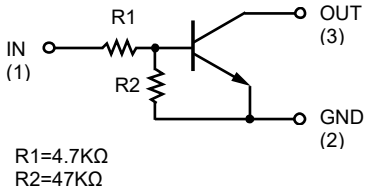
Digital Transistor(built-in resistors)

Feature

Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).

The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.

Only the on/off conditions need to be set for operation, making the device design easy.



R1=4.7KΩ
R2=47KΩ

Applications

Inverter

Interface

Driver

Mechanical Characteristics

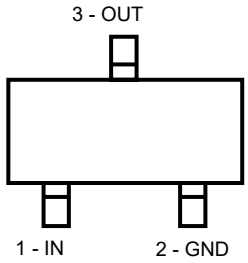
Lead finish:100% matte Sn(Tin)

Mounting position: Any

Qualified max reflow temperature:260℃

Pure tin plating: 7 ~ 17 um

Pin flatness：≤3mil



Top View

Structure

NPN epitaxial planar silicon transistor (Resistor built-in type)

Electrical characteristics per line@25°C(unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input voltage	$V_{I(off)}$	V_{CC}=5V,I_O=100μA	-	-	0.5	V
Input voltage	$V_{I(on)}$	V_O=0.3V,I_O=5mA	1.3	-	-	V
Output voltage	$V_{O(off)}$	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=0V	-	-	0.5	μA
DC current gain	G_1	V_O=5V, I_O=10mA	80	-	-	-
Input resistance	R_1	-	3.29	4.7	6.11	KΩ
Resistance ration	R_2/R_1	-	8	10	12	-
Transition frequency	f_T	V_{CE}=10V, I_E= −5mA, f=100MHz	-	250	-	MHz

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Absolute maximum rating@25

Rating	Symbol	Value	Units
Supply voltage	V_{CC}	50	V
Input voltage	V_{IN}	-5 to +30	V
Output current	I_O	100	mA
Output current	$I_{C(MAX.)}$	100	mA
Power dissipation	P_d	150	mW
Junction temperature	T_j	150	℃
Storage temperature	T_{stg}	-55 to +150	℃

Typical Characteristics

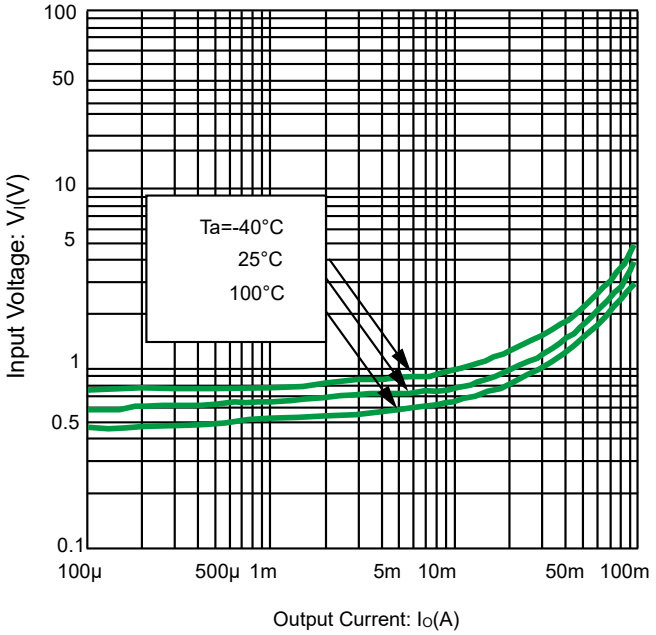


Fig 1.Input Voltage vs. output current
@V_O=0.3V (ON characteristics)

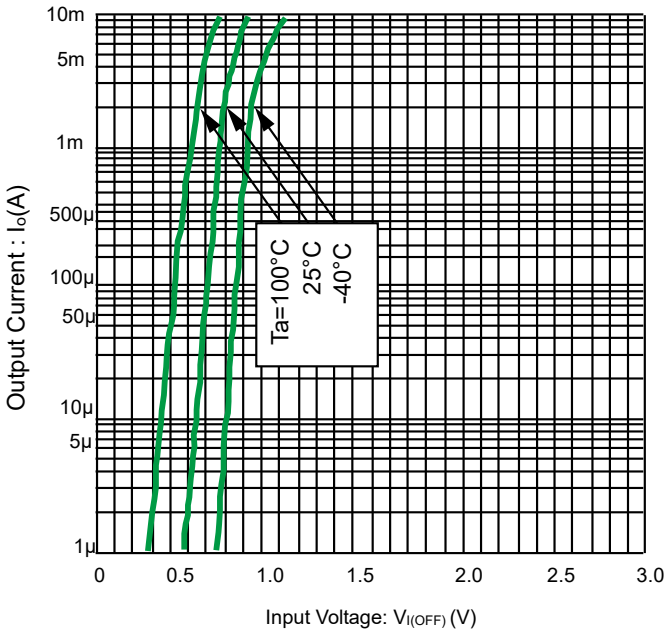


Fig 2.Output current vs. input voltage
@V_{CC}=5V(OFF characteristics)

