

این دیتاشیت توسط توکل الکترونیک تهیه و ارائه شده است.

جهت مشاهده قیمت، موجودی و ثبت سفارش این قطعه به وبسایت توکل الکترونیک مراجعه فرمایید.

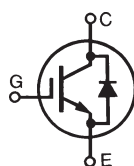


مشاهده قیمت و خرید

برای خرید و مشاهده سایر محصولات کلیک کنید

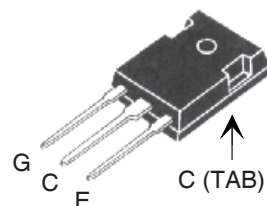


IXYS

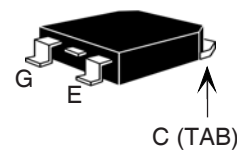
High Voltage, High Gain  
BIMOSFET™ Monolithic  
Bipolar MOS TransistorIXBH42N170  
IXBT42N170 $V_{CES} = 1700V$  $I_{C90} = 42A$  $V_{CE(sat)} \leq 2.8V$ 

| Symbol     | Test Conditions                                            | Maximum Ratings     |            |
|------------|------------------------------------------------------------|---------------------|------------|
| $V_{CES}$  | $T_C = 25^\circ C$ to $150^\circ C$                        | 1700                | V          |
| $V_{CGR}$  | $T_J = 25^\circ C$ to $150^\circ C$ , $R_{GE} = 1M\Omega$  | 1700                | V          |
| $V_{GES}$  | Continuous                                                 | $\pm 20$            | V          |
| $V_{GEM}$  | Transient                                                  | $\pm 30$            | V          |
| $I_{C25}$  | $T_C = 25^\circ C$                                         | 80                  | A          |
| $I_{LRMS}$ | Terminal Current Limit                                     | 75                  | A          |
| $I_{C90}$  | $T_C = 90^\circ C$                                         | 42                  | A          |
| $I_{CM}$   | $T_C = 25^\circ C$ , 1ms                                   | 300                 | A          |
| SSOA       | $V_{GE} = 15V$ , $T_{VJ} = 125^\circ C$ , $R_G = 10\Omega$ | $I_{CM} = 100$      | A          |
| (RBSOA)    | Clamped inductive load                                     | $V_{CES} \leq 1350$ | V          |
| $P_C$      | $T_C = 25^\circ C$                                         | 360                 | W          |
| $T_J$      |                                                            | -55 ... +150        | $^\circ C$ |
| $T_{JM}$   |                                                            | 150                 | $^\circ C$ |
| $T_{stg}$  |                                                            | -55 ... +150        | $^\circ C$ |
| $T_L$      | 1.6mm (0.062 in.) from case for 10s                        | 300                 | $^\circ C$ |
| $T_{SOLD}$ | Plastic body for 10 seconds                                | 260                 | $^\circ C$ |
| $M_d$      | Mounting torque (TO-247)                                   | 1.13/10             | Nm/lb.in.  |
| Weight     | TO-247                                                     | 6                   | g          |
|            | TO-268                                                     | 4                   | g          |

TO-247 (IXBH)



TO-268 (IXBT)

G = Gate      C = Collector  
E = Emitter    TAB = Collector

## Features

- High blocking voltage
- International standard packages
- Low conduction losses

## Advantages

- Low gate drive requirement
- High power density

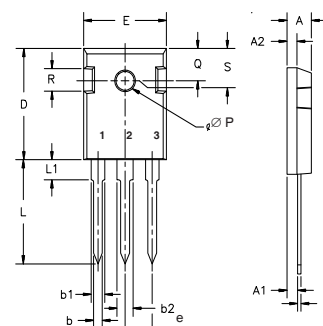
## Applications:

