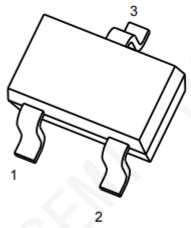
Description

The DTC043ZUBTL-JSM consists of NPN digital transistors with built-in bias resistors, enabling the configuration of an inverter circuit without the need for external input resistors.

The bias resistors are thin-film resistors with complete isolation, allowing for negative biasing of the input and almost completely eliminating parasitic effects. This series simplifies device design as only the on/off conditions need to be set for operation.

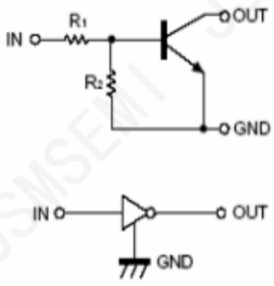


SOT-323

1. IN
2. GND
3. OUT

Features

- Built-in bias resistors for inverter circuit configuration without external input resistors
- Thin-film bias resistors with complete isolation for negative input biasing and minimal parasitic effects
- Simple device design with only on/off conditions requiring setting
- Wide supply voltage range up to 50V
- High input voltage range from -5V to +30V
- Low output voltage (on) of typically 0.1V
- High DC current gain with a minimum of 80
- Low input current and output leakage current
- High transition frequency of 250MHz



Circuit Diagram

Applications

- General-purpose inverter circuits
- Digital logic applications
- Signal processing circuits
- Low-power electronic devices
- Consumer electronics
- Industrial control systems

Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
DTC043ZUBTL-JSM	SOT-323	E23	-55 to150°C	3	T&R,3000	Rohs

Absolute Maximum Ratings(T_A=25℃unless otherwise specified)

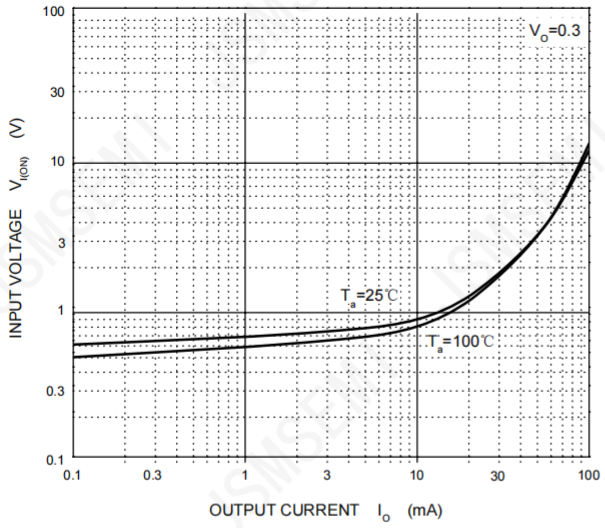
Symbol	Parameter	Limits	Unit
V_{CC}	Supply Voltage	50	V
V_{IN}	Input Voltage	-5～+30	V
I_O	Output Current	100	mA
T_J,T_{stg}	Operation Junction and Storage Temperature Range	-55～+150	℃

Electrical Characteristics(T_A=25℃ unless otherwise specified)

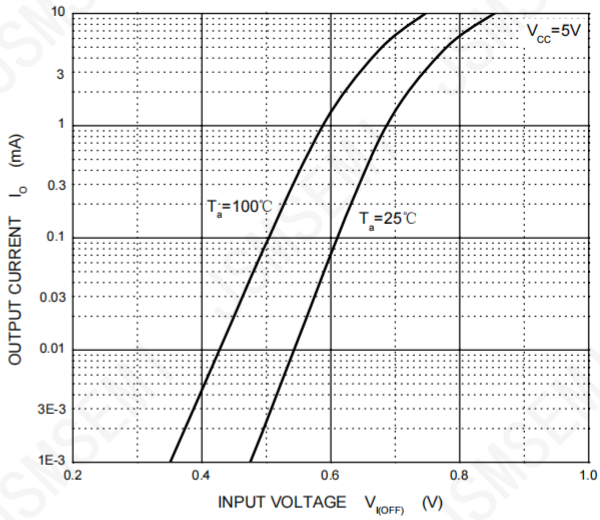
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	$V_{I(off)}$	V_{CC}=5V,I_O=100μA	0.5			V
	$V_{I(on)}$	V_O=0.3V ,I_O=5mA			1.3	V
Output voltage	$V_{O(on)}$	I_O/I_I=5mA/0.25mA		0.1	0.3	V
Input current	I_I	V_I=5V			1.8	mA
Output current	$I_{O(off)}$	V_{CC}=50V,V_I=0			0.5	μA
DC current gain	G_I	V_O=5V,I_O=10mA	80			
Input resistance	R_1		3.29	4.7	6.11	kΩ
Resistance ratio	R_2/R_1		8	10	12	
Transition frequency	f_T	V_O=10V ,I_O=5mA,f=100MHz		250		MHz

