TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TSC148D

High Voltage Fast-Switching NPN Power Transistor

TO-220

ITO-220

Pin Definition:
1. Base
2. Collector
3. Emitter

PRODUCT SUMMARY

BV_{CEO}	400V
BV_{CBO}	700V
I_C	8A
$V_{CE(SAT)}$	1.5V @ I_C / I_B = 5A / 1A

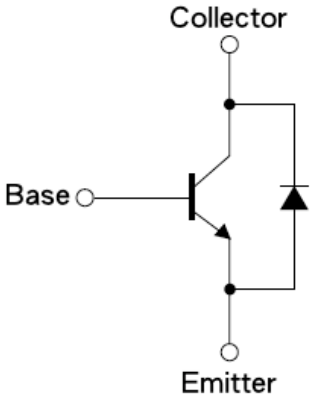
Features

- High Voltage Capability
- Very High Speed Switching

Applications

- Electronic Ballasts for Fluorescent Lighting
- Flyback and Forward Single Transistor Low Power Converters

Block Diagram



Ordering Information

Part No.	Package	Packing
TSC148DCZ C0	TO-220	50pcs / Tube
TSC148DCI C0	ITO-220	50pcs / Tube

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}	9	V
Collector Current		I_C	8	A
Collector Peak Current (tp < 5ms)		I_{CM}	16	A
Base Current		I_B	4	A
Base Peak Current (tp < 5ms)		I_{BM}	8	A
Total Dissipation	TO-220	P_{tot}	80	W
	ITO-220		36	W
Maximum Operating Junction Temperature		T_J	+150	°C
Storage Temperature Range		T_{STG}	-65 to +150	°C

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Electrical Specifications (Ta = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	I_C = 1mA, I_B = 0	BV_{CBO}	700	--	--	V
Collector-Emitter Breakdown Voltage[a]	I_C = 1mA, I_E = 0	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	I_E = 0.1mA, I_C = 0	BV_{EBO}	9	--	--	V
Collector Cutoff Current	V_{CB} = 700V, I_E = 0	I_{CBO}	--	--	10	uA
Collector Cutoff Current	V_{CE} = 400V, I_E = 0	I_{CEO}	--	--	100	uA
Emitter Cutoff Current	V_{EB} = 9V, I_C = 0	I_{EBO}	--	--	100	uA
Collector-Emitter Saturation Voltage[a]	I_C =2A, I_B =0.4A	$V_{CE(SAT)1}$	--	--	0.8	V
	I_C =5A, I_B =1A	$V_{CE(SAT)2}$	--	--	1.5	
	I_C =8A, I_B =2A	$V_{CE(SAT)3}$	--	--	2	
Base-Emitter Saturation Voltage[a]	I_C =4A, I_B =0.4A	$V_{BE(SAT)1}$	--	--	1.2	V
	I_C =5A, I_B =1A	$V_{BE(SAT)2}$	--	--	1.6	
DC Current Gain	V_{CE} =5V, I_C =2A	Hfe	18	--	40	
	V_{CE} =5V, I_C =5A		8	--	25	
Diode Forward Voltage	I_f =3A	Vf	--	--	2	V
Resistive Load Switching Time (Ratings)						
Turn On Time	V_{CC} =125V, I_C =5A, I_{B1}=I_{B2}=1A, t_p =25uS Duty Cycle<1%	t_{ON}	--	--	0.6	uS
Storage Time		t_{STG}	--	1.3	1.6	uS
Fall Time		t_f	--	--	0.3	uS

Notes:
a. Pulsed duration = 300uS, duty cycle ≤2%

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Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

