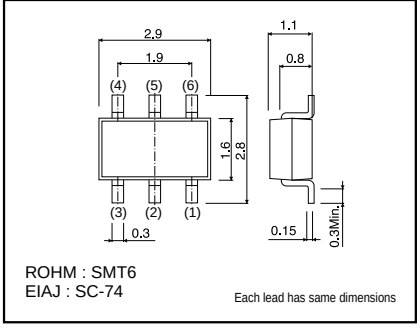
Power management (dual digital transistors)

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.

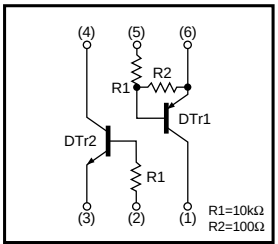
●Dimensions (Unit : mm)



●Package, marking, and packaging specifications

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

●Equivalent circuit



●Absolute maximum ratings (Ta=25°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	Pd	300(TOTAL)	mW ∗
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

∗ 200mW per element must not be exceeded.

●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= —100μA
	$V_{I(on)}$	—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	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=50μA
Collector-emitter breakdown voltage	BV_{CEO}	50	—	—	V	I_C=1mA
Emitter-base breakdown voltage	BV_{EBO}	5	—	—	V	I_E=50μA
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	kΩ	—

✻ Transition frequency of the device.

●**Electrical characteristic curves**

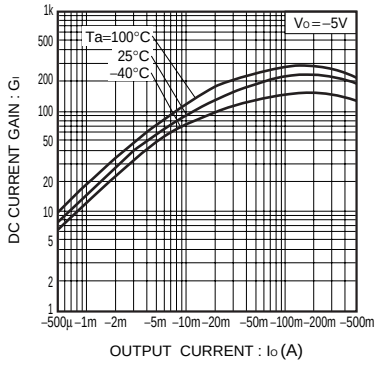


Fig.1 DC current gain vs. Output current characteristics

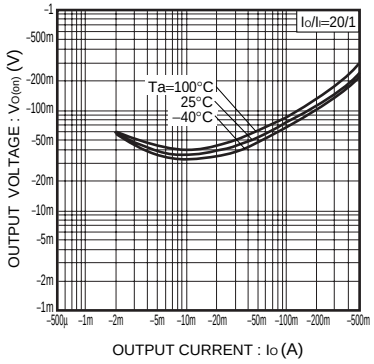


Fig.2 Output voltage vs. Output current characteristics

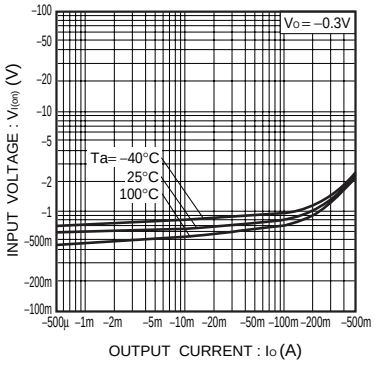


Fig.3 Input voltage vs. Output current (ON characteristics)

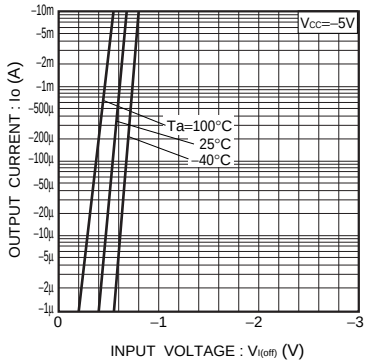


Fig.4 Output current vs. Input voltage (OFF characteristics)

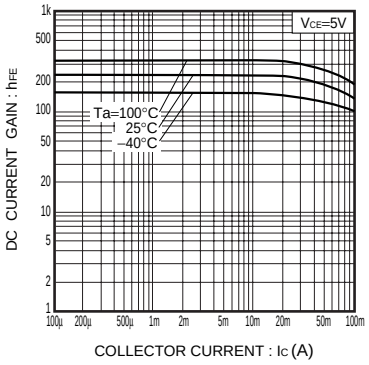


Fig.5 DC current gain vs. Collector current

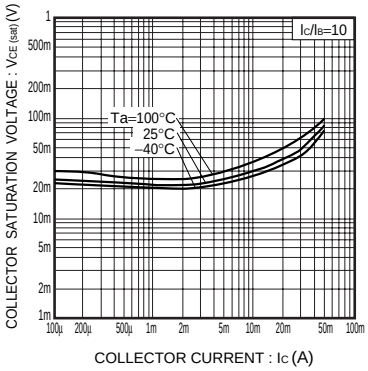


Fig.6 Collector-emitter saturation voltage vs. Collector current