

# Power management (dual digital transistors)

## IMD16A

### ●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.

### ●Package, marking, and packaging specifications

Part No.	IMD16A
Package	SMT6
Marking	D16
Code	T108
Basic ordering unit (pieces)	3000

### ●Absolute maximum ratings (Ta=25°C)

#### DTr<sub>1</sub> (PNP)

Parameter	Symbol	Limits	Unit
Supply voltage	$V_{CC}$	-50	V
Input voltage	$V_{IN}$	-12	V
		5	
Output current	$I_c$	-500	mA

#### DTr<sub>2</sub> (NPN)

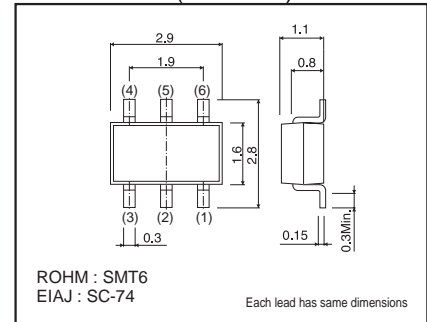
Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	50	V
Collector-emitter voltage	$V_{CEO}$	50	V
Emitter-base voltage	$V_{EBO}$	5	V
Collector current	$I_c$	100	mA

### Total

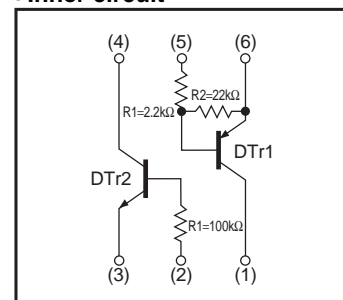
Parameter	Symbol	Limits	Unit
Collector power dissipation	$P_d$ *	300(TOTAL)	mW
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

\* 200mW per element must not be exceeded.

### ●Dimensions (Unit : mm)



### ●Inner circuit



## ●Electrical characteristics (Ta=25°C)

## DTr1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	–0.3	V	$V_{CC} = -5V, I_o = -100\mu A$
	$V_{I(on)}$	–2	–	–		$V_o = -0.3V, I_o = -20mA$
Output voltage	$V_{O(on)}$	–	–	–0.3	V	$I_o/I_i = -50mA / -2.5mA$
Input current	$I_i$	–	–	–3	mA	$V_i = -5V$
Output current	$I_{O(off)}$	–	–	–0.5	$\mu A$	$V_{CC} = -50V, V_i = 0V$
DC current gain	$G_i$ *1	82	–	–	–	$I_o = -50mA, V_o = -5V$
Transition frequency	$f_T$ *2	–	250	–	MHz	$V_{CE} = -10V, I_E = 50mA, f = 100MHz$
Input resistance	$R_1$	1.54	2.2	2.86	k $\Omega$	–
Resistance ratio	$R_2 / R_1$	8	10	12	–	–

\*1 Measured using pulse current. \*2 Transition frequency of mounted transistor.

## 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	$I_c/I_b = 1mA/0.1mA$
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	$R_1$	70	100	130	k $\Omega$	–

\*Transition frequency of mounted transistor.

●Electrical characteristic curves

DT<sub>r1</sub> (PNP)

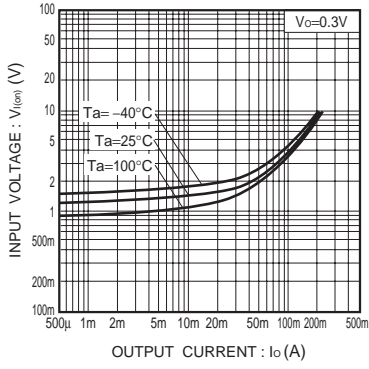


Fig.1 Input voltage vs. Output current (ON characteristics)

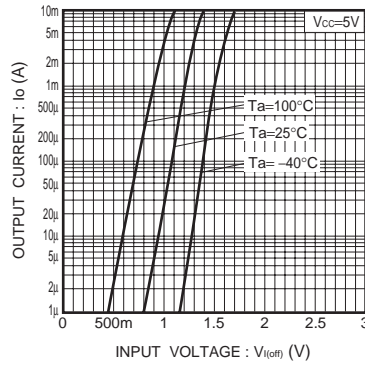


Fig.2 Output current vs. Input voltage (OFF characteristics)

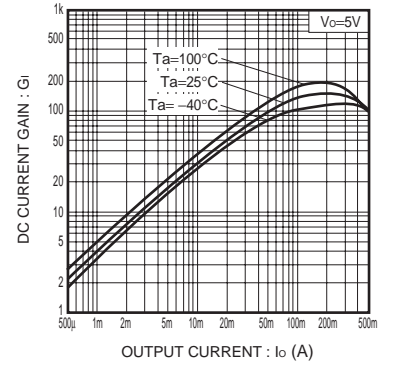


Fig.3 DC current gain vs. Output current characteristics

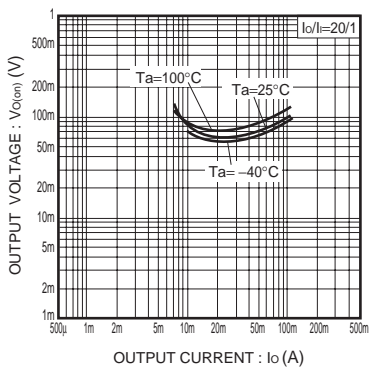


Fig.4 Output voltage vs. Output current characteristics

DT<sub>r2</sub> (NPN)

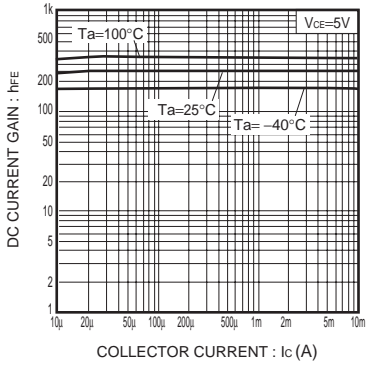


Fig.5 DC current gain vs. Output current characteristics

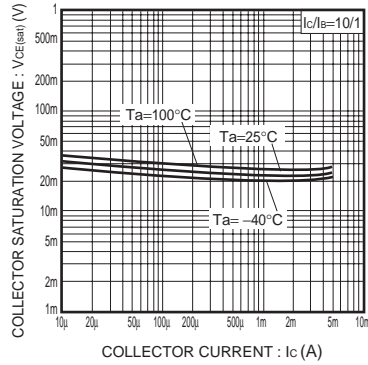


Fig.6 Output voltage vs. Output current characteristics

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