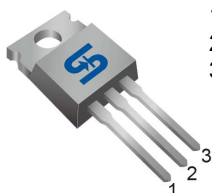


TO-220



**Pin Definition:**

1. Base
2. Collector
3. Emitter

**PRODUCT SUMMARY**

<b><math>BV_{CEO}</math></b>	400V
<b><math>BV_{CBO}</math></b>	950V
<b><math>I_C</math></b>	4A
<b><math>V_{CE(SAT)}</math></b>	1.5V @ $I_C=35A, I_B=0.1A$

**Features**

- High Voltage Capability
- High Switching Speed

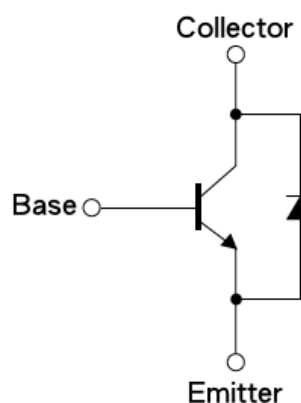
**Structure**

- Silicon Triple Diffused Type
- NPN Silicon Transistor

**Ordering Information**

Part No.	Package	Packing
TSC742ACZ C0	TO-220	50pcs / Tube

**Block Diagram**



**Absolute Maximum Rating** ( $T_A = 25^\circ C$  unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	$V_{CBO}$	950V	V
Collector-Emitter Voltage @ $V_{BE}=0V$	$V_{CES}$	400V	V
Emitter-Base Voltage	$V_{EBO}$	15	V
Collector Current	$I_C$	4	A
Collector Peak Current (tp <5ms)	$I_{CM}$	8	A
Base Current	$I_B$	2	A
Base Peak Current (tp <5ms)	$I_{BM}$	4	A
Power Total Dissipation @ $T_c=25^\circ C$	$P_{DTOT}$	70	W
Maximum Operating Junction Temperature	$T_J$	+150	$^\circ C$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ C$

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

**Thermal Performance**

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta_{JC}}$	1.8	$^\circ C/W$
Thermal Resistance - Junction to Ambient	$R_{\theta_{JA}}$	62.5	$^\circ C/W$

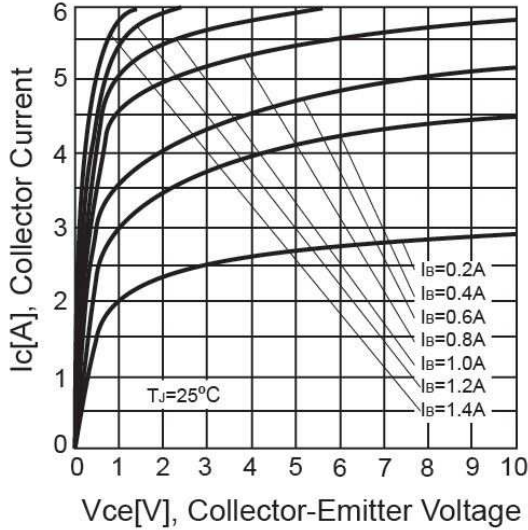
### Electrical Specifications ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Collector-Base Voltage	$I_C = 0.5\text{mA}$	$BV_{CBO}$	950	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}$	$BV_{CEO}$	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}$	$BV_{EBO}$	15	--	--	V
Collector Cutoff Current	$V_{CE} = 400\text{V}, I_B = 0$	$I_{CEO}$	--	--	10	$\mu\text{A}$
Collector Cutoff Current	$V_{CB} = 950\text{V}, I_E = 0$	$I_{CBO}$	--	--	10	$\mu\text{A}$
Collector-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$	$V_{CE(SAT)1}$	---	--	0.5	V
Collector-Emitter Saturation Voltage	$I_C = 3.5\text{A}, I_B = 1\text{A}$	$V_{CE(SAT)2}$	---	--	1.5	V
Base-Emitter Saturation Voltage	$I_C = 3.5\text{A}, I_B = 1\text{A}$	$V_{BE(SAT)1}$	--	--	1.5	V
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 0.1\text{A}$	$h_{FE}$	35	--	100	
	$V_{CE} = 5\text{V}, I_C = 0.5\text{A}$		35	--	--	
	$V_{CE} = 3\text{V}, I_C = 0.8\text{A}$		25	--	50	
<b>Resistive Load Switching Time (Ratings)</b>						
Rise Time	$V_{CC} = 125\text{V}, I_C = 2\text{A},$ $I_{B1} = -I_{B2} = -0.4\text{A},$ $t_P = 300\mu\text{s}, V_{BE(OFF)} = -5\text{V}$	$t_r$		0.17	2	$\mu\text{s}$
Storage Time		$t_{STG}$	--	--	6	$\mu\text{s}$
Fall Time		$t_f$	--	--	0.5	$\mu\text{s}$

