

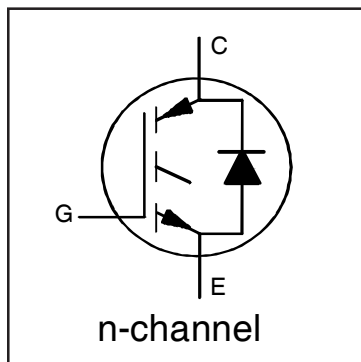
### INSULATED GATE BIPOLAR TRANSISTOR WITH ULTRAFAST SOFT RECOVERY DIODE

#### Features

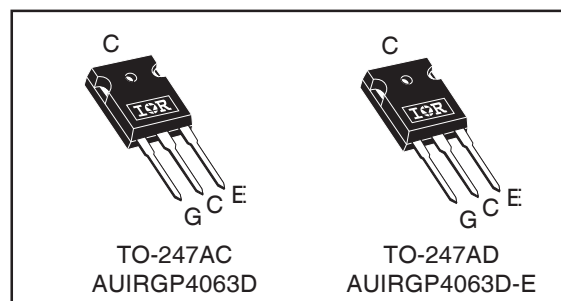
- Low  $V_{CE(ON)}$  Trench IGBT Technology
- Low switching losses
- Maximum Junction temperature 175 °C
- 5  $\mu$ S short circuit SOA
- Square RBSOA
- 100% of the parts tested for 4X rated current ( $I_{LM}$ )
- Positive  $V_{CE(ON)}$  Temperature co-efficient
- Ultra fast soft Recovery Co-Pak Diode
- Tight parameter distribution
- Lead Free Package

#### Benefits

- High Efficiency in a wide range of applications
- Suitable for a wide range of switching frequencies due to Low  $V_{CE(ON)}$  and Low Switching losses
- Rugged transient Performance for increased reliability
- Excellent Current sharing in parallel operation
- Low EMI



|  |
|--|
| $V_{CES} = 600V$                               |
| $I_C = 60A, T_C = 100^\circ C$                 |
| $t_{SC} \geq 5\mu s, T_{J(max)} = 175^\circ C$ |
| $V_{CE(on)} \text{ typ.} = 1.6V$               |



|          |           |          |
|----------|-----------|----------|
| <b>G</b> | <b>C</b>  | <b>E</b> |
| Gate     | Collector | Emitter  |

| Base part number | Package Type | Standard Pack |          | Orderable Part Number |
|------------------|--------------|---------------|----------|-----------------------|
|                  |              | Form          | Quantity |                       |
| AUIRGP4063D      | TO-247       | Tube          | 25       | AUIRGP4063D           |
| AUIRGP4063D-E    | TO-247       | Tube          | 25       | AUIRGP4063D-E         |

#### Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature ( $T_A$ ) is 25°C, unless otherwise specified.

|                           | Parameter   | Max.                              | Units |
|---------------------------|---|-----------------------------------|-------|
| $V_{CES}$                 | Collector-to-Emitter Voltage                        | 600                               | V     |
| $I_C @ T_C = 25^\circ C$  | Continuous Collector Current                        | 100                               | A     |
| $I_C @ T_C = 100^\circ C$ | Continuous Collector Current                        | 60                                |       |
| $I_{CM}$                  | Pulse Collector Current, $V_{GE} = 15V$             | 144                               |       |
| $I_{LM}$                  | Clamped Inductive Load Current, $V_{GE} = 20V$ ①    | 192                               |       |
| $I_F @ T_C = 25^\circ C$  | Diode Continuous Forward Current                    | 82                                |       |
| $I_F @ T_C = 100^\circ C$ | Diode Continuous Forward Current                    | 50                                |       |
| $I_{FM}$                  | Diode Maximum Forward Current ②                     | 192                               | V     |
| $V_{GE}$                  | Continuous Gate-to-Emitter Voltage                  | $\pm 20$                          |       |
|                           | Transient Gate-to-Emitter Voltage                   | $\pm 30$                          |       |
| $P_D @ T_C = 25^\circ C$  | Maximum Power Dissipation                           | 330                               | W     |
|                           |   | $P_D @ T_C = 100^\circ C$         |       |
| $T_J$<br>$T_{STG}$        | Operating Junction and<br>Storage Temperature Range | -55 to +175                       | °C    |
|                           | Soldering Temperature, for 10 sec.                  | 300 (0.063 in. (1.6mm) from case) |       |
|                           | Mounting Torque, 6-32 or M3 Screw                   | 10 lbf-in (1.1 N·m)               |       |

**Thermal Resistance**

|                         | Parameter  | Min. | Typ. | Max. | Units |
|-------------------------|--|------|------|------|-------|
| $R_{\theta JC}$ (IGBT)  | Thermal Resistance Junction-to-Case-(each IGBT)                | —    | —    | 0.45 | °C/W  |
| $R_{\theta JC}$ (Diode) | Thermal Resistance Junction-to-Case-(each Diode)               | —    | —    | 0.92 |       |
| $R_{\theta CS}$         | Thermal Resistance, Case-to-Sink (flat, greased surface)       | —    | 0.24 | —    |       |
| $R_{\theta JA}$         | Thermal Resistance, Junction-to-Ambient (typical socket mount) | —    | 80   | —    |       |

**Electrical Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

|                          | Parameter                               | Min. | Typ. | Max.      | Units   | Conditions  | Ref. Fig |
|--------------------------|---|------|------|-----------|---------|---|----------|
| $V_{(BR)CES}$            | Collector-to-Emitter Breakdown Voltage  | 600  | —    | —         | V       | $V_{GE} = 0V, I_C = 150\mu A$ ④                       | CT6      |
| $\Delta V_{(BR)CES}/T_J$ | Temperature Coeff. of Breakdown Voltage | —    | 0.30 | —         | V/°C    | $V_{GE} = 0V, I_C = 1mA$ (25°C-175°C)                 | CT6      |
| $V_{CE(on)}$             | Collector-to-Emitter Saturation Voltage | —    | 1.6  | 1.9       | V       | $I_C = 48A, V_{GE} = 15V, T_J = 25^\circ\text{C}$     | 5.6,7    |
|                          |   | —    | 1.9  | —         |         | $I_C = 48A, V_{GE} = 15V, T_J = 150^\circ\text{C}$    | 9,10,11  |
|                          |   | —    | 2.0  | —         |         | $I_C = 48A, V_{GE} = 15V, T_J = 175^\circ\text{C}$    |          |
| $V_{GE(th)}$             | Gate Threshold Voltage                  | 4.0  | —    | 6.5       | V       | $V_{CE} = V_{GE}, I_C = 1.4mA$                        | 9, 10,   |
| $\Delta V_{GE(th)}/T_J$  | Threshold Voltage temp. coefficient     | —    | -21  | —         | mV/°C   | $V_{CE} = V_{GE}, I_C = 1.0mA$ (25°C - 175°C)         | 11, 12   |
| $g_{fe}$                 | Forward Transconductance                | —    | 32   | —         | S       | $V_{CE} = 50V, I_C = 48A, PW = 80\mu s$               |          |
| $I_{CES}$                | Collector-to-Emitter Leakage Current    | —    | 1.0  | 150       | $\mu A$ | $V_{GE} = 0V, V_{CE} = 600V$                          |          |
|                          |   | —    | 450  | 1000      |         | $V_{GE} = 0V, V_{CE} = 600V, T_J = 175^\circ\text{C}$ |          |
| $V_{FM}$                 | Diode Forward Voltage Drop              | —    | 1.95 | 2.91      | V       | $I_F = 48A$   | 8        |
|                          |   | —    | 1.45 | —         |         | $I_F = 48A, T_J = 175^\circ\text{C}$                  |          |
| $I_{GES}$                | Gate-to-Emitter Leakage Current         | —    | —    | $\pm 100$ | nA      | $V_{GE} = \pm 20V$                                    |          |

