



# TIG056BF

## N-Channel IGBT

430V, 240A, VCE(sat); 3.6V TO-220F-3FS

ON Semiconductor®

<http://onsemi.com>

### Features

- Low-saturation voltage
- Ultrahigh speed switching
- Enhancement type
- Protection diode in

### Specifications

Absolute Maximum Ratings at Ta=25°C

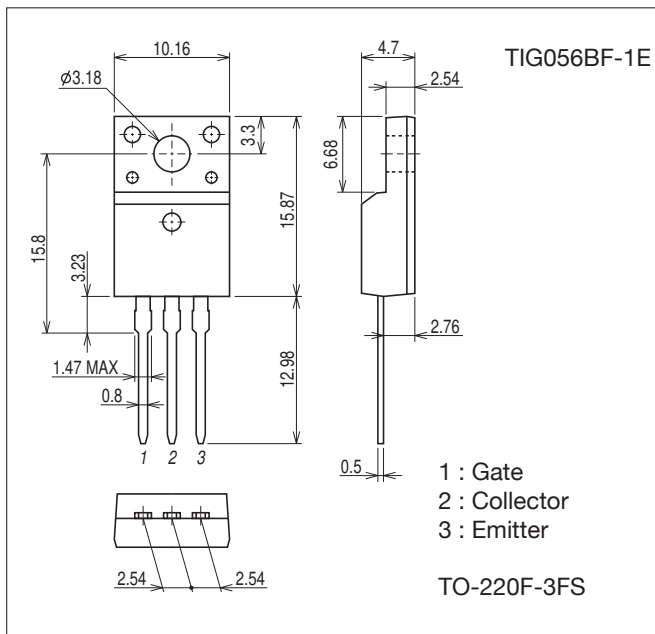
| Parameter                    | Symbol           | Conditions                                   | Ratings     | Unit |
|------------------------------|------------------|--|-------------|------|
| Collector to Emitter Voltage | V <sub>CES</sub> |  | 430         | V    |
| Gate to Emitter Voltage      | V <sub>GES</sub> |  | ±33         | V    |
| Collector Current (Pulse)    | I <sub>CP</sub>  | V <sub>GE</sub> =15V, C <sub>M</sub> =2000µF | 240         | A    |
| Allowable Power Dissipation  | P <sub>D</sub>   | T <sub>c</sub> =25°C                         | 30          | W    |
| Channel Temperature          | T <sub>ch</sub>  |  | 150         | °C   |
| Storage Temperature          | T <sub>stg</sub> |  | -55 to +150 | °C   |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

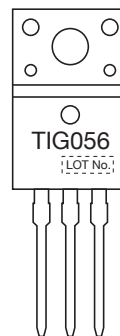
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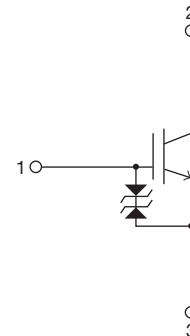
### Ordering & Package Information

| Device      | Package              | Shipping            | memo    |
|-------------|----------------------|---------------------|---------|
| TIG056BF-1E | TO-220F-3FS<br>SC-67 | 50<br>pcs./magazine | Pb-Free |

