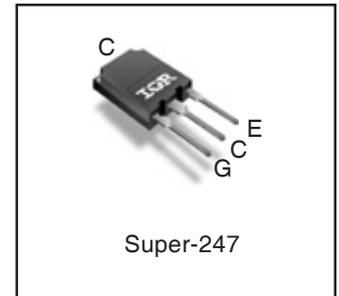
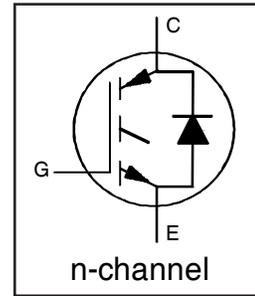


### INSULATED GATE BIPOLAR TRANSISTOR WITH ULTRAFAST SOFT RECOVERY DIODE



| G    | C         | E       |
|------|-----------|---------|
| Gate | Collector | Emitter |

$$V_{CES} = 600V$$

$$I_C = 160A, T_C = 100^\circ C$$

$$t_{SC} \geq 5\mu s, T_{J(max)} = 175^\circ C$$

$$V_{CE(on)} \text{ typ.} = 1.70V @ I_C = 120A$$

#### Applications

- Industrial Motor Drive
- Inverters
- UPS
- Welding

| Features  | Benefits  |
|---|---|
| Low $V_{CE(ON)}$ and Switching Losses               | High efficiency in a wide range of applications and switching frequencies                 |
| Square RBSOA and Maximum Junction Temperature 175°C | Improved reliability due to rugged hard switching performance and higher power capability |
| Positive $V_{CE(ON)}$ Temperature Coefficient       | Excellent current sharing in parallel operation   |
| 5μs short circuit SOA                               | Enables short circuit protection scheme   |
| Lead-Free, RoHS compliant                           | Environmentally friendly  |

| Base part number | Package Type | Standard Pack |          | Orderable part number |
|------------------|--------------|---------------|----------|-----------------------|
|                  |              | Form          | Quantity |                       |
| IRGPS46160DPbF   | Super-247    | Tube          | 25       | IRGPS46160DPbF        |

#### Absolute Maximum Ratings

| Parameter  | Max.   | Units |
|--|--|-------|
| $V_{CES}$<br>Collector-to-Emitter Voltage  | 600  | V     |
| $I_C @ T_C = 25^\circ C$<br>Continuous Collector Current                             | 240 <sup>②</sup>   | A     |
| $I_C @ T_C = 100^\circ C$<br>Continuous Collector Current                            | 160  |       |
| $I_{CM}$<br>Pulse Collector Current, $V_{GE} = 15V$                                  | 360  |       |
| $I_{LM}$<br>Clamped Inductive Load Current, $V_{GE} = 20V$ ①                         | 480  |       |
| $I_F @ T_C = 25^\circ C$<br>Diode Continuous Forward Current                         | 240 <sup>②</sup>   |       |
| $I_F @ T_C = 100^\circ C$<br>Diode Continuous Forward Current                        | 160 <sup>②</sup>   |       |
| $I_{FM}$<br>Diode Maximum Forward Current ④  | 480  | V     |
| $V_{GE}$<br>Continuous Gate-to-Emitter Voltage                                       | ±20  |       |
| $V_{GE}$<br>Transient Gate-to-Emitter Voltage  | ±30  | W     |
| $P_D @ T_C = 25^\circ C$<br>Maximum Power Dissipation                                | 750  |       |
| $P_D @ T_C = 100^\circ C$<br>Maximum Power Dissipation                               | 375  | °C    |
| $T_J$<br>Operating Junction and Storage Temperature Range                            | -55 to +175  |       |
| $T_{STG}$<br>Soldering Temperature, for 10 sec.<br>Mounting Torque, 6-32 or M3 Screw | 300 (0.063 in. (1.6mm) from case)<br>10 lbf·in (1.1 N·m) |       |

#### Thermal Resistance

| Parameter   | Min. | Typ. | Max. | Units |
|---|------|------|------|-------|
| $R_{\theta JC}$ (IGBT)<br>Junction-to-Case (IGBT) ②           | —    | —    | 0.20 | °C/W  |
| $R_{\theta JC}$ (Diode)<br>Junction-to-Case (Diode) ②         | —    | —    | 0.63 |       |
| $R_{\theta CS}$<br>Case-to-Sink (flat, greased surface)       | —    | 0.24 | —    |       |
| $R_{\theta JA}$<br>Junction-to-Ambient (typical socket mount) | —    | —    | 40   |       |

**Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

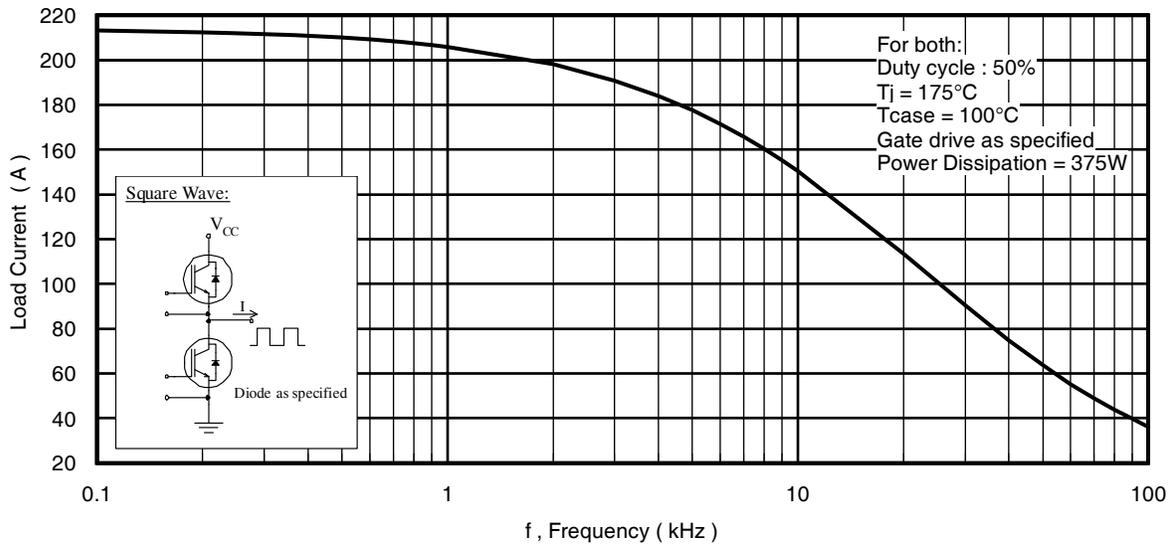
|  | Parameter                               | Min. | Typ. | Max. | Units | Conditions  |
|--|---|------|------|------|-------|---|
| V <sub>(BR)CES</sub>                   | Collector-to-Emitter Breakdown Voltage  | 600  | —    | —    | V     | V <sub>GE</sub> = 0V, I <sub>C</sub> = 100μA ③                            |
| ΔV <sub>(BR)CES</sub> /ΔT <sub>J</sub> | Temperature Coeff. of Breakdown Voltage | —    | 0.27 | —    | V/°C  | V <sub>GE</sub> = 0V, I <sub>C</sub> = 4.0mA (25°C-175°C)                 |
| V <sub>CE(on)</sub>                    | Collector-to-Emitter Saturation Voltage | —    | 1.70 | 2.05 | V     | I <sub>C</sub> = 120A, V <sub>GE</sub> = 15V, T <sub>J</sub> = 25°C       |
|  |   | —    | 2.15 | —    |       | I <sub>C</sub> = 120A, V <sub>GE</sub> = 15V, T <sub>J</sub> = 150°C      |
|  |   | —    | 2.20 | —    |       | I <sub>C</sub> = 120A, V <sub>GE</sub> = 15V, T <sub>J</sub> = 175°C      |
| V <sub>GE(th)</sub>                    | Gate Threshold Voltage                  | 4.0  | —    | 6.5  | V     | V <sub>CE</sub> = V <sub>GE</sub> , I <sub>C</sub> = 5.6mA                |
| ΔV <sub>GE(th)</sub> /ΔT <sub>J</sub>  | Threshold Voltage temp. coefficient     | —    | -17  | —    | mV/°C | V <sub>CE</sub> = V <sub>GE</sub> , I <sub>C</sub> = 5.6mA (25°C - 175°C) |
| g <sub>fe</sub>                        | Forward Transconductance                | —    | 77   | —    | S     | V <sub>CE</sub> = 50V, I <sub>C</sub> = 120A                              |
| I <sub>CES</sub>                       | Collector-to-Emitter Leakage Current    | —    | 1.0  | 150  | μA    | V <sub>GE</sub> = 0V, V <sub>CE</sub> = 600V                              |
|  |   | —    | 2.3  | —    | mA    | V <sub>GE</sub> = 0V, V <sub>CE</sub> = 600V, T <sub>J</sub> = 175°C      |
| V <sub>FM</sub>                        | Diode Forward Voltage Drop              | —    | 2.4  | 3.0  | V     | I <sub>F</sub> = 120A   |
|  |   | —    | 1.9  | —    |       | I <sub>F</sub> = 120A, T <sub>J</sub> = 175°C                             |
| I <sub>GES</sub>                       | Gate-to-Emitter Leakage Current         | —    | —    | ±400 | nA    | V <sub>GE</sub> = ±20V  |

