

Transistors

1A / 60V Digital transistor (with built-in resistors and zener diode)

DTDG23YP

●Applications

Inverter, Interface, Driver

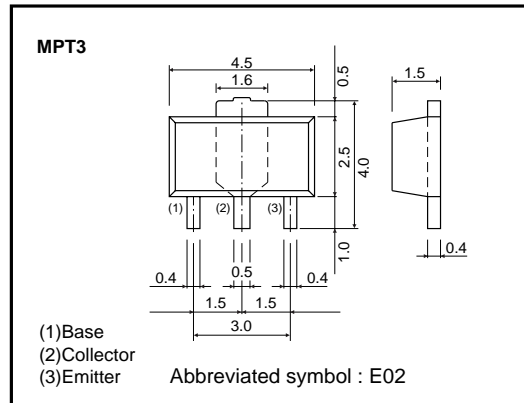
●Features

- 1) High DC current gain. (Min. 300 at $V_O / I_O=2V / 0.5A$)
- 2) Low $V_{O(on)}$. (Typ. 0.4V at $I_O / I_I=500mA / 5mA$)
- 3) Built-in zener diode gives strong protection against reverse surge by L-load (an inductive load).

●Structure

NPN epitaxial planar silicon transistor
(with built-in resistors and zener diode)

●External dimensions (Unit : mm)



●Packaging specifications

Package	MPT3
Packaging type	Taping
Code	T100
Part No.	Basic ordering unit (pieces) 1000
DTDG23YP	○

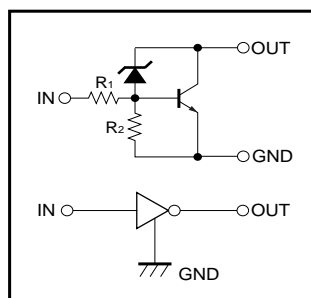
●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	60±10	V
Input voltage	V_{IN}	-6 to +40	V
Collector current	I_C	1	A
	I_{CP}	2 *1	A
Power dissipation	P_d	1.5 *2	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

*1 $P_w \leq 10ms$, Duty cycle $\leq 2\%$

*2 When mounted on 40×40×0.7mm ceramic board.

●Equivalent circuit



$R_1=2.2k\Omega$ $R_2=10k\Omega$

●Electrical characteristics (Ta=25°C)

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	-	-		$V_O=0.4V$, $I_O=100mA$
Output voltage	$V_{O(on)}$	-	-	0.4	V	$I_O/I_I=500mA/5mA$
Input current	I_I	-	-	3.6	mA	$V_I=5V$
Output current	$I_{O(off)}$	-	-	0.5	μA	$V_{CC}=40V$, $V_I=0V$
DC current gain	G_I	300	-	-	-	$V_O=2V$, $I_O=500mA$
Transition frequency	f_T *	-	80	-	MHz	$V_{CE}=5V$, $I_E=-0.1A$, $f=30MHz$
Input resistance	R_1	1.54	2.2	2.86	k Ω	-
Emitter-base resistance	R_2	7	10	13	k Ω	-

* Characteristics of built-in transistor

Transistors

●Electrical characteristics curves

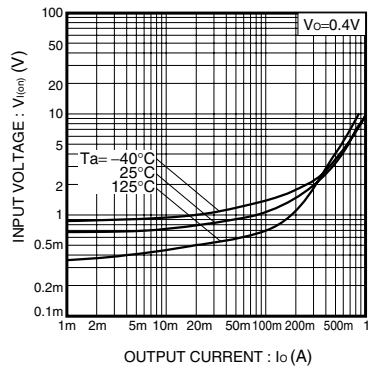


Fig.1 Input voltage vs. output current (ON characteristics)

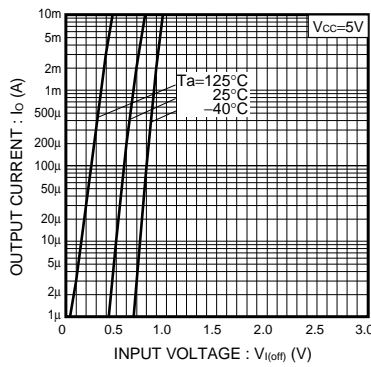


Fig.2 Output current vs. Input voltage (OFF characteristics)

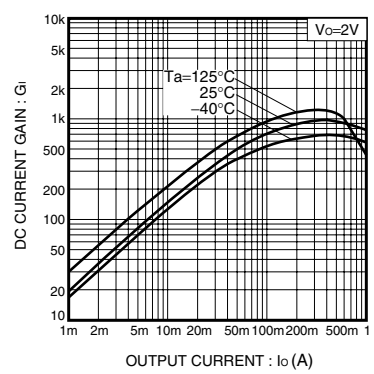


Fig.3 DC current gain vs. Output current

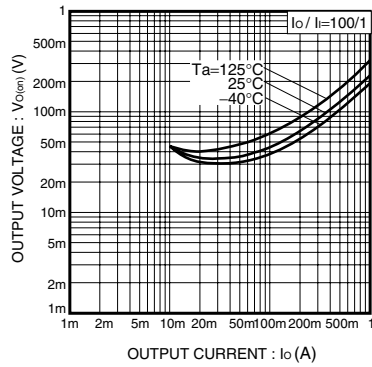


Fig.4 Output voltage vs. Output current