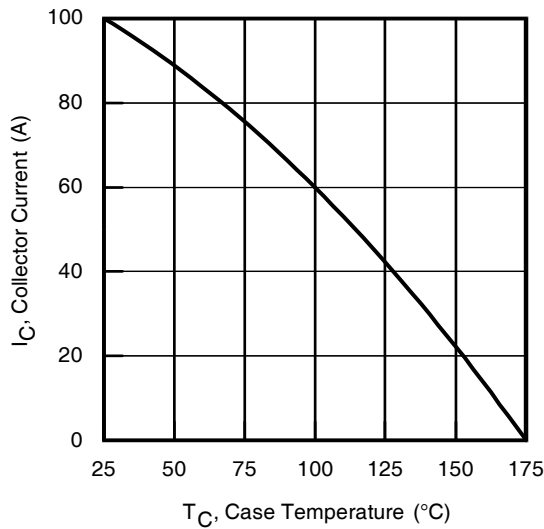
**Switching Characteristics @  $T_J = 25^\circ\text{C}$  (unless otherwise specified)**

|              | Parameter                            | Min.        | Typ. | Max. | Units   | Conditions  | Ref. Fig       |
|--------------|--------------------------------------|-------------|------|------|---------|---|----------------|
| $Q_g$        | Total Gate Charge (turn-on)          | —           | 95   | 140  | nC      | $I_C = 48A$   | 24             |
| $Q_{ge}$     | Gate-to-Emitter Charge (turn-on)     | —           | 28   | 42   |         | $V_{GE} = 15V$  | CT1            |
| $Q_{gc}$     | Gate-to-Collector Charge (turn-on)   | —           | 35   | 53   |         | $V_{CC} = 400V$   |                |
| $E_{on}$     | Turn-On Switching Loss               | —           | 625  | 1141 | $\mu J$ | $I_C = 48A, V_{CC} = 400V, V_{GE} = 15V$  | CT4            |
| $E_{off}$    | Turn-Off Switching Loss              | —           | 1275 | 1481 |         | $R_G = 10\Omega, L = 200\mu H, L_S = 150nH, T_J = 25^\circ\text{C}$   |                |
| $E_{total}$  | Total Switching Loss                 | —           | 1900 | 2622 |         | Energy losses include tail & diode reverse recovery   |                |
| $t_{d(on)}$  | Turn-On delay time                   | —           | 60   | 78   | ns      | $I_C = 48A, V_{CC} = 400V, V_{GE} = 15V$  | CT4            |
| $t_r$        | Rise time                            | —           | 40   | 56   |         | $R_G = 10\Omega, L = 200\mu H, L_S = 150nH, T_J = 25^\circ\text{C}$   |                |
| $t_{d(off)}$ | Turn-Off delay time                  | —           | 145  | 176  |         |   |                |
| $t_f$        | Fall time                            | —           | 35   | 46   |         |   |                |
| $E_{on}$     | Turn-On Switching Loss               | —           | 1625 | —    | $\mu J$ | $I_C = 48A, V_{CC} = 400V, V_{GE} = 15V$  | 13, 15         |
| $E_{off}$    | Turn-Off Switching Loss              | —           | 1585 | —    |         | $R_G = 10\Omega, L = 200\mu H, L_S = 150nH, T_J = 175^\circ\text{C}$ ④  | CT4            |
| $E_{total}$  | Total Switching Loss                 | —           | 3210 | —    |         | Energy losses include tail & diode reverse recovery   | WF1, WF2       |
| $t_{d(on)}$  | Turn-On delay time                   | —           | 55   | —    | ns      | $I_C = 48A, V_{CC} = 400V, V_{GE} = 15V$  | 14, 16         |
| $t_r$        | Rise time                            | —           | 45   | —    |         | $R_G = 10\Omega, L = 200\mu H, L_S = 150nH$   | CT4            |
| $t_{d(off)}$ | Turn-Off delay time                  | —           | 165  | —    |         | $T_J = 175^\circ\text{C}$   | WF1            |
| $t_f$        | Fall time                            | —           | 45   | —    |         |   | WF2            |
| $C_{ies}$    | Input Capacitance                    | —           | 3025 | —    | pF      | $V_{GE} = 0V$   | 23             |
| $C_{oes}$    | Output Capacitance                   | —           | 245  | —    |         | $V_{CC} = 30V$  |                |
| $C_{res}$    | Reverse Transfer Capacitance         | —           | 90   | —    |         | $f = 1.0MHz$  |                |
| RBSOA        | Reverse Bias Safe Operating Area     | FULL SQUARE |      |      |         | $T_J = 175^\circ\text{C}, I_C = 192A$<br>$V_{CC} = 480V, V_p = 600V$<br>$R_G = 10\Omega, V_{GE} = +15V$ to 0V | 4<br>CT2       |
| SCSOA        | Short Circuit Safe Operating Area    | 5           | —    | —    | $\mu s$ | $V_{CC} = 400V, V_p = 600V$<br>$R_G = 10\Omega, V_{GE} = +15V$ to 0V  | 22, CT3<br>WF4 |
| $E_{rec}$    | Reverse Recovery Energy of the Diode | —           | 845  | —    | $\mu J$ | $T_J = 175^\circ\text{C}$   | 17, 18, 19     |
| $t_{rr}$     | Diode Reverse Recovery Time          | —           | 115  | —    | ns      | $V_{CC} = 400V, I_F = 48A$  | 20, 21         |
| $I_{rr}$     | Peak Reverse Recovery Current        | —           | 40   | —    | A       | $V_{GE} = 15V, R_G = 10\Omega, L = 200\mu H, L_S = 150nH$   | WF3            |

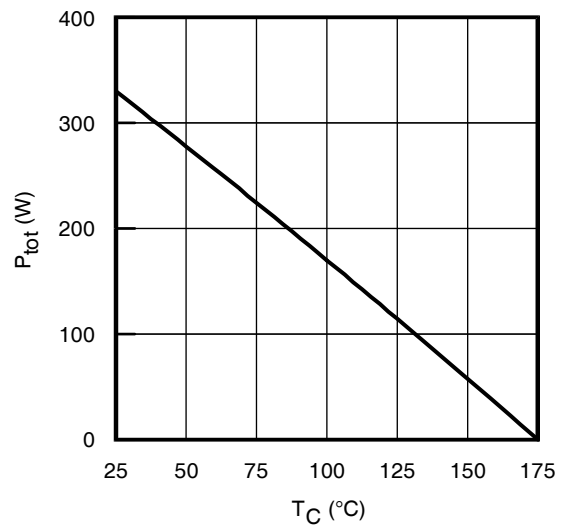
**Notes:**

- ①  $V_{CC} = 80\% (V_{CES}), V_{GE} = 20V, L = 200\mu H, R_G = 10\Omega$ .  
 ② This is only applied to TO-247AC package.

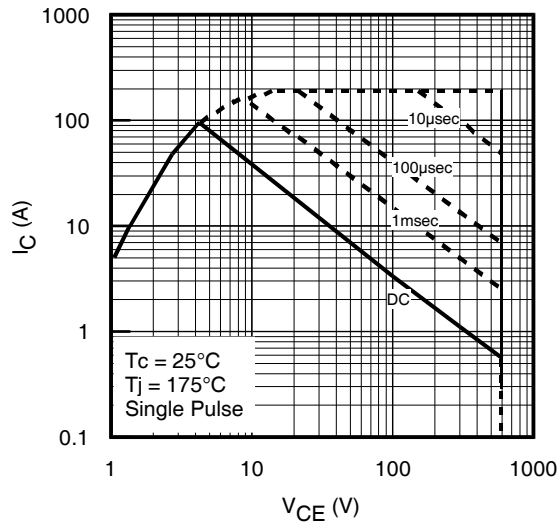
- ③ Pulse width limited by max. junction temperature.  
 ④ Refer to AN-1086 for guidelines for measuring  $V_{(BR)CES}$  safely.



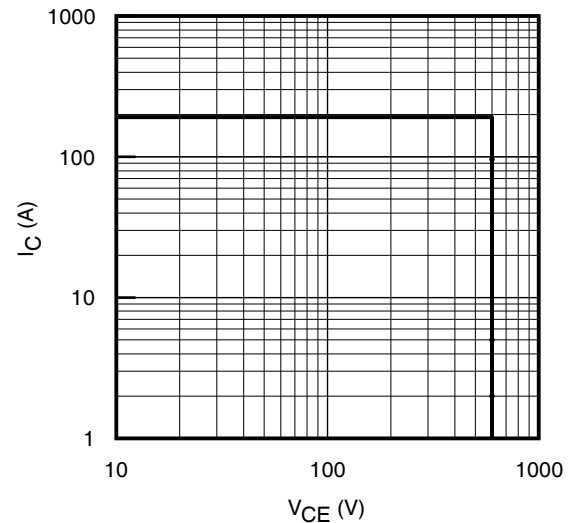
**Fig. 1** - Maximum DC Collector Current vs. Case Temperature



