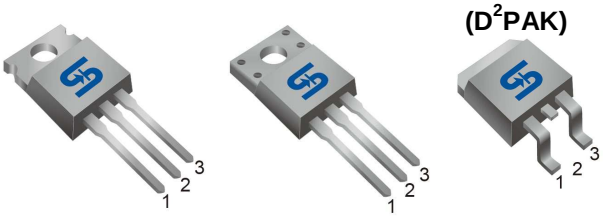
TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TSC148D

High Voltage Fast-Switching NPN Power Transistor

TO-220 | ITO-220 | TO-263-2L (D^2PAK)



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

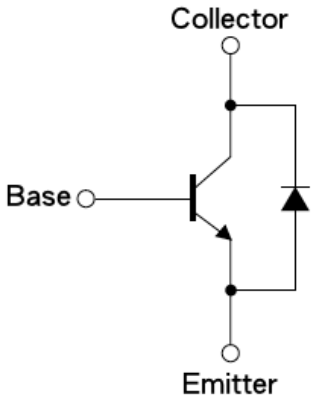
PRODUCT SUMMARY

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

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 Comer Spirit Product.
- Low Base Drive Requirement
- Suitable for Half Bridge Light Ballast Application

Block Diagram



Structure

- Silicon Triple Diffused Type
- NPN Silicon Transistor
- Integrated Anti-parallel Collector-Emitter Diode

Ordering Information

Part No.	Package	Packing
TSC148DCZ C0	TO-220	50pcs / Tube
TSC148DCI C0	ITO-220	50pcs / Tube
TSC148DCM RN	TO-263-2L	800pcs / 13” Reel

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

Parameter		Symbol	Limit	Unit
Collector-Base Voltage		V_{CBO}	700	V
Collector-Emitter Voltage		V_{CEO}	400	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 @ Tc=25ºC	TO-220, TO-263	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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Thermal Performance

Parameter		Symbol	Limit	Unit
Thermal Resistance - Junction to Case	TO-220	$R\Theta_{JC}$	1.78	°C/W
	ITO-220		5	
	TO-263-2L		1.78	
Thermal Resistance - Junction to Ambient	TO-220	$R\Theta_{JA}$	62.5	°C/W
	ITO-220		62.5	
	TO-263-2L		62.5	

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

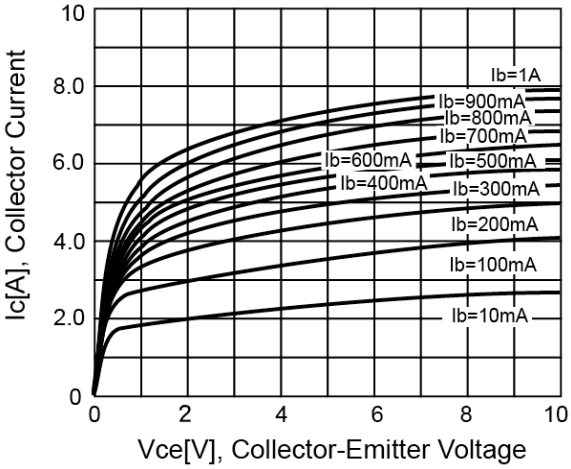


Figure 2. DC Current Gain

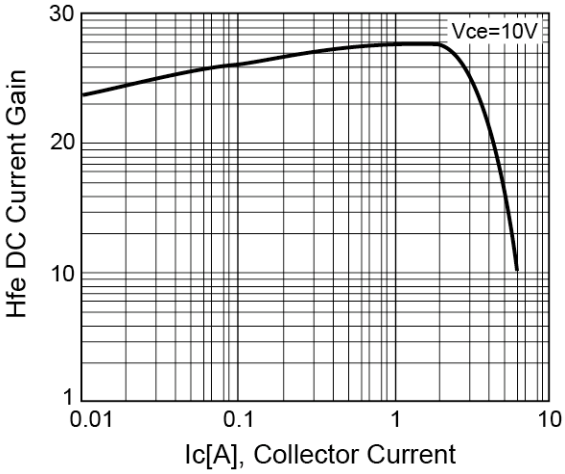


Figure 3. Vce(sat) v.s. Vbe(sat)

