Bias Resistor Transistor

NPN Silicon Surface Mount Transistor with Monolithic Bias Resistor Network

LDTDG12GPWT1G

●Applications

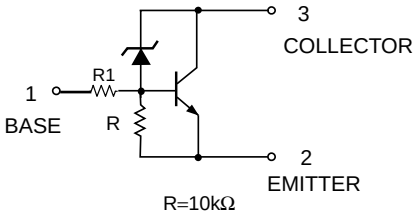
Driver

●Features

1) High h_{FE}.
   300 (Min.) (V_{CE} / I_C=2V / 0.5A)
2) Low saturation voltage,
   ($V_{CE(sat)}$=0.4V at I_C / I_B=500mA / 5mA)
3) Built-in zener diode gives strong protection against reverse surge by L- load (an inductive load).

- We declare that the material of product compliance with RoHS requirements.

SOT–323 (SC–70)



●Structure

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

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V_{CBO}	60±10	V
Collector-emitter voltage	V_{CEO}	60±10	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	1	A
	I_{CP}	2 ∗1	A
Collector power dissipation	P_C	0.5	W
		2 ∗2	
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

∗1 Pw≤10ms, Duty cycle≤1/2
∗2 When mounted on a 40×40×0.7 mm ceramic board.

DEVICE MARKING AND RESISTOR VALUES

Device	Marking	R1 (K)	R2 (K)	Shipping
LDTDG12GPWT1G	Q7	1	22	3000/Tape & Reel
LDTDG12GPWT3G	Q7	1	22	10000/Tape & Reel

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	50	–	70	V	I_C=50μA
Collector-emitter breakdown voltage	BV_{CEO}	50	–	70	V	I_C=1mA
Emitter-base breakdown voltage	BV_{EBO}	5	–	–	V	I_E=720μA
Collector cutoff current	I_{CBO}	–	–	0.5	μA	V_{CB}=40V
Emitter cutoff current	I_{EBO}	300	–	580	μA	V_{EB}=4V
Collector-emitter saturation voltage	V_{CE}(sat)	–	–	0.4	V	I_C/I_B=500mA/5mA
DC current transfer ratio	h_{FE}	300	–	–	–	V_{CE}=2V, I_C=500mA
Emitter-base resistance	R	7	10	13	kΩ	–
Transition frequency	f_T ∗	–	80	–	MHz	V_{CE}=5V, I_E=–0.1A, f=30MHz

