

Transistors

# General purpose transistor (isolated transistors)

## EMD29

DTB513Z □ and DTC114E □ A are housed independently in a EMT6 package.

●Applications

DC / DC converter  
Motor driver

●Features

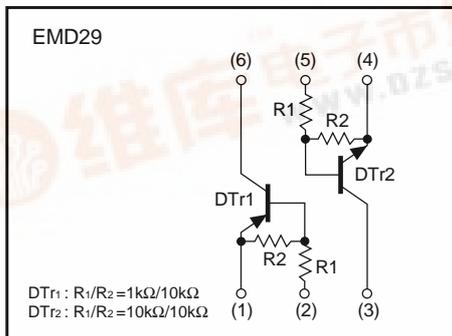
- 1) DT<sub>r1</sub> : PNP digital transistor  
DT<sub>r2</sub> : NPN digital transistor
- 2) Mounting possible with EMT3 automatic mounting machines.

●Structure

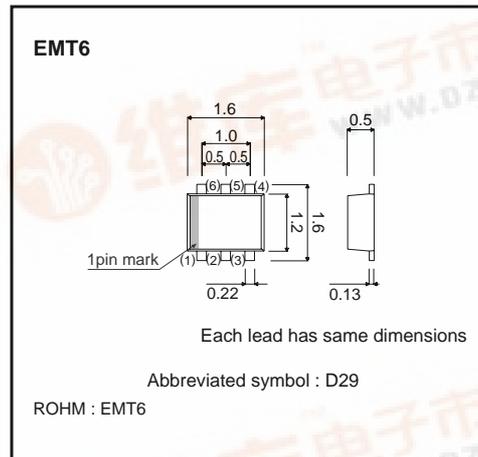
PNP / NPN Silicon epitaxial planar digital transistor

The following characteristics apply to both DT<sub>r1</sub> and DT<sub>r2</sub>.

●Equivalent circuit



●External dimensions (Unit : mm)



●Packaging specifications

Type	EMD29
Package	EMT6
Marking	D29
Code	T2R
Basic ordering unit (pieces)	8000

## Transistors

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

#### DTr1

Parameter	Symbol	DTr1	Unit
Supply voltage	V <sub>CC</sub>	-12	V
Input voltage	V <sub>IN</sub>	-12 to +5	V
Output current	I <sub>C (MAX.)</sub>	-500	mA
Power dissipation	P <sub>d</sub>	120	mW *
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

\* Each terminal mounted on a recommended.

#### DTr2

Parameter	Symbol	DTr2	Unit
Supply voltage	V <sub>CC</sub>	50	V
Input voltage	V <sub>IN</sub>	-10 to +40	V
Output current	I <sub>o</sub>	50	mA
	I <sub>C (MAX.)</sub>	100	
Power dissipation	P <sub>d</sub>	120	mW *
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

\* Each terminal mounted on a recommended.

#### DTr1/DTr2

Parameter	Symbol	Limits	Unit
Power dissipation	P <sub>d</sub>	150(TOTAL)	mW *
Storage temperature	T <sub>stg</sub>	-55 to +125	°C

\* Each terminal mounted on a recommended.

## Transistors

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

## DTr1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	–0.3	V	$V_{CC} = -5V / I_o = -100\mu A$
	$V_{I(on)}$	–2.5	–	–	V	$V_o = -0.3V / I_o = -20mA$
Output voltage	$V_{O(on)}$	–	–60	–300	mV	$I_o = -100mA, I_i = -5mA$
Input current	$I_i$	–	–	–6.4	mA	$V_i = -5V$
Output current	$I_{O(off)}$	–	–	–0.5	$\mu A$	$V_{CC} = -12V / V_i = 0V$
DC current gain	$G_i$	140	–	–	–	$V_o = -2V / I_o = -100mA$
Transition frequency	$f_T$	–	260	–	MHz	$V_{CE} = -10V / I_E = 5mA, f = 100MHz$
Input resistance	$R_1$	0.7	1.0	1.3	$k\Omega$	–
Resistance ratio	$R_2/R_1$	8	10	12	–	–

\* Characteristics of built-in transistor.

## DTr2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{I(off)}$	–	–	0.5	V	$V_{CC} = 5V / I_o = 100\mu A$
	$V_{I(on)}$	3	–	–	V	$V_o = 0.3V / I_o = 2mA$
Output voltage	$V_{O(on)}$	–	100	300	mV	$I_o = 10mA, I_i = 0.5mA$
Input current	$I_i$	–	–	880	$\mu A$	$V_i = 5V$
Output current	$I_{O(off)}$	–	–	0.5	$\mu A$	$V_{CC} = 50V / V_i = 0V$
DC current gain	$G_i$	30	–	–	–	$V_o = 5V / I_o = 5mA$
Transition frequency	$f_T$	–	250	–	MHz	$V_{CE} = 10V / I_E = -5mA, f = 100MHz$
Input resistance	$R_1$	7	10	13	$k\Omega$	–
Resistance ratio	$R_2/R_1$	0.8	1	1.2	–	–

\* Characteristics of built-in transistor.

