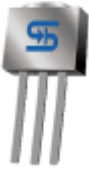

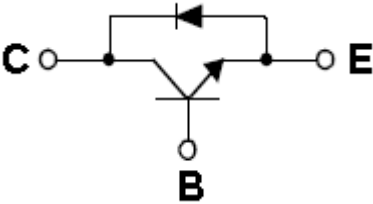
		<h1>TSC5304D</h1> <h2>High Voltage NPN Transistor with Diode</h2>										
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>TO-251</b></p>  </div> <div style="text-align: center;"> <p><b>TO-252</b></p>  </div> </div> <p>Pin assignment:</p> <ol style="list-style-type: none"> <li>1. Base</li> <li>2. Collector</li> <li>3. Emitter</li> </ol>		<p><b><math>BV_{CEO} = 400V</math></b></p> <p><b><math>BV_{CBO} = 750V</math></b></p> <p><b><math>I_c = 4A</math></b></p> <p><b><math>V_{CE(SAT)}, = 1.2V @ I_c / I_b = 4A / 1A</math></b></p>										
<p><b>Features</b></p> <ul style="list-style-type: none"> <li>✧ Built-in free-wheeling diode makes efficient anti saturation operation.</li> <li>✧ No need to interest an hfe value because of low variable storage-time spread even though comer spirit product.</li> <li>✧ Low base drive requirement.</li> <li>✧ Suitable for half bridge light ballast applications.</li> </ul>		<p><b>Ordering Information</b></p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Part No.</th> <th>Packing</th> <th>Package</th> </tr> </thead> <tbody> <tr> <td>TSC5304DCH</td> <td>Tube</td> <td>TO-251</td> </tr> <tr> <td>TSC5304DCP</td> <td>T&amp;R</td> <td>TO-252</td> </tr> </tbody> </table>		Part No.	Packing	Package	TSC5304DCH	Tube	TO-251	TSC5304DCP	T&R	TO-252
Part No.	Packing	Package										
TSC5304DCH	Tube	TO-251										
TSC5304DCP	T&R	TO-252										
<p><b>Structure</b></p> <ul style="list-style-type: none"> <li>✧ Silicon triple diffused type.</li> <li>✧ NPN silicon transistor with Diode</li> </ul>		<p><b>Block Diagram</b></p> 										
<p><b>Absolute Maximum Rating</b> (<math>T_a = 25^\circ C</math> unless otherwise noted)</p>												
Parameter		Symbol	Limit	Unit								
Collector-Base Voltage		$V_{CBO}$	750V	V								
Collector-Emitter Voltage		$V_{CEO}$	400V	V								
Emitter-Base Voltage		$V_{EBO}$	10	V								
Collector Current	DC	$I_c$	4	A								
	Pulse		8									
Base Current	DC	$I_b$	1.5	A								
	Pulse		4									
Total Power Dissipation ( $T_c=25^\circ C$ )		$P_D$	35	W								
Operating Junction Temperature		$T_J$	+150	$^\circ C$								
Operating Junction and Storage Temperature Range		$T_{STG}$	- 65 to +150	$^\circ C$								
Thermal Resistance Junction to Case		$R_{\theta jc}$	6	$^\circ C/W$								
Thermal Resistance Junction to Ambient		$R_{\theta ja}$	90	$^\circ C/W$								