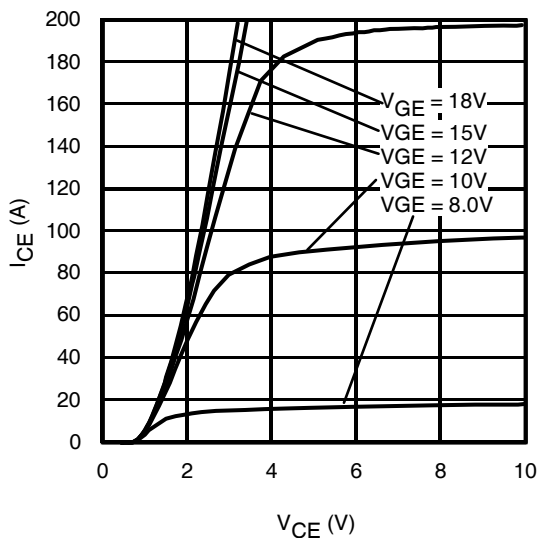
**Fig. 2** - Power Dissipation vs. Case Temperature



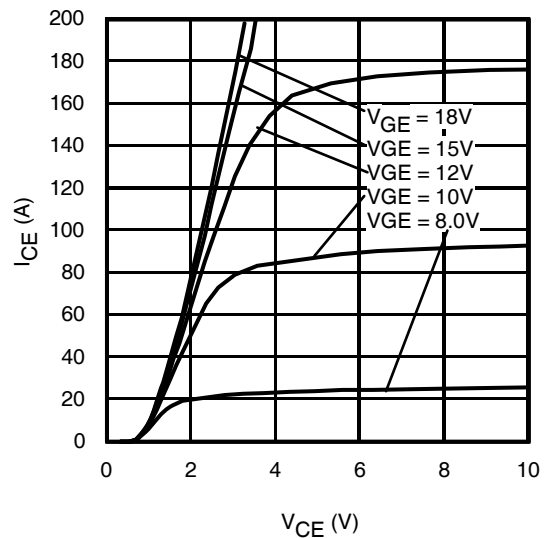
**Fig. 3** - Forward SOA  
 $T_c = 25^\circ\text{C}$ ,  $T_j \leq 175^\circ\text{C}$ ;  $V_{GE} = 15\text{V}$



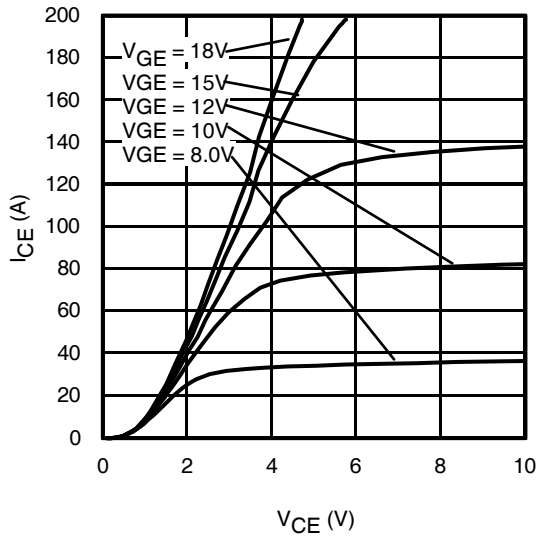
**Fig. 4** - Reverse Bias SOA  
 $T_j = 175^\circ\text{C}$ ;  $V_{GE} = 15\text{V}$



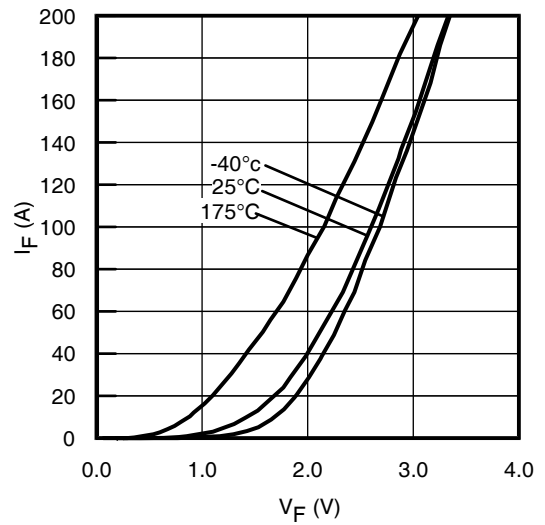
**Fig. 5** - Typ. IGBT Output Characteristics  
 $T_j = -40^\circ\text{C}$ ;  $t_p = 80\mu\text{s}$



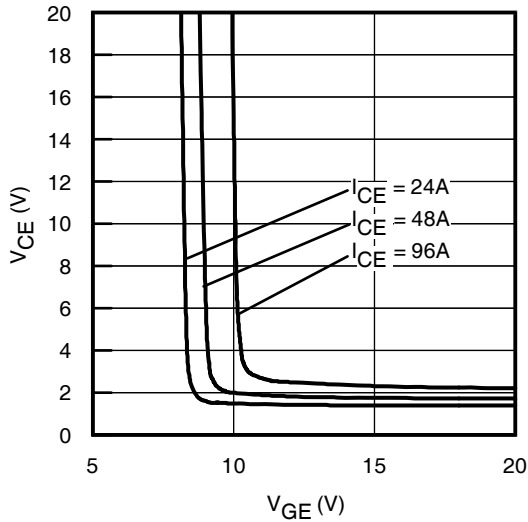
**Fig. 6** - Typ. IGBT Output Characteristics  
 $T_j = 25^\circ\text{C}$ ;  $t_p = 80\mu\text{s}$



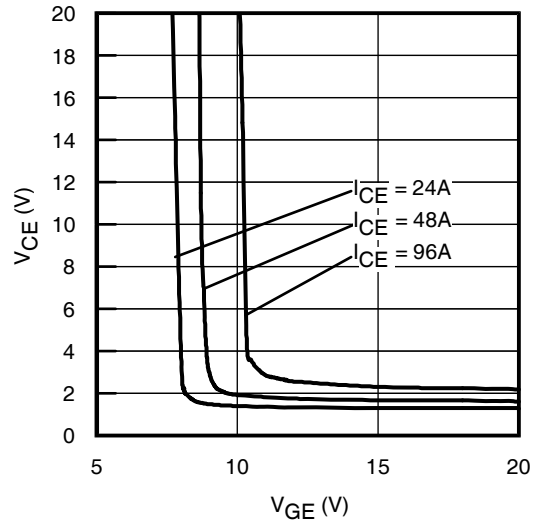
**Fig. 7 - Typ. IGBT Output Characteristics**  
 $T_J = 175^\circ\text{C}$ ;  $t_p = 80\mu\text{s}$



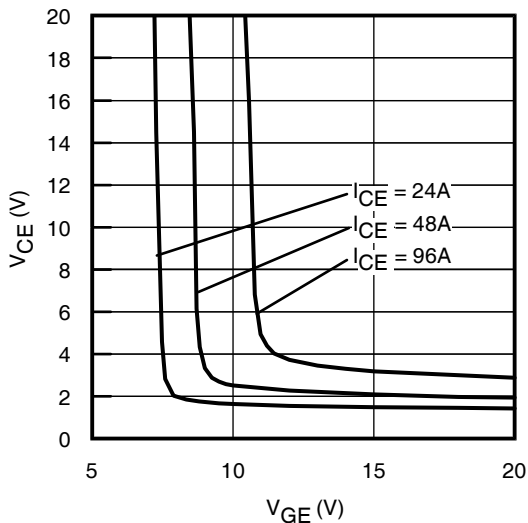
**Fig. 8 - Typ. Diode Forward Characteristics**  
 $t_p = 80\mu\text{s}$



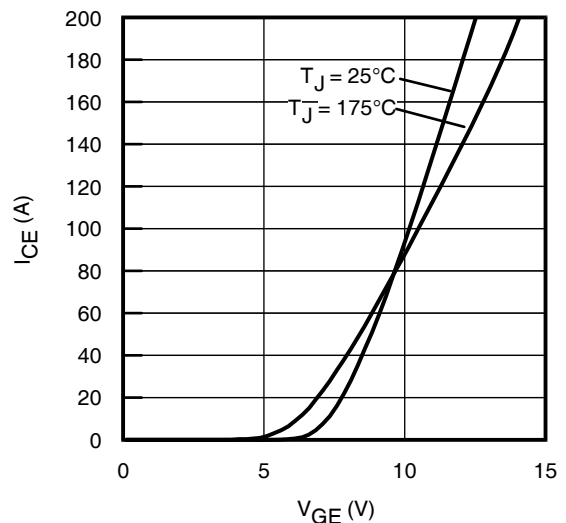
**Fig. 9 - Typical  $V_{CE}$  vs.  $V_{GE}$**   
 $T_J = -40^\circ\text{C}$