**Switching Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

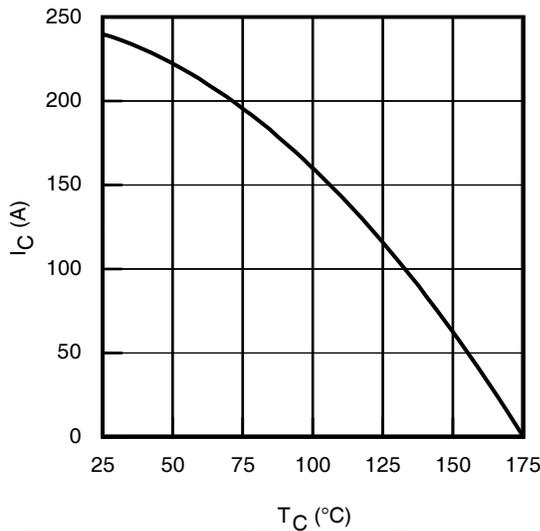
|                     | Parameter                            | Min.        | Typ.  | Max. | Units | Conditions   |
|---------------------|--------------------------------------|-------------|-------|------|-------|--|
| Q <sub>g</sub>      | Total Gate Charge                    | —           | 240   | —    | nC    | I <sub>C</sub> = 120A<br>V <sub>GE</sub> = 15V<br>V <sub>CC</sub> = 400V   |
| Q <sub>ge</sub>     | Gate-to-Emitter Charge               | —           | 70    | —    |       |  |
| Q <sub>gc</sub>     | Gate-to-Collector Charge             | —           | 90    | —    |       |  |
| E <sub>on</sub>     | Turn-On Switching Loss               | —           | 5750  | —    | μJ    | I <sub>C</sub> = 120A, V <sub>CC</sub> = 400V, V <sub>GE</sub> = 15V<br>R <sub>G</sub> = 4.7Ω, L = 66μH, T <sub>J</sub> = 25°C                         |
| E <sub>off</sub>    | Turn-Off Switching Loss              | —           | 3430  | —    |       |  |
| E <sub>total</sub>  | Total Switching Loss                 | —           | 9180  | —    |       |  |
| t <sub>d(on)</sub>  | Turn-On delay time                   | —           | 80    | —    | ns    | Energy losses include tail<br>& diode reverse recovery ⑥   |
| t <sub>r</sub>      | Rise time                            | —           | 70    | —    |       |  |
| t <sub>d(off)</sub> | Turn-Off delay time                  | —           | 190   | —    |       |  |
| t <sub>f</sub>      | Fall time                            | —           | 40    | —    |       |  |
| E <sub>on</sub>     | Turn-On Switching Loss               | —           | 7740  | —    | μJ    | I <sub>C</sub> = 120A, V <sub>CC</sub> = 400V, V <sub>GE</sub> =15V<br>R <sub>G</sub> = 4.7Ω, L = 66μH, T <sub>J</sub> = 175°C                         |
| E <sub>off</sub>    | Turn-Off Switching Loss              | —           | 4390  | —    |       |  |
| E <sub>total</sub>  | Total Switching Loss                 | —           | 12130 | —    |       |  |
| t <sub>d(on)</sub>  | Turn-On delay time                   | —           | 80    | —    | ns    | Energy losses include tail<br>& diode reverse recovery ⑥   |
| t <sub>r</sub>      | Rise time                            | —           | 75    | —    |       |  |
| t <sub>d(off)</sub> | Turn-Off delay time                  | —           | 230   | —    |       |  |
| t <sub>f</sub>      | Fall time                            | —           | 55    | —    |       |  |
| C <sub>ies</sub>    | Input Capacitance                    | —           | 7750  | —    | pF    | V <sub>GE</sub> = 0V<br>V <sub>CC</sub> = 30V<br>f = 1.0Mhz  |
| C <sub>oes</sub>    | Output Capacitance                   | —           | 550   | —    |       |  |
| C <sub>res</sub>    | Reverse Transfer Capacitance         | —           | 225   | —    |       |  |
| RBSOA               | Reverse Bias Safe Operating Area     | FULL SQUARE |       |      |       | T <sub>J</sub> = 175°C, I <sub>C</sub> = 480A<br>V <sub>CC</sub> = 480V, V <sub>p</sub> ≤ 600V<br>R <sub>G</sub> = 4.7 Ω, V <sub>GE</sub> = +20V to 0V |
| SCSOA               | Short Circuit Safe Operating Area    | 5           | —     | —    | μs    | V <sub>CC</sub> = 400V, V <sub>p</sub> ≤ 600V<br>R <sub>G</sub> = 4.7 Ω, V <sub>GE</sub> = +15V to 0V  |
| E <sub>rec</sub>    | Reverse Recovery Energy of the Diode | —           | 500   | —    | μJ    | T <sub>J</sub> = 175°C   |
| t <sub>rr</sub>     | Diode Reverse Recovery Time          | —           | 130   | —    | ns    | V <sub>CC</sub> = 400V, I <sub>F</sub> = 120A  |
| I <sub>rr</sub>     | Peak Reverse Recovery Current        | —           | 36    | —    | A     | V <sub>GE</sub> = 15V, R <sub>G</sub> = 4.7 Ω, L = 100μH   |

**Notes:**

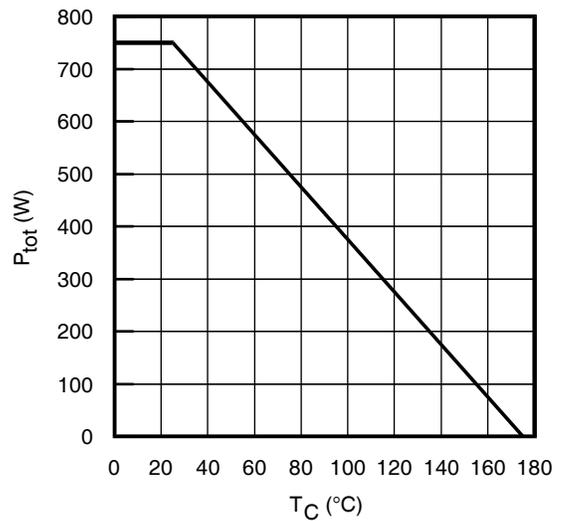
- ① V<sub>CC</sub> = 80% (V<sub>CES</sub>), V<sub>GE</sub> = 20V, L = 66μH, R<sub>G</sub> = 4.7Ω, tested in production I<sub>LM</sub> ≤ 400A.
- ② Pulse width limited by max. junction temperature.
- ③ Refer to AN-1086 for guidelines for measuring V<sub>(BR)CES</sub> safely.
- ④ R<sub>θ</sub> is measured at T<sub>J</sub> of approximately 90°C.
- ⑤ Values influenced by parasitic L and C in measurement.
- ⑥ Calculated continuous current based on maximum allowable junction temperature. Package IGBT current limit is 195A. Package diode current limit is 120A. Note that current limitations arising from heating of the device leads may occur.



