

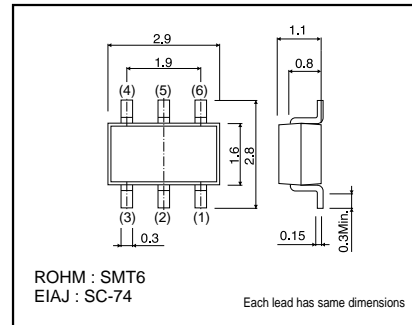
# Power management (dual digital transistors)

## IMD10A

●Features

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

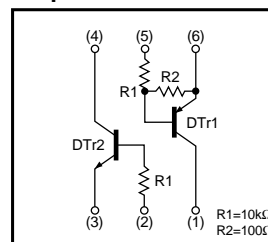
●Dimensions (Unit : mm)



●Package, marking, and packaging specifications

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

●Equivalent circuit



●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.

## Transistors

## ●Electrical characteristics (Ta=25°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	—	—		$V_{O} = -0.3V, I_{O} = -100mA$
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	$\mu A$	$V_{CC} = -50V, V_{I} = 0V$
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	$\Omega$	—
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	$\mu A$	$V_{CB} = 50V$
Emitter cutoff current	$I_{EBO}$	—	—	0.5	$\mu A$	$V_{EB} = 4V$
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.

Transistors

●Electrical characteristic curves

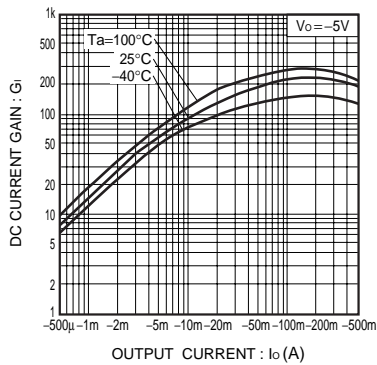


Fig.1 DC current gain vs. Output current characteristics

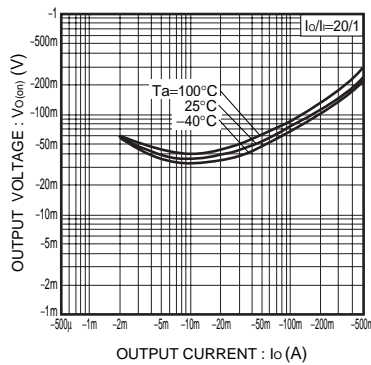


Fig.2 Output voltage vs. Output current characteristics

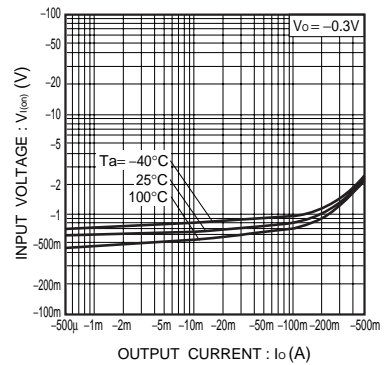


Fig.3 Input voltage vs. Output current (ON characteristics)

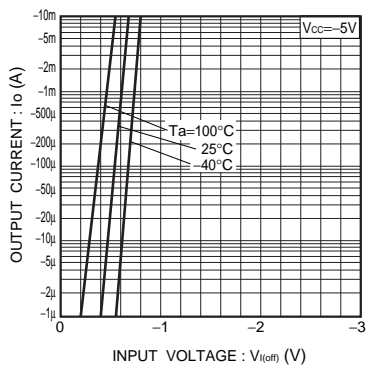


Fig.4 Output current vs. Input voltage (OFF characteristics)

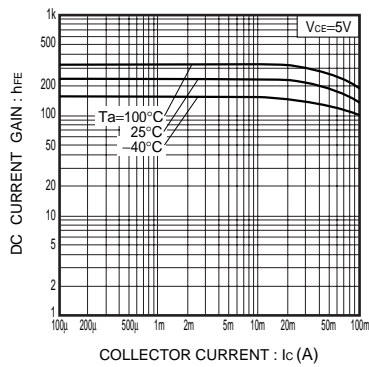


Fig.5 DC current gain vs. Collector current

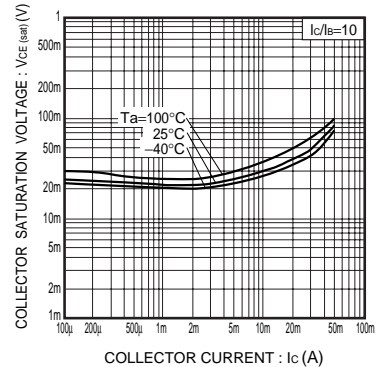


Fig.6 Collector-emitter saturation voltage vs. Collector current

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