- Switched-mode and resonant-mode power supplies
- Uninterruptible power supplies (UPS)
- Laser generator
- Capacitor discharge circuit
- AC switches

| Symbol        | Test Conditions<br>( $T_J = 25^\circ C$ unless otherwise specified)  | Characteristic Values |      |                      |
|---------------|----------------------------------------------------------------------|-----------------------|------|----------------------|
|               |                                                                      | Min.                  | Typ. | Max.                 |
| $BV_{CES}$    | $I_C = 250\mu A$ , $V_{GE} = 0V$                                     | 1700                  |      | V                    |
| $V_{GE(th)}$  | $I_C = 250\mu A$ , $V_{CE} = V_{GE}$                                 | 2.5                   |      | 5.5 V                |
| $I_{CES}$     | $V_{CE} = 0.8 \cdot V_{CES}$<br>$V_{GE} = 0V$<br>$T_J = 125^\circ C$ |                       |      | 50 $\mu A$<br>1.5 mA |
| $I_{GES}$     | $V_{CE} = 0V$ , $V_{GE} = \pm 20V$                                   |                       |      | $\pm 100$ nA         |
| $V_{CE(sat)}$ | $I_C = 42A$ , $V_{GE} = 15V$ , Note 1<br>$T_J = 125^\circ C$         |                       | 2.7  | 2.8 V<br>V           |

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified)                                                                                         | Characteristic Values |      |                        |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|------------------------|
|              |                                                                                                                                                                   | Min.                  | Typ. | Max.                   |
| $g_{fs}$     | $I_C = 42\text{A}$ , $V_{CE} = 10\text{V}$ , Note 1                                                                                                               | 24                    | 32   | S                      |
| $C_{ies}$    | $V_{CE} = 25\text{V}$ , $V_{GE} = 0\text{V}$ , $f = 1\text{MHz}$                                                                                                  |                       | 3990 | pF                     |
| $C_{oes}$    |                                                                                                                                                                   |                       | 225  | pF                     |
| $C_{res}$    |                                                                                                                                                                   |                       | 70   | pF                     |
| $Q_g$        | $I_C = 42\text{A}$ , $V_{GE} = 15\text{V}$ , $V_{CE} = 0.5 \cdot V_{CES}$                                                                                         |                       | 188  | nC                     |
| $Q_{ge}$     |                                                                                                                                                                   |                       | 29   | nC                     |
| $Q_{gc}$     |                                                                                                                                                                   |                       | 76   | nC                     |
| $t_{d(on)}$  | <b>Resistive Switching times, <math>T_J = 25^\circ\text{C}</math></b><br>$I_C = 42\text{A}$ , $V_{GE} = 15\text{V}$<br>$V_{CE} = 850\text{V}$ , $R_G = 10\Omega$  |                       | 37   | ns                     |
| $t_r$        |                                                                                                                                                                   |                       | 139  | ns                     |
| $t_{d(off)}$ |                                                                                                                                                                   |                       | 340  | ns                     |
| $t_f$        |                                                                                                                                                                   |                       | 665  | ns                     |
| $t_{d(on)}$  | <b>Resistive Switching times, <math>T_J = 125^\circ\text{C}</math></b><br>$I_C = 42\text{A}$ , $V_{GE} = 15\text{V}$<br>$V_{CE} = 850\text{V}$ , $R_G = 10\Omega$ |                       | 36   | ns                     |
| $t_r$        |                                                                                                                                                                   |                       | 188  | ns                     |
| $t_{d(off)}$ |                                                                                                                                                                   |                       | 330  | ns                     |
| $t_f$        |                                                                                                                                                                   |                       | 740  | ns                     |
| $R_{thJC}$   | (TO-247)                                                                                                                                                          |                       | 0.25 | $0.35^\circ\text{C/W}$ |
| $R_{thCS}$   |                                                                                                                                                                   |                       |      | $^\circ\text{C/W}$     |