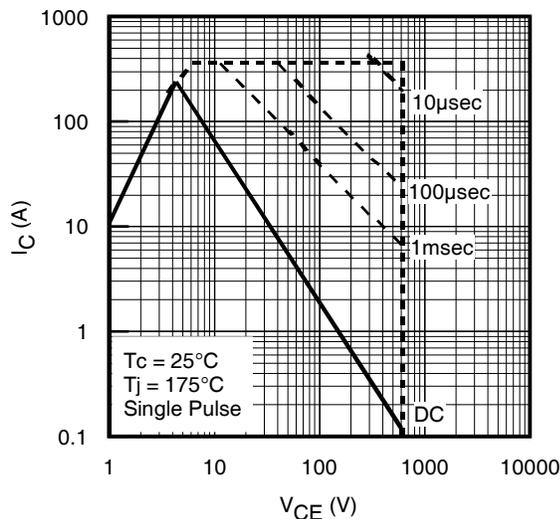
**Fig. 1 - Typical Load Current vs. Frequency**  
(Load Current =  $I_{RMS}$  of fundamental)



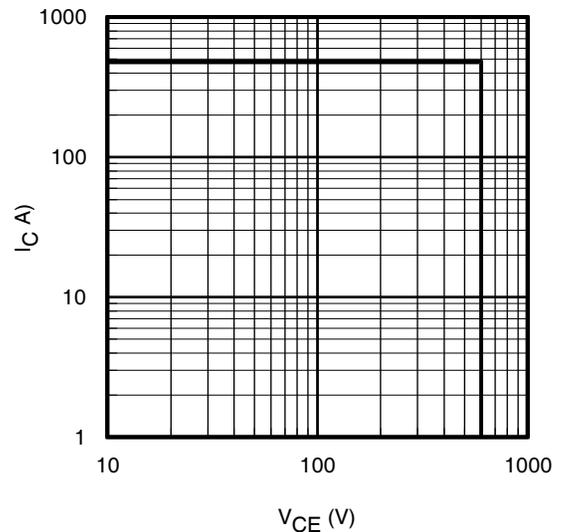
**Fig. 2 - Maximum DC Collector Current vs. Case Temperature**



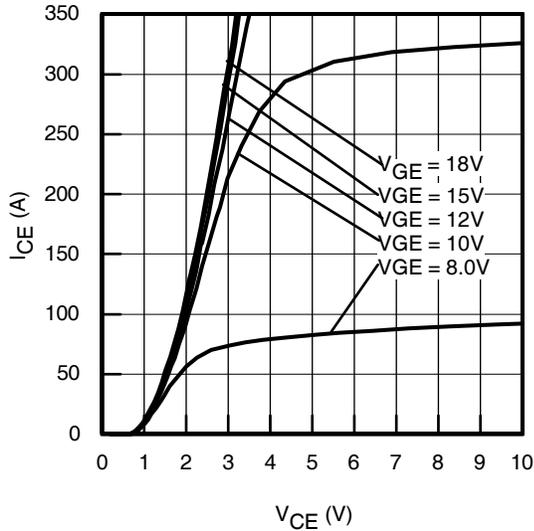
**Fig. 3 - Power Dissipation vs. Case Temperature**



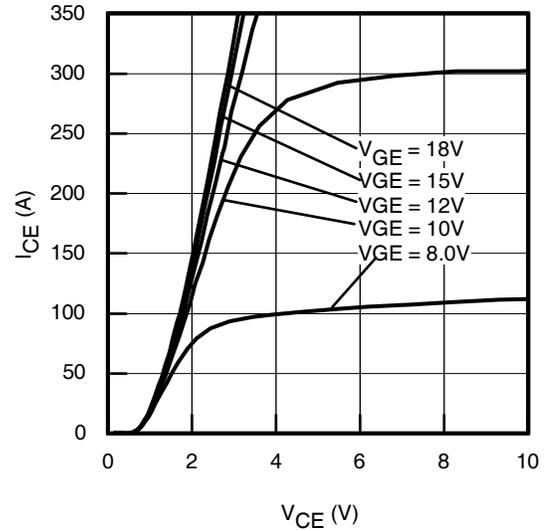
**Fig. 4 - Forward SOA**  
 $T_C = 25^\circ\text{C}$ ,  $T_J \leq 175^\circ\text{C}$ ;  $V_{GE} = 15\text{V}$



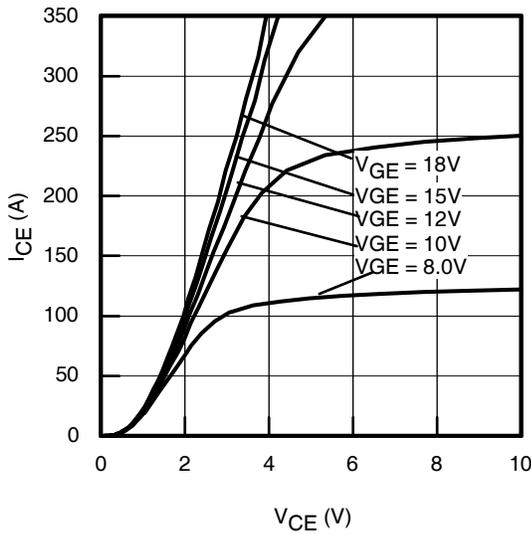
**Fig. 5 - Reverse Bias SOA**  
 $T_J = 175^\circ\text{C}$ ;  $V_{GE} = 20\text{V}$



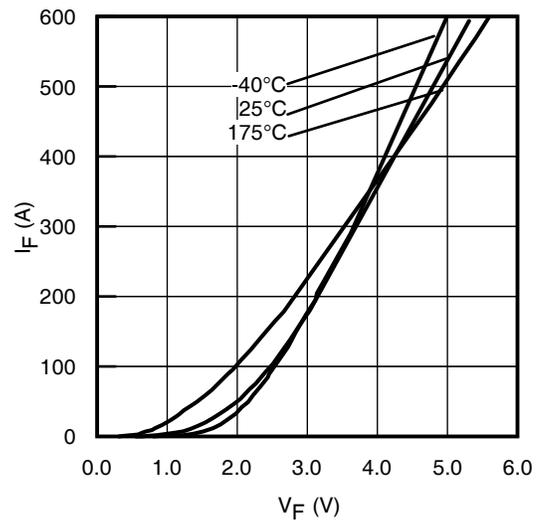
**Fig. 6** - Typ. IGBT Output Characteristics  
 $T_J = -40^\circ\text{C}$ ;  $t_p = 80\mu\text{s}$



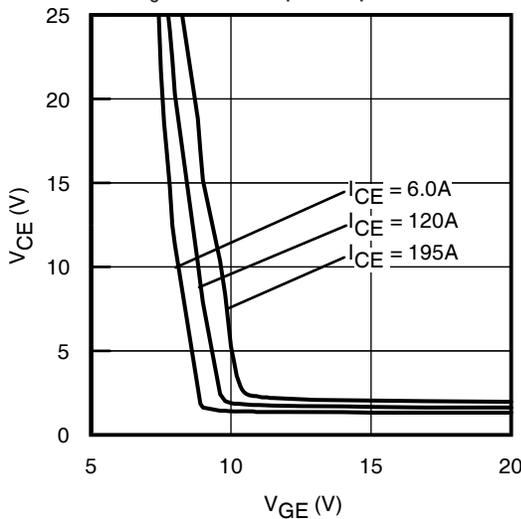
**Fig. 7** - Typ. IGBT Output Characteristics  
 $T_J = 25^\circ\text{C}$ ;  $t_p = 80\mu\text{s}$



