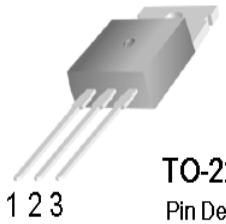
WTX13009 / WTF13009
POWER TRANSISTOR

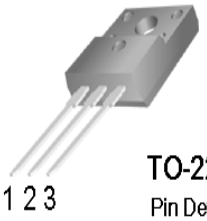
High Voltage NPN Power Transistor

Features

- High Voltage
- High Switch Speed
- BV_{CEO} : 400V
- BV_{CBO} : 700V
- I_C : 12A
- $V_{CE(SAT)}$: 2V @ I_C / I_B = 8A / 1.6A



TO-220
Pin Definition
1. Base
2. Collector
3. Emitter

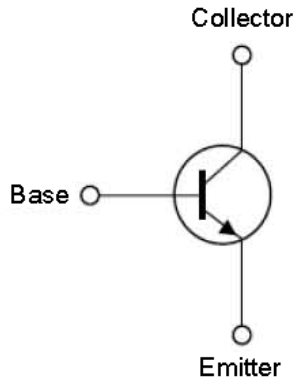


TO-220F
Pin Definition
1. Base
2. Collector
3. Emitter

Application

- Electronic Ballasts
- Adapter
- Lighting

INTERNAL SCHMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Tc = 25℃)

Parameter	Symbol	Max rating	Unit
Collector-Base Voltage	VCBO	700	V
Collector-Emitter Voltage	VCEO	400	V
Emitter-Base Voltage	VEBO	9	V
Collector Current (DC)	I_C	12	A
Collector Current (Pulse)		24	A
Base Current (DC)	I_B	6	A
Total Power Dissipation (TO-220)	P_D	75	W
Total Power Dissipation (TO-220F)	P_D	30	W
Junction Temperature	T_J	+150	℃
Operating Junction and Storage Temperature Range	T_{STG}	-55 ~ +150	℃

Note: Single Pulse. Pw=300uS, Duty≦ 2%

ELECTRICAL CHARACTERISTICS (Tc = 25℃)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-Base Voltage	BVCBO	IC = 1mA, IB=0	800	–	–	V
Collector-Emitter Breakdown Voltage	BVCEO	IC = 10mA, IE=0	450	–	–	V
Emitter- Base Breakdown Voltage	BVEBO	IE = 1mA, IC=0	9	–	–	V
Collector Cutoff Current	ICEO	VCE = 400V, IB=0	–	–	1	mA
Collector Cutoff Current	ICBO	VCB = 700V, IE=0	–	–	1	mA
Emitter Cutoff Current	IEBO	VEB = 9V, IC=0	–	–	1	mA
DC Current Gain	hFE1	VCE = 5V, IC=5A	15	–	40	
	hFE2	VCE = 5V, IC=8A	5	–	30	
Collector-Emitter Saturation Voltage	VCE(SAT1)	IC = 5A, IB = 1A	–	–	1.2	V
	VCE(SAT2)	IC = 8A, IB =1.6A	–	–	1.6	
Base-Emitter Saturation Voltage	VBE(SAT1)	IC = 5A, IB = 1A	–	–	1.5	V
	VBE(SAT2)	IC = 8A, IB =1.6A	–	–	2	

Dynamic

Frequency	f_T	VCE = 10V, IC=0.5A	4	–	–	MHz
Output Capacitance	Cob	VCB = 10V, f=0.1MHz	–	180	–	pF

Resistive Load Switching Time (Ratings)

Rise Time	t_r	Vcc=125V,IC=8A, IB1=1A,IB2=1.6A, tp=25uS Duty Cycle ≦ 2%	–	0.75	1.3	uS
Storage Time	t_{STG}		–	3	5	uS
Fall Time	t_f		–	0.5	0.9	uS

