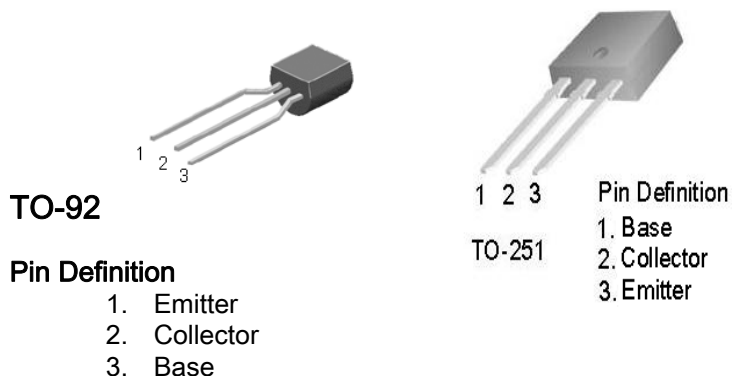
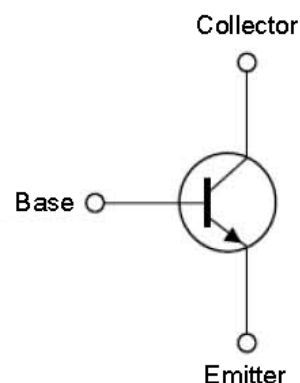


High Voltage NPN Transistor



INTERNAL SCHEMATIC DIAGRAM



Features

- High Voltage
- High Switch Speed
- $BV_{CEO} : 500V$
- $BV_{CBO} : 850V$
- $I_C : 1.5A$
- $V_{CE(SAT)} : 0.5V @ I_C / I_B = 0.5A / 0.1A$
- Silicon Triple Diffused Type

Application

- Electronic Ballasts
- Adapter
- Charger
- Lighting

ABSOLUTE MAXIMUM RATINGS ($T_c = 25^{\circ}C$)

Parameter	Symbol	Max Rating	Unit
Collector-Base Voltage	VCBO	850	V
Collector-Emitter Voltage	VCEO	500	V
Emitter-Base Voltage	VEBO	10	V
Collector Current(DC)	IC	1.5	A
Collector Current(Pulse)	ICP	3	A
Total Power Dissipation(TO92)	Ptot	1.96	W
Total Power Dissipation(TO251)		30	
Junction Temperature	TJ	150	$^{\circ}C$
Operating Junction and Storage Temperature Range	TSTG	-55 ~ +150	$^{\circ}C$

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-Base Voltage	BVCBO	$I_C = 1\text{mA}$, $I_B = 0$	850	—	—	V
Collector-Emitter Breakdown Voltage	BVCEO	$I_C = 10\text{mA}$, $I_E = 0$	500	—	—	V
Emitter- Base Breakdown Voltage	BVEBO	$I_E = 1\text{mA}$, $I_C = 0$	9	—	—	V
Collector Cutoff Current	ICBO	$V_{CB} = 800\text{V}$, $I_E = 0$	—	—	10	μA
Emitter Cutoff Current	IEBO	$V_{EB} = 10\text{V}$, $I_C = 0$	—	—	0.5	μA
DC Current Gain	hFE1	$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$	15	—	40	
	hFE2	$V_{CE} = 10\text{V}$, $I_C = 400\text{mA}$	20	—	40	
	hFE3	$V_{CE} = 10\text{V}$, $I_C = 1\text{A}$	6	—	40	
Collector-Emitter Saturation Voltage	$V_{CE}(\text{SAT}1)$	$I_C/I_B = 0.5\text{A} / 0.1\text{A}$	—	0.3	0.5	V
	$V_{CE}(\text{SAT}2)$	$I_C/I_B = 1.0\text{A} / 0.25\text{A}$	—	0.5	1	
	$V_{CE}(\text{SAT}3)$	$I_C/I_B = 1.5\text{A} / 0.5\text{A}$	—	0.9	2	
Base-Emitter Saturation Voltage	$V_{BE}(\text{SAT}1)$	$I_C/I_B = 0.5\text{A} / 0.1\text{A}$	—	—	1	V
	$V_{BE}(\text{SAT}2)$	$I_C/I_B = 1.0\text{A} / 0.25\text{A}$	—	—	1.2	