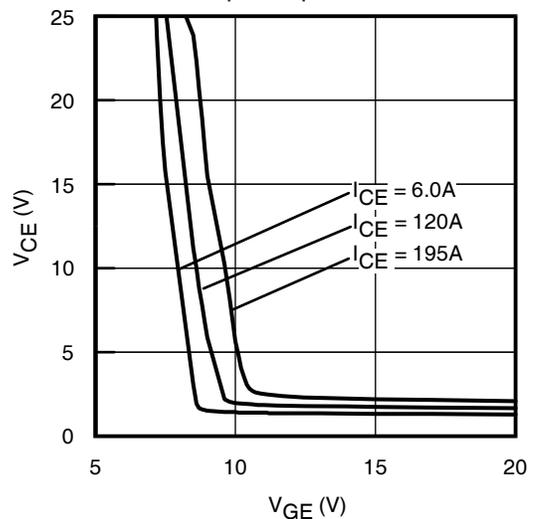
**Fig. 8** - Typ. IGBT Output Characteristics  
 $T_J = 175^\circ\text{C}$ ;  $t_p = 80\mu\text{s}$



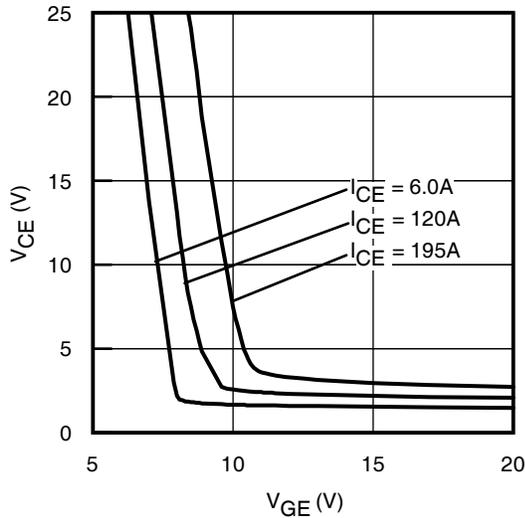
**Fig. 9** - Typ. Diode Forward Characteristics  
 $t_p = 80\mu\text{s}$



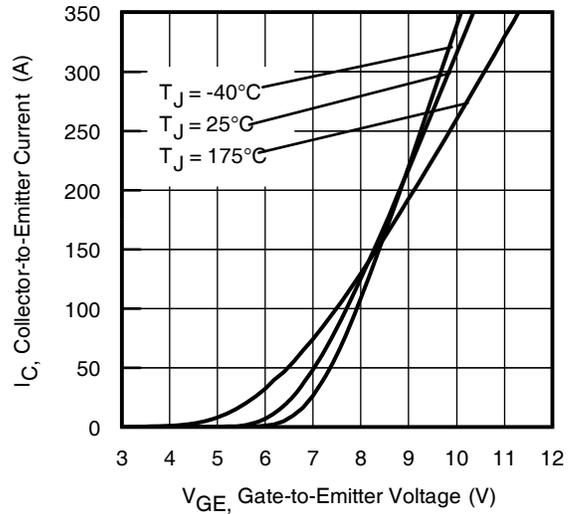
**Fig. 10** - Typical  $V_{CE}$  vs.  $V_{GE}$   
 $T_J = -40^\circ\text{C}$



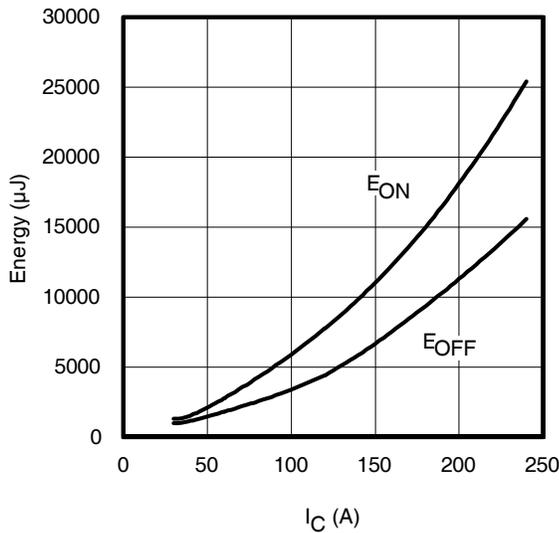
**Fig. 11** - Typical  $V_{CE}$  vs.  $V_{GE}$   
 $T_J = 25^\circ\text{C}$



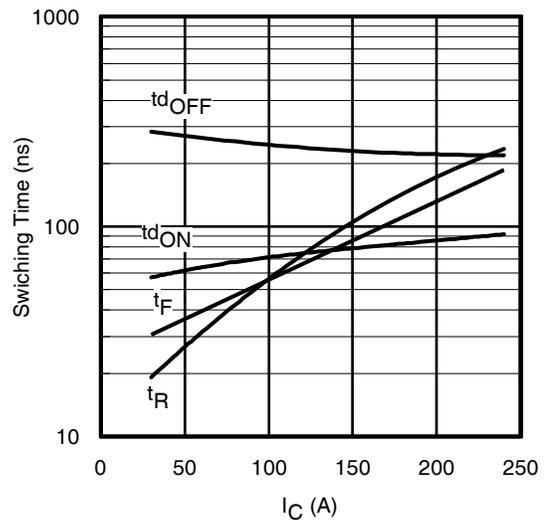
**Fig. 12** - Typical  $V_{CE}$  vs.  $V_{GE}$   
 $T_J = 175^\circ\text{C}$



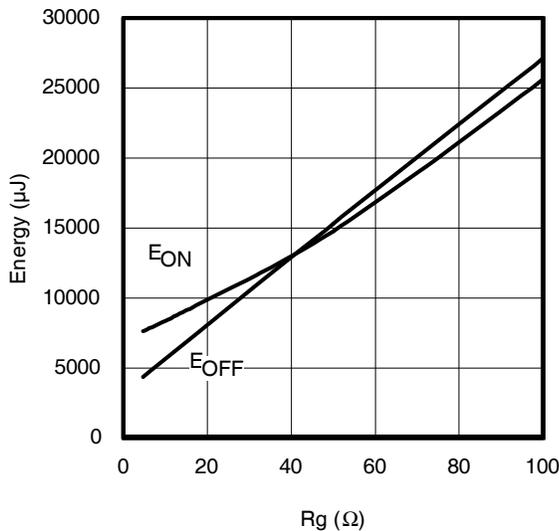
**Fig. 13** - Typ. Transfer Characteristics  
 $V_{CE} = 50\text{V}$ ;  $t_p = 10\mu\text{s}$



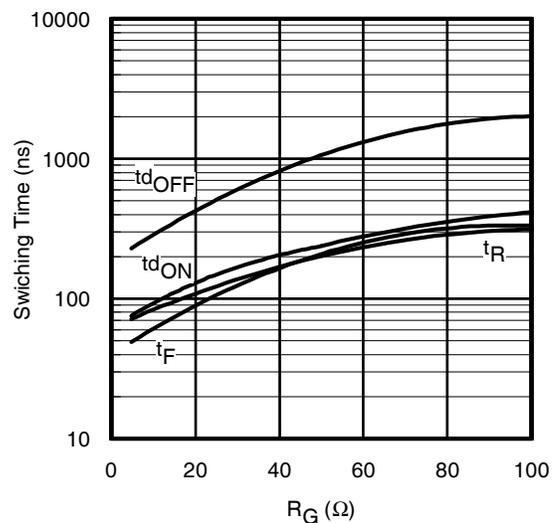
**Fig. 14** - Typ. Energy Loss vs.  $I_C$   
 $T_J = 175^\circ\text{C}$ ;  $L = 66\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ;  $R_G = 4.7\Omega$ ;  $V_{GE} = 15\text{V}$



