



TO-92



Pin Definition:

1. Emitter
2. Collector
3. Base

PRODUCT SUMMARY

V_{CEO}	400V
V_{CBO}	700V
I_C	1A
$V_{CE(SAT)}$	1.1V @ $I_C / I_B = 1A / 0.25A$

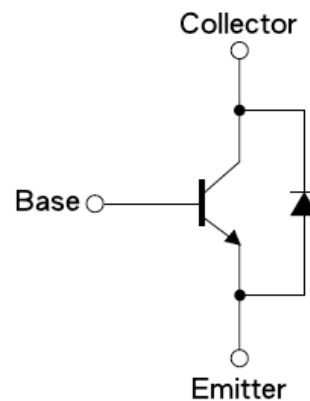
Features

- Build-in Free-wheeling Diode Makes Efficient Anti-saturation Operation
- No Need to Interest an hfe Value Because of Low Variable Storage-time Spread Even Though Corner Spirit Product.
- Low Base Drive Requirement
- Suitable for Half Bridge Light Ballast Application

Structure

- Silicon Triple Diffused Type
- NPN Silicon Transistor with Diode

Block Diagram



Ordering Information

Part No.	Package	Packing
TSC5301DCT B0	TO-92	1Kpcs / Bulk
TSC5301DCT B0G	TO-92	1Kpcs / Bulk
TSC5301DCT A3	TO-92	2Kpcs / Ammo
TSC5301DCT A3G	TO-92	2Kpcs / Ammo

Note: "G" denote for Halogen free

Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	700V	V
Collector-Emitter Voltage	V_{CEO}	400V	V
Emitter-Base Voltage	V_{EBO}	10	V
Collector Current	I_C	1	A
Collector Peak Current (tp <5ms)	I_{CM}	2	A
Base Current	I_B	0.5	A
Base Peak Current (tp <5ms)	I_{BM}	1	A
Total Dissipation @ Tc ≤ 25°C	P_{tot}	0.6	W
Maximum Operating Junction Temperature	T_J	+150	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R\theta_{JC}$	83.3	$^{\circ}\text{C}/\text{W}$
Junction to Ambient Thermal Resistance	$R\theta_{JA}$	200	$^{\circ}\text{C}/\text{W}$

Electrical Specifications (Ta = 25 $^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	$I_C = 1\text{mA}, I_E = 0$	BV_{CBO}	700	--	--	V
Collector-Emitter Breakdown Voltage ^a	$I_C = 10\text{mA}, I_E = 0$	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}, I_C = 0$	BV_{EBO}	10	--	--	V
Collector Cutoff Current	$V_{CB} = 700\text{V}, I_E = 0$	I_{CBO}	--	--	1	μA
Emitter Cutoff Current	$V_{EB} = 9\text{V}, I_C = 0$	I_{EBO}	--	--	1	μA
Collector-Emitter Saturation Voltage ^a	$I_C = 0.5\text{A}, I_B = 0.1\text{A}$	$V_{CE(SAT)1}$	--	--	0.5	V
	$I_C = 1\text{A}, I_B = 0.25\text{A}$	$V_{CE(SAT)2}$	--	1.1	1.5	
Base-Emitter Saturation Voltage ^a	$I_C = 0.5\text{A}, I_B = 0.1\text{A}$	$V_{BE(SAT)1}$	--	--	1.1	V
	$I_C = 1\text{A}, I_B = 0.25\text{A}$	$V_{BE(SAT)2}$	--	--	1.2	
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	$h_{FE 1}$	10	--	--	
	$V_{CE} = 5\text{V}, I_C = 400\text{mA}$	$h_{FE 2}$	10	--	30	
	$V_{CE} = 5\text{V}, I_C = 1\text{A}$	$h_{FE 3}$	5	--	--	
Turn On Time	$V_{CC} = 250\text{V}, I_C = 1\text{A}$,	t_{ON}	--	0.5	0.7	μS
Storage Time	$I_{B1} = I_{B2} = 0.2\text{A}, t_p = 25\mu\text{S}$	t_{STG}	--	0.5	0.9	μS
Fall Time	Duty Cycle < 1%	t_f	--	0.2	0.4	μS
Diode						
Fall Time	$I_C = 1\text{A}$	t_F	--	--	800	μS
Forward Voltage Drop	$I_C = 1\text{A}$	V_f	--	--	1.4	V

Notes:

a. Pulsed duration = 300 μS , duty cycle $\leq 2\%$

Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

Figure 1. Static Characteristics

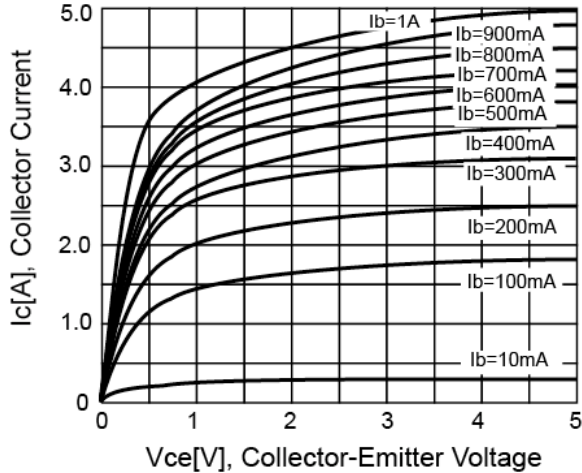


Figure 2. DC Current Gain

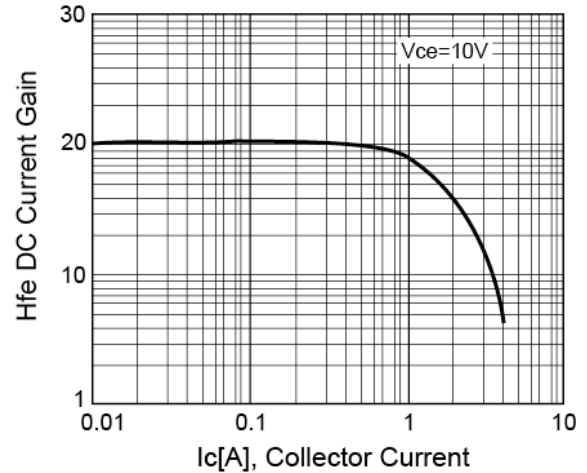


Figure 3. Vce(sat) v.s. Vbe(sat)