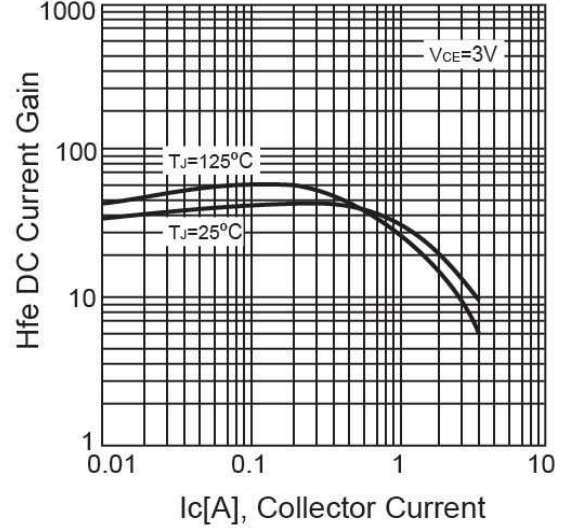
**Notes:** Pulsed duration = 380 $\mu\text{s}$ , duty cycle  $\leq 2\%$

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

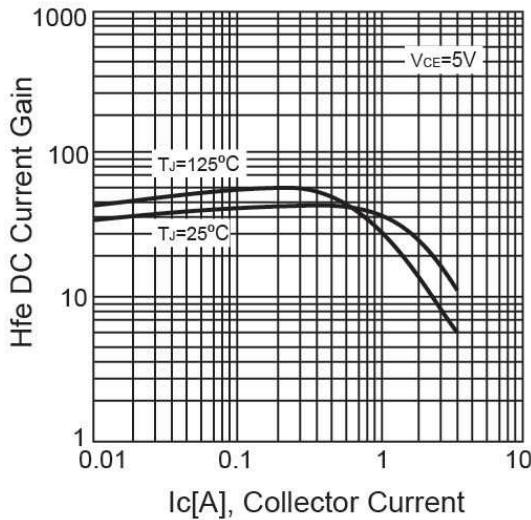
**Figure 1. Static Characteristics**



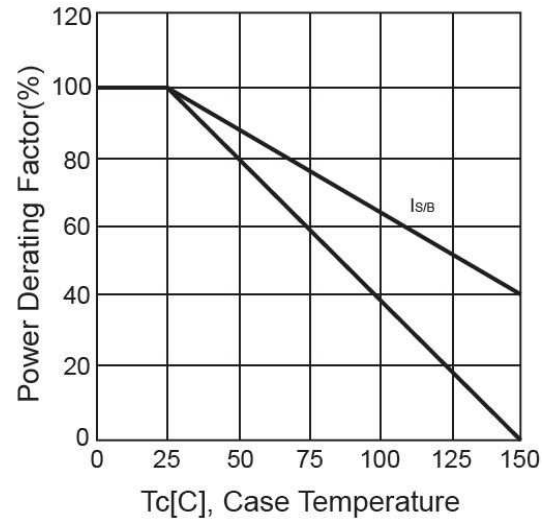
**Figure 2. DC Current Gain**



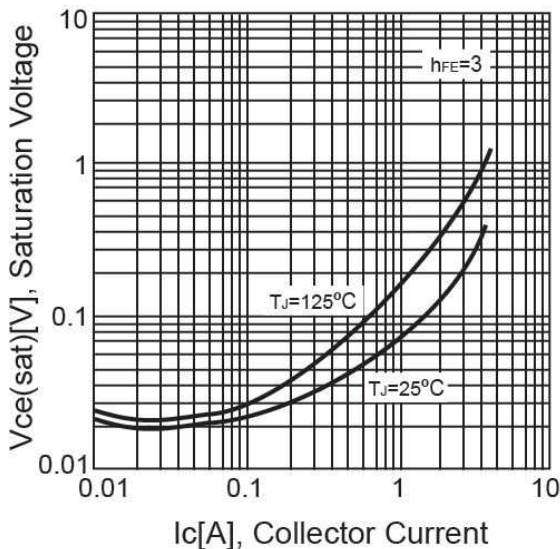
**Figure 3. DC Current Gain**



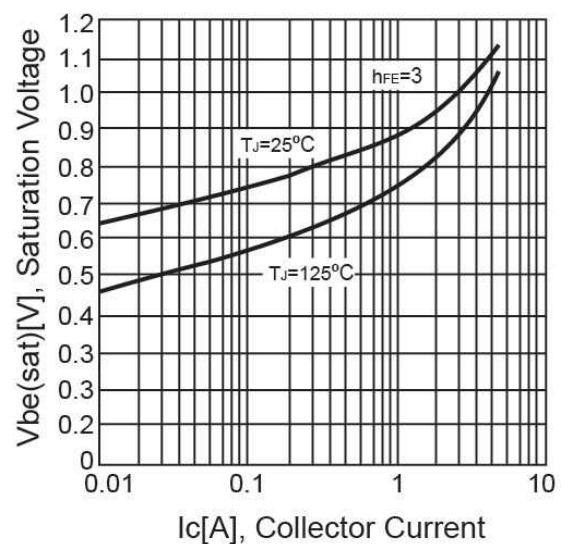
**Figure 4. Power Derating**



**Figure 5. Collector-Emitter Saturation Voltage**

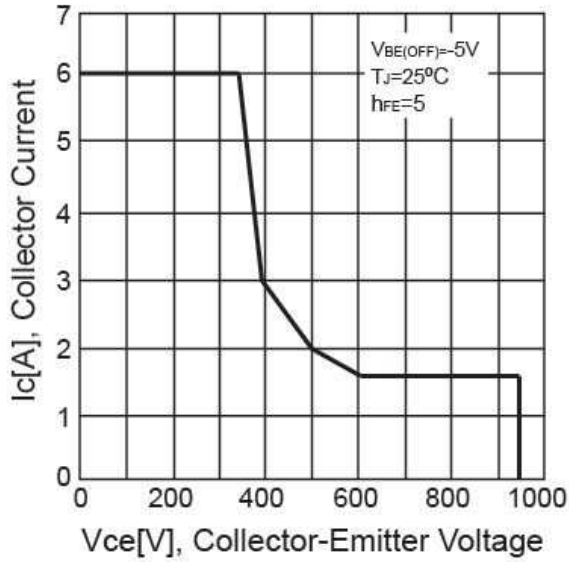


