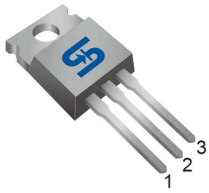
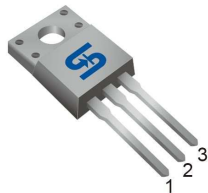


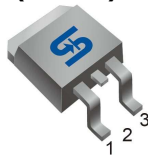
TO-220



ITO-220



TO-263-2L
(D²PAK)



Pin Definition:

1. Base
2. Collector
3. Emitter

PRODUCT SUMMARY

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

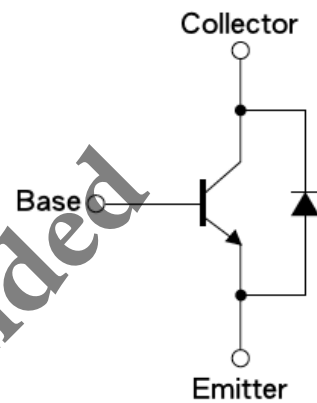
Features

- Build-in Free-wheeling Diode Makes Efficient Anti-saturation Operation
- No Need to Interest an h_{fe} 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
- Integrated Anti-parallel Collector-Emitter Diode

Block Diagram



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=25°C	TO-220, TO-263	80	W
	ITO-220	36	W
Maximum Operating Junction Temperature	T_J	+150	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

Thermal Performance

Parameter		Symbol	Limit	Unit
Thermal Resistance - Junction to Case	TO-220	$R_{\theta_{JC}}$	1.78	$^{\circ}\text{C/W}$
	ITO-220		5	
	TO-263-2L		1.78	
Thermal Resistance - Junction to Ambient	TO-220	$R_{\theta_{JA}}$	62.5	$^{\circ}\text{C/W}$
	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	$I_C = 1\text{mA}, I_B = 0$	BV_{CBO}	700	--	--	V
Collector-Emitter Breakdown Voltage ^a	$I_C = 1\text{mA}, I_E = 0$	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 0.1\text{mA}, I_C = 0$	BV_{EBO}	9	--	--	V
Collector Cutoff Current	$V_{CB} = 700\text{V}, I_E = 0$	I_{CBO}	--	--	10	μA
Collector Cutoff Current	$V_{CE} = 400\text{V}, I_E = 0$	I_{CEO}	--	--	100	μA
Emitter Cutoff Current	$V_{EB} = 9\text{V}, I_C = 0$	I_{EBO}	--	--	100	μA
Collector-Emitter Saturation Voltage ^a	$I_C = 2\text{A}, I_B = 0.4\text{A}$	$V_{CE(SAT)1}$	--	--	0.8	V
	$I_C = 5\text{A}, I_B = 1\text{A}$	$V_{CE(SAT)2}$	--	--	1.5	
	$I_C = 8\text{A}, I_B = 2\text{A}$	$V_{CE(SAT)3}$	--	--	2	
Base-Emitter Saturation Voltage ^a	$I_C = 4\text{A}, I_B = 0.4\text{A}$	$V_{BE(SAT)1}$	--	--	1.2	V
	$I_C = 5\text{A}, I_B = 1\text{A}$	$V_{BE(SAT)2}$	--	--	1.6	
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 2\text{A}$	Hfe	18	--	40	
	$V_{CE} = 5\text{V}, I_C = 5\text{A}$		8	--	25	
Diode Forward Voltage	$I_f = 3\text{A}$	Vf	--	--	2	V

Resistive Load Switching Time (Ratings)

Turn On Time	$V_{CC} = 125\text{V}, I_C = 5\text{A},$ $I_{B1} = I_{B2} = 1\text{A},$ $t_p = 25\mu\text{S}$ Duty Cycle < 1%	t_{ON}	--	--	0.6	μS
Storage Time		t_{STG}	--	1.3	1.6	μS
Fall Time		t_f	--	--	0.3	μS

