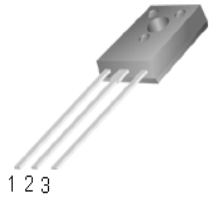


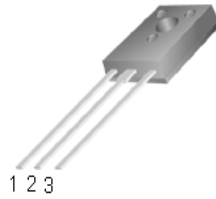
High Voltage NPN Transistor



TO-126

Pin Definition

1. Emitter
2. Collector
3. Base



TO-126 R

Pin Definition

1. Base
2. Collector
3. Emitter



TO-251

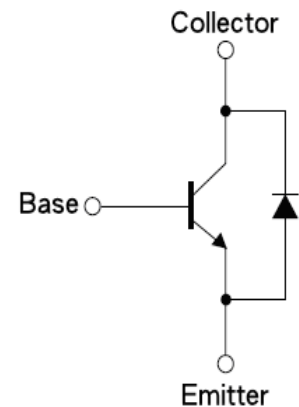
Pin Definition

1. Base
2. Collector
3. Emitter

Features

- High Voltage
- Very High Switch Speed
- $BV_{CEO} : 400V$
- $BV_{CBO} : 800V$
- $I_C : 2.5A$
- $V_{CE(SAT)} : \max 1V @ I_C / I_B = 1A / 0.25A$
- Silicon Triple Diffused Type

INTERNAL SCHEMATIC DIAGRAM



Application

- Electronic Ballasts
- Adapter
- Lighting

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

Parameter	Symbol	Max Rating	Unit
Collector-Base Voltage	VCBO	800	V
Collector-Emitter Voltage	VCEO	400	V
Emitter-Base Voltage	VEBO	9	V
Collector Current(DC)	IC	2.5	A
Collector Current(Pulse)	ICP	5	A
Total Power Dissipation(TO126)	PD	20	W
Total Power Dissipation(TO251)		30	
Junction Temperature	TJ	150	°C
Operating Junction and Storage Temperature Range	TSTG	-55 ~ +150	°C

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-Base Voltage	BVCBO	$I_C = 1\text{mA}$, $I_B = 0$	800	—	—	V
Collector-Emitter Breakdown Voltage	BVCEO	$I_C = 10\text{mA}$, $I_E = 0$	400	—	—	V
Emitter- Base Breakdown Voltage	BVEBO	$I_E = 1\text{mA}$, $I_C = 0$	9	—	—	V
Collector Cutoff Current	ICBO	$V_{CB} = 700\text{V}$, $I_E = 0$	—	—	1	μA
Emitter Cutoff Current	IEBO	$V_{EB} = 9\text{V}$, $I_C = 0$	—	—	1	μA
DC Current Gain	hFE1	$V_{CE} = 5\text{V}$, $I_C = 500\text{mA}$	25	—	—	
	hFE2	$V_{CE} = 5\text{V}$, $I_C = 1\text{A}$	15	—	30	
	hFE3	$V_{CE} = 5\text{V}$, $I_C = 2\text{A}$	5	—	—	
Collector-Emitter Saturation Voltage	$V_{CE(SAT1)}$	$I_C/I_B = 0.5\text{A} / 0.1\text{A}$	—	—	0.5	V
	$V_{CE(SAT2)}$	$I_C/I_B = 1\text{A} / 0.25\text{A}$	—	—	1	
Base-Emitter Saturation Voltage	$V_{BE(SAT1)}$	$I_C/I_B = 0.5\text{A} / 0.1\text{A}$	—	—	1.2	V
	$V_{BE(SAT2)}$	$I_C/I_B = 1\text{A} / 0.25\text{A}$	—	—	1.4	

Resistive Load Switching Time (Ratings)

Rise Time	t_r	$V_{CC} = 250\text{V}$, $I_C = 1\text{A}$,	—	—	0.8	μS
Storage Time	t_{STG}	$I_{B1} = I_{B2} = 0.2\text{A}$,	—	3	6	μS
Fall Time	t_f	$t_p = 25\mu\text{S}$ Duty Cycle $\leq 1\%$	—	0.2	0.7	μS