**Figure 6. Base-Emitter Saturation Voltage**

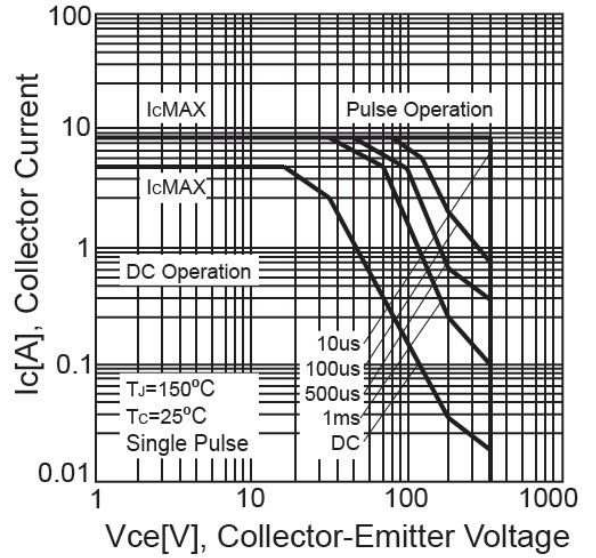


**Electrical Characteristics Curve** ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)

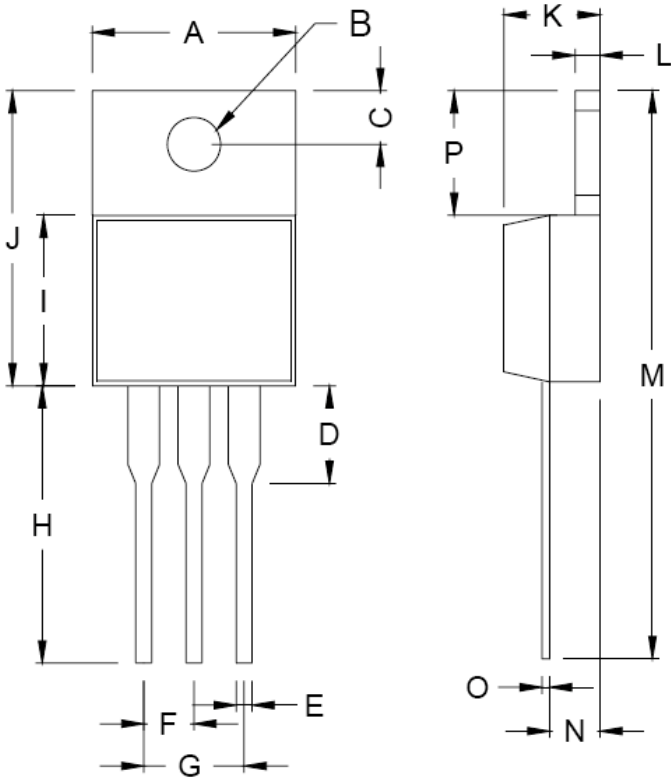
**Figure 7. Reverse Bias SOA**



**Figure 8. Safety Operating Area**

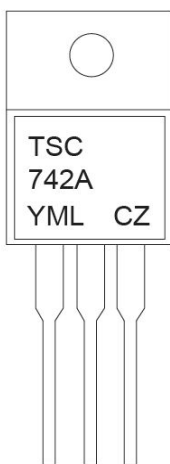


**TO-220 Mechanical Drawing**



DIM	TO-220 DIMENSION			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.000	10.500	0.394	0.413
B	3.740	3.910	0.147	0.154
C	2.440	2.940	0.096	0.116
D	-	6.350	-	0.250
E	0.381	1.106	0.015	0.040
F	2.345	2.715	0.092	0.058
G	4.690	5.430	0.092	0.107
H	12.700	14.732	0.500	0.581
I	8.382	9.017	0.330	0.355
J	14.224	16.510	0.560	0.650
K	3.556	4.826	0.140	0.190
L	0.508	1.397	0.020	0.055
M	27.700	29.620	1.060	1.230
N	2.032	2.921	0.080	0.115
O	0.255	0.610	0.010	0.024
P	5.842	6.858	0.230	0.270

**Marking Diagram**



- Y** = Year Code
- M** = Month Code  
(A=Jan, B=Feb, C=Mar, D=Apr, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- = Month Code for Halogen Free Product  
(O=Jan, P=Feb, Q=Mar, R=Apr, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
- L** = Lot Code

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