

Power management (dual digital transistors)

UMC5N / FMC5A

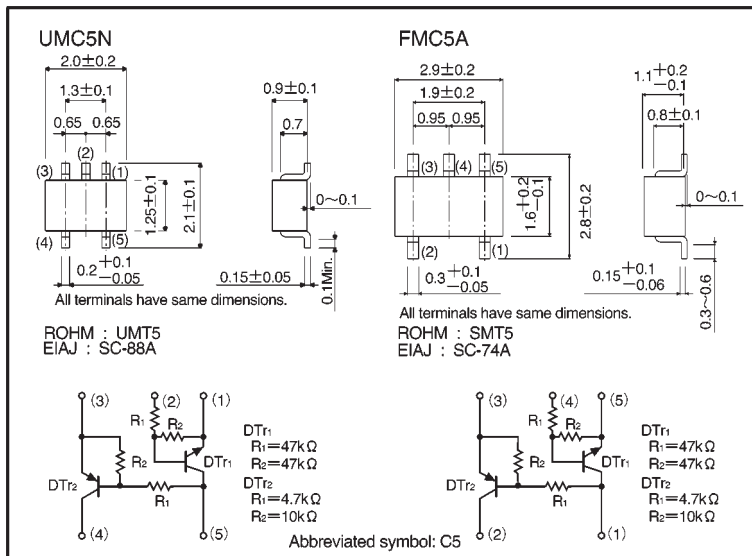
●Features

- 1) Both the DTA143X chip and DTZ144E chip in a 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)

●External dimensions (Units: mm)



●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits		Unit	
			DT _{R1} (NPN)	DT _{R2} (PNP)		
Supply voltage		V _{CC}	50	−50	V	
Input voltage		V _{IN}	40	−20	V	
			−10	7		
Output current		I _O (Max.)	30	−100	mA	
		I _C (Max.)	100	−100		
Power dissipation	UMC5N	P _d	150(TOTAL)		mW	* *:2
	FMC5A		300(TOTAL)			
Junction temperature		T _j	150		°C	
Storage temperature		T _{stg}	−55~+150		°C	

*1 120mW per element must not be exceeded.

*2 200mW per element must not be exceeded.

●Electrical characteristics, DTr₁ (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	0.5	V	$V_{CC}=5V, I_o=100\mu A$
	$V_{I(on)}$	3	—	—		$V_o=0.3V, I_o=2mA$
Output voltage	$V_{O(on)}$	—	0.1	0.3	V	$I_o=10mA, I_i=0.5mA$
Input current	I_i	—	—	0.18	mA	$V_i=5V$
Output current	$I_{O(off)}$	—	—	0.5	μA	$V_{CC}=50V, V_i=0V$
DC current gain	G_i	68	—	—	—	$V_o=5V, I_o=5mA$
Transition frequency	f_T	—	250	—	MHz	$V_{CE}=10mA, I_E=-5mA, f=100MHz$ *
Input resistance	R_i	32.9	47	61.1	k Ω	—
Resistance ratio	R_2/R_1	0.8	1	1.2	—	—

* Transition frequency of the device

●Electrical characteristics, DTr₂ (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.3	V	$V_{CC}=-5V, I_o=-100\mu A$
	$V_{I(on)}$	-2.5	—	—		$V_o=-0.3V, I_o=-20mA$
Output voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_o=-10mA, I_i=-0.5mA$
Input current	I_i	—	—	-1.8	mA	$V_i=-5V$
Output current	$I_{O(off)}$	—	—	-0.5	μA	$V_{CC}=-50V, V_i=0V$
DC current gain	G_i	30	—	—	—	$V_o=-5V, I_o=-10mA$
Transition frequency	f_T	—	250	—	MHz	$V_{CE}=-10mA, I_E=5mA, f=100MHz$ *
Input resistance	R_i	3.29	4.7	6.11	k Ω	—
Resistance ratio	R_2/R_1	1.7	2.1	2.6	—	—

* Transition frequency of the device

●Packaging specifications

Part No.	Packaging type	Taping	
	Code	TR	T148
	Basic ordering unit (pieces)	3000	3000
UMC5N		○	—
FMC5A		—	○