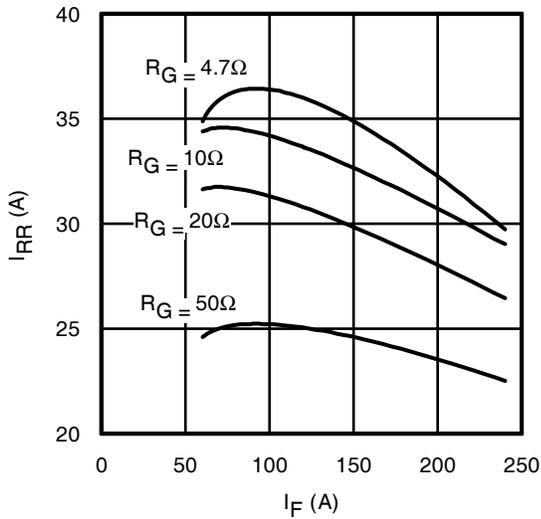
**Fig. 15** - Typ. Switching Time vs.  $I_C$   
 $T_J = 175^\circ\text{C}$ ;  $L = 66\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ;  $R_G = 4.7\Omega$ ;  $V_{GE} = 15\text{V}$



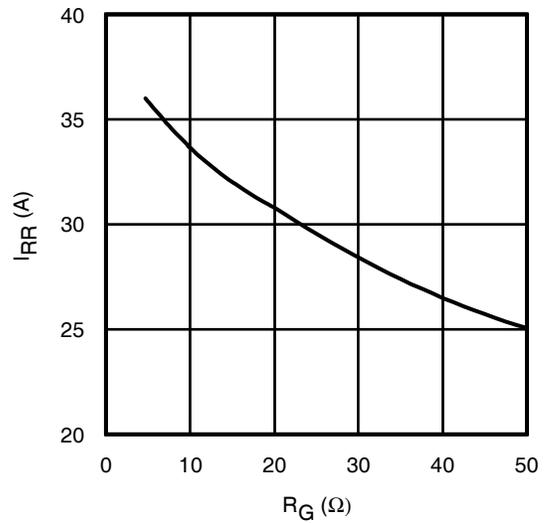
**Fig. 16** - Typ. Energy Loss vs.  $R_G$   
 $T_J = 175^\circ\text{C}$ ;  $L = 66\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ;  $I_{CE} = 120\text{A}$ ;  $V_{GE} = 15\text{V}$



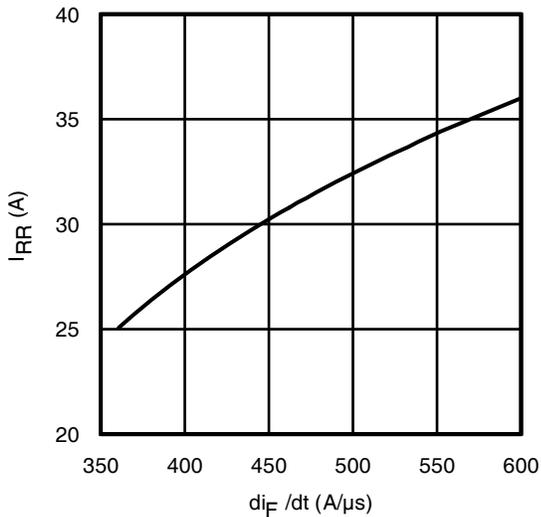
**Fig. 17** - Typ. Switching Time vs.  $R_G$   
 $T_J = 175^\circ\text{C}$ ;  $L = 66\mu\text{H}$ ;  $V_{CE} = 400\text{V}$ ;  $I_{CE} = 120\text{A}$ ;  $V_{GE} = 15\text{V}$



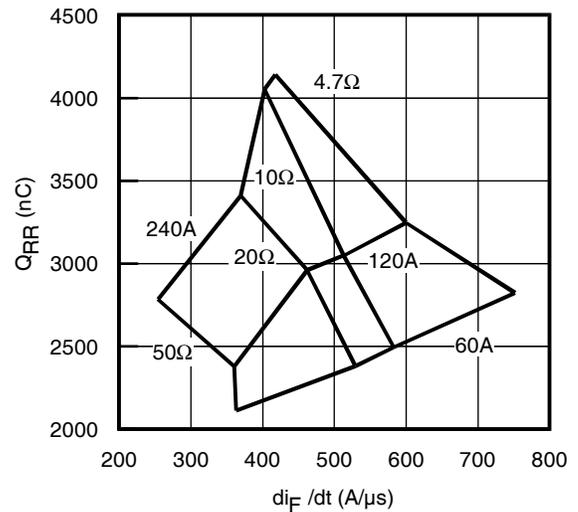
**Fig. 18** - Typ. Diode  $I_{RR}$  vs.  $I_F$   
 $T_J = 175^\circ\text{C}$



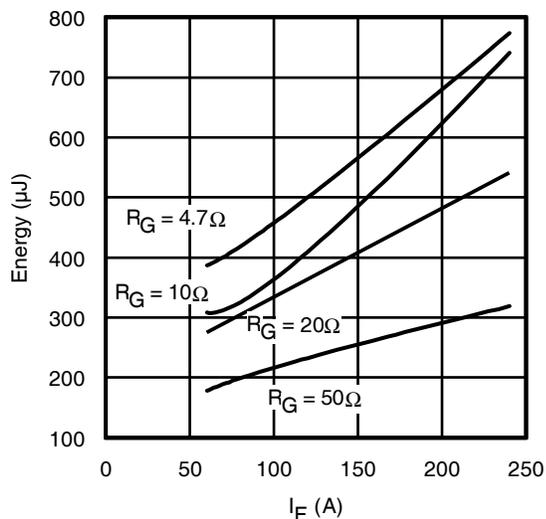
**Fig. 19** - Typ. Diode  $I_{RR}$  vs.  $R_G$   
 $T_J = 175^\circ\text{C}$



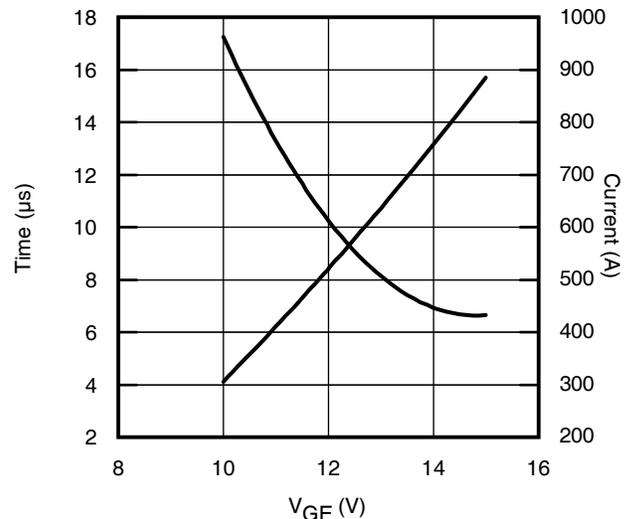
**Fig. 20** - Typ. Diode  $I_{RR}$  vs.  $di_F/dt$   
 $V_{CC} = 400\text{V}$ ;  $V_{GE} = 15\text{V}$ ;  $I_F = 120\text{A}$ ;  $T_J = 175^\circ\text{C}$



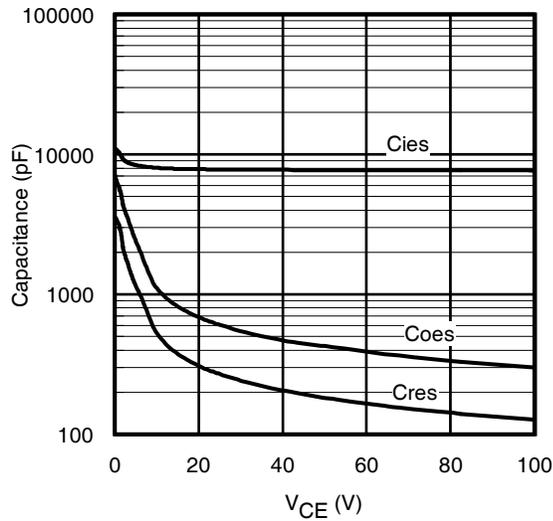
**Fig. 21** - Typ. Diode  $Q_{RR}$  vs.  $di_F/dt$   
 $V_{CC} = 400\text{V}$ ;  $V_{GE} = 15\text{V}$ ;  $T_J = 175^\circ\text{C}$