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

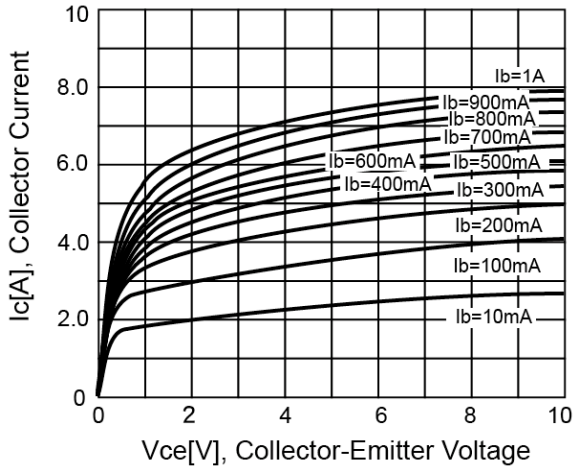


Figure 2. DC Current Gain

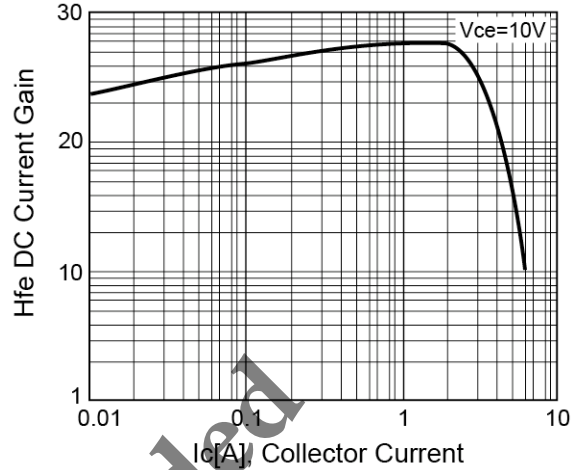


Figure 3. $V_{ce(sat)}$ v.s. $V_{be(sat)}$

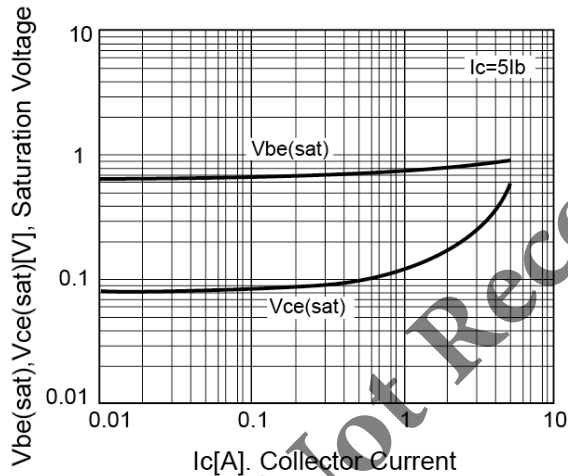
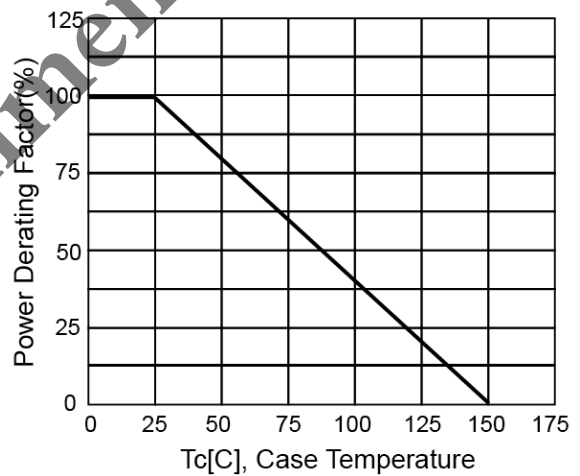
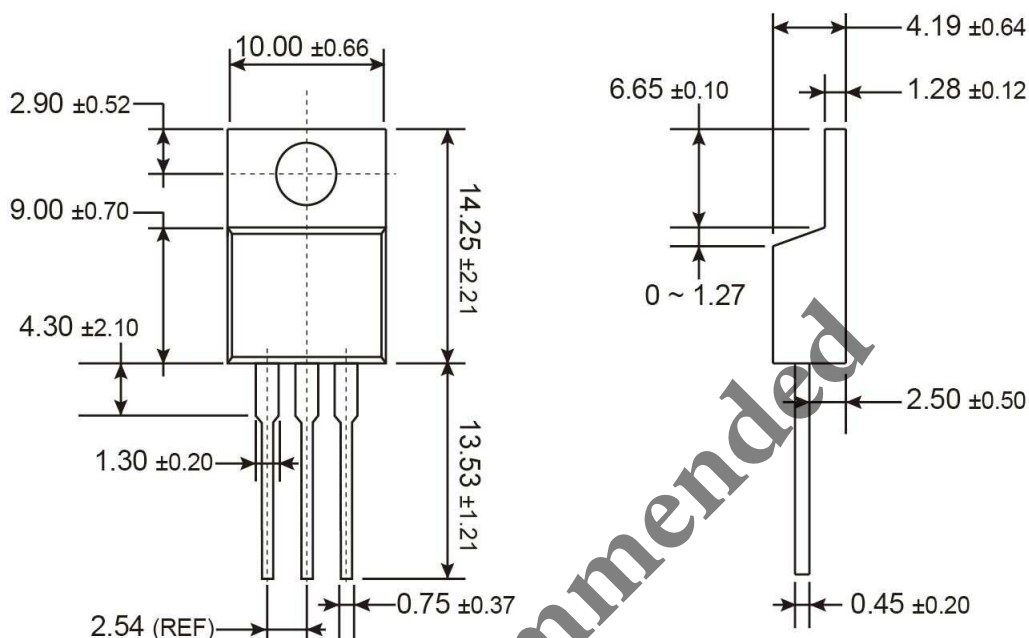


