

## Digital transistors (built-in resistors)

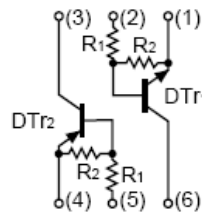
### EMD12 General purpose transistors (dual transistors)

#### FEATURES

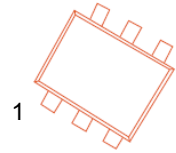
- Both the DTC144E chip and DTA144E chip in a package.
- Mounting possible with SOT-563 automatic mounting machines.
- Transistor elements are independent, eliminating interference.
- Mounting cost and area be cut in half.

#### Marking: D12

Equivalent circuit



SOT-563



#### T<sub>R1</sub> Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V <sub>CC</sub>	50	V
Input voltage	V <sub>IN</sub>	-10~40	V
Output current	I <sub>O</sub>	100	mA
	I <sub>C(MAX)</sub>	100	
Power dissipation	Pd	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55~150	°C

#### T<sub>R1</sub> Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>	0.5			V	V <sub>CC</sub> =5V, I <sub>O</sub> =100μA
	V <sub>I(on)</sub>			3		V <sub>O</sub> =0.3V, I <sub>O</sub> =2mA
Output voltage	V <sub>O(on)</sub>		0.1	0.3	V	I <sub>O</sub> /I <sub>I</sub> =10mA/0.5mA
Input current	I <sub>I</sub>			0.18	mA	V <sub>I</sub> =5V
Output current	I <sub>O(off)</sub>			0.5	μA	V <sub>CC</sub> =50V, V <sub>I</sub> =0
DC current gain	G <sub>I</sub>	68				V <sub>O</sub> =5V, I <sub>O</sub> =5mA
Input resistance	R <sub>1</sub>	32.9	47	61.1	KΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2		-
Transition frequency	f <sub>T</sub>		250		MHz	V <sub>CE</sub> =10V, I <sub>E</sub> =5mA, f=100MHz

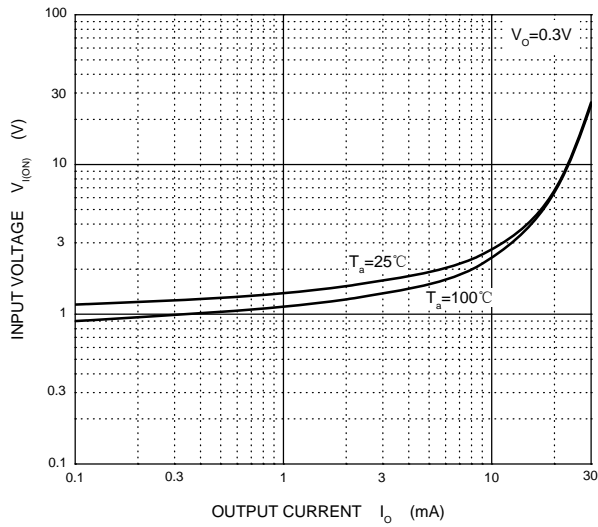
**T<sub>R2</sub> Absolute maximum ratings (Ta=25°C)**

Parameter	Symbol	Limits	Unit
Supply voltage	V <sub>CC</sub>	-50	V
Input voltage	V <sub>IN</sub>	-40~10	V
Output current	I <sub>O</sub>	-100	mA
	I <sub>C(MAX)</sub>	-100	
Power dissipation	Pd	150	mW
Junction temperature	T <sub>J</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55~150	°C