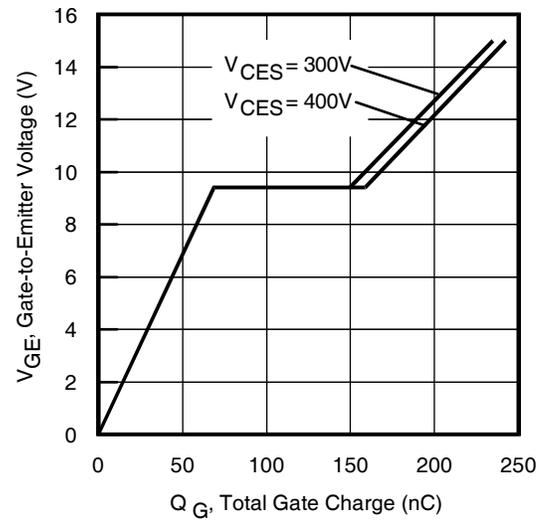
**Fig. 22** - Typ. Diode  $E_{RR}$  vs.  $I_F$   
 $T_J = 175^\circ\text{C}$



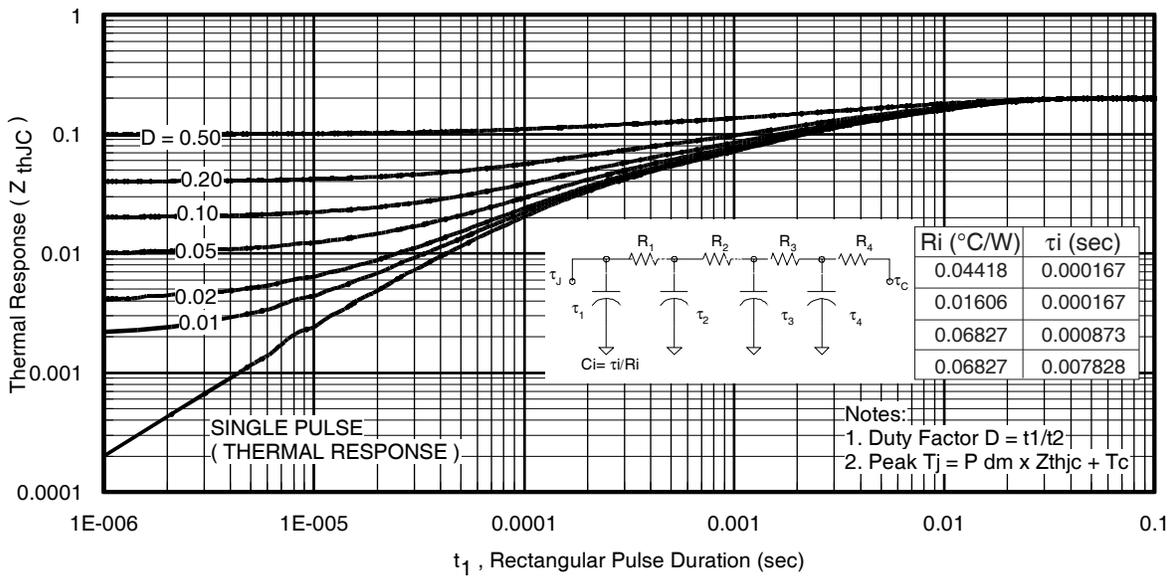
**Fig. 23** -  $V_{GE}$  vs. Short Circuit Time  
 $V_{CC} = 400\text{V}$ ;  $T_C = 25^\circ\text{C}$



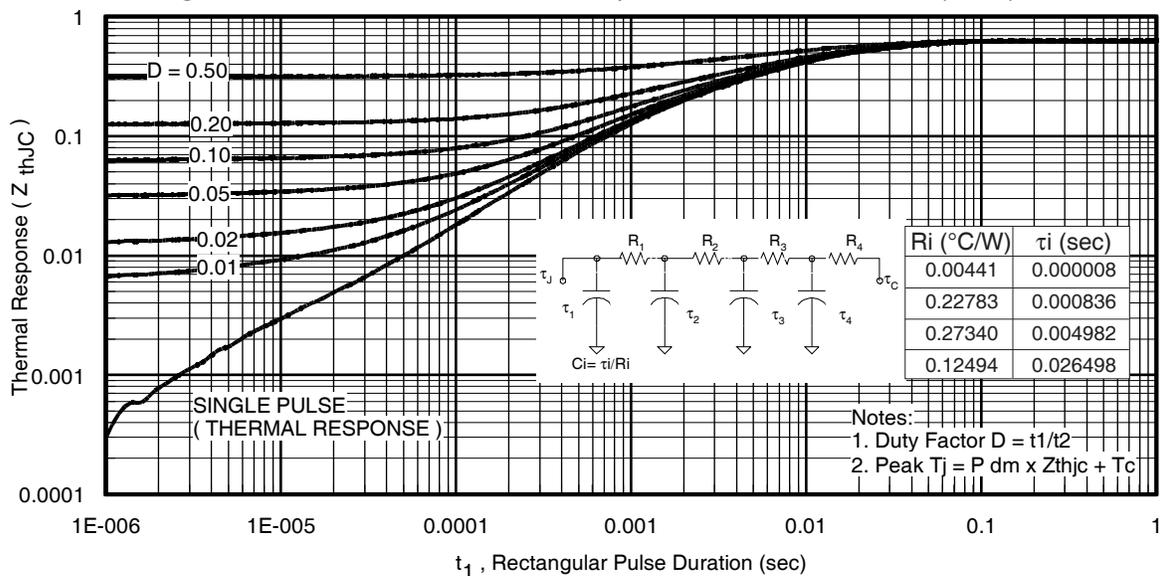
**Fig. 24 - Typ. Capacitance vs.  $V_{CE}$**   
 $V_{GE} = 0V$ ;  $f = 1MHz$