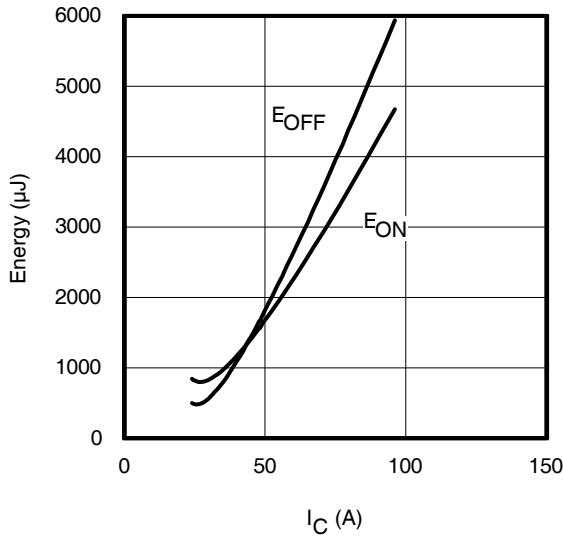
**Fig. 10 - Typical  $V_{CE}$  vs.  $V_{GE}$**   
 $T_J = 25^\circ\text{C}$



**Fig. 11 - Typical  $V_{CE}$  vs.  $V_{GE}$**   
 $T_J = 175^\circ\text{C}$

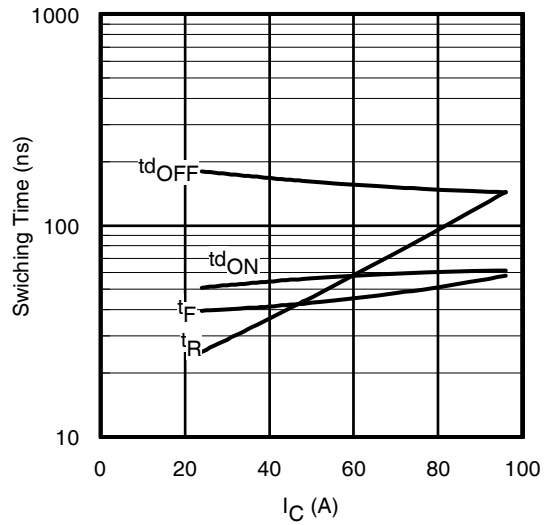


**Fig. 12 - Typ. Transfer Characteristics**  
 $V_{CE} = 50V$ ;  $t_p = 10\mu\text{s}$



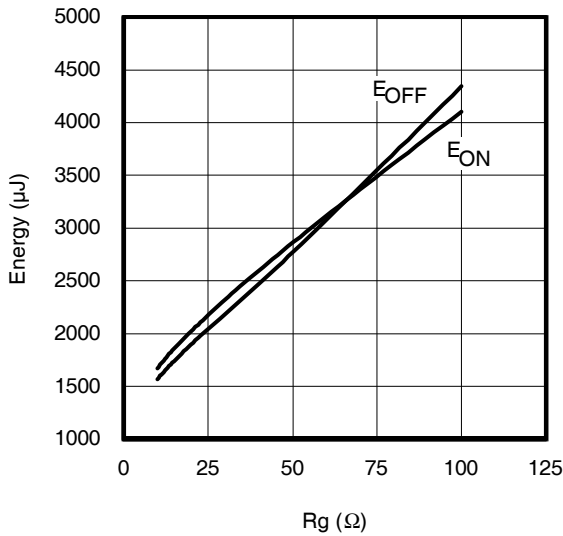
**Fig. 13 - Typ. Energy Loss vs.  $I_C$**

$T_J = 175^\circ\text{C}$ ;  $L = 200\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ,  $R_G = 10\Omega$ ;  $V_{GE} = 15\text{V}$



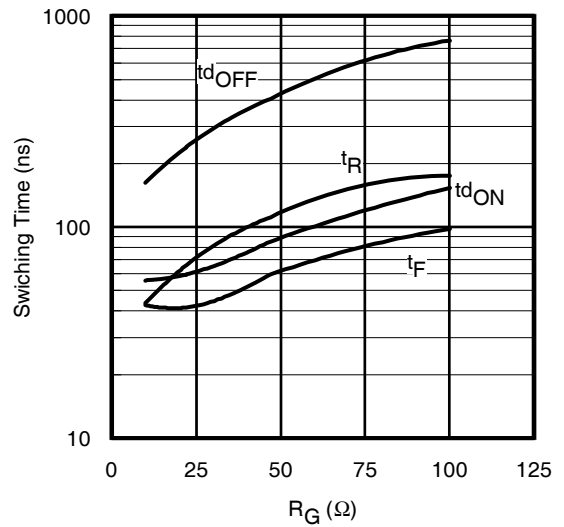
**Fig. 14 - Typ. Switching Time vs.  $I_C$**

$T_J = 175^\circ\text{C}$ ;  $L = 200\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ,  $R_G = 10\Omega$ ;  $V_{GE} = 15\text{V}$



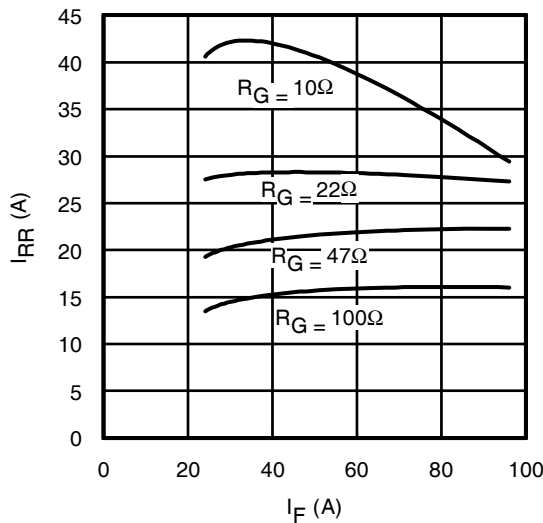
**Fig. 15 - Typ. Energy Loss vs.  $R_G$**

$T_J = 175^\circ\text{C}$ ;  $L = 200\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ,  $I_{CE} = 48\text{A}$ ;  $V_{GE} = 15\text{V}$



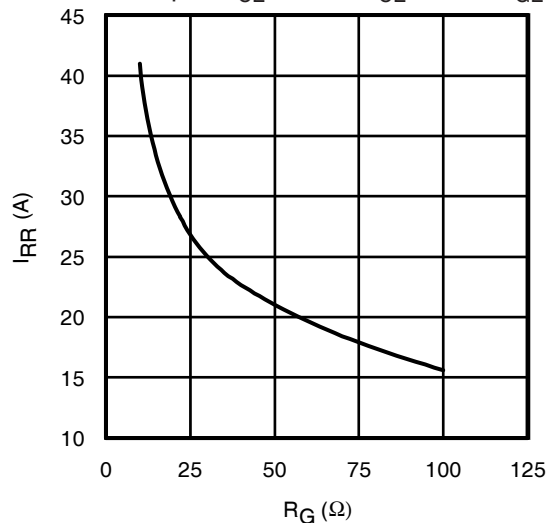
**Fig. 16 - Typ. Switching Time vs.  $R_G$**

$T_J = 175^\circ\text{C}$ ;  $L = 200\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ,  $I_{CE} = 48\text{A}$ ;  $V_{GE} = 15\text{V}$



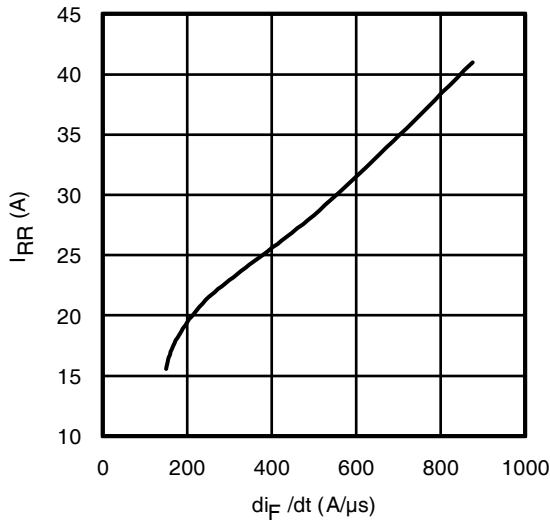
**Fig. 17 - Typ. Diode  $I_{RR}$  vs.  $I_F$**

