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Power management (dual digital transistors)

UMC5N / FMC5A

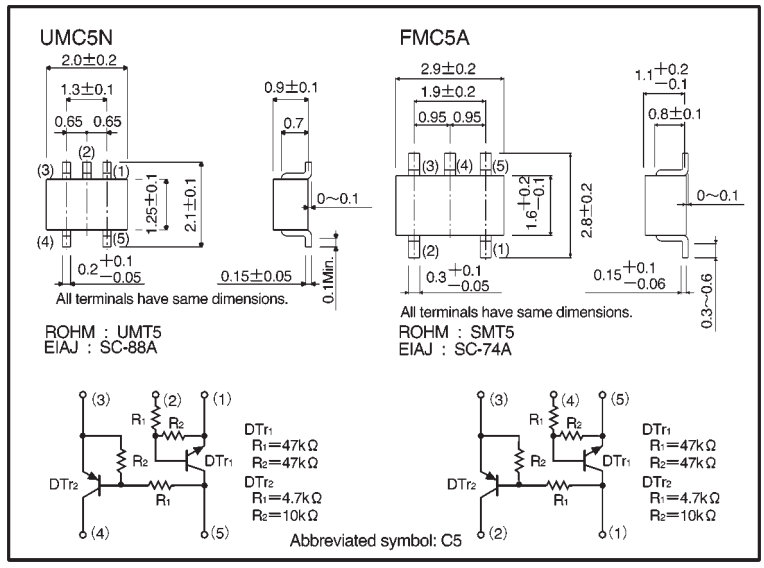
●Features

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	
			DTr1 (NPN)	DTr2 (PNP)		
Supply voltage		VCC	50	−50	V	
Input voltage		VIN	40	−20	V	
			−10	7		
Output current		IO(Max.)	30	−100	mA	
		IC(Max.)	100	−100		
Power dissipation	UMC5N	Pd	150 (TOTAL)		mW	∗1
	FMC5A		300 (TOTAL)			∗2
Junction temperature		Tj	150		℃	
Storange temperature		Tstg	−55～+150		℃	

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

●Electrical characteristics, DTr_1 (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	0.5	V	V_{CC}=5V, I_O=100 μA
	$V_{I(on)}$	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_1	32.9	47	61.1	kΩ	—
Resistance ratio	R_2/R_1	0.8	1	1.2	—	—

∗ Transition frequency of the device

●Electrical characteristics, DTr_2 (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	−0.3	V	V_{CC}=−5V, I_O=−100 μA
	$V_{I(on)}$	−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_1	3.29	4.7	6.11	kΩ	—
Resistance ratio	R_2/R_1	1.7	2.1	2.6	—	—

∗ Transition frequency of the device

●Packaging specifications

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

●Electrical characteristic curves

DTr1 (NPN)

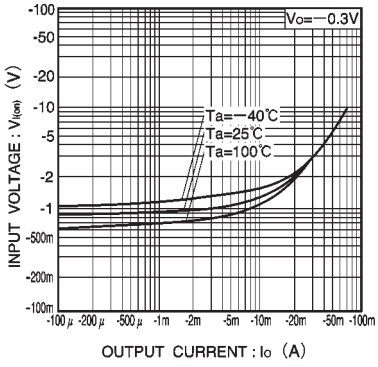


Fig.1 Input voltage vs. output current (ON characteristics)

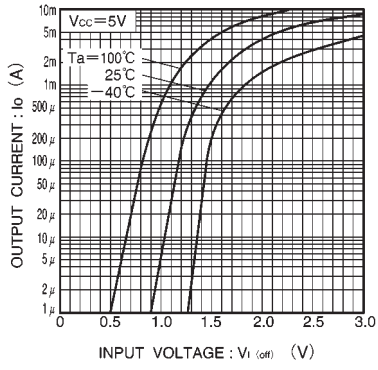


Fig.2 Output current vs. input voltage (OFF characteristics)

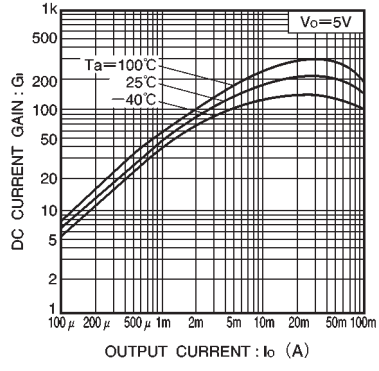


Fig.3 DC current gain vs. output current

DTr2 (PNP)

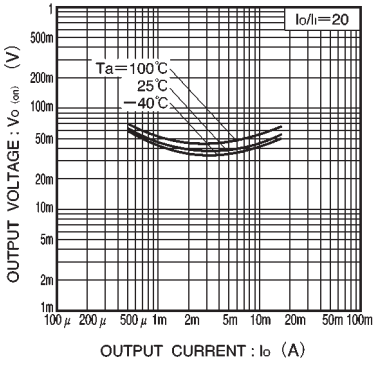


Fig.4 Output voltage vs. output current

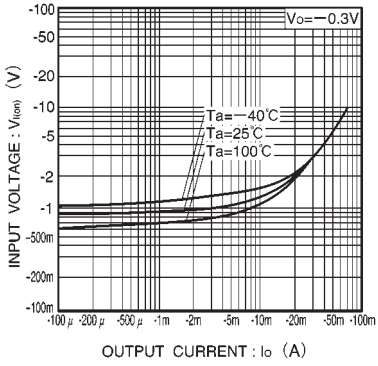


Fig.5 Input voltage vs. output current (ON characteristics)

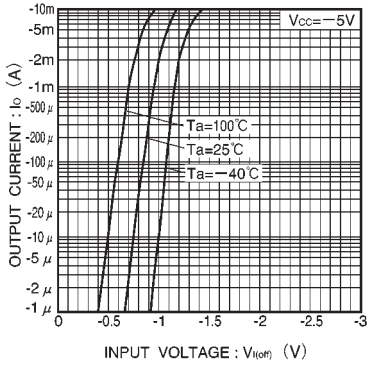


Fig.6 Output current vs. input voltage (OFF characteristics)

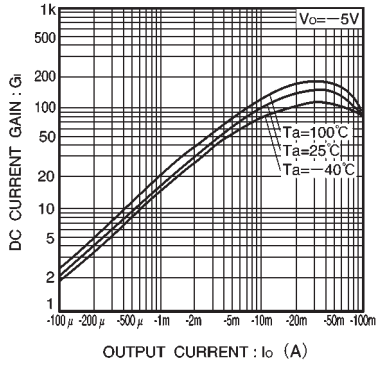


Fig.7 DC current gain vs. output current

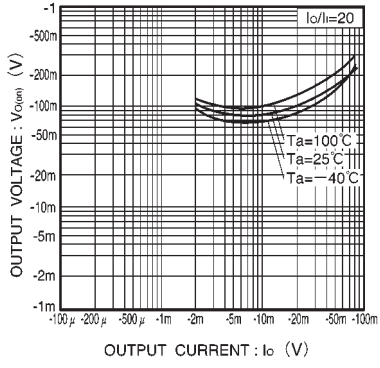


Fig.8 Output voltage vs. output current