### TO-247 (IXBH) Outline



Terminals: 1 - Gate  
2 - Drain  
3 - Source  
Tab - Drain

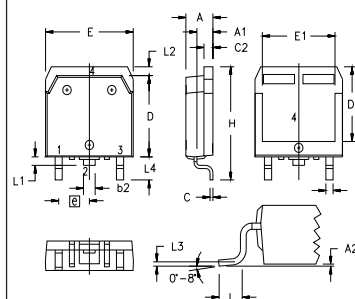
| Dim.           | Millimeter<br>Min. | Max.  | Inches<br>Min. | Max.  |
|----------------|--------------------|-------|----------------|-------|
| A              | 4.7                | 5.3   | .185           | .209  |
| A <sub>1</sub> | 2.2                | 2.54  | .087           | .102  |
| A <sub>2</sub> | 2.2                | 2.6   | .059           | .098  |
| b              | 1.0                | 1.4   | .040           | .055  |
| b <sub>1</sub> | 1.65               | 2.13  | .065           | .084  |
| b <sub>2</sub> | 2.87               | 3.12  | .113           | .123  |
| C              | .4                 | .8    | .016           | .031  |
| D              | 20.80              | 21.46 | .819           | .845  |
| E              | 15.75              | 16.26 | .610           | .640  |
| e              | 5.20               | 5.72  | 0.205          | 0.225 |
| L              | 19.81              | 20.32 | .780           | .800  |
| L1             |                    | 4.50  |                | .177  |
| ∅P             | 3.55               | 3.65  | .140           | .144  |
| Q              | 5.89               | 6.40  | 0.232          | 0.252 |
| R              | 4.32               | 5.49  | .170           | .216  |
| S              | 6.15               | BSC   | .242           | BSC   |

### Reverse Diode

| Symbol   | Test Conditions<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified)                               | Characteristic Values |      |               |
|----------|---------------------------------------------------------------------------------------------------------|-----------------------|------|---------------|
|          |                                                                                                         | Min.                  | Typ. | Max.          |
| $V_F$    | $I_F = 42\text{A}$ , $V_{GE} = 0\text{V}$                                                               |                       |      | 2.8 V         |
| $t_{rr}$ | $I_F = 21\text{A}$ , $V_{GE} = 0\text{V}$ , $-di_F/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 100\text{V}$ |                       | 1.32 | $\mu\text{s}$ |
| $I_{RM}$ |                                                                                                         |                       | 36   | A             |

Note 1: Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .

### TO-268 (IXBT) Outline



| SYM | INCHES   |      | MILLIMETERS |       |
|-----|----------|------|-------------|-------|
|     | MIN      | MAX  | MIN         | MAX   |
| A   | .193     | .201 | 4.90        | 5.10  |
| A1  | .106     | .114 | 2.70        | 2.90  |
| A2  | .001     | .010 | 0.02        | 0.25  |
| b   | .045     | .057 | 1.15        | 1.45  |
| b2  | .075     | .083 | 1.90        | 2.10  |
| C   | .016     | .026 | 0.40        | 0.65  |
| C2  | .057     | .063 | 1.45        | 1.60  |
| D   | .543     | .551 | 13.80       | 14.00 |
| D1  | .488     | .500 | 12.40       | 12.70 |
| E   | .624     | .632 | 15.85       | 16.05 |
| E1  | .524     | .535 | 13.30       | 13.60 |
| e   | .215 BSC |      | 5.45 BSC    |       |
| H   | .736     | .752 | 18.70       | 19.10 |
| L   | .094     | .106 | 2.40        | 2.70  |
| L1  | .047     | .055 | 1.20        | 1.40  |
| L2  | .039     | .045 | 1.00        | 1.15  |
| L3  | .010 BSC |      | 0.25 BSC    |       |
| L4  | .150     | .161 | 3.80        | 4.10  |

IXYS reserves the right to change limits, test conditions and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

|           |           |           |           |              |              |              |              |              |             |
|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665    | 6,404,065 B1 | 6,683,344    | 6,727,585    | 7,005,734 B2 | 7,157,338B2 |
| 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343    | 6,710,405 B2 | 6,759,692    | 7,063,975 B2 |             |
| 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505    | 6,710,463    | 6,771,478 B2 | 7,071,537    |             |