∗ Characteristics of built-in transistor

LDTDG12GPWT1G

●Electrical characteristic curves

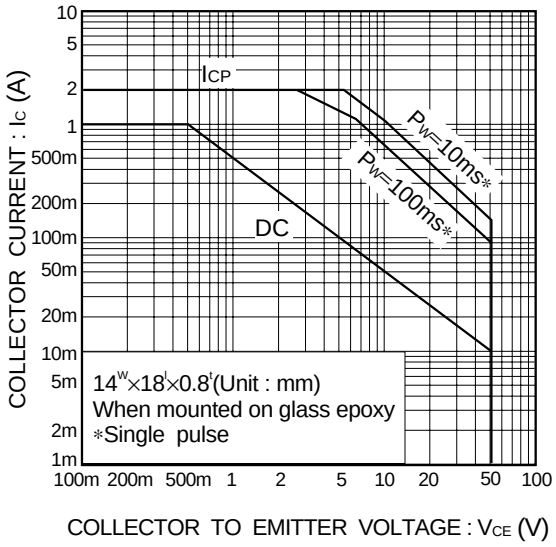


Fig.1 Safe operating area

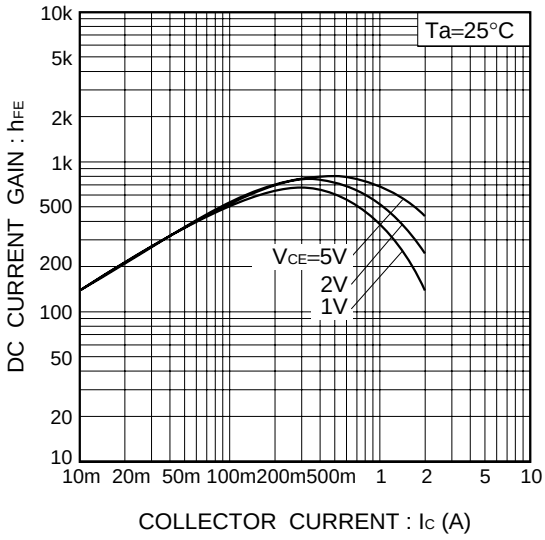


Fig.2 DC current gain vs. collector current

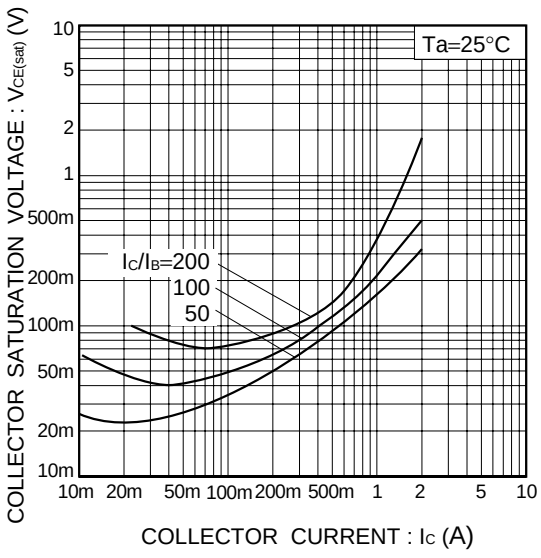
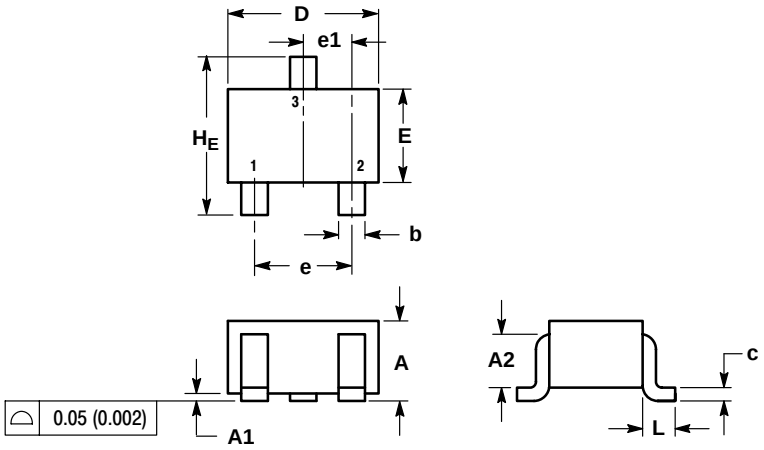


Fig.3 Collector-emitter saturation voltage vs. collector current

LDTDG12GPWT1G

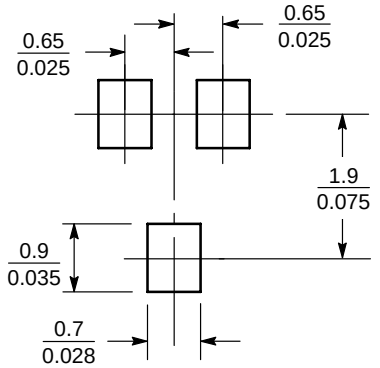
SC−70 (SOT−323)



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

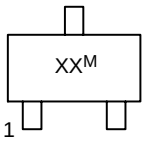
	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2		0.7 REF			0.028 REF	
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.10	2.20	0.071	0.083	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1		0.65 BSC			0.026 BSC	
L		0.425 REF			0.017 REF	
H_E	2.00	2.10	2.40	0.079	0.083	0.095

SOLDERING FOOTPRINT*



SCALE 10:1 $\left(\frac{mm}{inches}\right)$

GENERIC MARKING DIAGRAM



XX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.