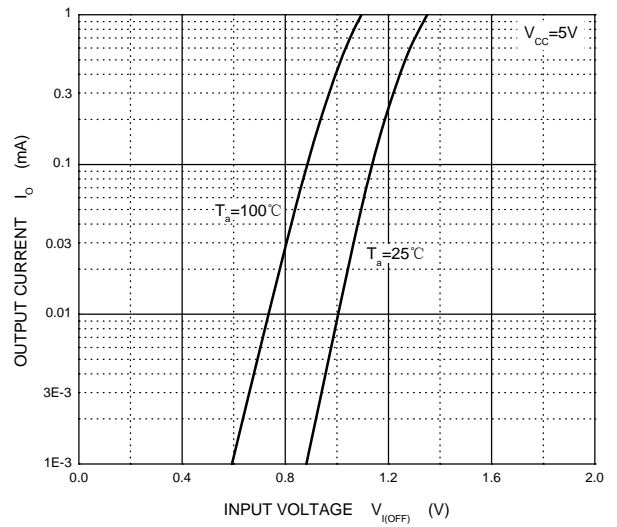
**T<sub>R2</sub> Electrical characteristics (Ta=25°C)**

Parameter	Symbol	Min.	Typ	Max.	Unit	Conditions
Input voltage	V <sub>I(off)</sub>	-0.5			V	V <sub>CC</sub> =-5V, I <sub>O</sub> =-100μA
	V <sub>I(on)</sub>			-3		V <sub>O</sub> =-0.3V, I <sub>O</sub> =-2mA
Output voltage	V <sub>O(on)</sub>		-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> =-10mA/-0.5mA
Input current	I <sub>I</sub>			-0.18	mA	V <sub>I</sub> =-5V
Output current	I <sub>O(off)</sub>			-0.5	μA	V <sub>CC</sub> =-50V, V <sub>I</sub> =0
DC current gain	G <sub>I</sub>	68				V <sub>O</sub> =-5V, I <sub>O</sub> =-5mA
Input resistance	R <sub>1</sub>	32.9	47	61.1	KΩ	-
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2		-
Transition frequency	f <sub>T</sub>		250		MHz	V <sub>CE</sub> =-10V, I <sub>E</sub> =-5mA, f=100MHz