### Marking



### Electrical Connection

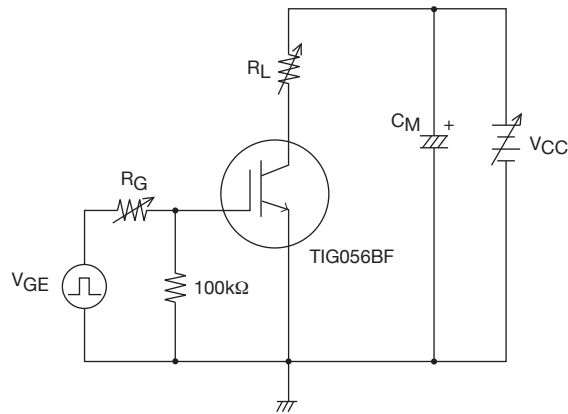


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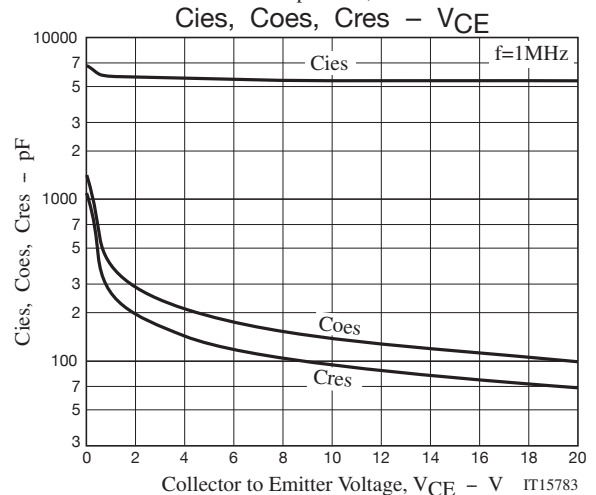
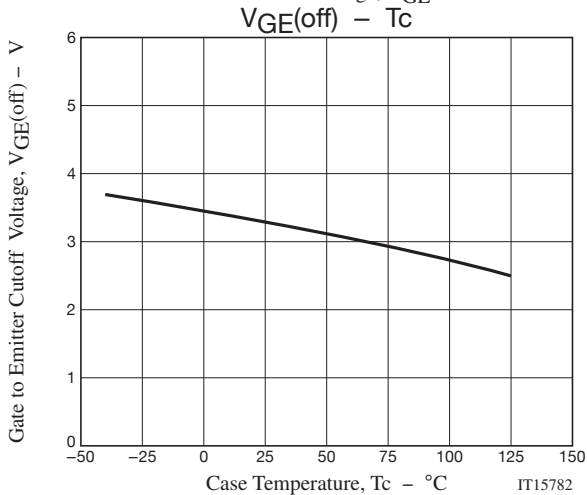
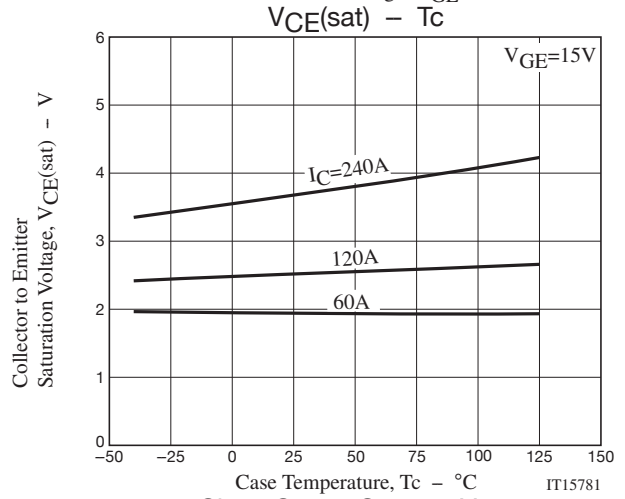
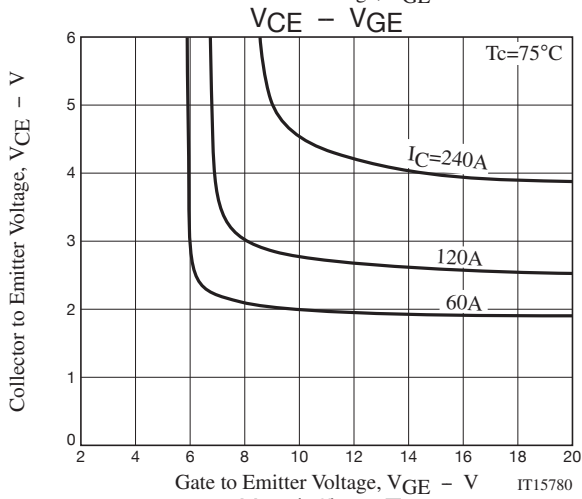
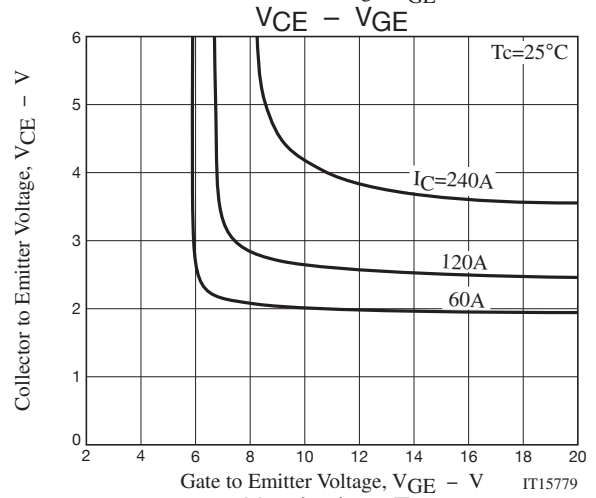
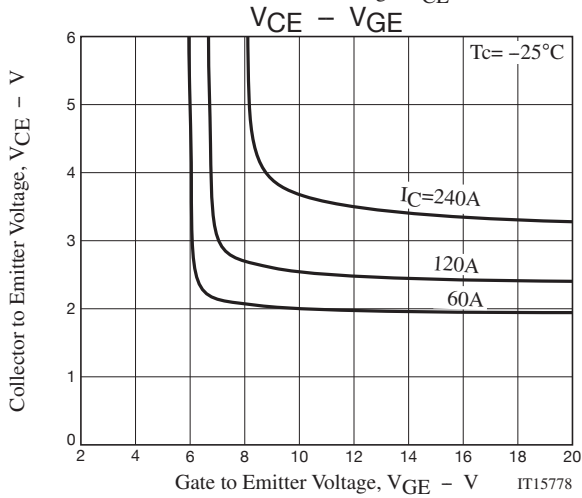
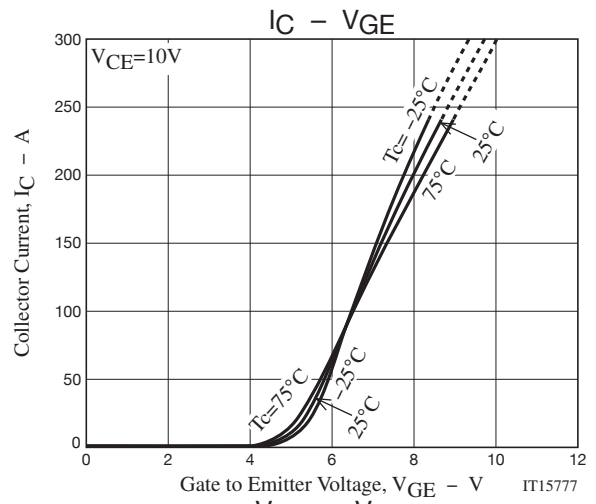
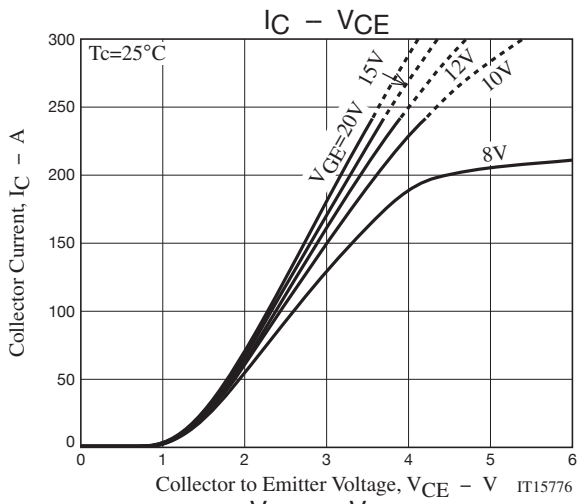
## Electrical Characteristics at $T_a=25^\circ\text{C}$