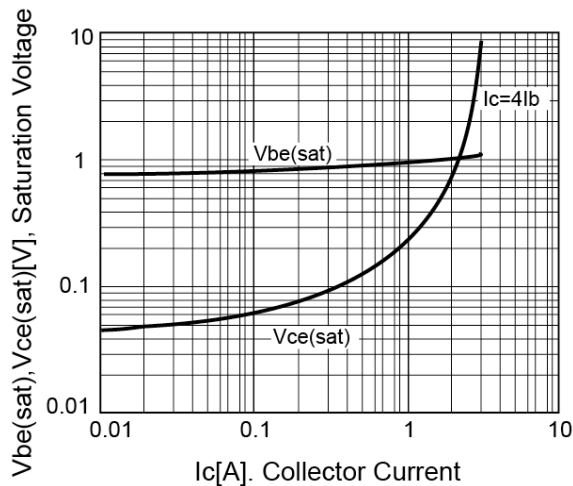


Figure 4. Power Derating

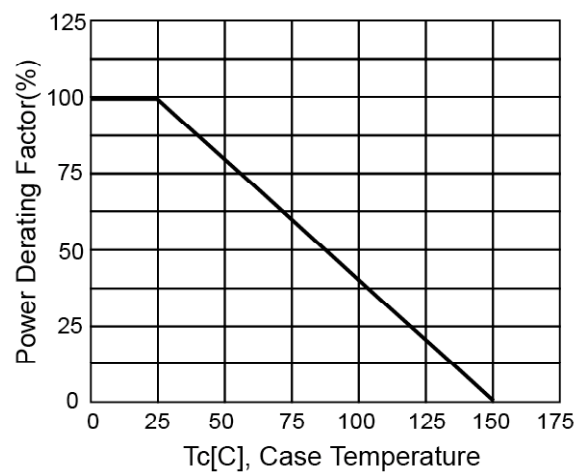
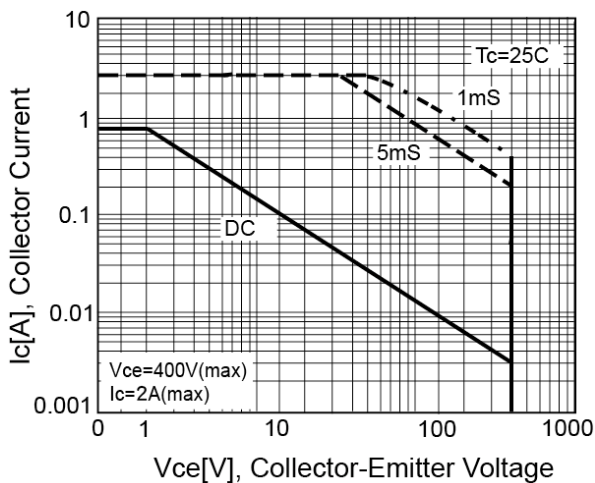
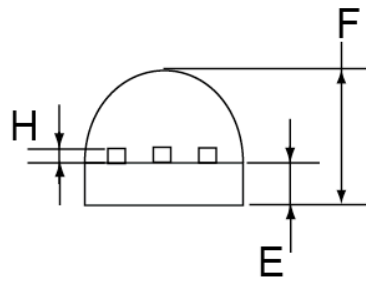
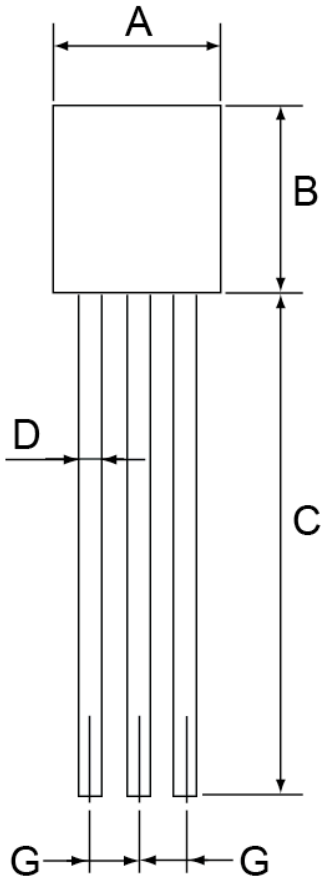


Figure 5. Safety Operating Area



TO-92 Mechanical Drawing

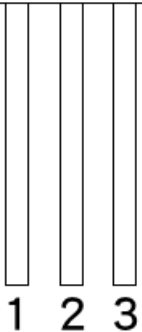


TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	13.53 (typ)		0.532 (typ)	
D	0.39	0.49	0.015	0.019
E	1.18	1.28	0.046	0.050
F	3.30	3.70	0.130	0.146
G	1.27	1.31	0.050	0.051
H	0.33	0.43	0.013	0.017

Marking Diagram



- Y** = Year Code
- M** = Month Code
(A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code



Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.