Typical Performance Curves

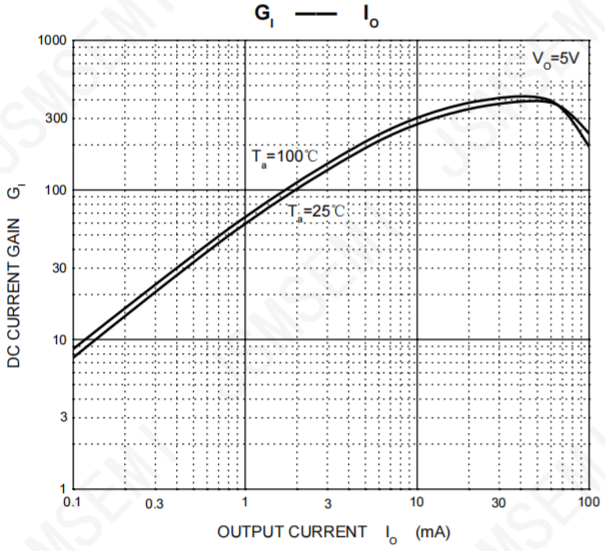
ON Characteristics



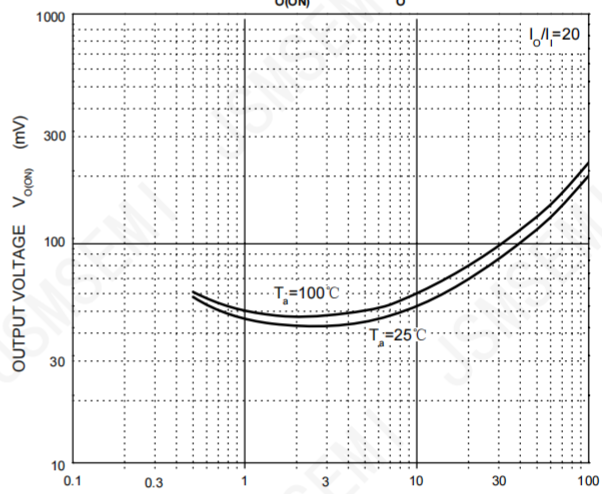
OFF Characteristics



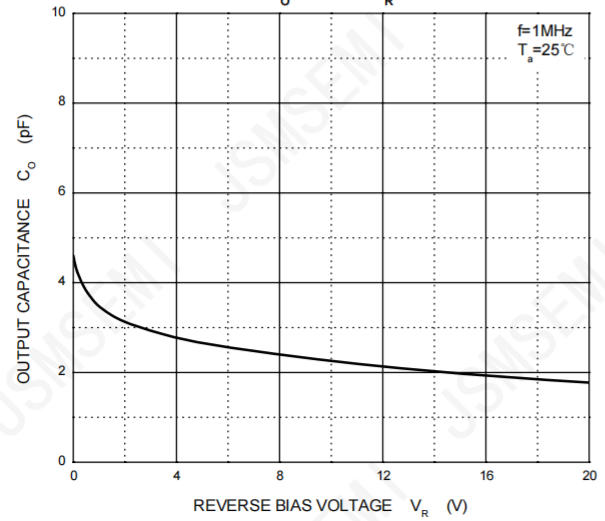
G_I — I_O



$V_{O(ON)}$ — I_O

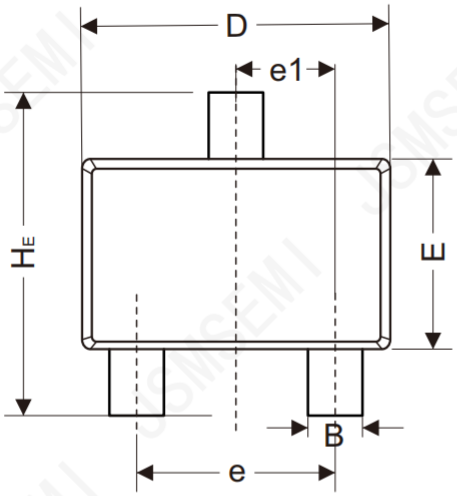


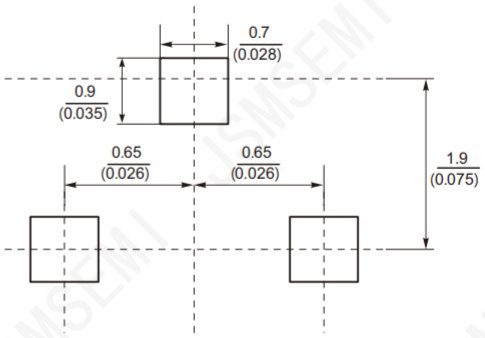
C_O — V_R



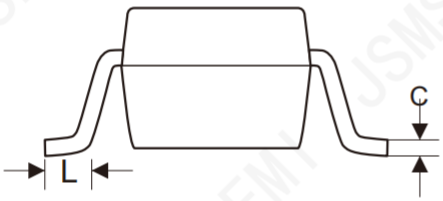
Package Information

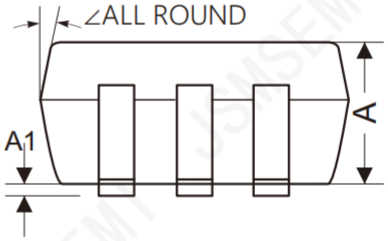
SOT-323(SC70)





RECOMMENDED LAND PATTERN (Unit: mm)





UNIT		A	A1	B	C	D	E	e	e1	L	HE
mm	max	1.00	0.10	0.40	0.25	2.20	1.35	1.40	0.65 (BSC)	0.425 REF	2.40
	min	0.80	0.00	0.30	0.10	1.80	1.15	1.20			2.00
mil	max	39.37	3.94	15.75	9.84	86.61	53.15	55.12	25.59 (BSC)	16.73 REF	94.49
	min	31.50	0.00	11.81	3.94	70.87	45.28	47.24			78.74

Revision History

Rev.	Change	Date
V1.0	Initial version	2/23/2024

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