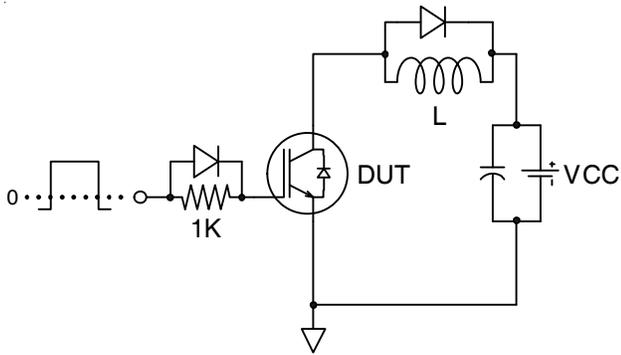
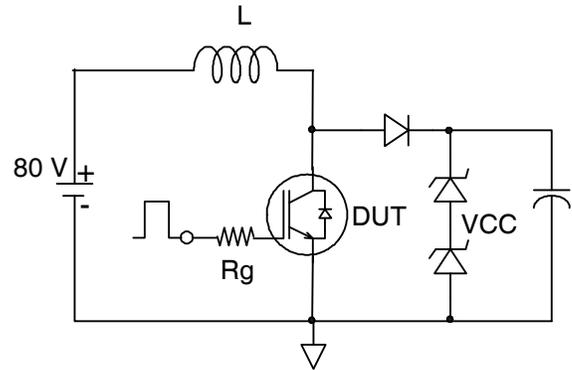
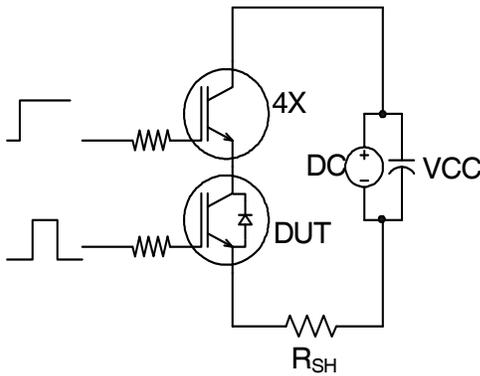
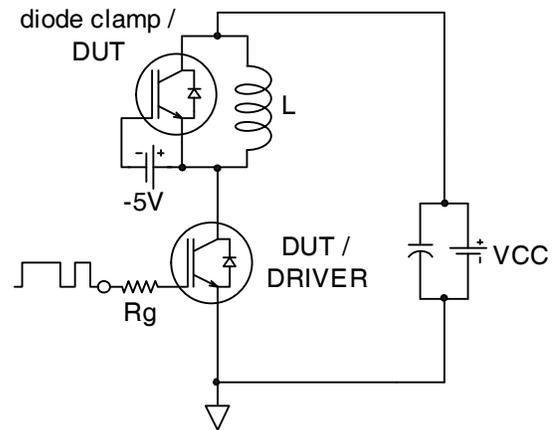
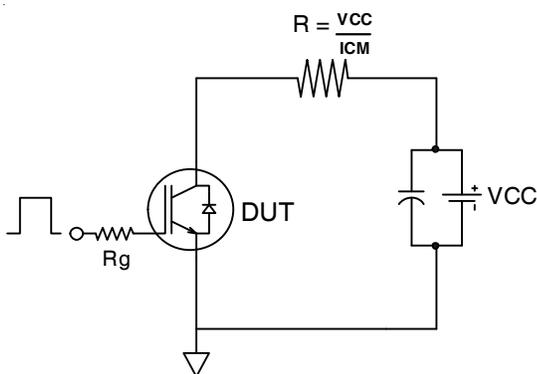
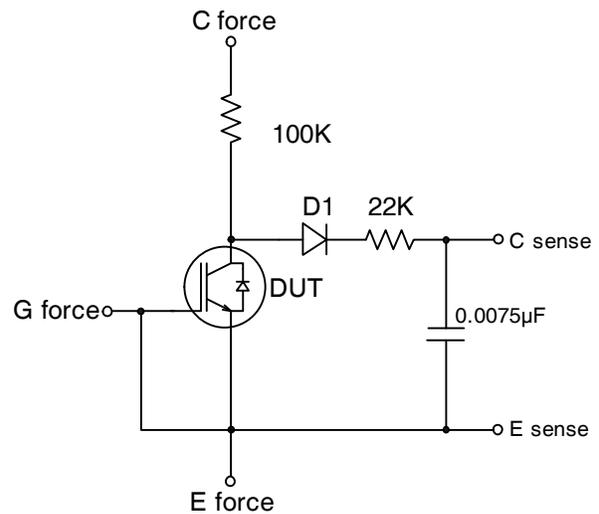
**Fig. 25 - Typical Gate Charge vs.  $V_{GE}$**   
 $I_{CE} = 120A$ ;  $L = 100\mu H$