Figure 1. Static Characteristics

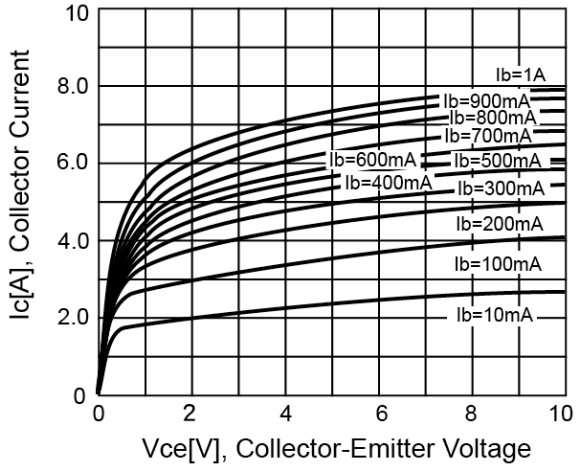


Figure 2. DC Current Gain

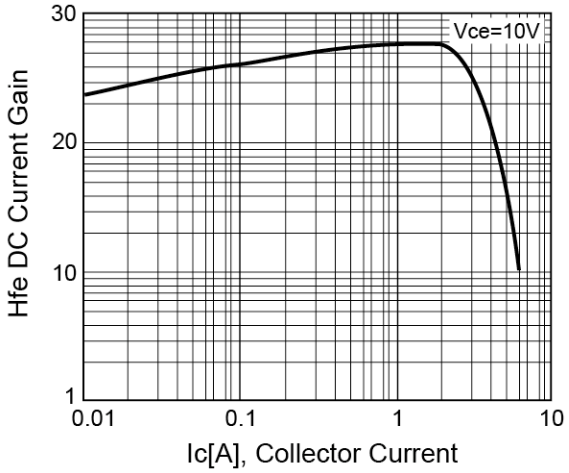


Figure 3. Vce(sat) v.s. Vbe(sat)

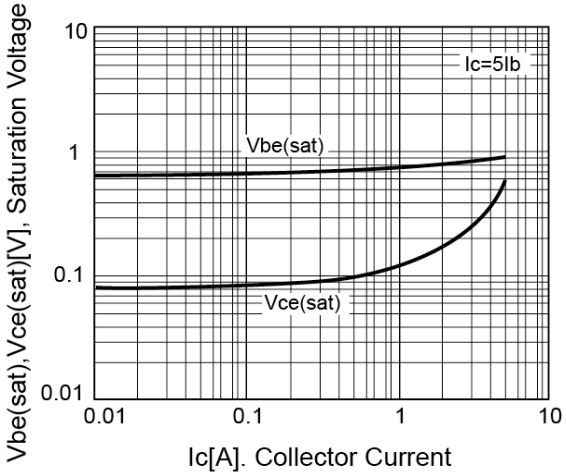
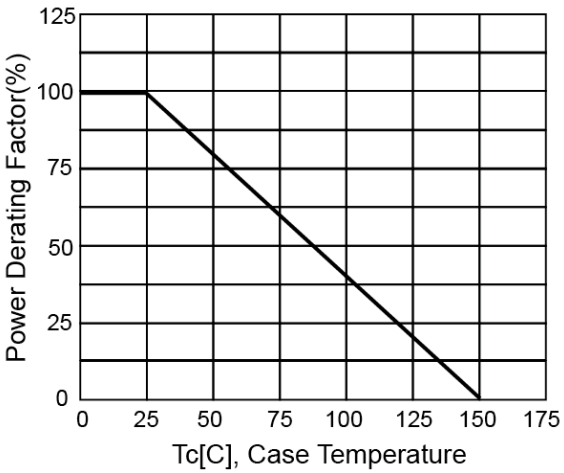


Figure 4. Power Derating



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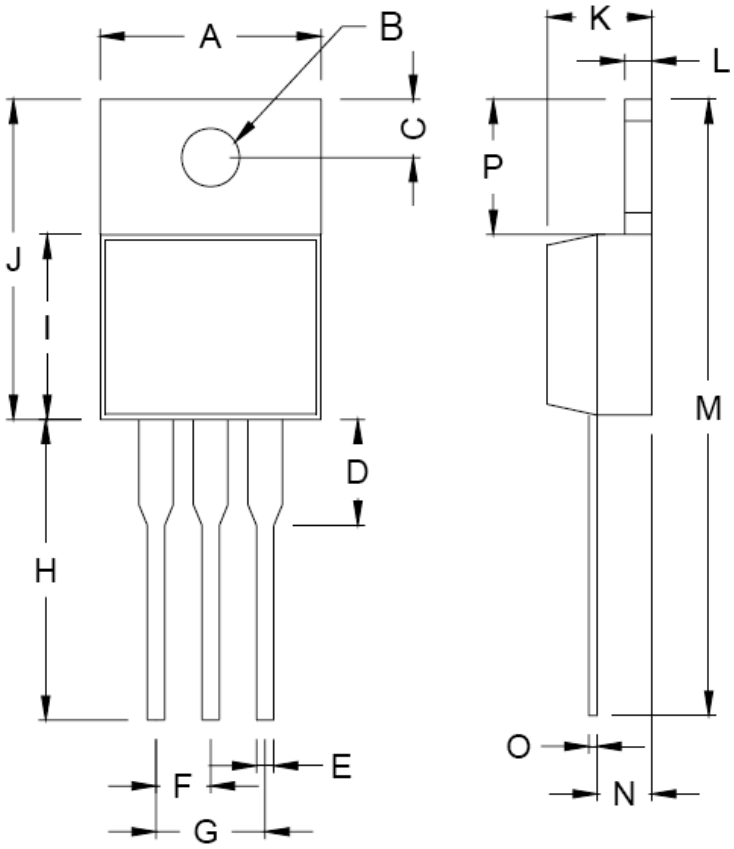
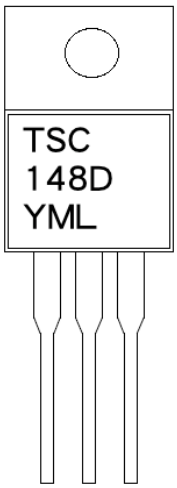
TO-220 Mechanical Drawing