| Parameter                               | Symbol               | Conditions   | Ratings |      |          | Unit          |    |
|---|----------------------|--|---------|------|----------|---------------|----|
|   |                      |  | min     | typ  | max      |               |    |
| Collector to Emitter Breakdown Voltage  | $V_{(BR)CES}$        | $I_C=2\text{mA}, V_{GE}=0\text{V}$                                     | 430     |      |          | V             |    |
| Collector to Emitter Cutoff Current     | $I_{CES}$            | $V_{CE}=320\text{V}, V_{GE}=0\text{V}$                                 |         |      | 100      | $\mu\text{A}$ |    |
| Gate to Emitter Leakage Current         | $I_{GES}$            | $V_{GE}=\pm 30\text{V}, V_{CE}=0\text{V}$                              |         |      | $\pm 10$ | $\mu\text{A}$ |    |
| Gate to Emitter Threshold Voltage       | $V_{GE(\text{off})}$ | $V_{CE}=10\text{V}, I_C=1\text{mA}$                                    | 2.5     |      | 5.0      | V             |    |
| Collector to Emitter Saturation Voltage | $V_{CE(\text{sat})}$ | $I_C=240\text{A}, V_{GE}=15\text{V}$                                   |         | 3.6  | 5.0      | V             |    |
| Input Capacitance                       | $C_{ies}$            | $V_{CE}=20\text{V}, f=1\text{MHz}$                                     |         | 5500 |          | pF            |    |
| Output Capacitance                      | $C_{oes}$            |  |         |      | 100      |               | pF |
| Reverse Transfer Capacitance            | $C_{res}$            |  |         |      | 70       |               | pF |
| Turn-ON Delay Time                      | $t_{d(\text{on})}$   |  |         |      | 46       |               | ns |
| Rise Time                               | $t_r$                | $V_{CE}=320\text{V}, I_C=240\text{A}, V_{GE}=15\text{V}, R_G=10\Omega$ |         |      | 32       |               | ns |
| Turn-OFF Delay Time                     | $t_{d(\text{off})}$  |  |         |      | 140      |               | ns |
| Fall Time                               | $t_f$                |  |         |      | 270      |               | ns |