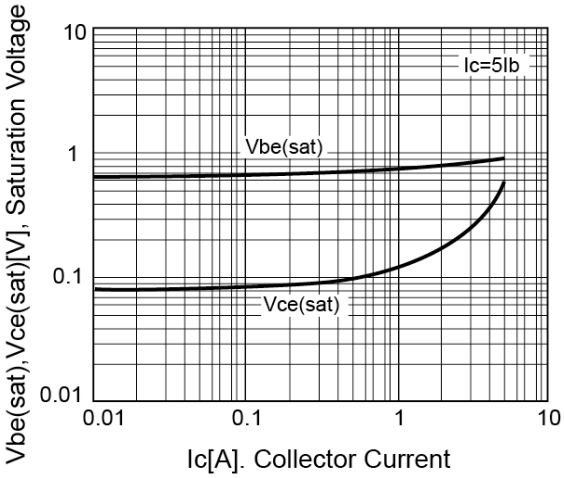
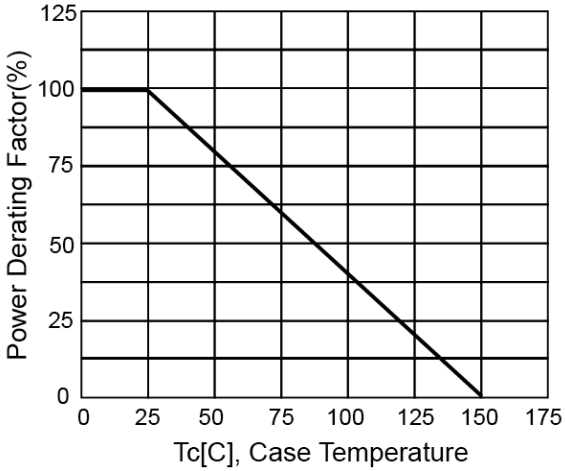


Figure 4. Power Derating



TSC148D

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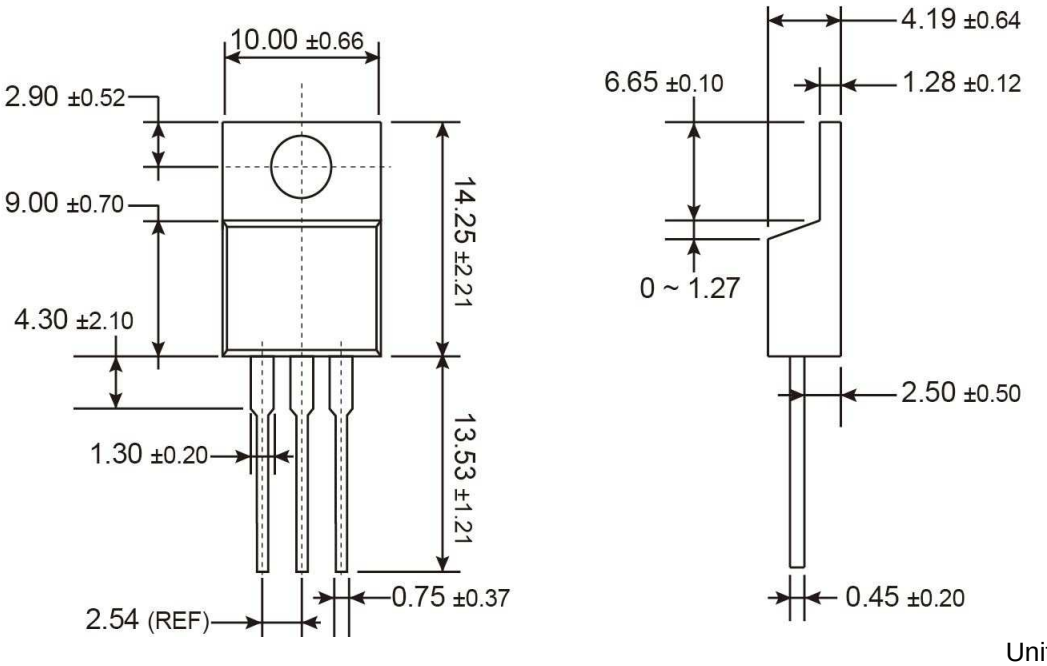
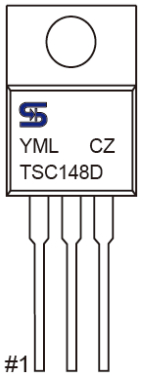
NPN Power Transistor