TO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.31	10.550	0.366	0.415
B	3.740	3.910	0.147	0.154
C	2.440	2.940	0.096	0.116
D	2.22	3.22	0.087	0.127
E	0.78	0.98	0.030	0.038
F	2.34	2.65	0.092	0.104
G	4.69	5.31	0.184	0.209
H	12.32	13.88	0.485	0.546
I	8.74	9.26	0.344	0.364
J	15.07	16.07	0.593	0.632
K	4.35	4.65	0.171	0.183
L	1.16	1.40	0.045	0.055
M	27.39	30.35	1.078	1.194
N	1.785	2.675	0.070	0.105
O	1.50	1.75	0.059	0.068
P	5.75	7.65	0.226	0.301

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)
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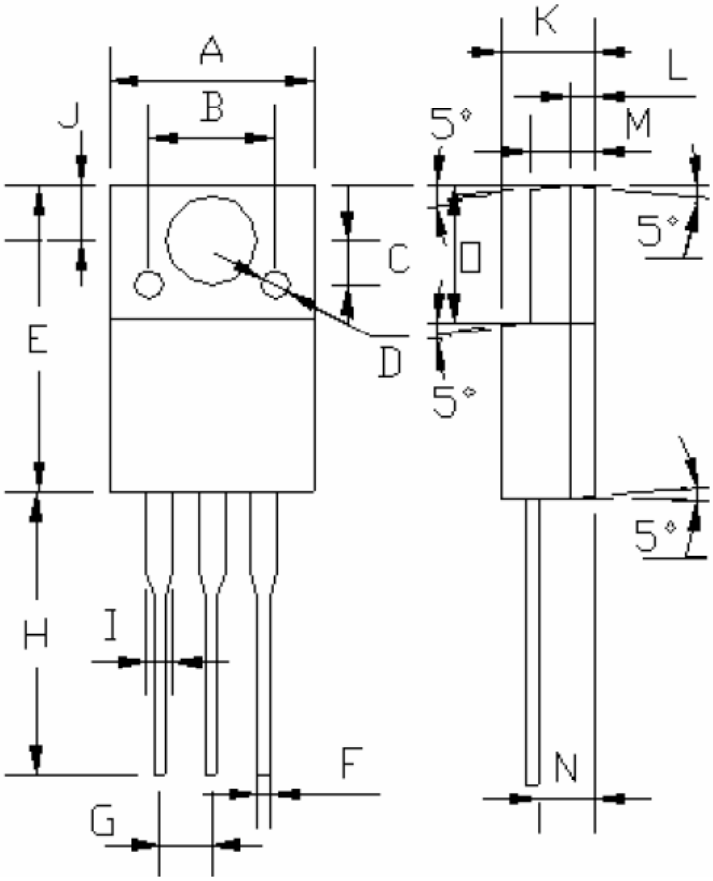
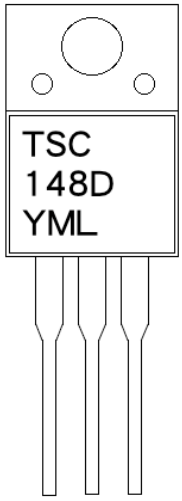
ITO-220 Mechanical Drawing



ITO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.96	10.36	0.392	0.407
B	6.20 (typ.)		0.244 (typ.)	
C	2.20 (typ.)		0.087 (typ.)	
D	1.40 (typ.)		0.055 (typ.)	
E	15.07	16.07	0.593	0.632
F	0.80 (typ.)		0.031 (typ.)	
G	2.44	2.64	0.096	0.104
H	13.08	13.48	0.514	0.530
I	1.47 (max.)		0.057 (max.)	
J	3.20	3.40	0.125	0.133
K	4.60	4.80	0.181	0.188
L	1.15 (typ.)		0.045 (typ.)	
M	2.44	2.64	0.096	0.104
N	2.60	2.80	0.102	0.110
O	6.55	6.65	0.258	0.262

Marking Diagram



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