**Fig. 1. Output Characteristics**  
**@ 25°C**

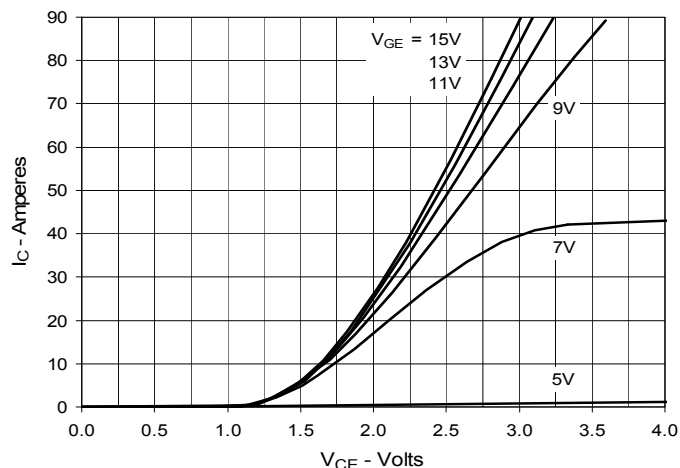


**Fig. 2. Extended Output Characteristics**  
**@ 25°C**

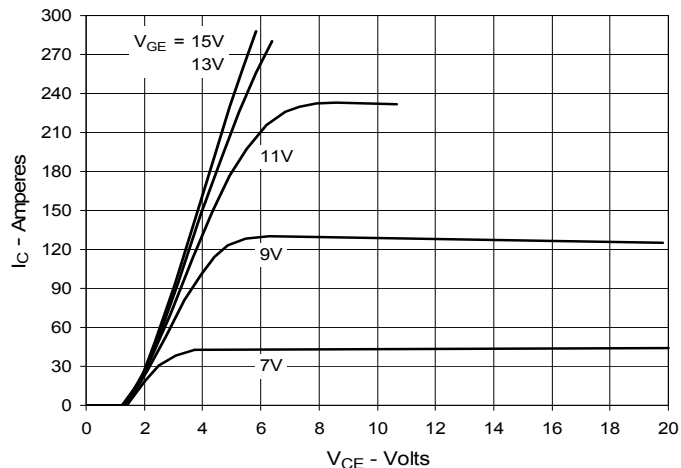


**Fig. 3. Output Characteristics**  
**@ 125°C**

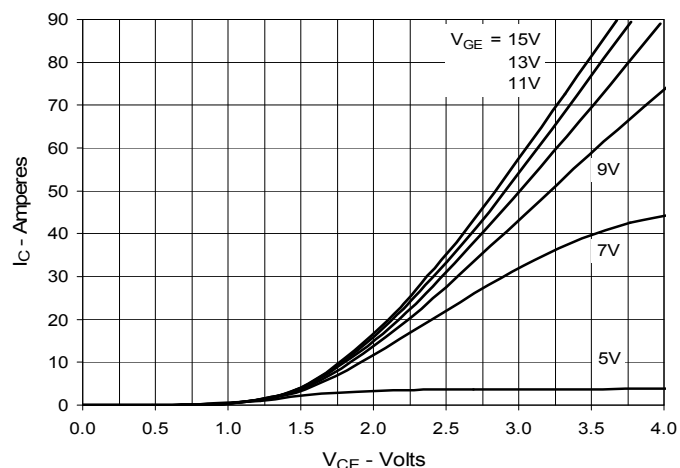