TO-220 Mechanical Drawing



Unit: Millimeters

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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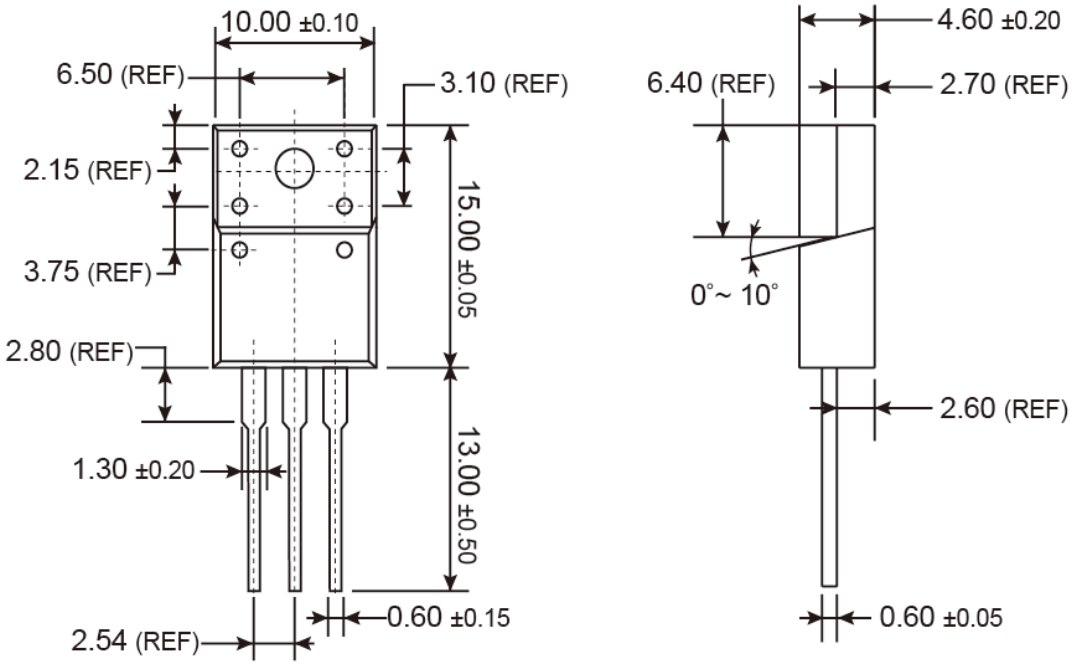
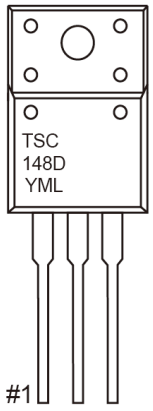
NPN Power Transistor

ITO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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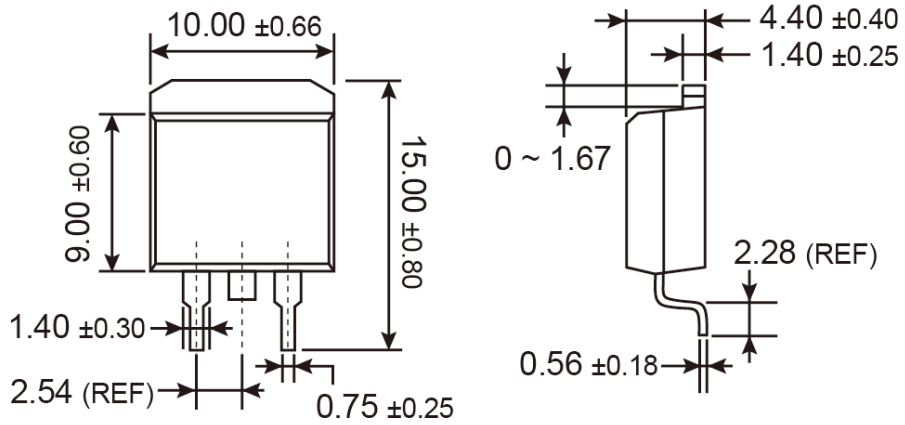
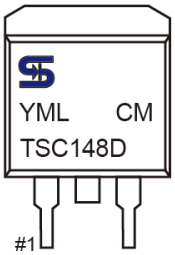
NPN Power Transistor

TO-263 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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