Dynamic

Frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 0.1\text{A}$	4	—	—	MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $f = 0.1\text{MHz}$	—	21	—	pF

Resistive Load Switching Time (Ratings)

Delay Time	t_d	$V_{CC} = 125\text{V}$, $I_C = 1\text{A}$, $I_{B1} = I_{B2} = 0.2\text{A}$, $t_p = 25\mu\text{s}$ Duty Cycle $\leq 1\%$	—	0.05	0.2	μs
Rise Time	t_r		—	1.1	—	μs
Storage Time	t_{STG}		—	2	4	μs
Fall Time	t_f		—	0.4	0.7	μs

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

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

Figure 1. Static Characteristics

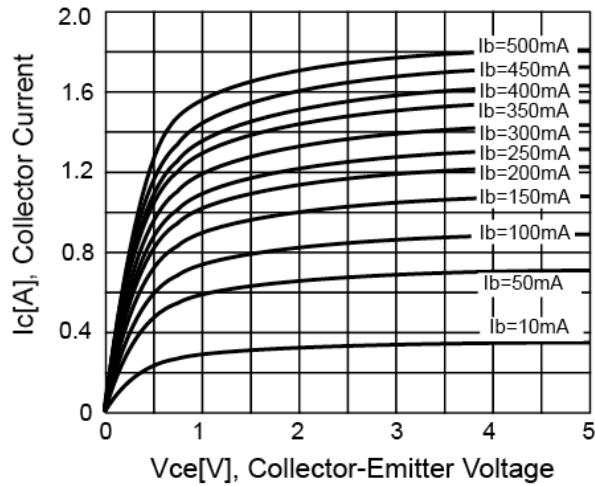


Figure 2. DC Current Gain

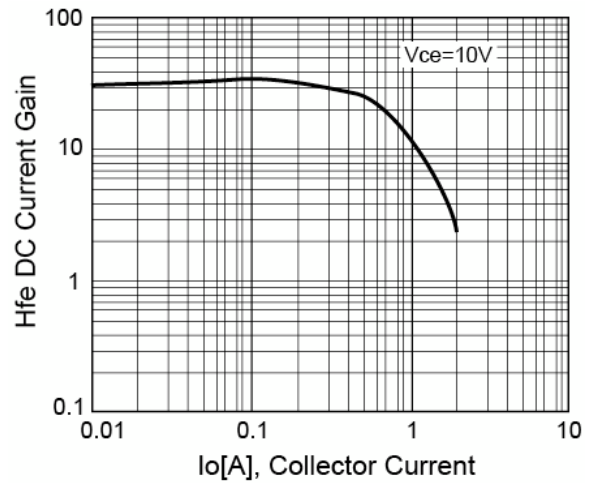


Figure 3. $V_{ce(sat)}$ v.s. $V_{be(sat)}$

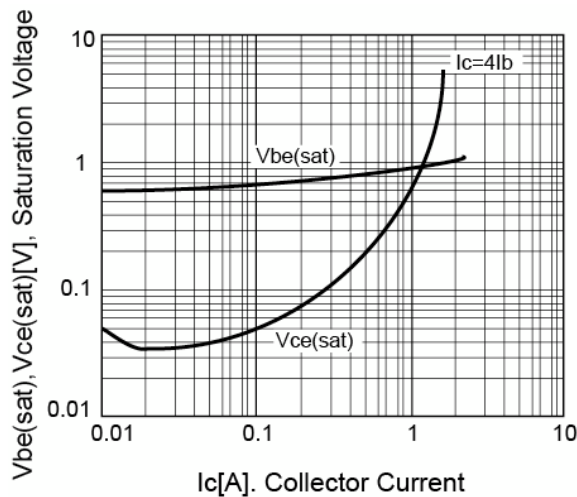


Figure 4. Power Derating

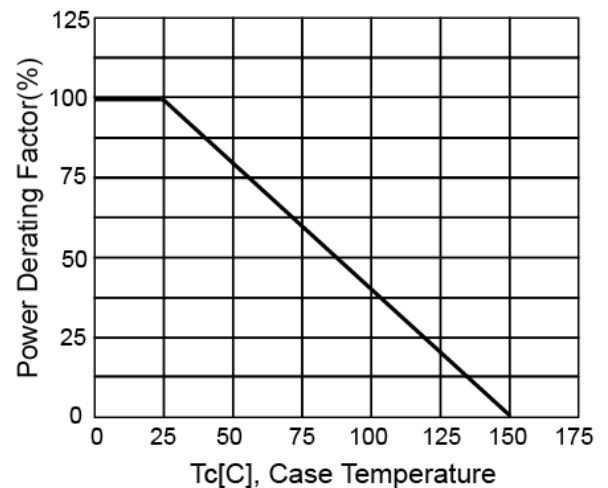


Figure 5. Reverse Bias SOA

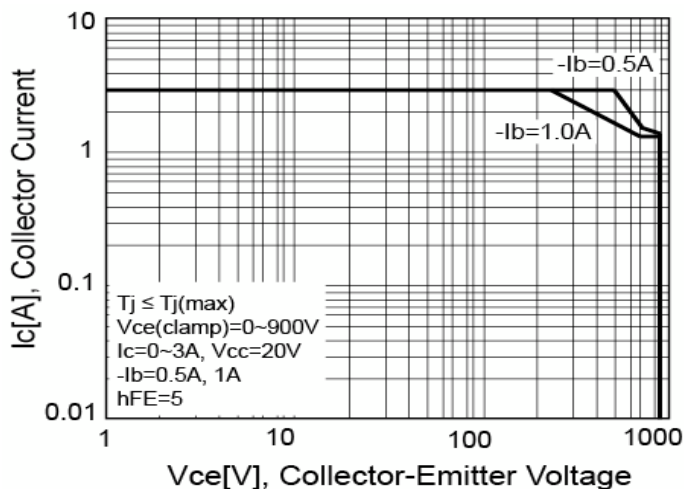
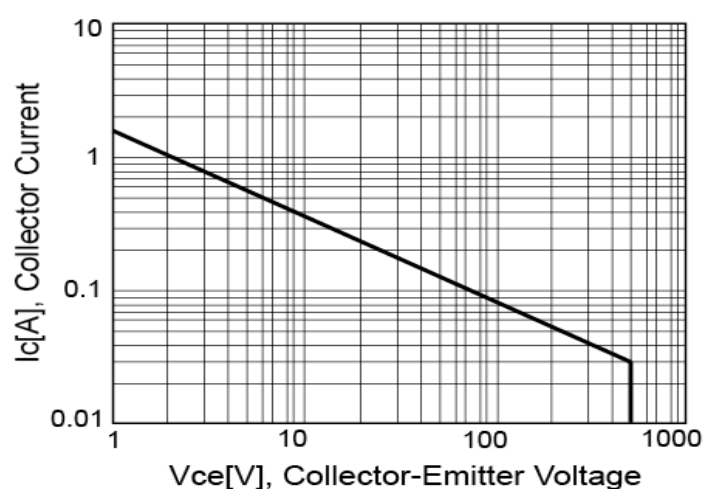