Digital Transistor(built-in resistors)

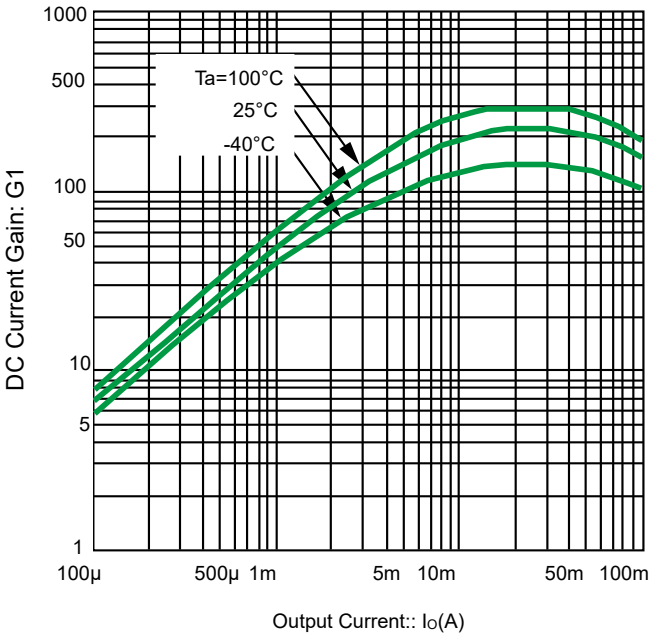


Fig 3.DC current gain vs. output current

@V_O=5V

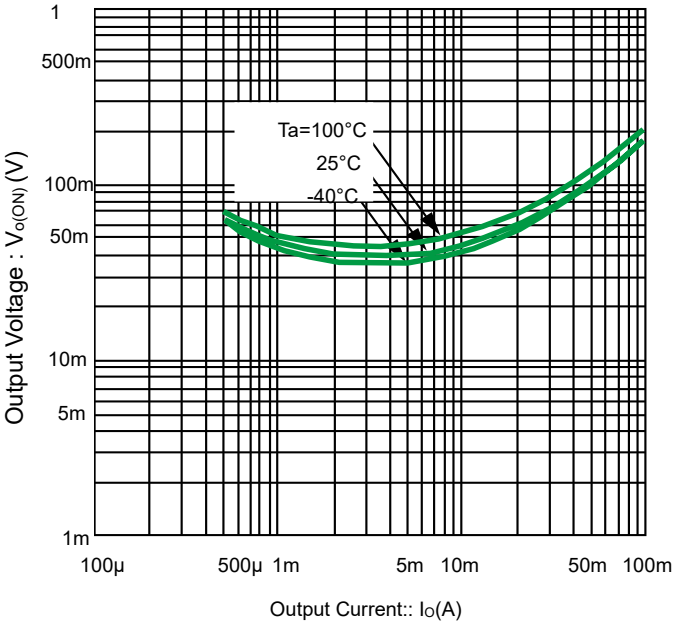
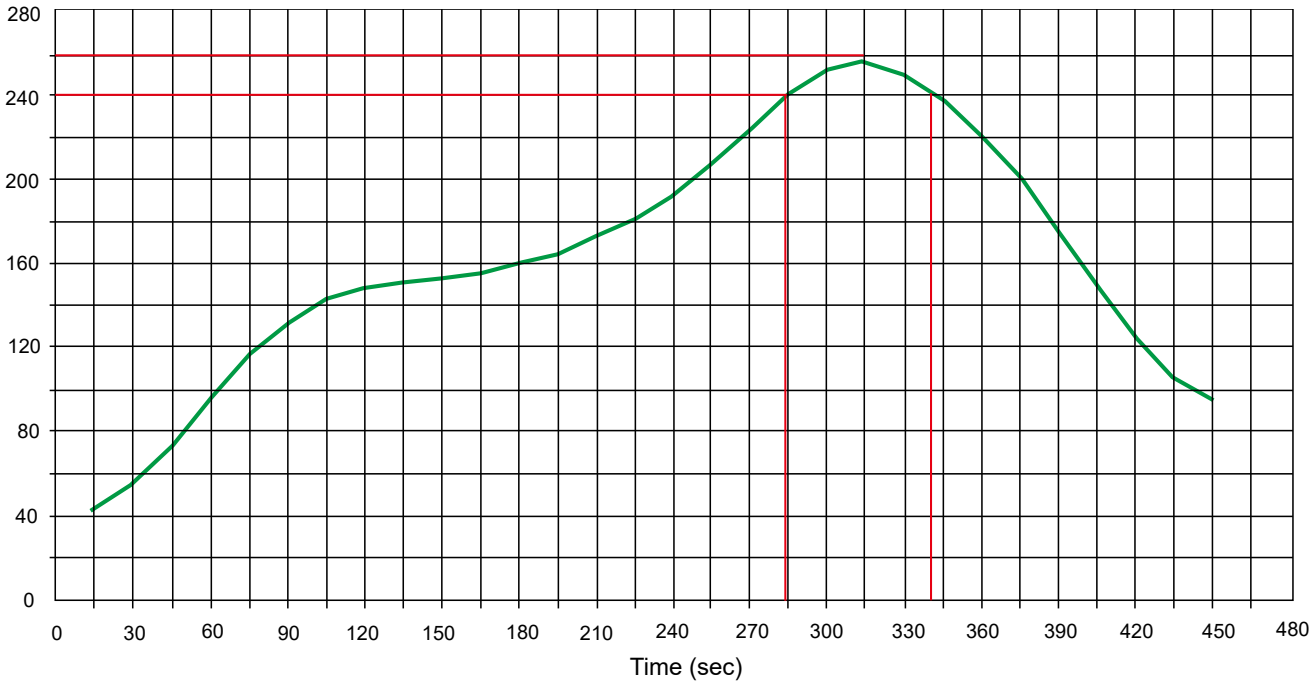


