

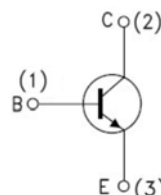


## WGF13005

## Features:

- High Voltage Capability
- High Switching Speed
- Suitable for Electronic Ballast and Switching Mode Power Supply
- 100% Avalanche Tested

TO-220F



1. Base (B)
2. Collector (C)
3. Emitter (E)

### Absolute Maximum Ratings\*

$T = 25^{\circ}\text{C}$  unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	720	V
$V_{CEO}$	Collector-Emitter Voltage	450	V
$V_{EBO}$	Emitter-Base Voltage	12	V
$I_C$	Collector Current (DC)	4	A
$I_{CP}$	Collector Current (Pulse)	8	A
$I_B$	Base Current	2	A
$P_C$	Collector Dissipation ( $T_C = 25^{\circ}\text{C}$ )	70	W
$T_J$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-65 ~ 150	$^{\circ}\text{C}$

### Electrical Characteristics

$T_C = 25^{\circ}\text{C}$  unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 50\mu\text{A}, I_E = 0$	850			V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}, I_B = 0$	450			V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}, I_C = 0$	12			V
$I_{CES}$	Collector Cut-off Current	$V_{CE} = 720\text{V}, V_{EB} = 0$			1	mA
$I_{CEO}$	Collector Cut-off Current	$V_{CE} = 400\text{V}, I_B = 0$			5	mA
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			5	mA
$h_{FE}$	DC Current Gain	$V_{CE} = 5\text{V}, I_C = 5\text{mA}$ $V_{CE} = 5\text{V}, I_C = 2\text{A}$	19 15		23 18	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 4.0\text{A}, I_B = 1.0\text{A}$ $I_C = 5.0\text{A}, I_B = 1.0\text{A}$			0.7 1.2	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 5.0\text{A}, I_B = 1.0\text{A}$			1.2	V
$V_f$	Internal Diode Forward Voltage Drop	$I_F = 2\text{A}$			2.5	V

\* Pulse Test:  $PW \leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

### Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.78	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	$^{\circ}\text{C}/\text{W}$