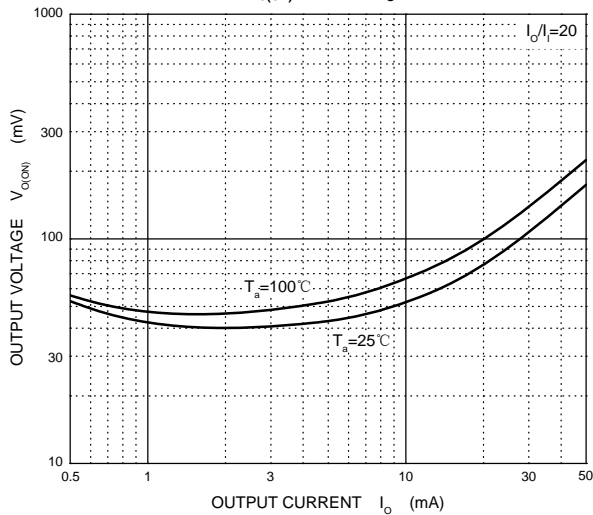
ON Characteristics



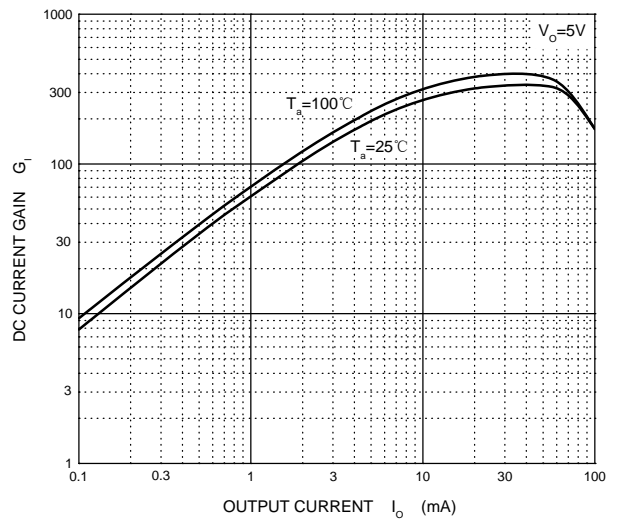
OFF Characteristics



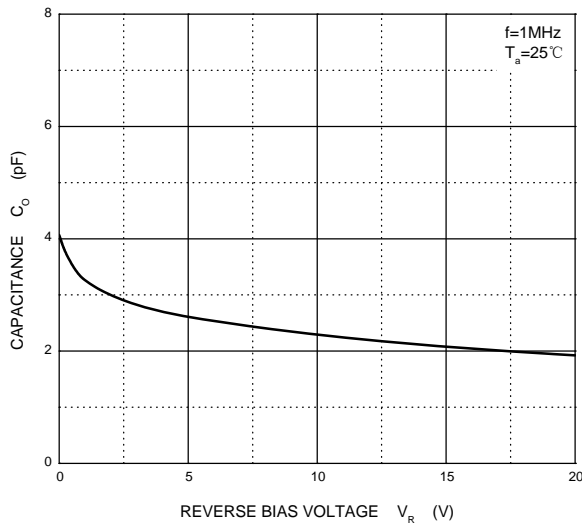
$V_{O(ON)} - I_O$



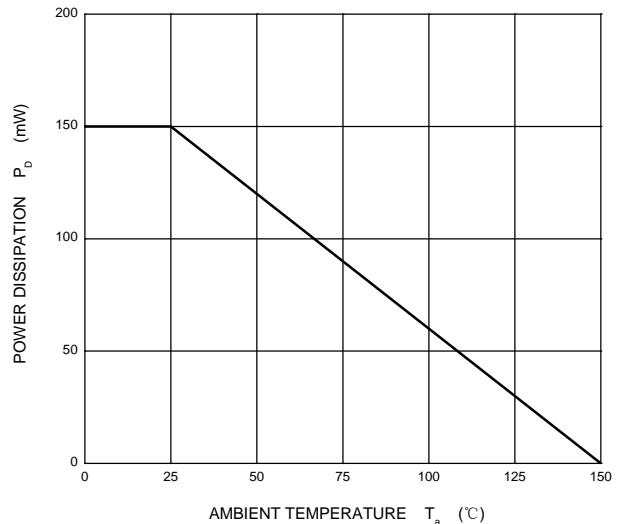
$G_1 - I_O$



$C_O - V_R$

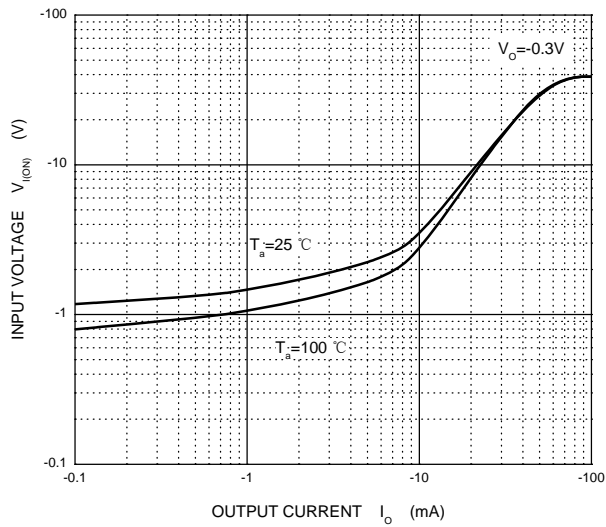