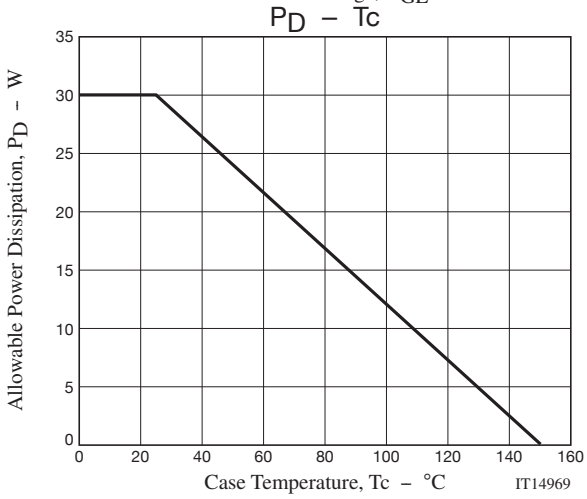
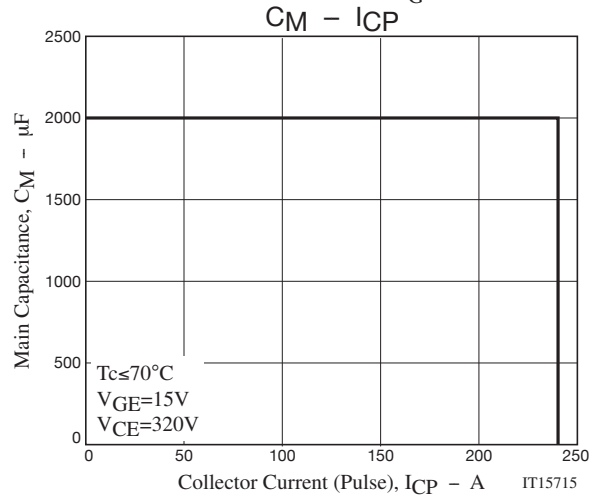
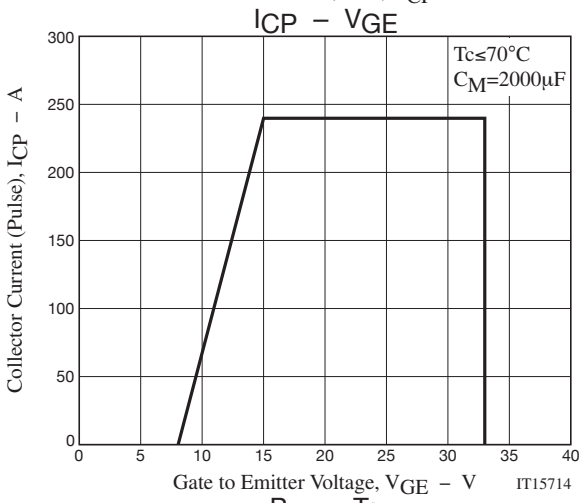
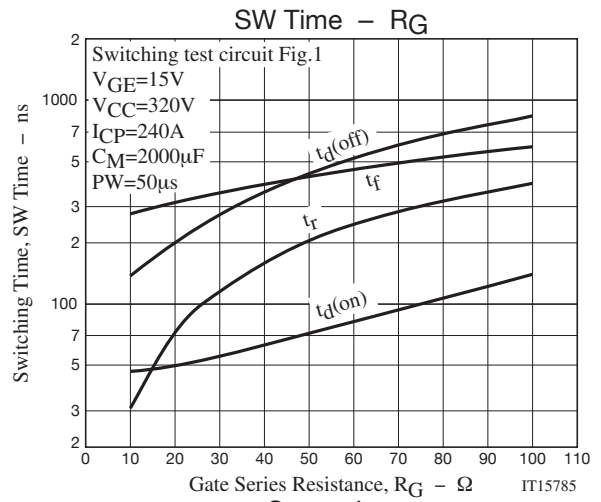
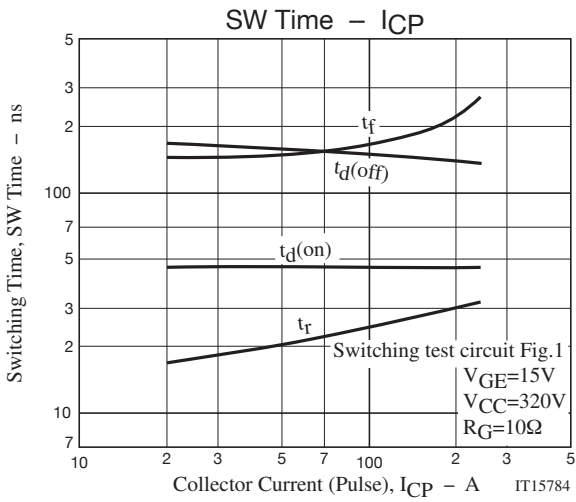
**Fig1 Large Current R Load Switching Circuit**