$T_J = 175^\circ\text{C}$

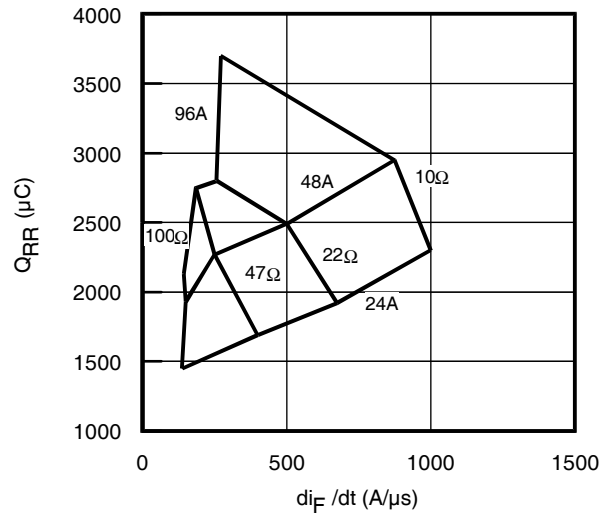


**Fig. 18 - Typ. Diode  $I_{RR}$  vs.  $R_G$**

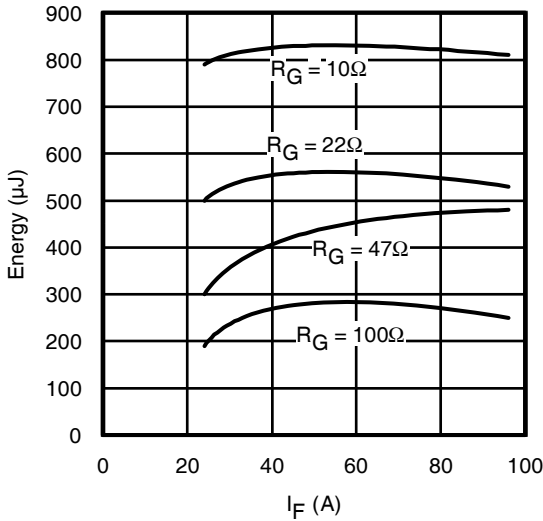
$T_J = 175^\circ\text{C}$



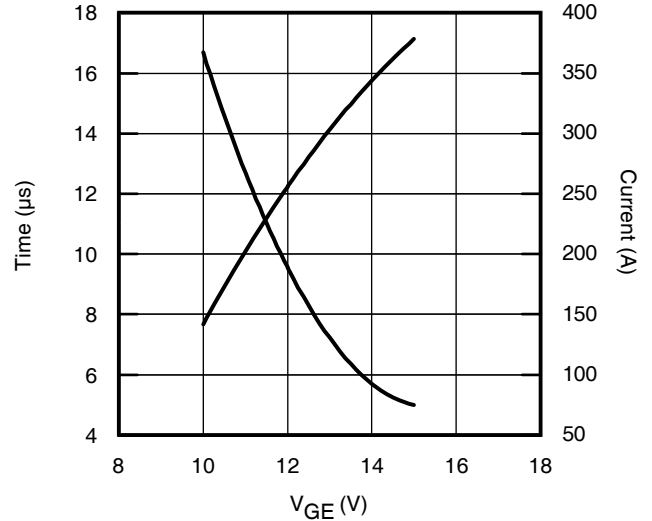
**Fig. 19** - Typ. Diode  $I_{RR}$  vs.  $di_F/dt$   
 $V_{CC} = 400V$ ;  $V_{GE} = 15V$ ;  $I_F = 48A$ ;  $T_J = 175^\circ C$



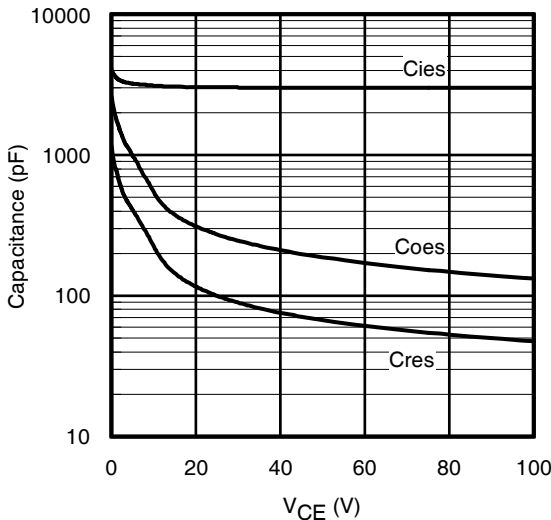
**Fig. 20** - Typ. Diode  $Q_{RR}$  vs.  $di_F/dt$   
 $V_{CC} = 400V$ ;  $V_{GE} = 15V$ ;  $T_J = 175^\circ C$



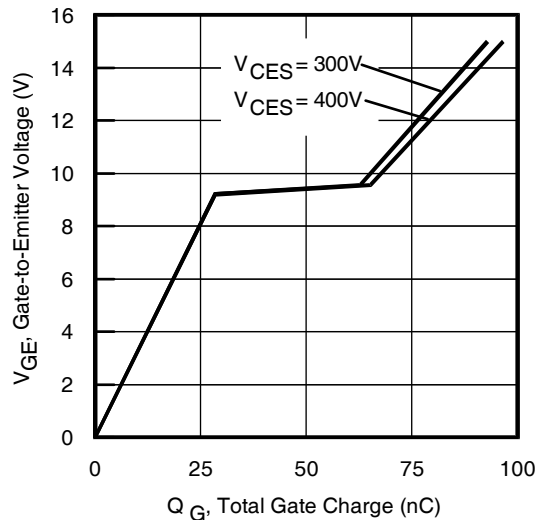
**Fig. 21** - Typ. Diode  $E_{RR}$  vs.  $I_F$   
 $T_J = 175^\circ C$



**Fig. 22** -  $V_{GE}$  vs. Short Circuit Time  
 $V_{CC} = 400V$ ;  $T_C = 25^\circ C$



**Fig. 23** - Typ. Capacitance vs.  $V_{CE}$   
 $V_{GE} = 0V$ ;  $f = 1MHz$



**Fig. 24** - Typical Gate Charge vs.  $V_{GE}$   
 $I_{CE} = 48A$ ;  $L = 600\mu H$

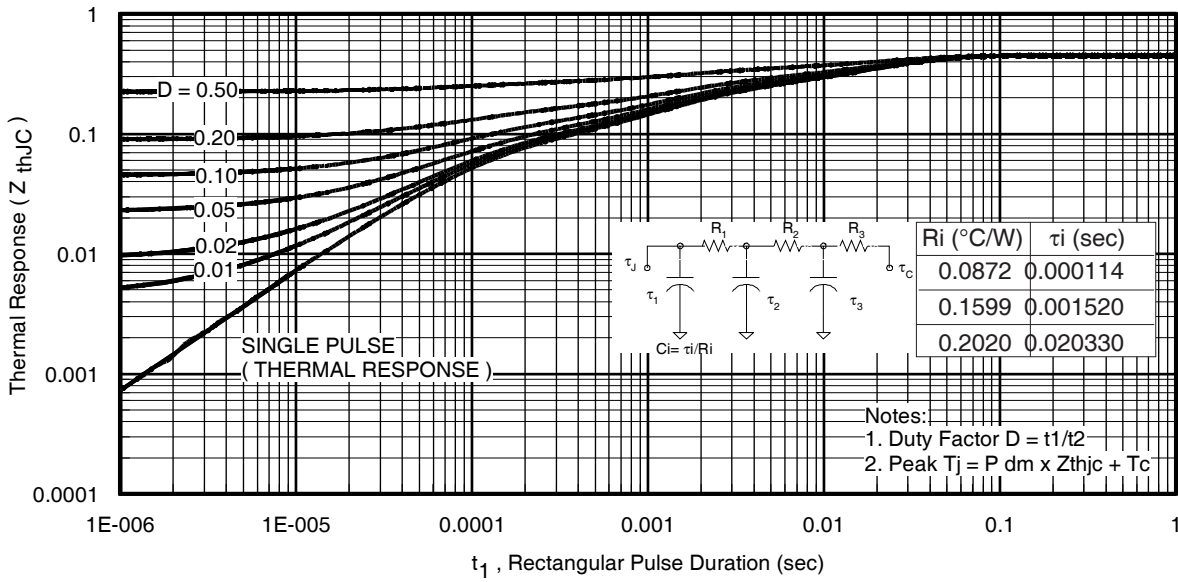


Fig 25. Maximum Transient Thermal Impedance, Junction-to-Case (IGBT)