Fig 4.Output current vs. output voltage

@I_O/I_I =20

Solder Reflow Recommendation

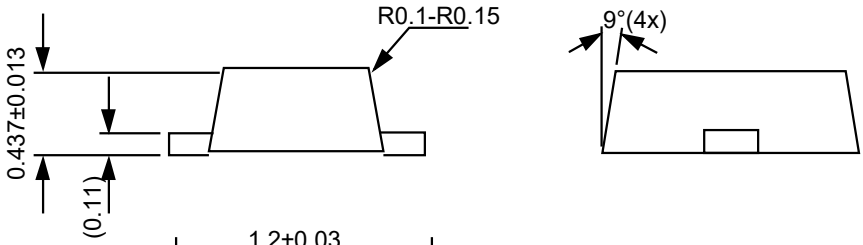
Peak Temp=257℃, Ramp Rate=0.802deg. ℃/sec



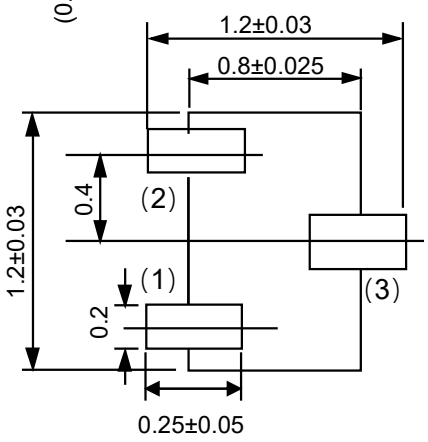
Digital Transistor(built-in resistors)

Product dimension (SOT-723)

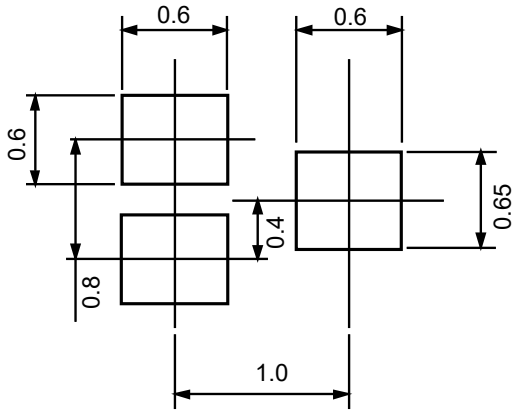
Side View



Bottom View



Unit: mm



Unit：mm

Ordering information

Device	Package	Shipping
DTC143ZM	SOT-723 (Pb-Free)	8000 / Tape & Reel

Marking information