# TIG056BF



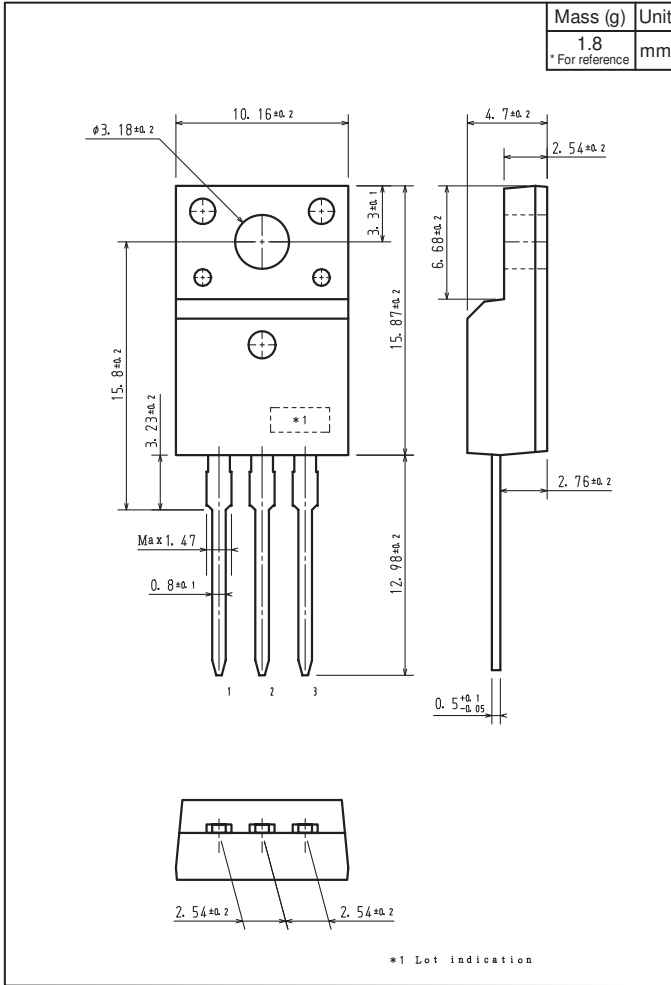
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## Outline Drawing

TIG056BF-1E



Note on usage : TIG056BF has protection diode between gate and emitter but handling it requires sufficient care to be taken.

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