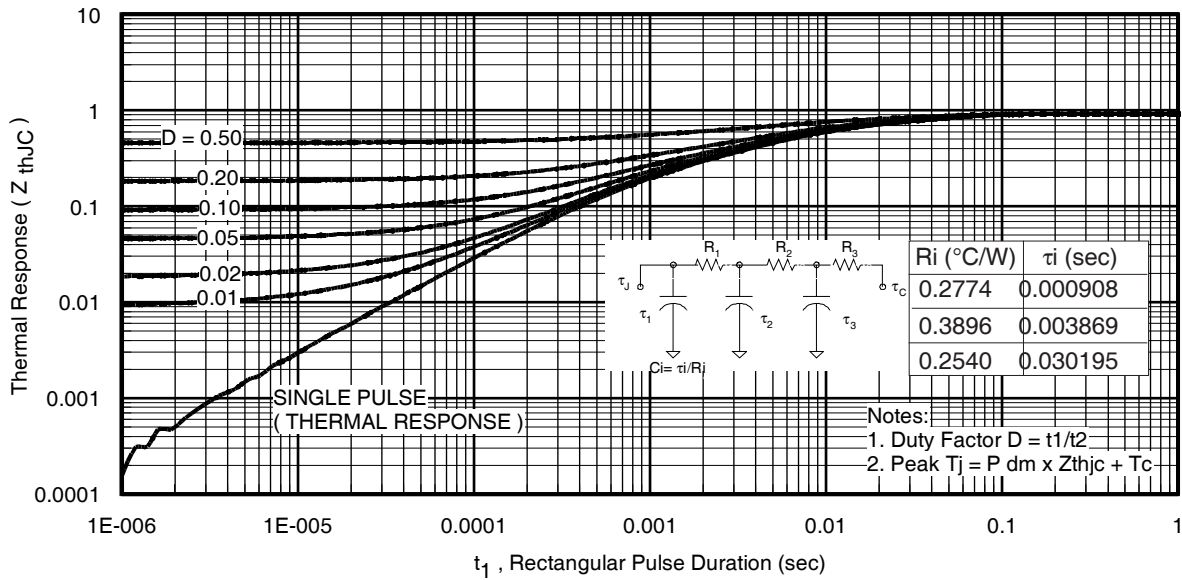


Fig. 26. Maximum Transient Thermal Impedance, Junction-to-Case (DIODE)

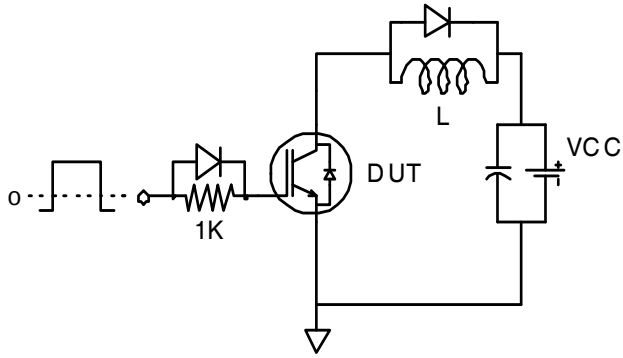


Fig.C.T.1 - Gate Charge Circuit (turn-off)

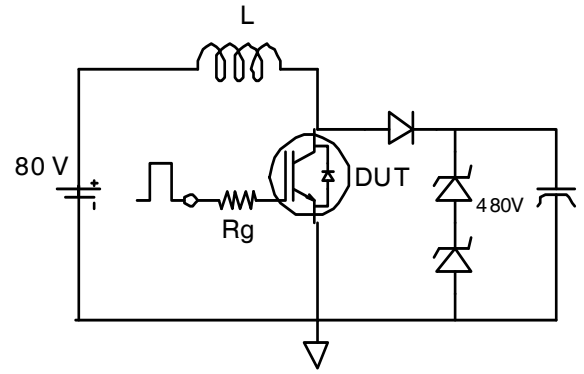


Fig.C.T.2 - RBSOA Circuit

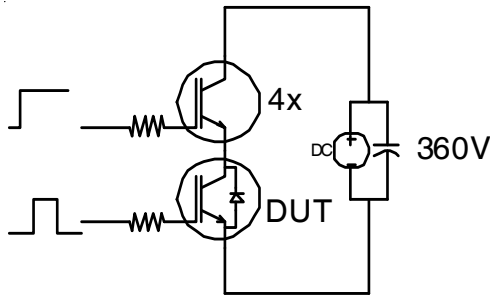


Fig.C.T.3 - S.C. SOA Circuit

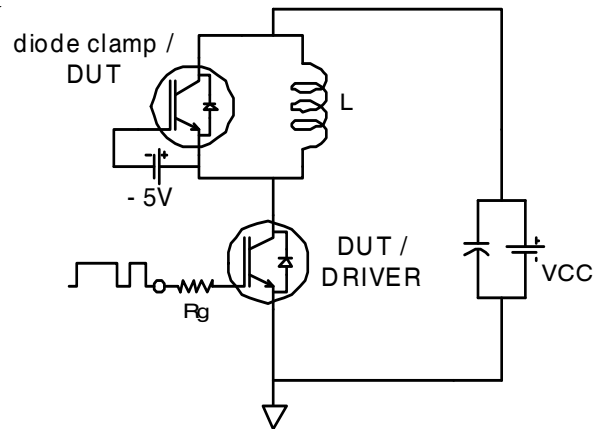


Fig.C.T.4 - Switching Loss Circuit

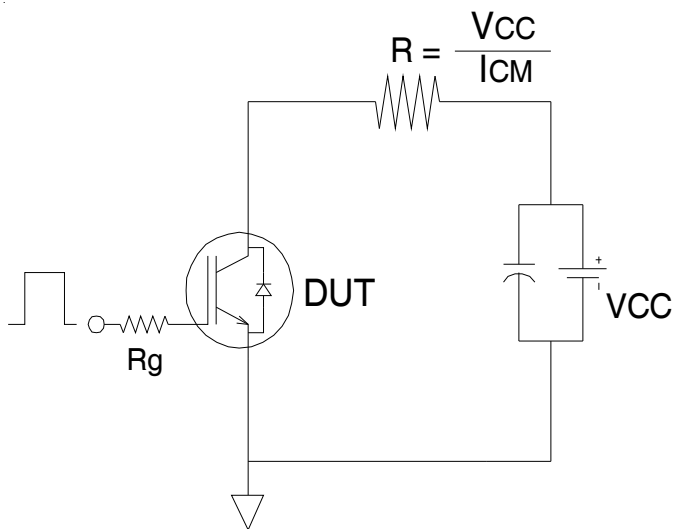


Fig.C.T.5 - Resistive Load Circuit

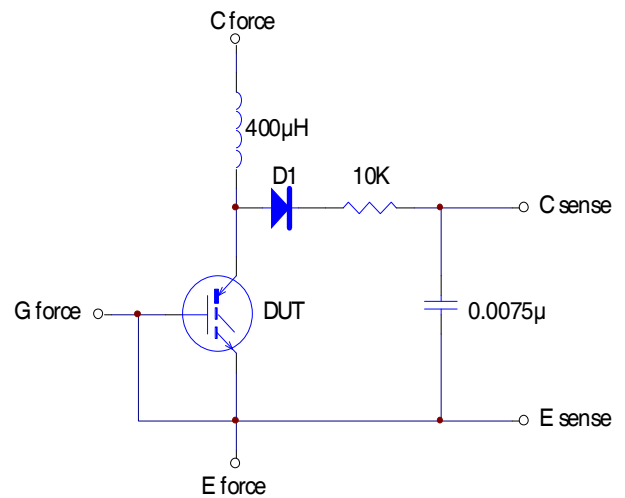
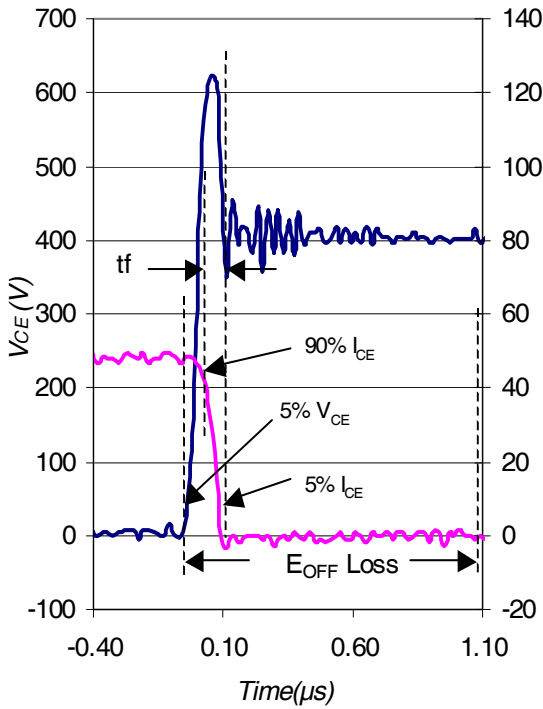
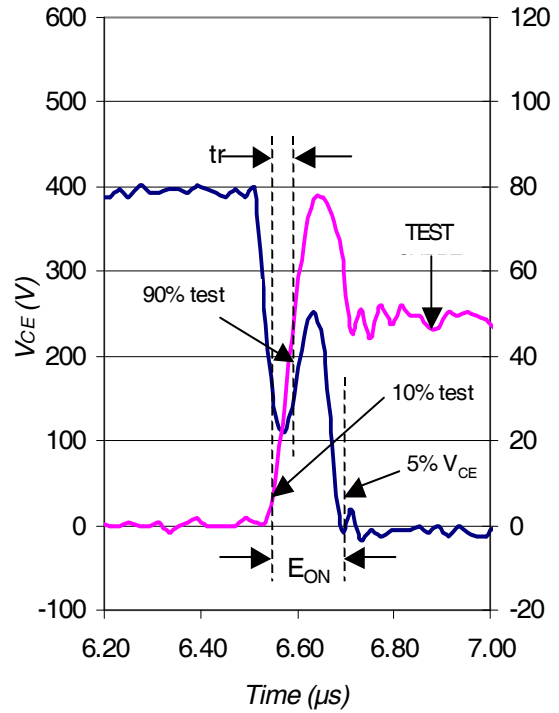