Typical Performance Characteristics

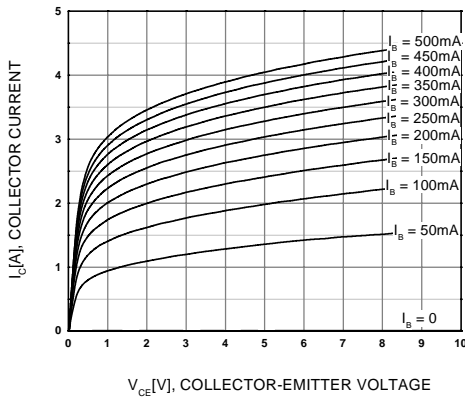


Figure 1. Static Characteristic

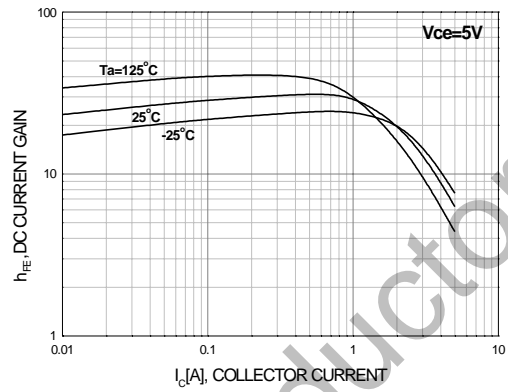


Figure 2. DC Current Gain

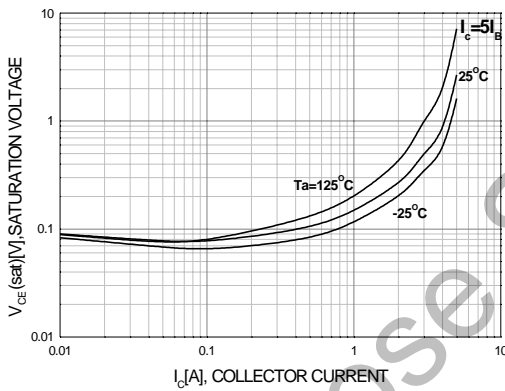


Figure 3. Collector-Emitter Saturation Voltage

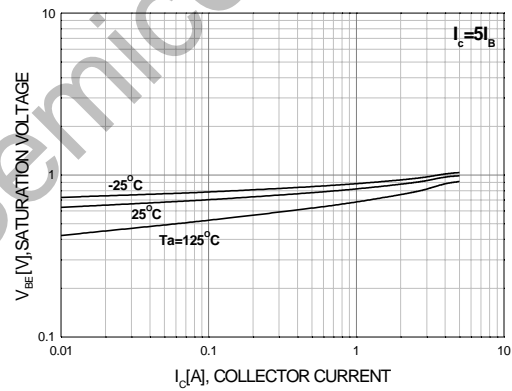


Figure 4. Base-Emitter Saturation Voltage

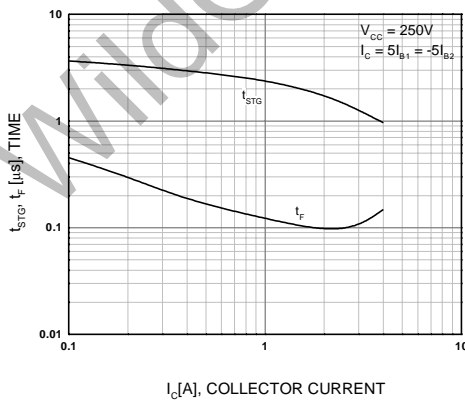


Figure 5. Resistive Load Switching Time

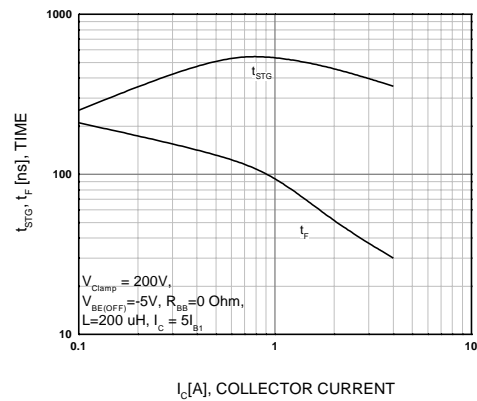


Figure 6. Inductive Load Switching Time

Typical Performance Characteristics

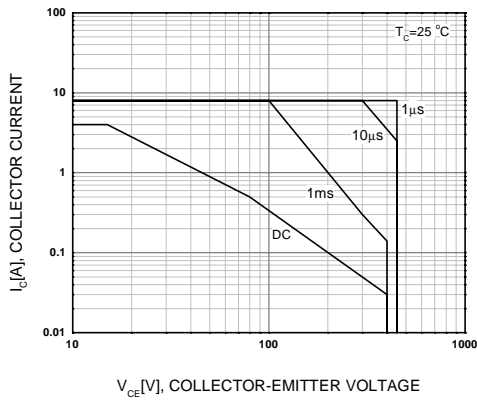


Figure 7. Forward Bias Safe Operating Area

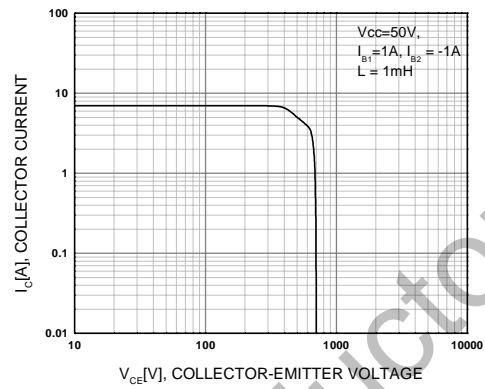


Figure 8. Reverse Bias Safe Operating Area

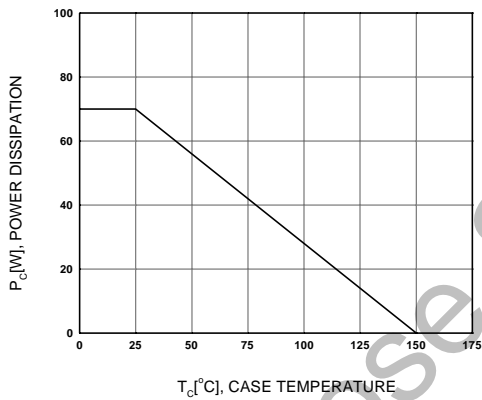
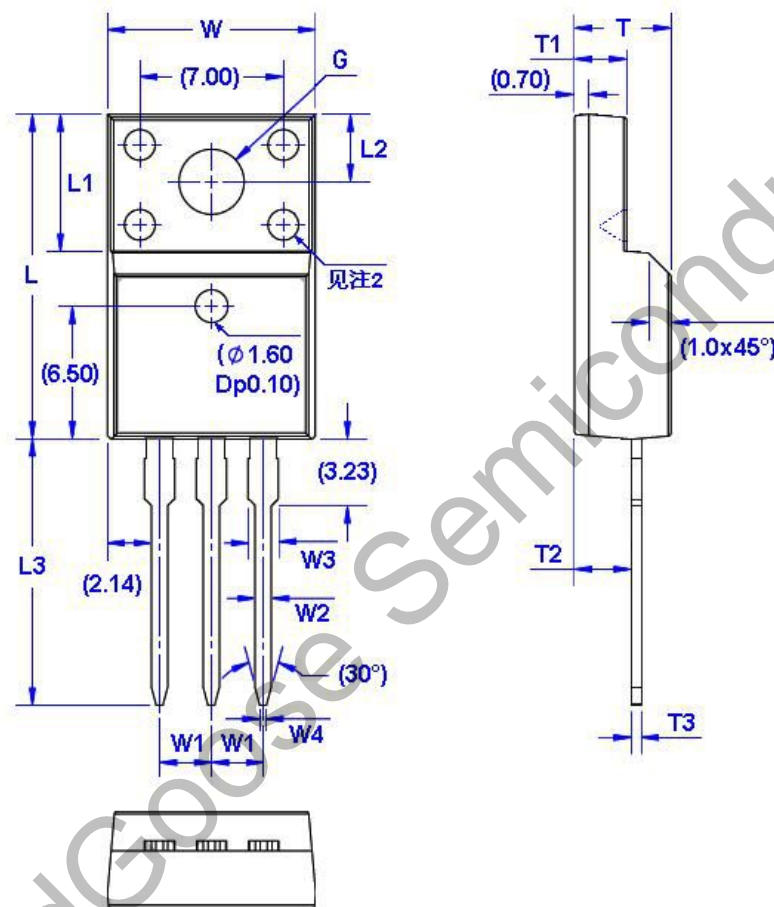


Figure 9. Power Derating

Package Dimension

## TO-220F

Unit: mm



Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.96	10.36	W4	0.25	0.45	L3	12.78	13.18	T3	0.45	0.60
W1	2.54 (TYP)		L	15.67	16.07	T	4.50	4.90	G( $\Phi$ )	3.08	3.28
W2	0.70	0.90	L1	6.48	6.88	T1	2.34	2.74			
W3	1.24	1.47	L2	3.20	3.40	T2	2.56	2.96			

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