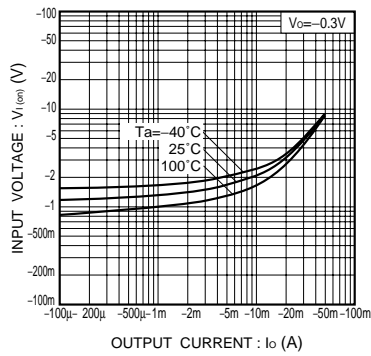


Fig.5 Input voltage vs. output current (ON characteristics)

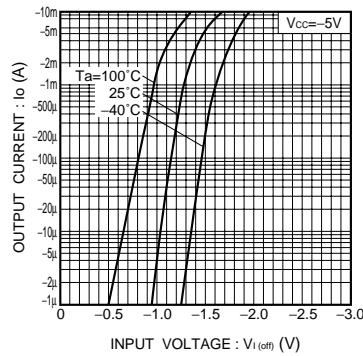


Fig.6 Output current vs. input voltage (OFF characteristics)

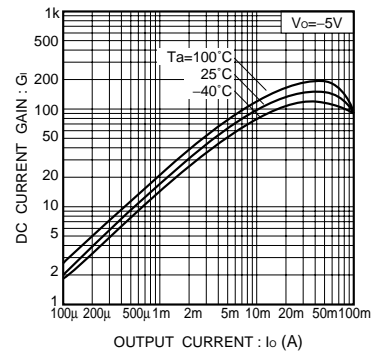


Fig.7 DC current gain vs. output current

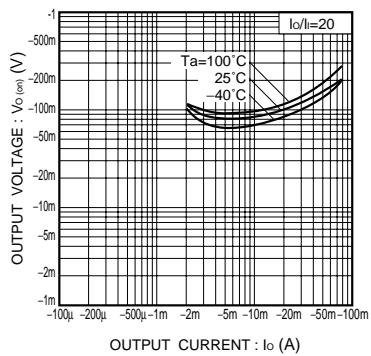


Fig.8 Output voltage vs. output current