Fig.C.T.6 - BVCES Filter Circuit

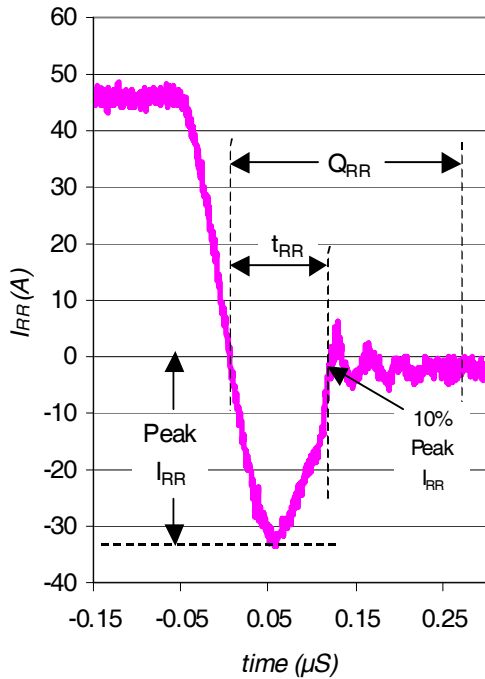




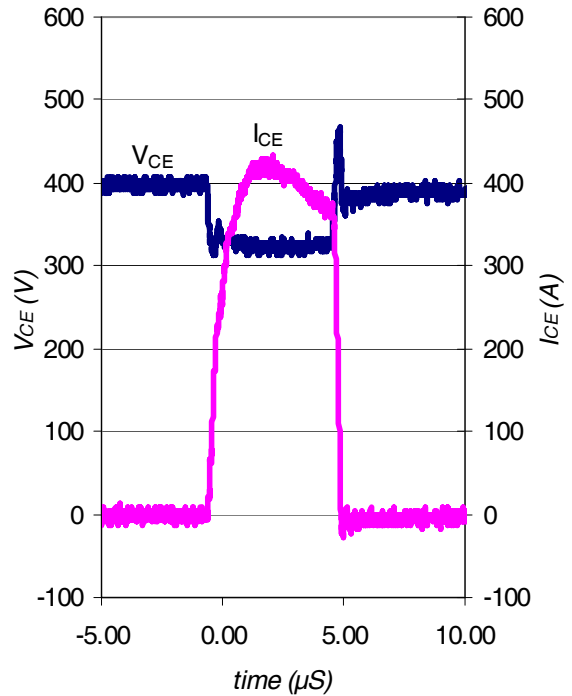
**Fig. WF1** - Typ. Turn-off Loss Waveform  
@  $T_J = 175^\circ\text{C}$  using Fig. CT.4



**Fig. WF2** - Typ. Turn-on Loss Waveform  
@  $T_J = 175^\circ\text{C}$  using Fig. CT.4



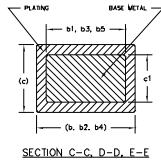
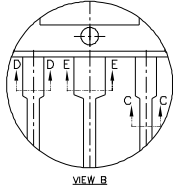
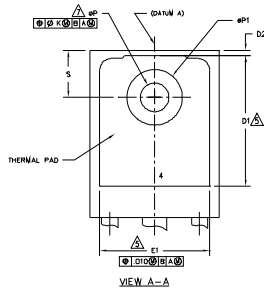
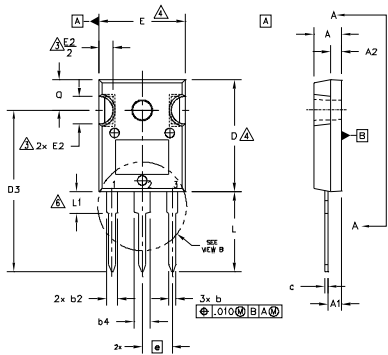
**Fig. WF3** - Typ. Diode Recovery Waveform  
@  $T_J = 175^\circ\text{C}$  using Fig. CT.4



**Fig. WF4** - Typ. S.C. Waveform  
@  $T_J = 25^\circ\text{C}$  using Fig. CT.3

## TO-247AC Package Outline

Dimensions are shown in millimeters (inches)



**NOTES:**

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
2. DIMENSIONS ARE SHOWN IN INCHES.  
CONTOUR OF SLOT OPTIONAL.
- △ DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- △ THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.
- △ LEAD FINISH UNCONTROLLED IN L1.
- △ φP TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5 ° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154 INCH.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AC .

| SYMBOL | DIMENSIONS |       |             |       | NOTES |
|--------|------------|-------|-------------|-------|-------|
|        | INCHES     |       | MILLIMETERS |       |       |
|        | MIN.       | MAX.  | MIN.        | MAX.  |       |
| A      | .183       | .209  | 4.65        | 5.31  |       |
| A1     | .087       | .102  | 2.21        | 2.59  |       |
| A2     | .059       | .098  | 1.50        | 2.49  |       |
| b      | .039       | .055  | 0.99        | 1.40  |       |
| b1     | .039       | .053  | 0.99        | 1.35  |       |
| b2     | .065       | .094  | 1.65        | 2.39  |       |
| b3     | .065       | .092  | 1.65        | 2.34  |       |
| b4     | .102       | .135  | 2.59        | 3.43  |       |
| b5     | .102       | .133  | 2.59        | 3.38  |       |
| c      | .015       | .035  | 0.38        | 0.89  |       |
| c1     | .015       | .033  | 0.38        | 0.84  |       |
| D      | .776       | .815  | 19.71       | 20.70 | 4     |
| D1     | .515       | -     | 13.08       | -     | 5     |
| D2     | .020       | .053  | 0.51        | 1.35  |       |
| D3     | 1.122      | 1.161 | 28.50       | 29.50 | 4     |
| E      | .602       | .625  | 15.29       | 15.87 |       |
| E1     | .530       | -     | 13.46       | -     |       |
| E2     | .178       | .216  | 4.52        | 5.49  |       |
| e      | .215 BSC   |       | 5.46 BSC    |       |       |
| φk     | .010       |       | 0.25        |       |       |
| L      | .559       | .634  | 14.20       | 16.10 |       |
| L1     | .146       | .169  | 3.71        | 4.29  |       |
| φP     | .140       | .144  | 3.56        | 3.66  |       |
| φP1    | -          | .291  | -           | 7.39  |       |
| Q      | .209       | .224  | 5.31        | 5.69  |       |
| S      | .217 BSC   |       | 5.51 BSC    |       |       |

**PART NUMBERS AFFECTED:**

- AUIRGP4PH50S
- AUIRGP4066D1/E
- AUIRGP40630/E
- AUIRGP50B60PD1/E
- AUIRGP35B60PD/E
- AUIRGP4062D1/E
- AUIRGP65A20D0
- AUIRGP65G20D0
- AUIRGP/F66524D0
- AUIRGP/F76524D0
- AUIRGP/F66548D0
- AUIRGP/F76548D0