Figure 4. Power Derating

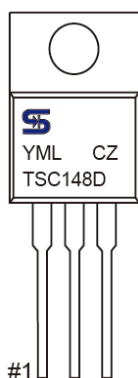


TO-220 Mechanical Drawing



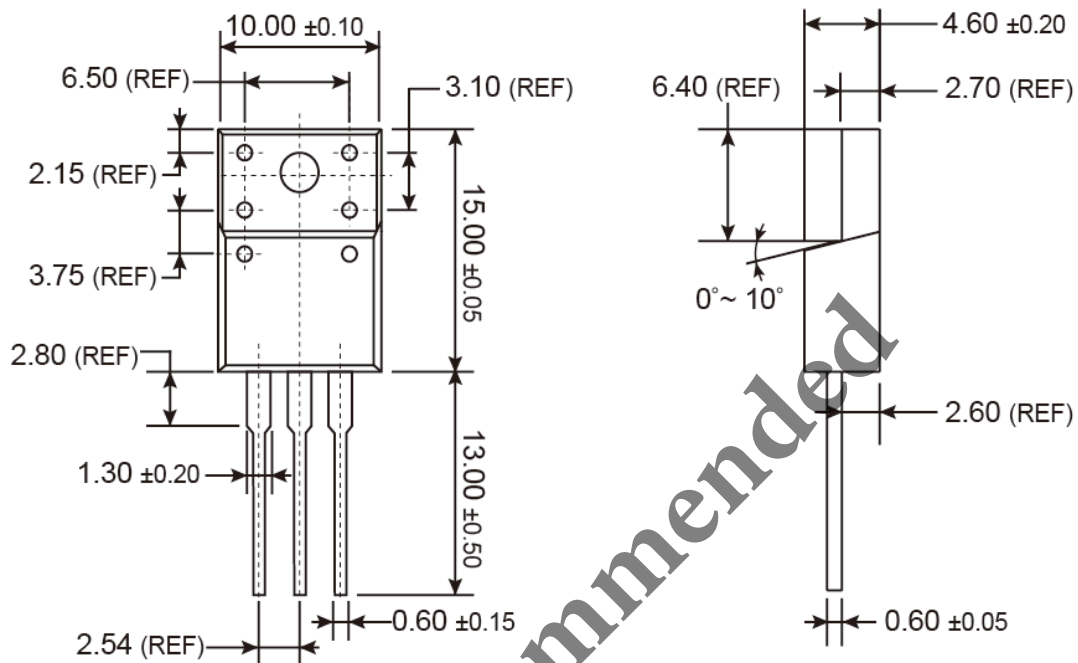
Unit: Millimeters

Marking Diagram



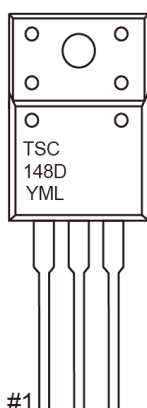
Y = Year Code
M = Month Code
 (A=Jan, B=Feb, C=Mar, D=Apr, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
L = Lot Code

ITO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



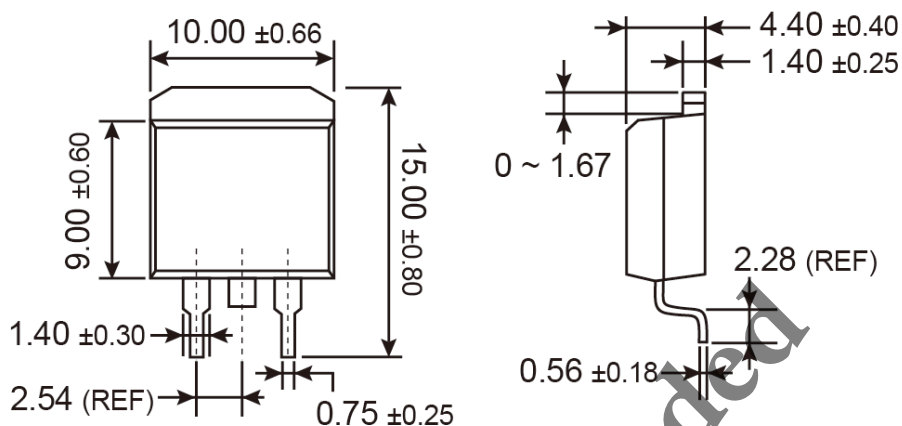
Y = Year Code

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)

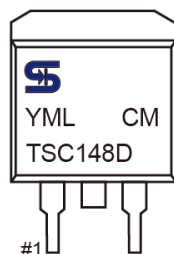
L = Lot Code

TO-263 Mechanical Drawing



Unit: Millimeters

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)
L = Lot Code

Not Recommended

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