Note: 1. Single pulse,  $P_w = 300\mu S$ , Duty  $\leq 2\%$

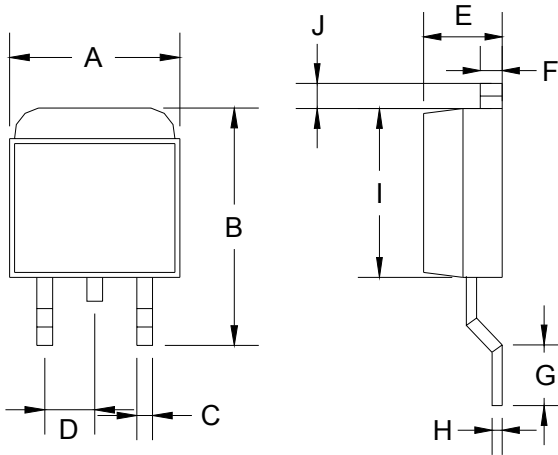


Electrical Characteristics						
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Collector-Base Voltage	$I_C = 1\text{mA}, I_B = 0$	$BV_{CBO}$	750	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}, I_E = 0$	$BV_{CEO}$	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}, I_C = 0$	$BV_{EBO}$	9	--	--	V
Collector Cutoff Current	$V_{CB} = 500\text{V}, I_E = 0$	$I_{CBO}$	--	--	10	$\mu\text{A}$
Emitter Cutoff Current	$V_{EB} = 9\text{V}, I_C = 0$	$I_{EBO}$	--	--	10	$\mu\text{A}$
Collector-Emitter Saturation Voltage	$I_C / I_B = 1.0\text{A} / 0.2\text{A}$	$V_{CE(SAT)1}$	--	--	0.35	V
	$I_C / I_B = 2.0\text{A} / 0.5\text{A}$	$V_{CE(SAT)2}$	--	--	0.55	
	$I_C / I_B = 4.0\text{A} / 1.0\text{A}$	$V_{CE(SAT)3}$	--	--	1.25	
Base-Emitter Saturation Voltage	$I_C / I_B = 1.0\text{A} / 0.2\text{A}$	$V_{CB(SAT)1}$	--	--	1.0	V
	$I_C / I_B = 2.0\text{A} / 0.5\text{A}$	$V_{CB(SAT)2}$	--	--	1.1	
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 0.5\text{A}$	$h_{FE1}$	15	20	--	
	$V_{CE} = 5\text{V}, I_C = 2\text{A}$	$h_{FE2}$	10	--	--	
Turn On Time	$V_{CC} = 250\text{V}, I_C = 2\text{A},$ $I_{B1} = I_{B2} = 0.4\text{A}, t_p = 25\mu\text{S}$ Duty cycle < 1%	$t_{ON}$	--	--	0.5	$\mu\text{S}$
Storage Time		$t_{STG}$	--	--	3	$\mu\text{S}$
Fall Time		$t_F$	--	--	0.2	$\mu\text{S}$
<b>Doide</b>						
Fall Time	$I_C = 2\text{A}$	$t_F$	--	--	500	nS
Forward Voltage	$I_C = 2\text{A}$	$V_f$	--	--	1.3	V

Note : pulse test: pulse width  $\leq 300\mu\text{S}$ , duty cycle  $\leq 2\%$

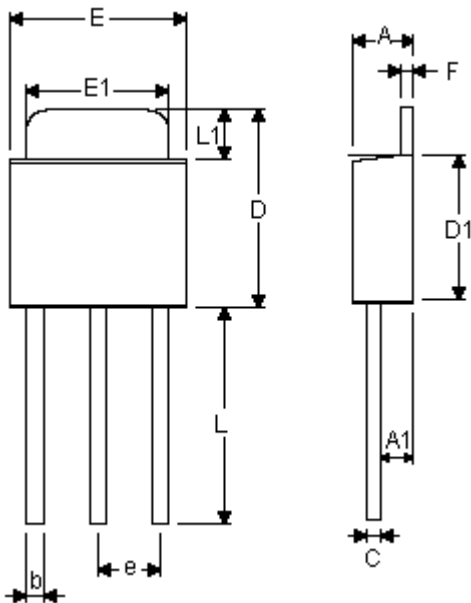


### TO-252 Mechanical Drawing



DIM	TO-252 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.570	6.840	0.259	0.269
B	9.250	10.400	0.364	0.409
C	0.550	0.700	0.022	0.028
D	2.560	2.670	0.101	0.105
E	2.300	2.390	0.090	0.094
F	0.490	0.570	0.019	0.022
G	1.460	1.580	0.057	0.062
H	0.520	0.570	0.020	0.022
I	5.340	5.550	0.210	0.219
J	1.460	1.640	0.057	0.065

### TO-251 Mechanical Drawing



DIM	TO-251 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.4	0.087	0.095
A1	1.10	1.30	0.043	0.051
b	0.40	0.80	0.016	0.032
C	0.40	0.60	0.016	0.024
D	6.70	7.30	0.264	0.287
D1	5.40	5.65	0.213	0.222
E	6.40	6.65	0.252	0.262
e	2.10	2.50	0.083	0.098
F	0.40	0.60	0.016	0.024
L	7.00	8.00	0.276	0.315
L1	1.60	1.86	0.063	0.073