Figure 6. Safety Operating Area



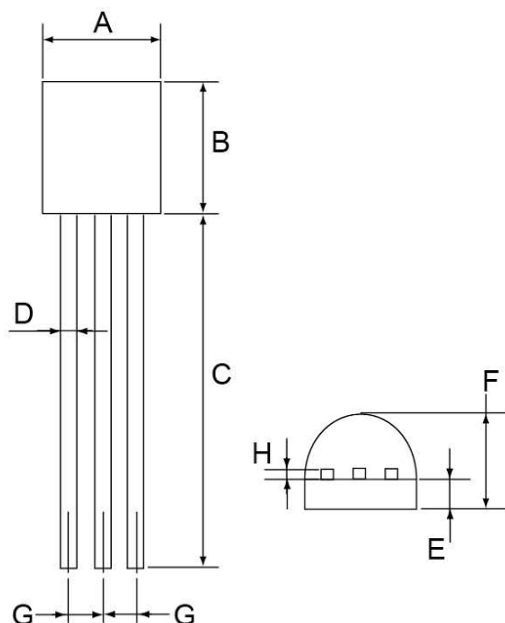
Ordering Information

Type NO	Marking	Package Code
WTBV49SL	BV49SL	TO-92

Marking and Pin Define

First Line	WTC	Company Name	
Second Line	BV49SL	Product Code	
Third Line	<u>B</u> <u>K</u> <u>0</u> <u>T</u> <u>L</u>	1st (Year Code)	A-2010 B-2011 C-2012 ...
		2nd (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
		3rd (Lot Code)	0~9 , A~Z
		4th (Product Code)	M - MOS , T - Transistor, L - Linear
		5th (Package Code)	I - TO251, D - TO252 , L - TO92, M - TO126, X - TO220, F - TO220F, Y - SOT89, S - SOP8
		6th (Spec Code)	(Reserve)

TO-92 Package Dimension



TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.3	4.7	0.169	0.185
B	4.3	4.7	0.169	0.185
C	13.53(typ)		0.532(typ)	
D	0.39	0.49	0.015	0.019
E	1.18	1.28	0.046	0.5
F	3.3	3.7	0.13	0.146
G	1.27	1.31	0.05	0.051
H	0.33	0.43	0.013	0.017

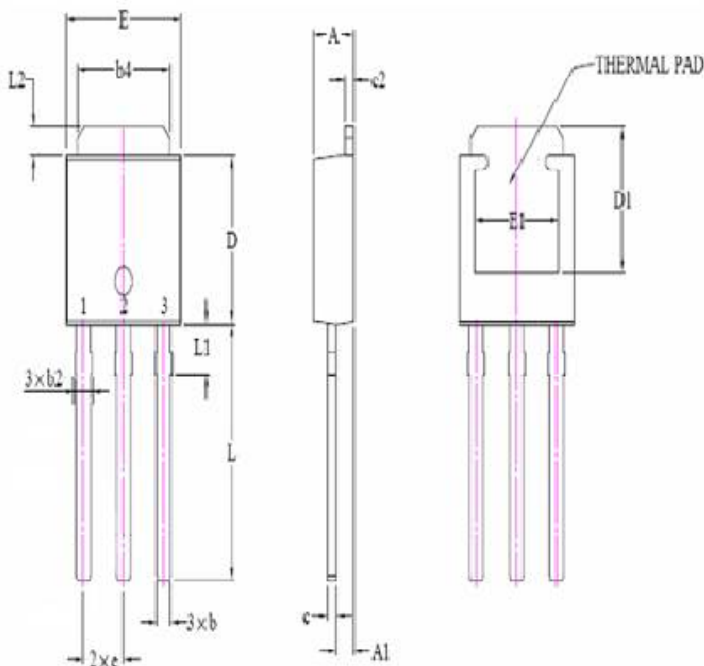
Ordering Information

Type NO	Marking	Package Code
WTI49S	49SI	TO-251

Marking and Pin Define

First Line	WTC	Company Name	
Second Line	49SI	Product Code	
Third Line	A J 0 T M	1st (Year Code)	A-2010 B-2011 C-2012 ...
		2nd (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
		3rd (Lot Code)	0~9, A~Z
		4th (Product Code)	M - MOS, T - Transistor, L - Linear
		5th (Package Code)	I - TO251, D - TO252, L - TO92, M - TO126, X - TO220, F - TO220F, Y - SOT89, S - SOP8
		6th (Spec Code)	(Reserve)

TO-251 Package Dimension



Symbol	TO-251DL			
	Millimeters		Inches	
	Min	Max	Min	Max
A	2.230	2.420	0.087	0.095
A1	0.900	1.140	0.035	0.045
b	0.550	0.670	0.022	0.026
b2	0.700	0.950	0.030	0.038
b4	5.200	5.400	0.205	0.213
c	0.450	0.570	0.018	0.023
c2	0.450	0.550	0.018	0.022
D	5.950	6.250	0.234	0.246
D1	4.300	4.500	0.165	0.177
E	5.400	5.700	0.212	0.254
E1	4.750	4.850	0.187	0.191
e	2.28 REF		0.090 REF	
L	8.900	9.500	0.350	0.374
L1	1.900	2.290	0.075	0.090
L2	0.900	1.000	0.035	0.039