Note: Pulse test: pulse width ≦ 300uS, duty cycle ≦ 2%

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

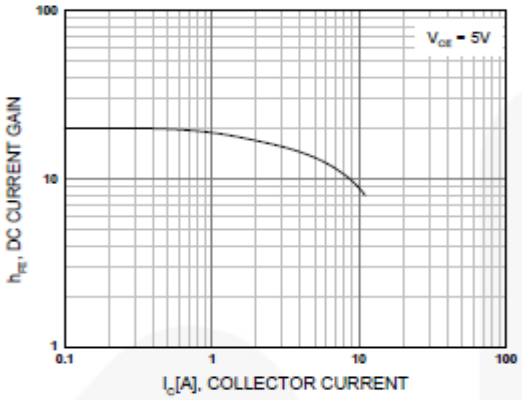


Figure 1. DC Current Gain

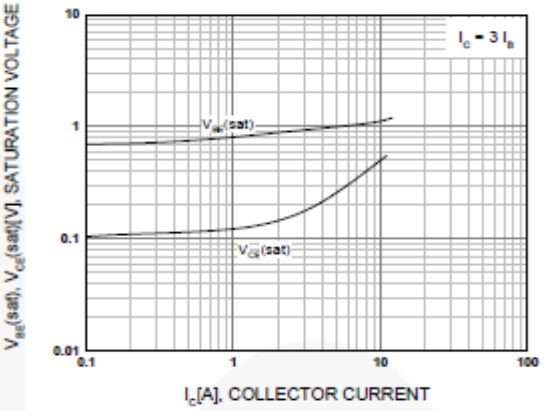


Figure 2. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

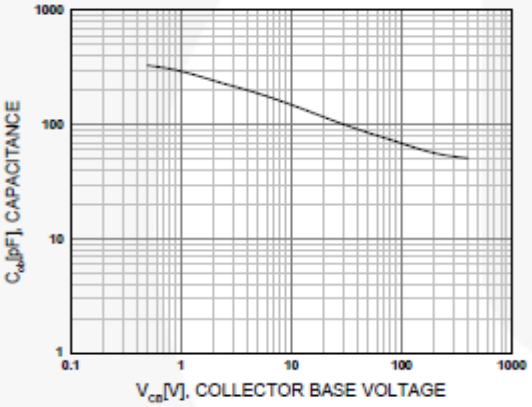


Figure 3. Collector Output Capacitance

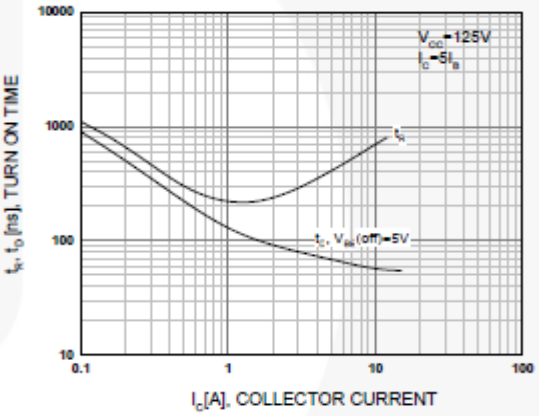


Figure 4. Turn-On Time

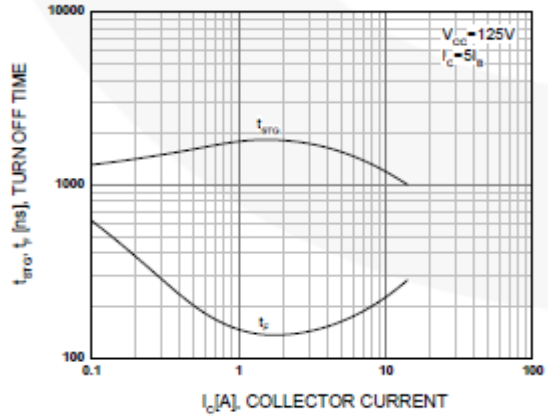


Figure 5. Turn-Off Time

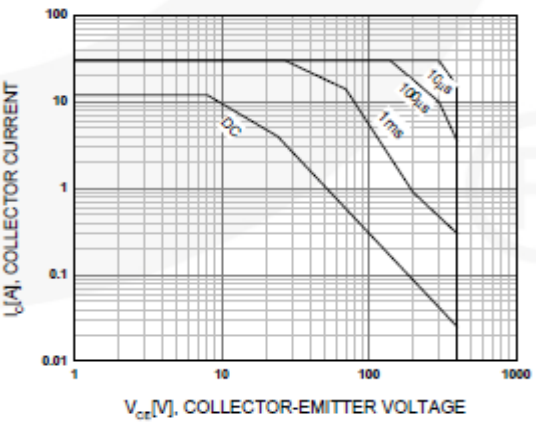


Figure 6. Forward Bias Safe Operating Area

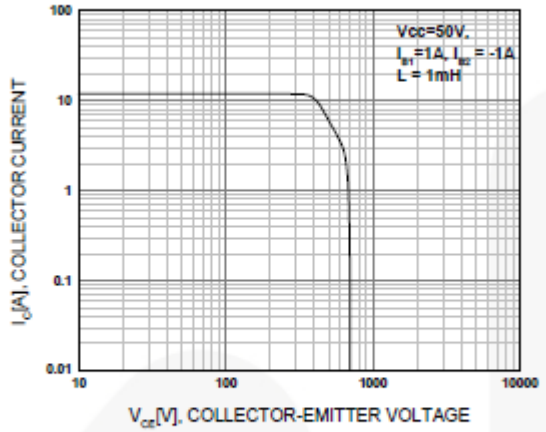


Figure 7. Reverse Bias Safe Operating Area

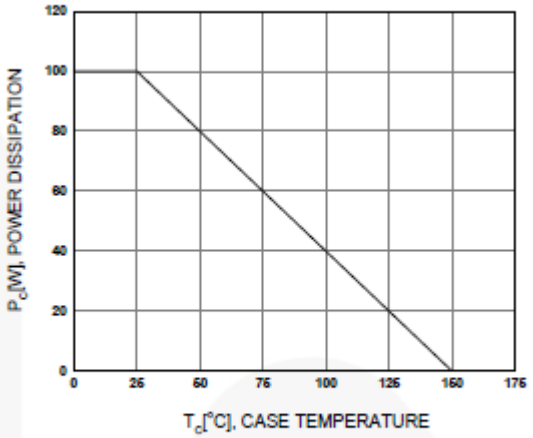
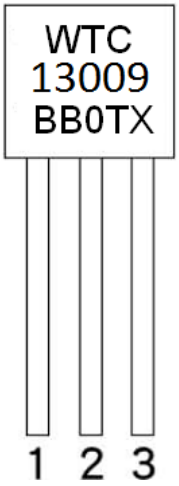