**LEAD ASSIGNMENTS**

**HEXFET**

- 1.- GATE
- 2.- DRAIN
- 3.- SOURCE
- 4.- DRAIN

**IGBTs, CoPACK**

- 1.- GATE
- 2.- COLLECTOR
- 3.- EMITTER
- 4.- COLLECTOR

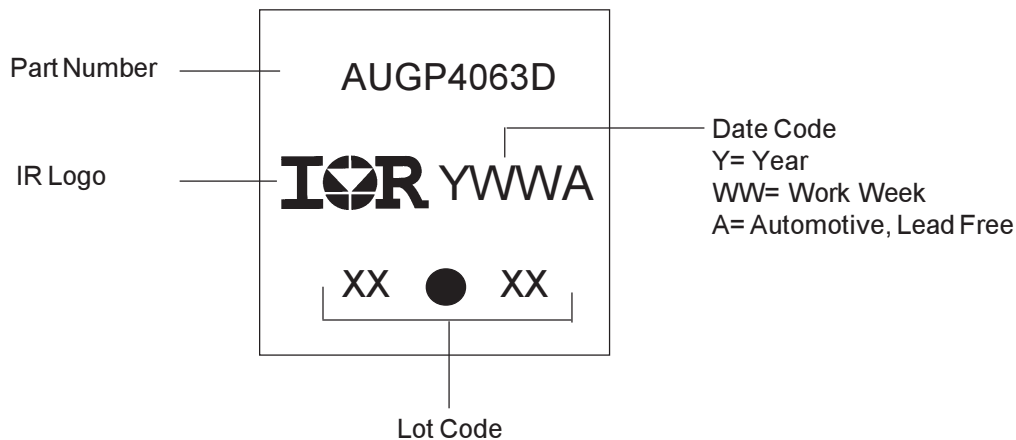
**DIODES**

- 1.- ANODE/OPEN
- 2.- CATHODE
- 3.- ANODE

**SPECIAL NOTE:**

- a) ADDED D3 FOR SPECIAL REQUIREMENT

## TO-247AC Part Marking Information

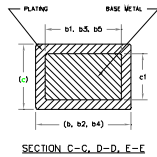
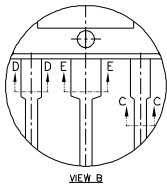
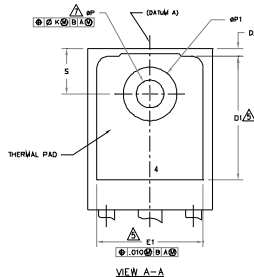
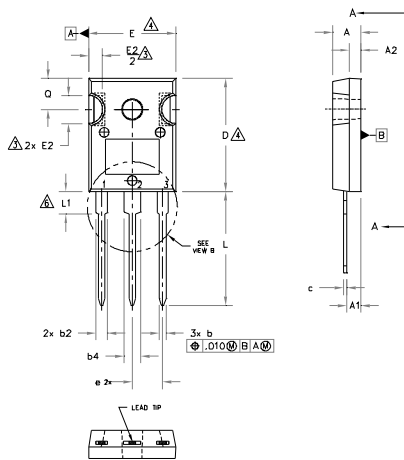


TO-247AC package is not recommended for Surface Mount Application.

Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

# TO-247AD Package Outline

Dimensions are shown in millimeters (inches)



**NOTES:**

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
2. DIMENSIONS ARE SHOWN IN INCHES.
- CONTOUR OF SLOT OPTIONAL.
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
4. LEAD FINISH UNCONTROLLED IN L1.
5. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.
6. ØP TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5 ° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154 INCH.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AD.

| SYMBOL | DIMENSIONS |      |             |       | NOTES |
|--------|------------|------|-------------|-------|-------|
|        | INCHES     |      | MILLIMETERS |       |       |
|        | MIN.       | MAX. | MIN.        | MAX.  |       |
| A      | .190       | .203 | 4.83        | 5.13  |       |
| A1     | .087       | .102 | 2.21        | 2.59  |       |
| A2     | .059       | .098 | 1.50        | 2.49  |       |
| b      | .039       | .055 | 0.99        | 1.40  |       |
| b1     | .039       | .053 | 0.99        | 1.35  |       |
| b2     | .065       | .094 | 1.65        | 2.39  |       |
| b3     | .065       | .092 | 1.65        | 2.34  |       |
| b4     | .102       | .135 | 2.59        | 3.43  |       |
| b5     | .102       | .133 | 2.59        | 3.38  |       |
| c      | .015       | .035 | 0.38        | 0.89  |       |
| c1     | .015       | .033 | 0.38        | 0.84  |       |
| D      | .776       | .815 | 19.71       | 20.70 | 4     |
| D1     | .515       | -    | 13.08       | -     | 5     |
| D2     | .020       | .053 | 0.51        | 1.35  |       |
| E      | .602       | .625 | 15.29       | 15.87 | 4     |
| E1     | .530       | -    | 13.46       | -     |       |
| E2     | .178       | .216 | 4.52        | 5.49  |       |
| e      | .215 BSC   |      | 5.46 BSC    |       |       |
| Øk     | .010       |      | 0.25        |       |       |
| L      | .780       | .827 | 19.57       | 21.00 |       |
| L1     | .146       | .169 | 3.71        | 4.29  |       |
| ØP     | .140       | .144 | 3.56        | 3.66  |       |
| ØP1    | -          | .291 | -           | 7.39  |       |
| Q      | .209       | .224 | 5.31        | 5.69  |       |
| S      | .217 BSC   |      | 5.51 BSC    |       |       |

**LEAD ASSIGNMENTS**

**HEXFET**

- 1.- GATE
- 2.- DRAIN
- 3.- SOURCE
- 4.- DRAIN

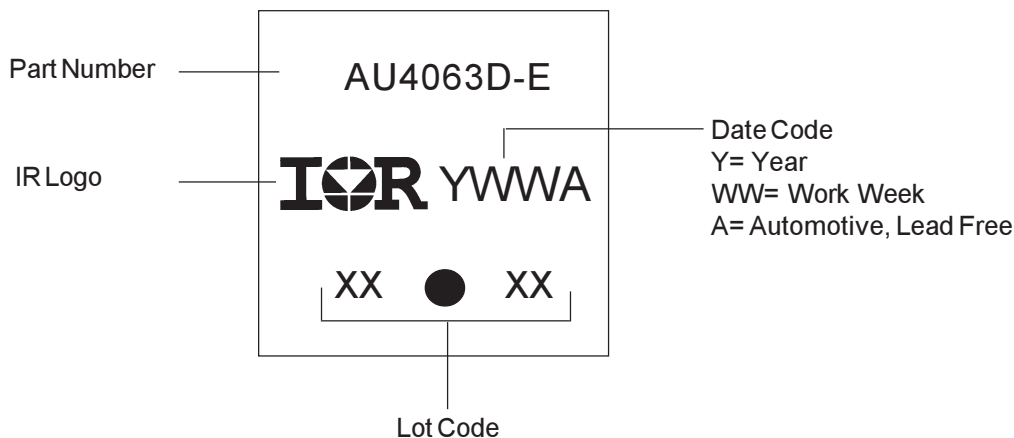
**IGBTs, CoPACK**

- 1.- GATE
- 2.- COLLECTOR
- 3.- EMITTER
- 4.- COLLECTOR

**DIODES**

- 1.- ANODE/OPEN
- 2.- CATHODE
- 3.- ANODE

## TO-247AD Part Marking Information



TO-247AD package is not recommended for Surface Mount Application.

Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

**Qualification Information<sup>†</sup>**

|                                   |                      |   |     |
|-----------------------------------|----------------------|---|-----|
| <b>Qualification Level</b>        |                      | Automotive<br>(per AEC-Q101) <sup>†</sup>   |     |
|                                   |                      | Comments: This part number(s) passed Automotive qualification. IR's Industrial and Consumer qualification level is granted by extension of the higher Automotive level. |     |
| <b>Moisture Sensitivity Level</b> |                      | TO-247AC  | N/A |
|                                   |                      | TO-247AD  | N/A |
| <b>ESD</b>                        | Machine Model        | Class M4 ( $\pm 425V$ ) <sup>††</sup><br>(per AEC-Q101-002)   |     |
|                                   | Human Body Model     | Class H2 ( $\pm 4000V$ ) <sup>††</sup><br>(per AEC-Q101-001)  |     |
|                                   | Charged Device Model | Class C5 ( $\pm 1125V$ ) <sup>††</sup><br>(per AEC-Q101-005)  |     |
| <b>RoHS Compliant</b>             |                      | Yes   |     |

† Qualification standards can be found at International Rectifier's web site: <http://www.irf.com>

†† Highest passing voltage.

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<http://www.irf.com/technical-info/>

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233 Kansas St., El Segundo, California 90245

Tel: (310) 252-7105



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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.