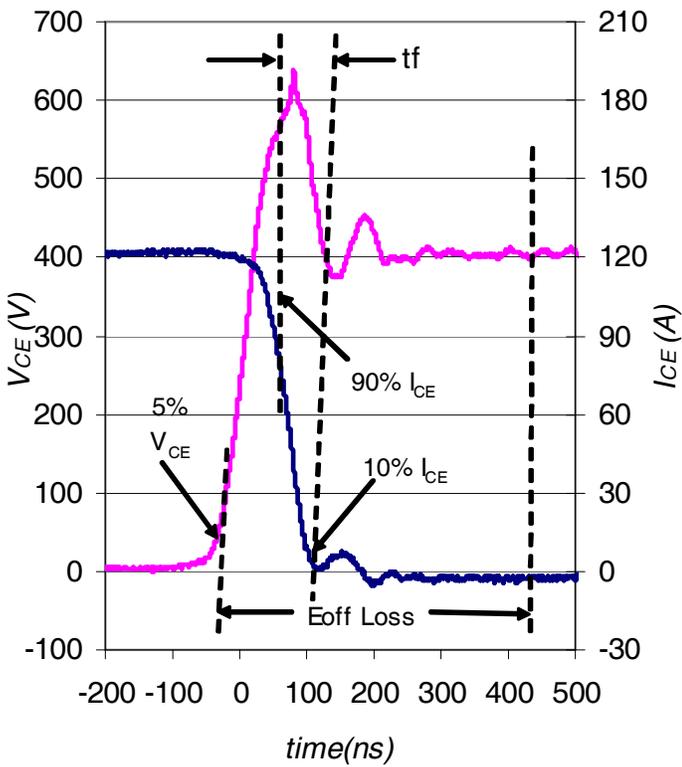


**Fig. 26. Maximum Transient Thermal Impedance, Junction-to-Case (IGBT)**

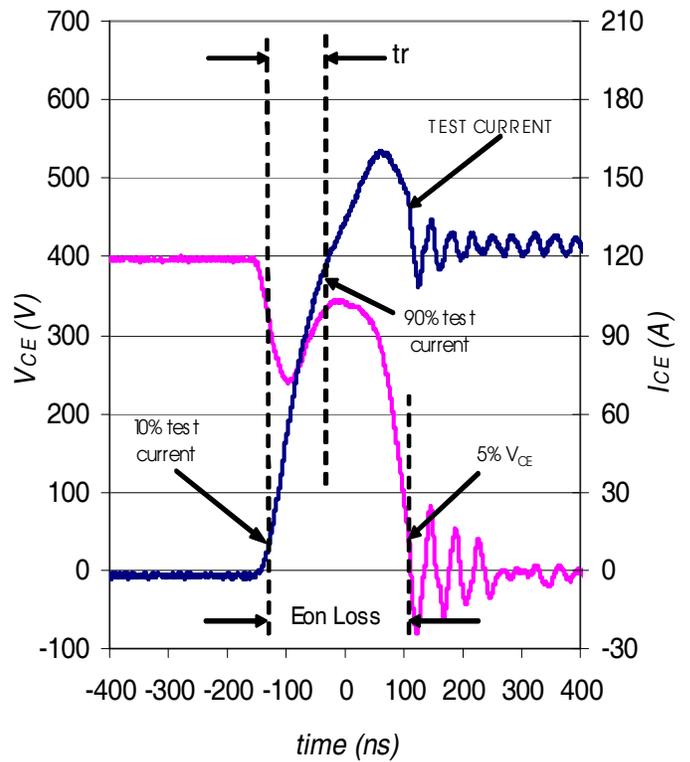


**Fig. 27. Maximum Transient Thermal Impedance, Junction-to-Case (DIODE)**

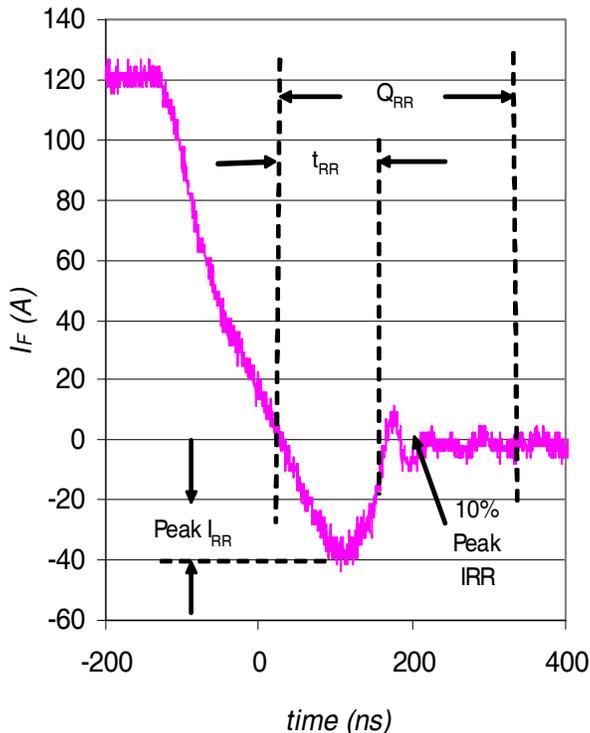

**Fig.C.T.1 - Gate Charge Circuit (turn-off)**

**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**



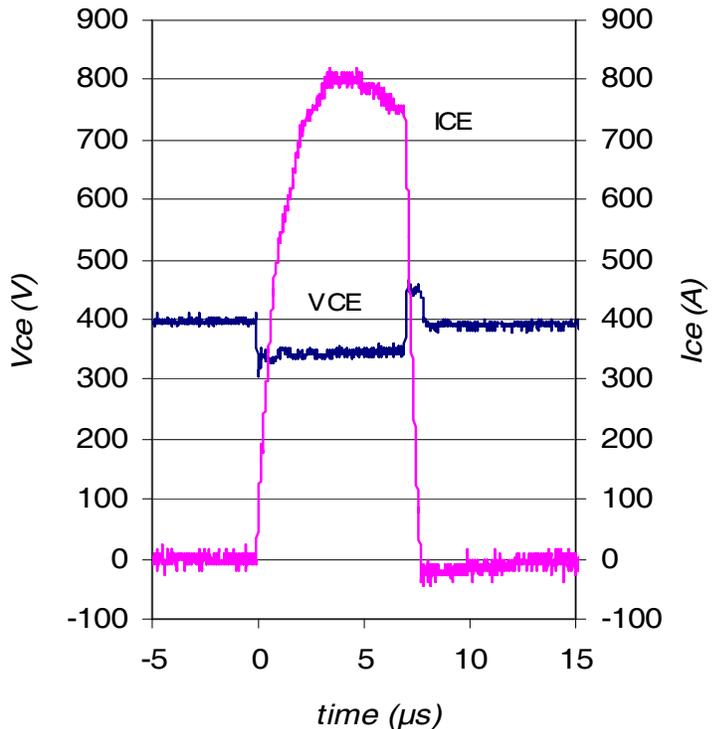
**Fig. WF1** - Typ. Turn-off Loss Waveform  
@  $T_J = 175^\circ\text{C}$  using Fig. CT.4



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

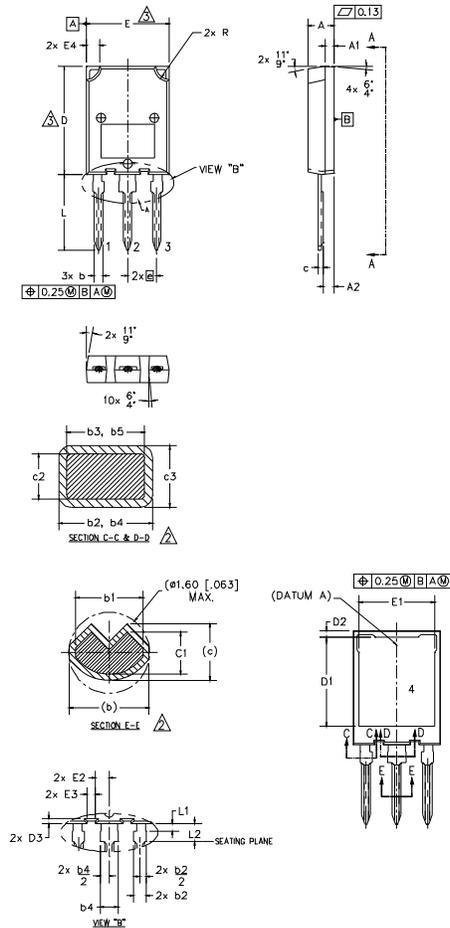


**Fig. WF3** - Typ. Diode Recovery Waveform  
@  $T_J = 175^\circ\text{C}$  using Fig. CT.4



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

# Case Outline and Dimensions — Super-247



- NOTES:
1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M-1994
  2. DIMENSIONS b1, b3, b5, c1 & c3 APPLY TO BASE METAL ONLY.
  3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTER EXTREMES OF THE PLASTIC BODY.
  4. ALL DIMENSIONS SHOWN IN MILLIMETERS.
  5. CONTROLLING DIMENSION: MILLIMETER.
  6. OUTLINE CONFORMS TO JEDEC OUTLINE TO-274AA

| SYMBOL | DIMENSIONS  |       |          |      | NOTES |
|--------|-------------|-------|----------|------|-------|
|        | MILLIMETERS |       | INCHES   |      |       |
|        | MIN.        | MAX.  | MIN.     | MAX. |       |
| A      | 4.50        | 5.50  | .177     | .217 |       |
| A1     | 1.45        | 2.15  | .057     | .085 |       |
| A2     | 1.65        | 2.35  | .065     | .093 |       |
| b      | 1.45        | 1.60  | .054     | .063 |       |
| b1     | 1.40        | 1.50  | .055     | .059 | 2     |
| b2     | 2.00        | 2.40  | .079     | .094 |       |
| b3     | 1.95        | 2.35  | .077     | .093 | 2     |
| b4     | 3.00        | 3.15  | .118     | .124 |       |
| b5     | 2.95        | 3.35  | .116     | .132 | 2     |
| c      | 1.10        | 1.30  | .043     | .051 |       |
| c1     | 0.90        | 1.10  | .035     | .043 | 2     |
| c2     | 0.65        | 0.85  | .026     | .033 |       |
| c3     | 0.50        | 0.70  | .020     | .028 | 2     |
| D      | 19.80       | 20.80 | .780     | .819 | 3     |
| D1     | 15.50       | 16.10 | .610     | .634 |       |
| D2     | 0.70        | 1.30  | .028     | .051 |       |
| D3     | 0.75        | 1.25  | .030     | .049 |       |
| E      | 15.10       | 16.10 | .594     | .634 | 3     |
| E1     | 13.30       | 13.90 | .524     | .547 |       |
| E2     | 2.25        | 2.70  | .089     | .109 |       |
| E3     | 1.20        | 1.70  | .047     | .067 |       |
| E4     | 2.00        | 3.00  | .079     | .118 |       |
| e      | 5.45 BSC    |       | .215 BSC |      |       |
| L      | 13.80       | 14.80 | .535     | .583 |       |
| L1     | 1.00        | 1.60  | .039     | .063 |       |
| L2     | 3.85        | 4.25  | .152     | .167 |       |
| R      | 2.00        | 3.00  | .079     | .118 |       |

**LEAD ASSIGNMENTS**
**MOSEFT**

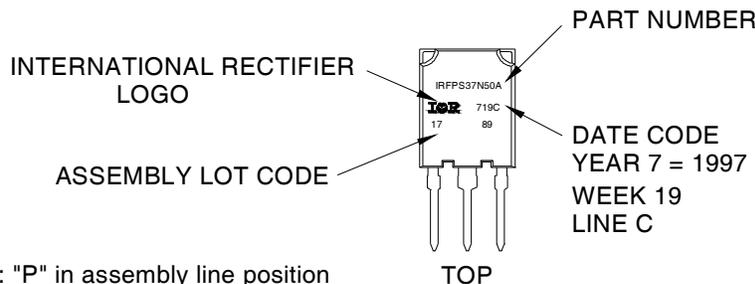
1. - GATE
2. - DRAIN
3. - SOURCE
4. - DRAIN

**IGBT**

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

## Super-247 (TO-274AA) Part Marking Information

EXAMPLE: THIS IS AN IRFPS37N50A WITH  
ASSEMBLY LOT CODE 1789  
ASSEMBLED ON WW 19, 1997  
IN THE ASSEMBLY LINE "C"



Note: "P" in assembly line position indicates "Lead-Free"

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>        |                      | Industrial<br>(per International Rectifier's internal guidelines) |     |
| <b>Moisture Sensitivity Level</b> |                      | Super-247   | N/A |
| <b>ESD</b>                        | Human Body Model     | Class H3B ( 8000V ) <sup>††</sup><br>AEC-Q101-001                 |     |
|                                   | Charged Device Model | Class C5 (1125V ) <sup>††</sup><br>AEC-Q101-005                   |     |
| <b>RoHS Compliant</b>             |                      | Yes   |     |

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

†† Highest passing voltage.

**Revision History**

| <b>Date</b> | <b>Comments</b>   |
|-------------|---|
| 11/14/2014  | <ul style="list-style-type: none"> <li>• Added note ④ to I<sub>FM</sub> Diode Maximum Forward Current on page 1.</li> <li>• Added note ⑤ to switching losses test condition on page 2.</li> </ul> |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- 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.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- 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

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

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

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