**Fig. 4. Dependence of  $V_{CE(sat)}$  on Junction Temperature**

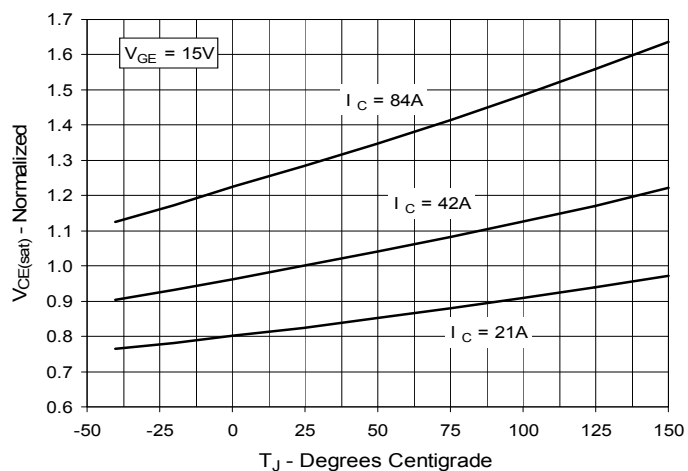


**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

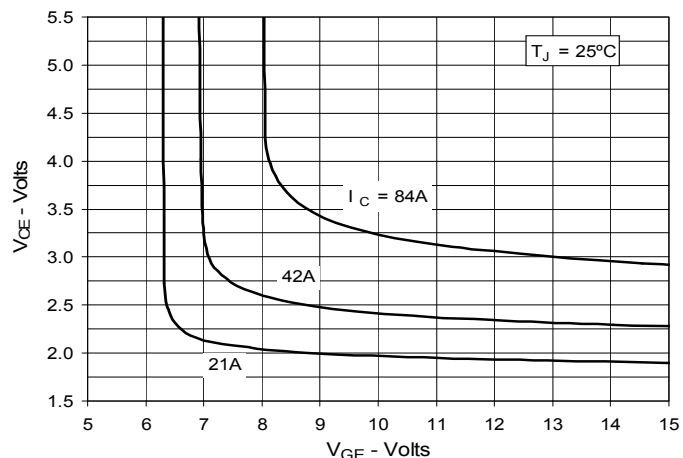


**Fig. 6. Input Admittance**

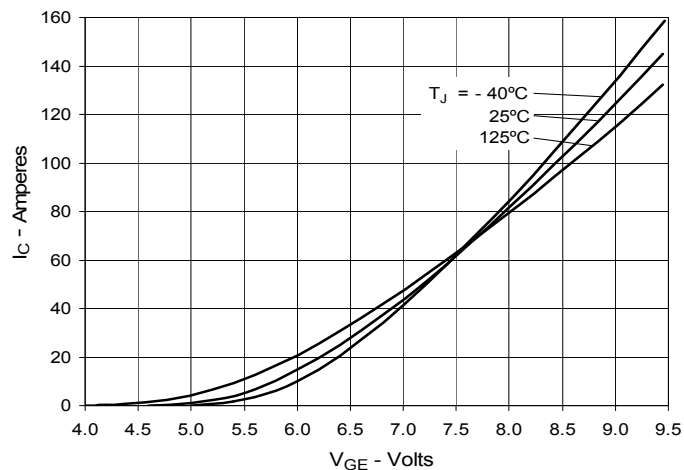


Fig. 7. Transconductance

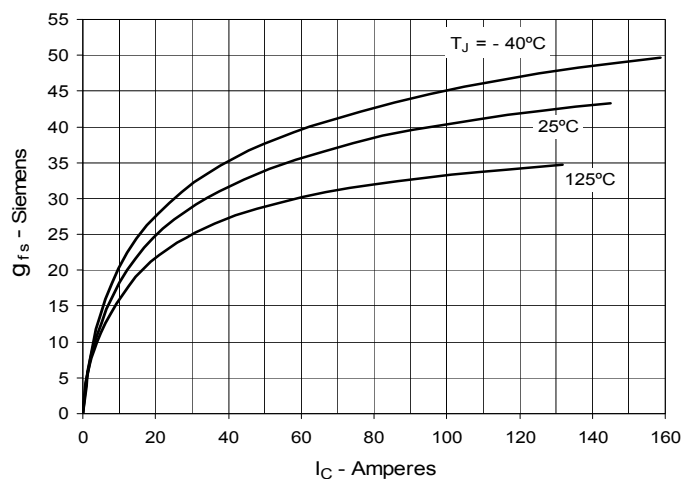