● Electrical characteristic curves

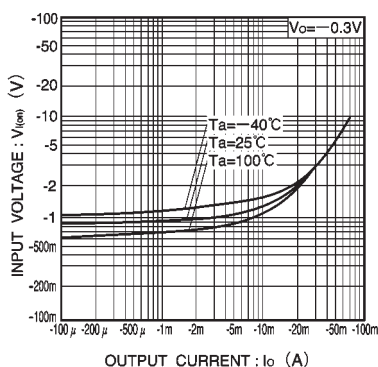
DTr₁ (NPN)

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

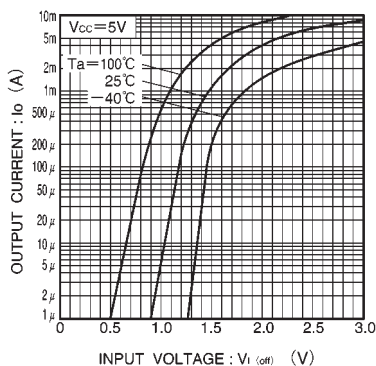


Fig.2 Output current vs. input voltage (OFF characteristics)

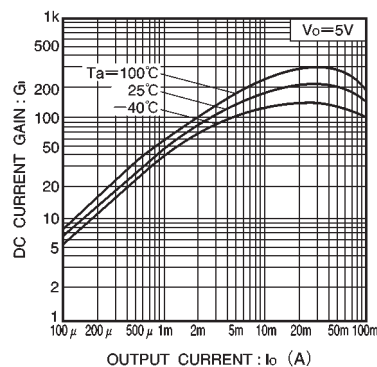


Fig.3 DC current gain vs. output current

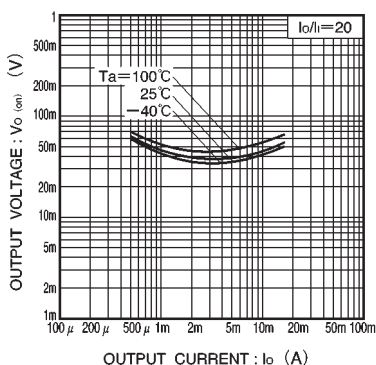
DTr₂ (PNP)

Fig.4 Output voltage vs. output current

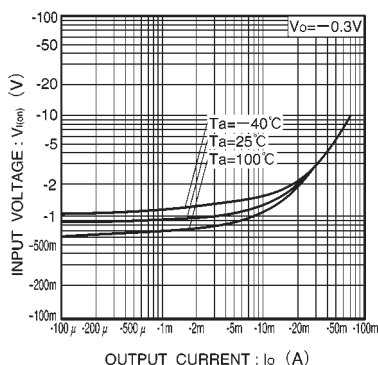


Fig.5 Input voltage vs. output current (ON characteristics)

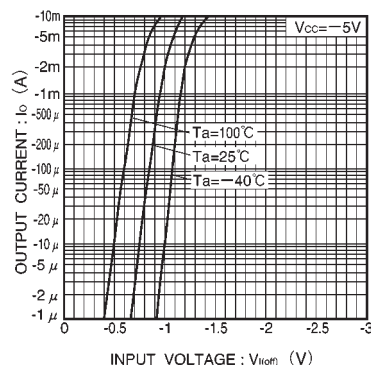


Fig.6 Output current vs. input voltage (OFF characteristics)

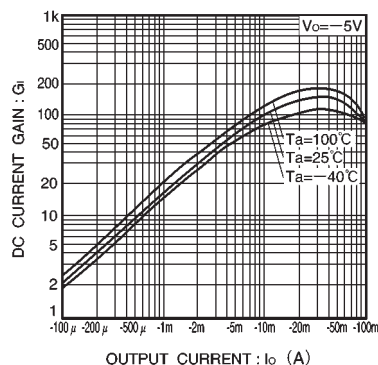


Fig.7 DC current gain vs. output current

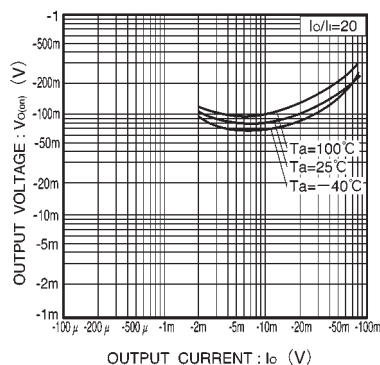


Fig.8 Output voltage vs. output current