Figure 8. Power Derating

Ordering Information

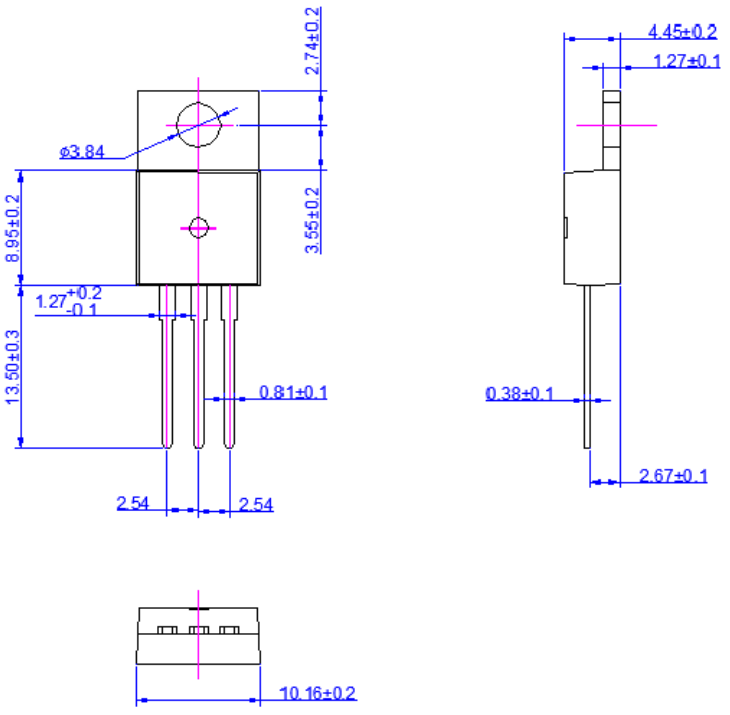
Type NO	Marking	Package Code
WTX13009	13009	TO-220

Marking and Pin Define



First Line	WTC	Company Name	
Second Line	13009	Product Code	
Third Line	B B 0 T X	1st (Year Code)	A-2010 B-2011 C-2012 D-2013 ...
		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)

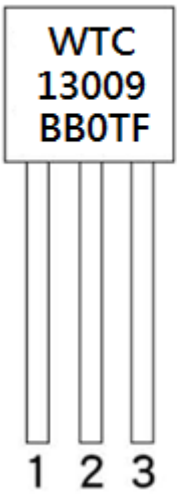
TO-220 Package Dimension



Ordering Information

Type NO	Marking	Package Code
WTF13009	13009	TO-220F

Marking and Pin Define



First Line	WTC	Company Name	
Second Line	13009	Product Code	
Third Line	B B 0 T F	1st (Year Code)	A-2010 B-2011 C-2012 D-2013 ....
		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-220F Package Dimension