Fig. 8. Forward Voltage Drop of Intrinsic Diode

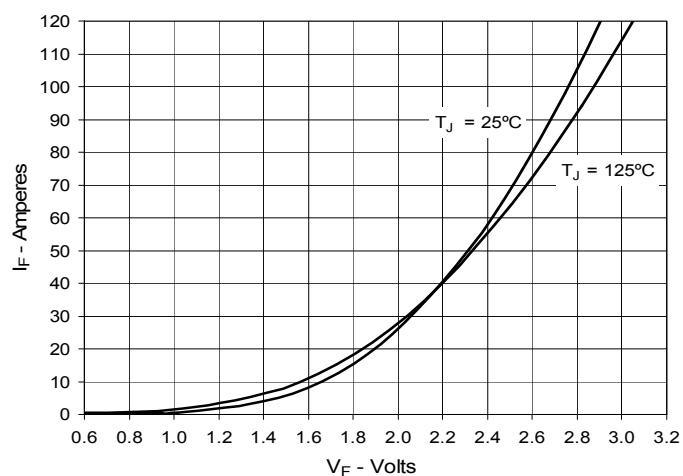


Fig. 9. Gate Charge

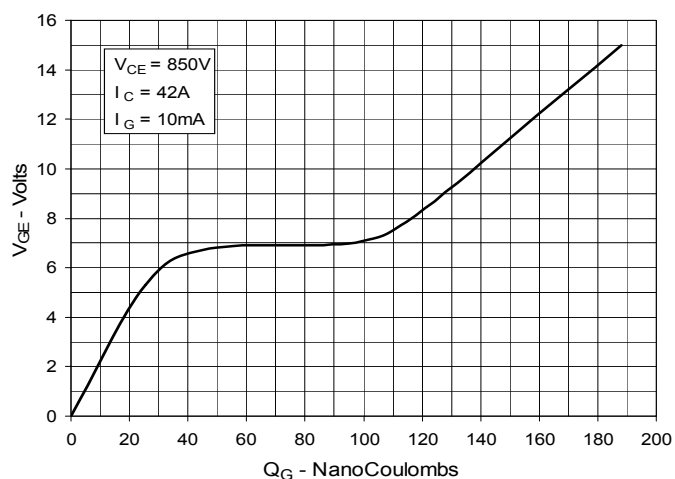


Fig. 10. Capacitance

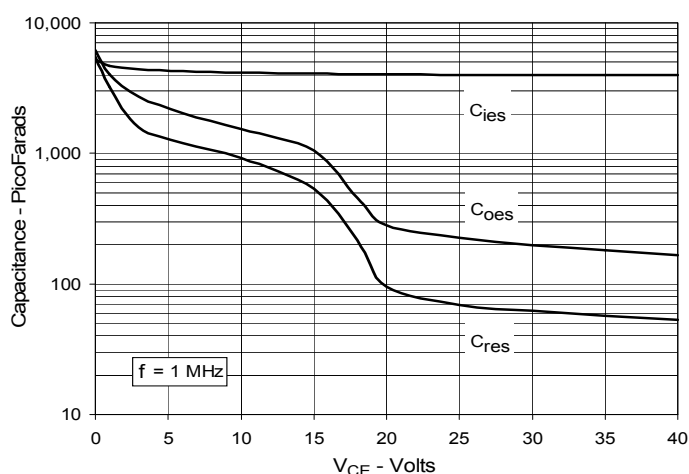


Fig. 11. Reverse-Bias Safe Operating Area

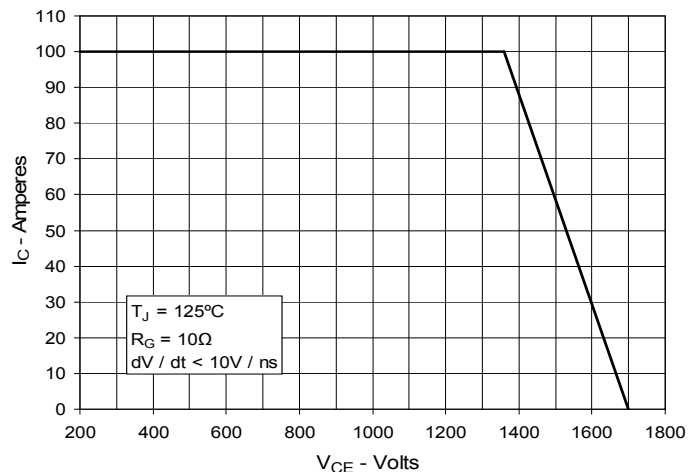