$P_D - T_a$

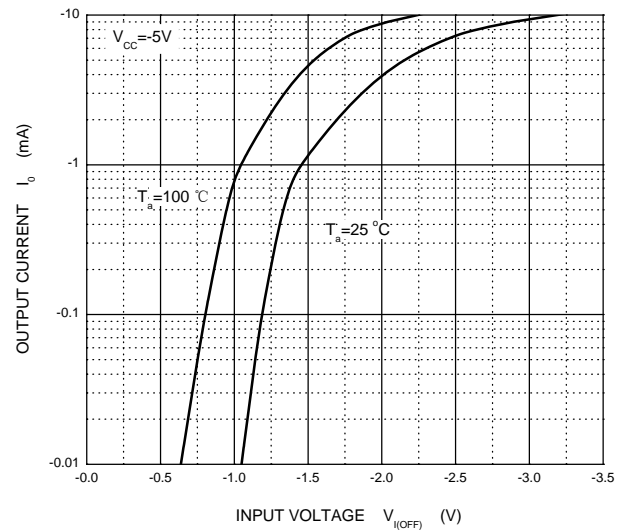




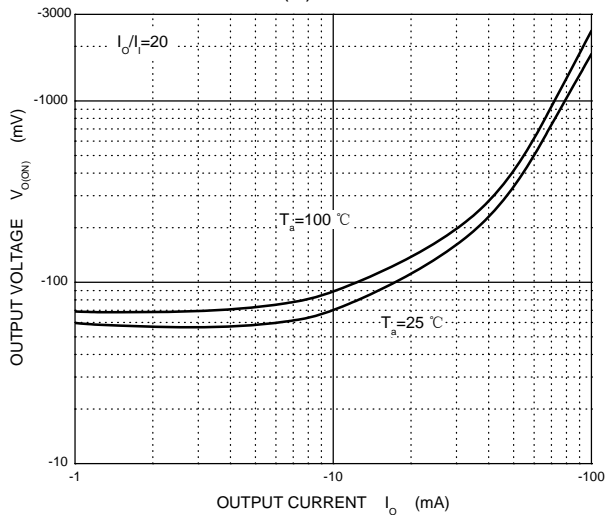
ON Characteristics



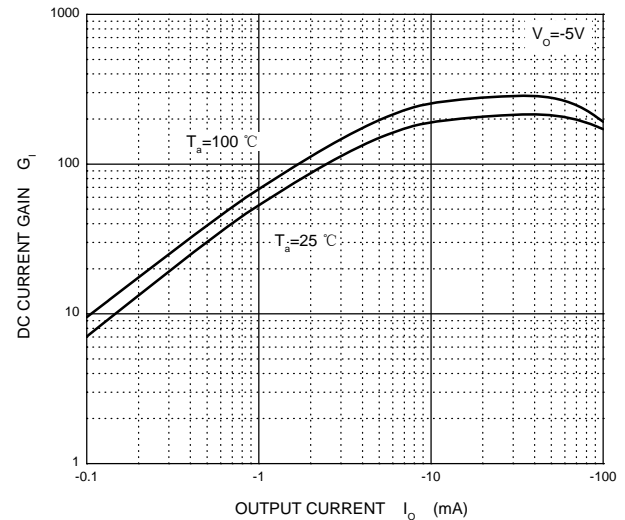
OFF Characteristics



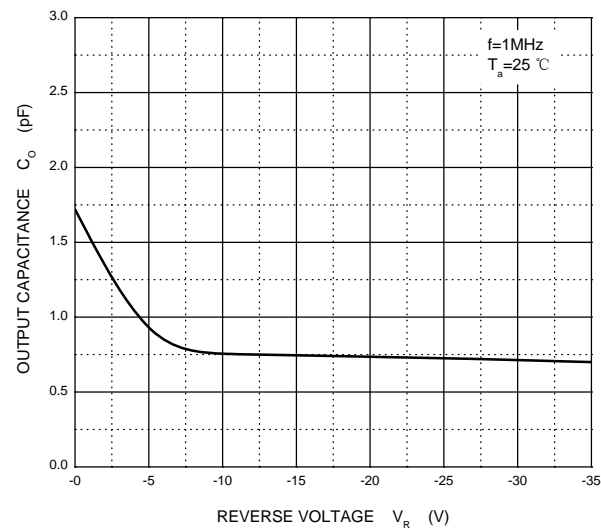
$V_{o(ON)} - I_o$



$G_i - I_o$



$C_o - V_R$



$P_D - T_a$