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

Figure 1. Static Characteristics

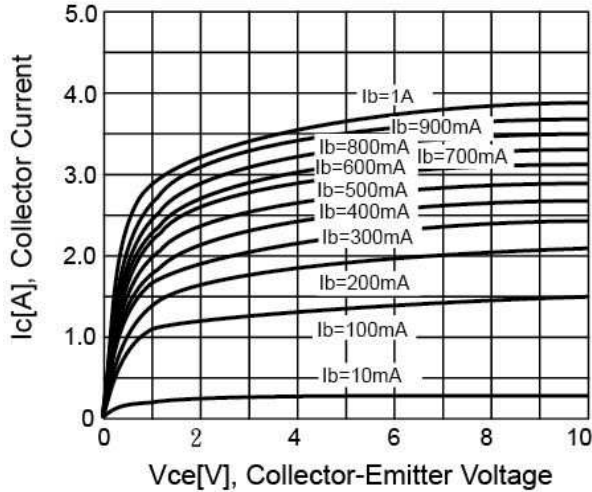


Figure 2. DC Current Gain

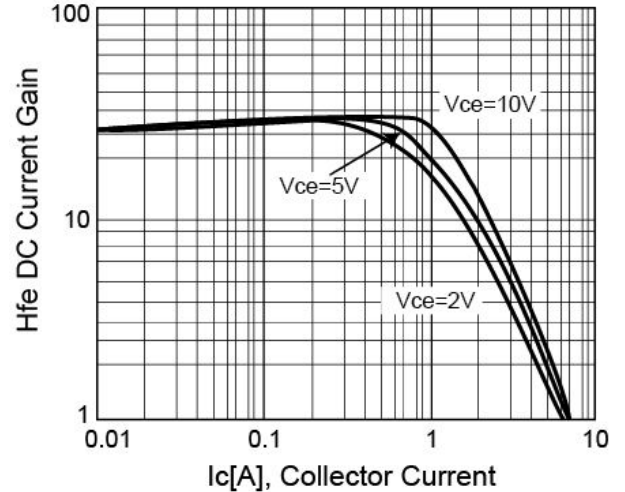


Figure 3. $V_{ce(sat)}$ v.s. $V_{be(sat)}$

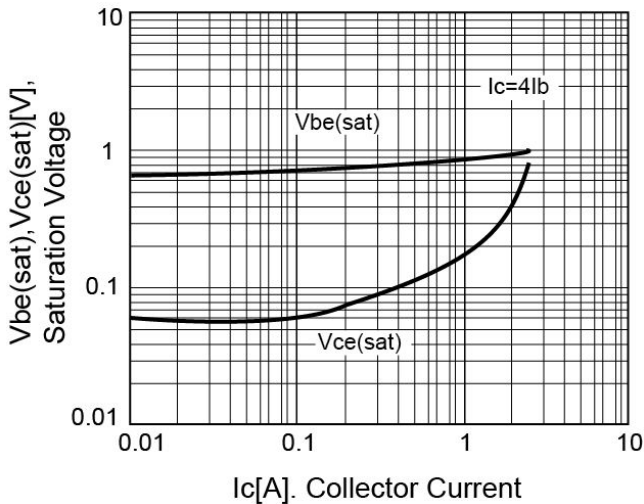


Figure 4. Power Derating

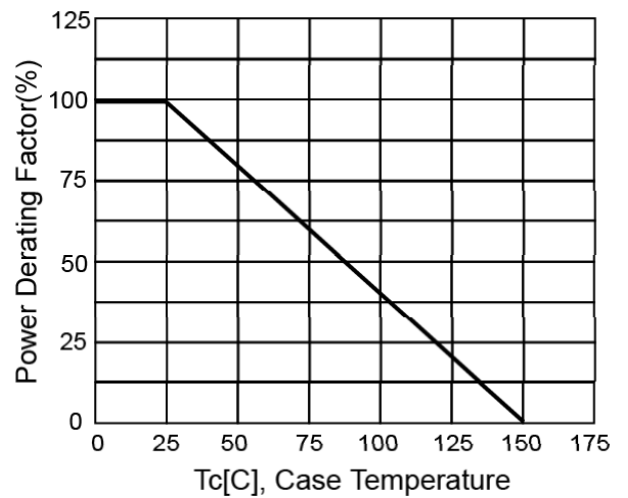


Figure 5. Reverse Bias SOA

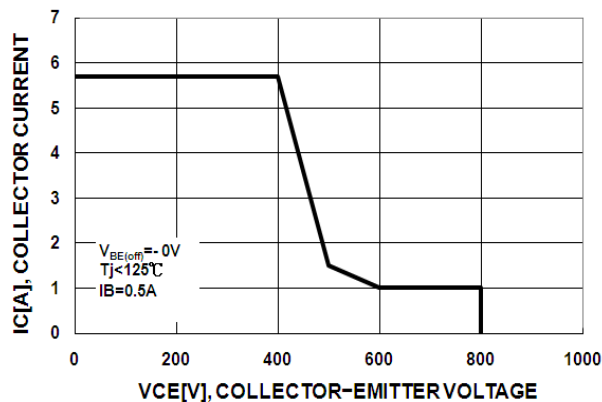
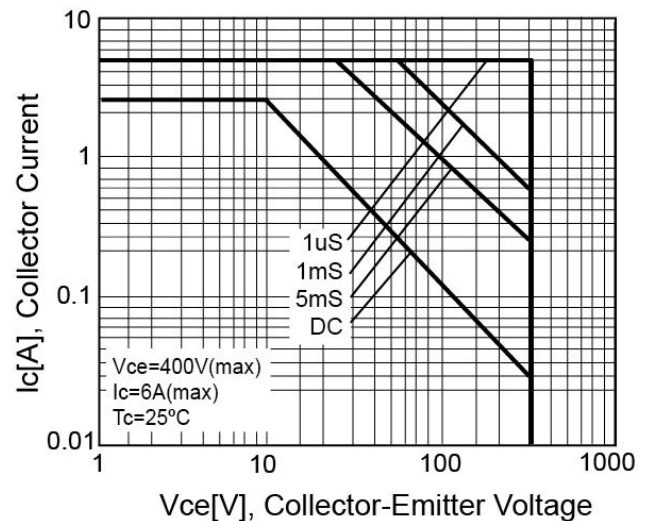