Fig. 12. Maximum Transient Thermal Impedance

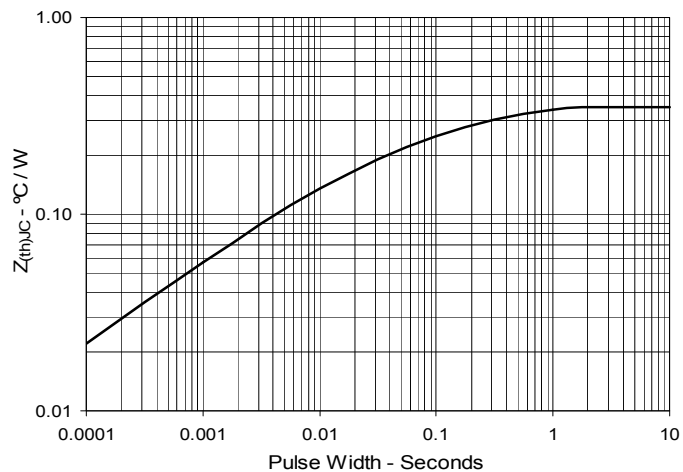


**Fig. 13. Resistive Turn-on  
Rise Time vs. Junction Temperature**

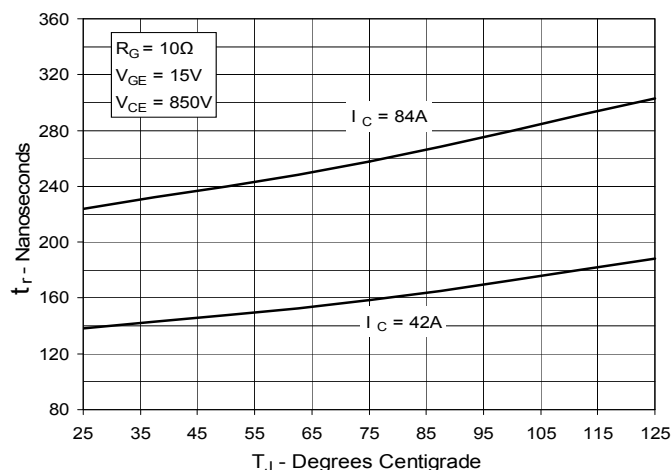


**Fig. 14. Resistive Turn-on  
Rise Time vs. Drain Current**

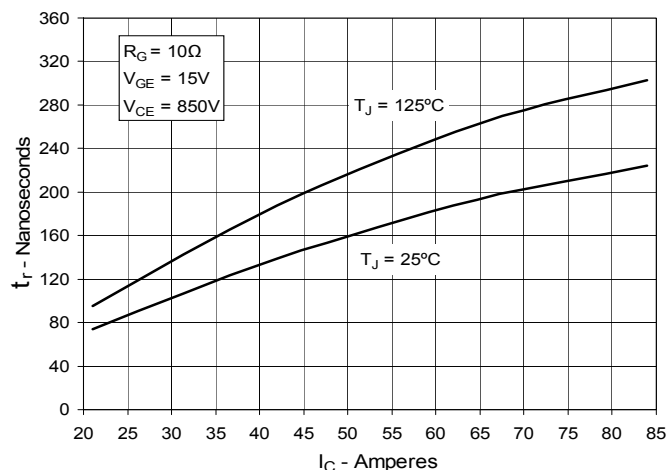