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●Electrical characteristic curves

DTr1

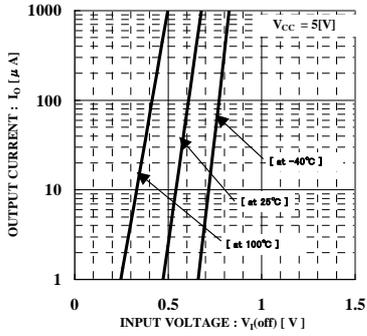


Fig.1 Output current vs. input voltage (OFF characteristics)

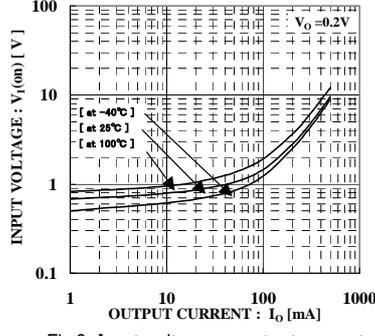


Fig.2 Input voltage vs. output current (ON characteristics) I

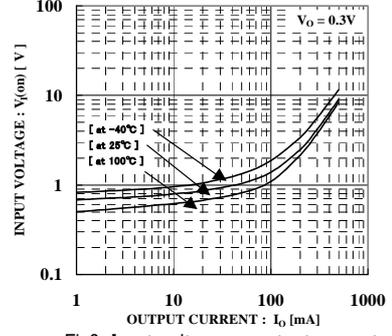


Fig.3 Input voltage vs. output current (ON characteristics) II

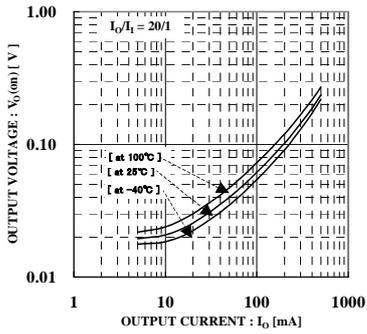


Fig.4 Output voltage vs. output current I

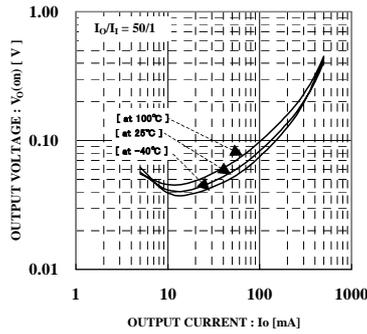


Fig.5 Output voltage vs. output current II

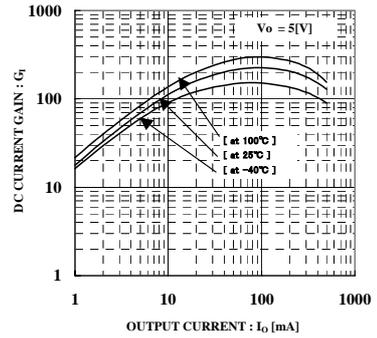


Fig.6 DC current gain vs. output current

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DTr2

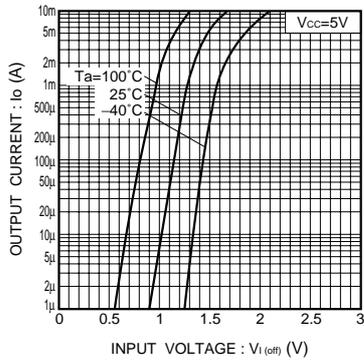


Fig.7 Output current vs. input voltage (OFF characteristics)

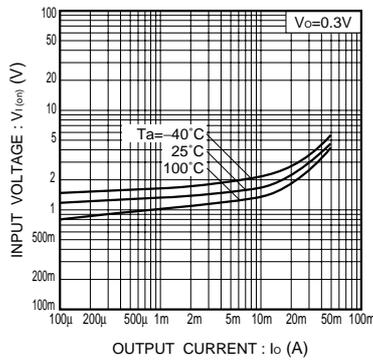


Fig.8 Input voltage vs. output current (ON characteristics)

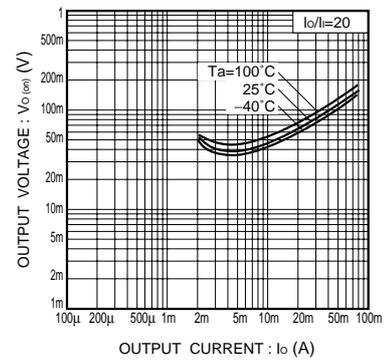


Fig.9 Output voltage vs. output current

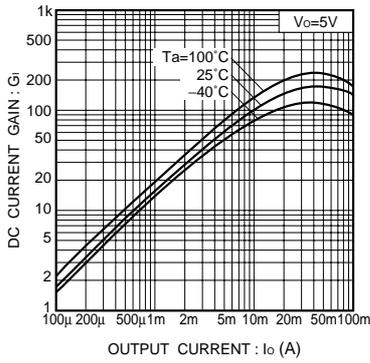


Fig.10 DC current gain vs. output current

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