

Transistors

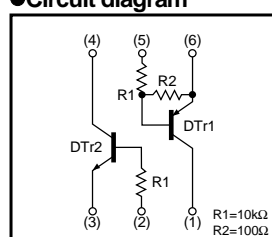
Power management (dual digital transistors)

IMD10A

●Features

- 1) Two digital transistors in a SMT package.
- 2) Up to 500mA can be driver.
- 3) Low $V_{CE(sat)}$ of driver transistors for low power dissipation.

●Circuit diagram



●Package, marking, and packaging specifications

Part No.	IMD10A
Package	SMT6
Marking	D10
Code	T108
Basic ordering unit (pieces)	3000

●Absolute maximum ratings ($T_a=25^\circ\text{C}$)

DTr1

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	-50	V
Input voltage	V_{IN}	-5 to +5	V
Collector current	I_C	-500	mA

DTr2

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	100	mA

Total

Parameter	Symbol	Limits	Unit
Power dissipation	P_d	300(TOTAL)	mW *
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

* 200mW per element must not be exceeded.

●Electrical characteristics ($T_a=25^\circ\text{C}$)

DTr1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	—	—	-0.3	V	$V_{CC} = -5V$, $I_O = -100\mu A$
	$V_{I(on)}$	-1.5	—	—	V	$V_O = -0.3V$, $I_O = -100mA$
Output voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_O = -100mA$, $I_i = -5mA$
Input current	I_i	—	—	-25	mA	$V_i = -2V$
Output current	$I_{O(off)}$	—	—	-0.5	μA	$V_{CC} = -50V$, $V_i = 0V$
DC current gain	G_i	68	—	—	—	$I_O = -100mA$, $V_O = -5V$
Transition frequency	f_T	—	200	—	MHz	$V_{CE} = -10V$, $I_E = 50mA$, $f = 100MHz$ *
Input resistance	R_1	70	100	130	Ω	—
Resistance ratio	R_2 / R_1	80	100	120	—	—

* Transition frequency of the device.

DTr2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	50	—	—	V	$I_C = 50\mu A$
Collector-emitter breakdown voltage	BV_{CEO}	50	—	—	V	$I_C = 1mA$
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	$I_E = 50\mu A$
Collector cutoff current	I_{CBO}	—	—	0.5	μA	$V_{CB} = 50V$
Emitter cutoff current	I_{EBO}	—	—	0.5	μA	$V_{EB} = 4V$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	0.3	V	$I_C = 10mA$, $I_B = 1mA$
DC current transfer ratio	h_{FE}	100	250	600	—	$V_{CE} = 5V$, $I_C = 1mA$
Transition frequency	f_T	—	250	—	MHz	$V_{CE} = 10V$, $I_E = -5mA$, $f = 100MHz$ *
Input resistance	R_1	7	10	13	$k\Omega$	—

* Transition frequency of the device.

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●Electrical characteristic curves

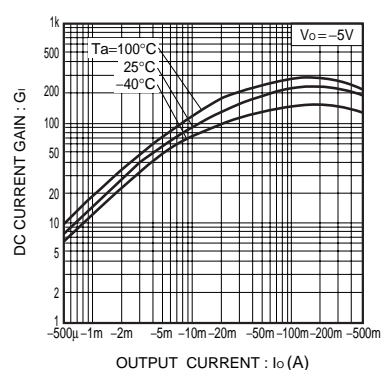


Fig.1 DC current gain vs. Output current characteristics

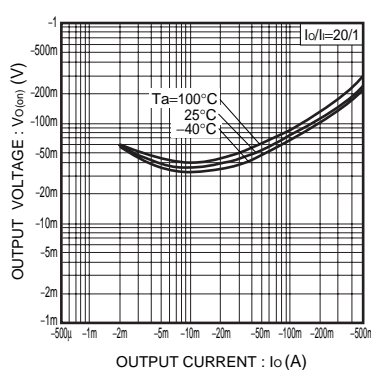


Fig.2 Output voltage vs. Output current characteristics

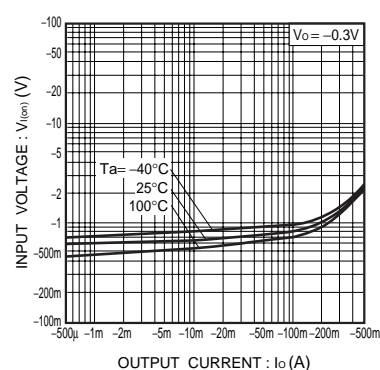


Fig.3 Input voltage vs. Output current (ON characteristics)

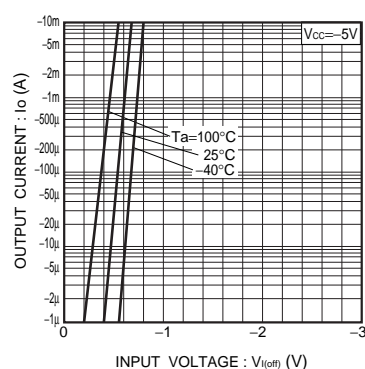


Fig.4 Output current vs. Input voltage (OFF characteristics)

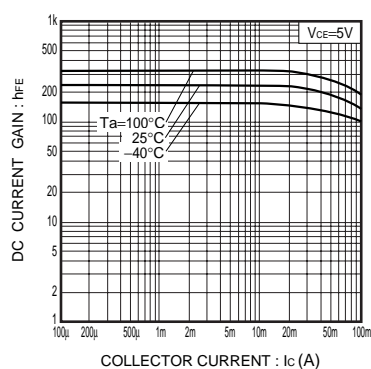


Fig.5 DC current gain vs. Collector current

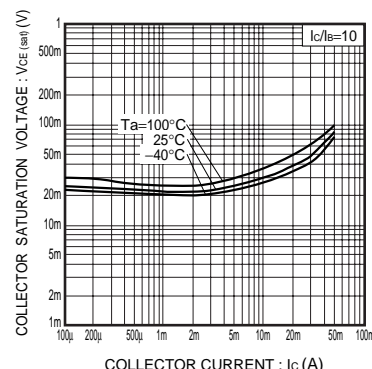


Fig.6 Collector-emitter saturation voltage vs. Collector current

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