Figure 6. Safety Operating Area



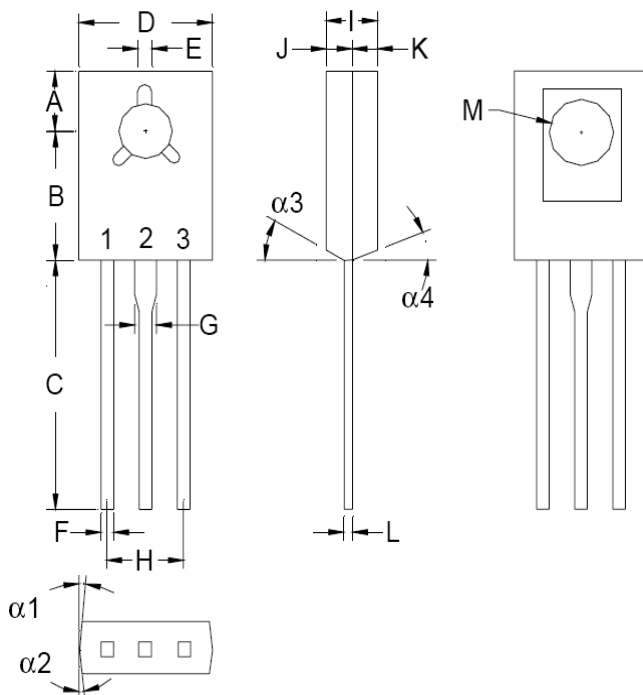
Ordering Information

Type NO	Marking	Package Code
WTBV53DM	BV53DM	TO-126
WTBV53DMR	BV53DM	TO-126R

Marking and Pin Define

First Line	WTC	Company Name	
Second Line	BV53DM	Product Code	
Third Line	CC0TM	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-126 Package Dimension



TO-126 DIMENSION				
	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
$\alpha 1$	—	3°	—	3°
$\alpha 2$	—	3°	—	3°
$\alpha 3$	—	3°	—	3°
$\alpha 4$	—	3°	—	3°
A	0.15	0.153	3.81	3.91
B	0.275	0.279	6.99	7.09
C	0.531	0.61	13.5	15.5
D	0.285	0.303	7.52	7.72
E	0.034	0.041	0.95	1.05
F	0.028	0.031	0.71	0.81
G	0.048	0.052	1.22	1.32
H	0.17	0.189	4.34	4.8
I	0.095	0.105	2.41	2.66
J	0.045	0.055	1.14	1.39
K	0.045	0.055	1.14	1.39
L	—	0.021	—	0.55
M	0.137	0.152	3.5	3.86

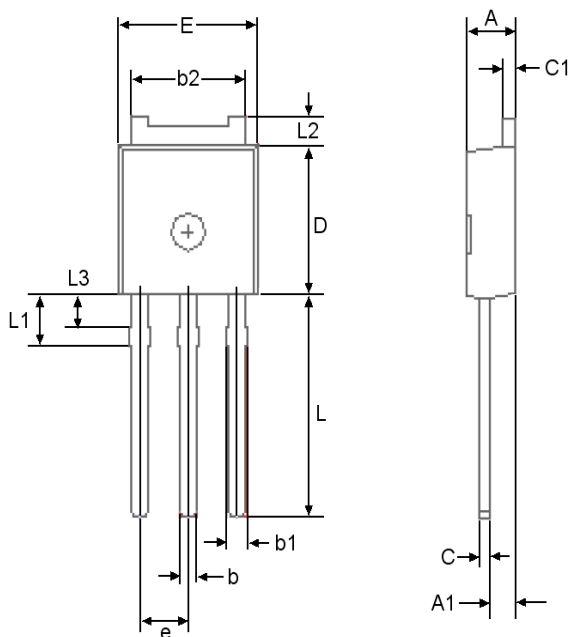
Ordering Information

Type NO	Marking	Package Code
WTI53D	53DI	TO-251

Marking and Pin Define

First Line	WTC	Company Name	
Second Line	53DI	Product Code	
Third Line	CC0TI	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



TO-251 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
C	0.46	0.58	0.018	0.023
C1	0.46	0.58	0.018	0.023
D	5.97	6.10	0.235	0.240
E	6.35	6.73	0.250	0.265
e	2.28 BSC.		0.90 BSC.	
L	8.89	9.65	0.350	0.380
L1	1.91	2.28	0.075	0.090
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.045	0.060