**Fig. 15. Resistive Turn-on  
Switching Times vs. Gate Resistance**

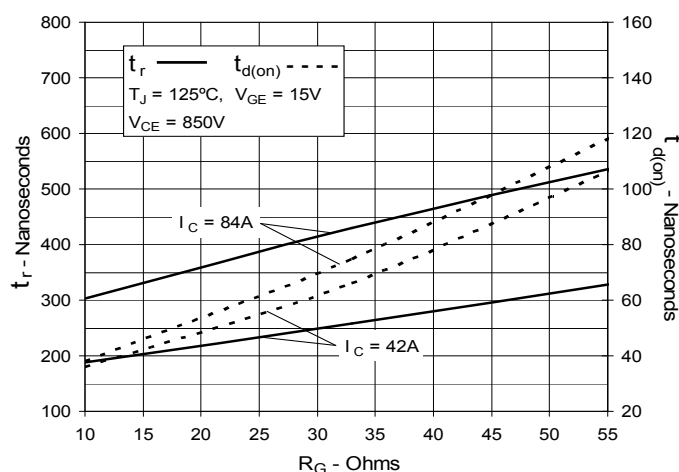


**Fig. 16. Resistive Turn-off  
Switching Times vs. Junction Temperature**

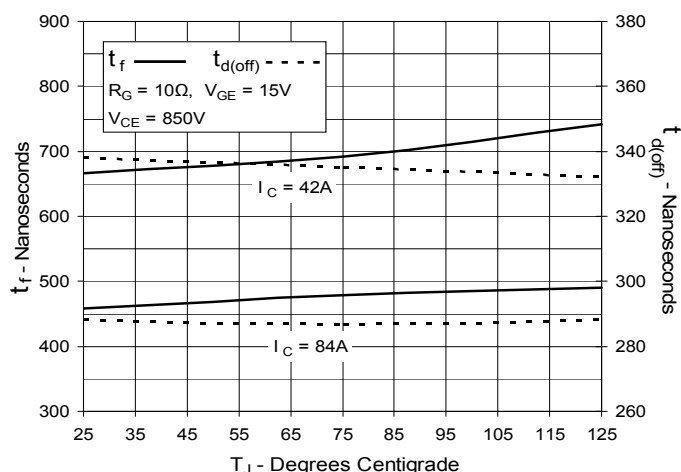


**Fig. 17. Resistive Turn-off  
Switching Times vs. Drain Current**

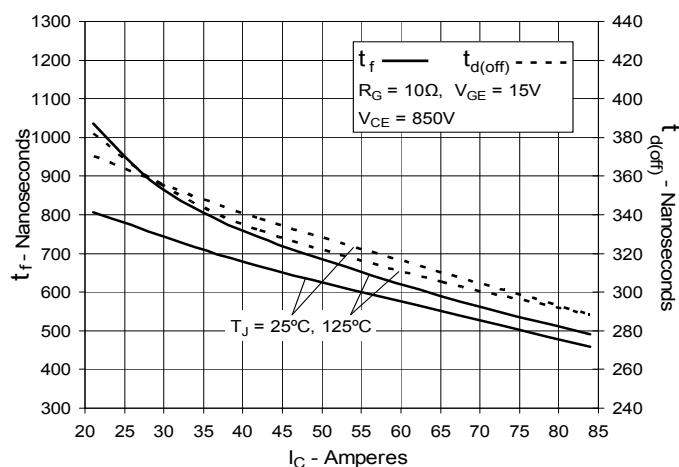
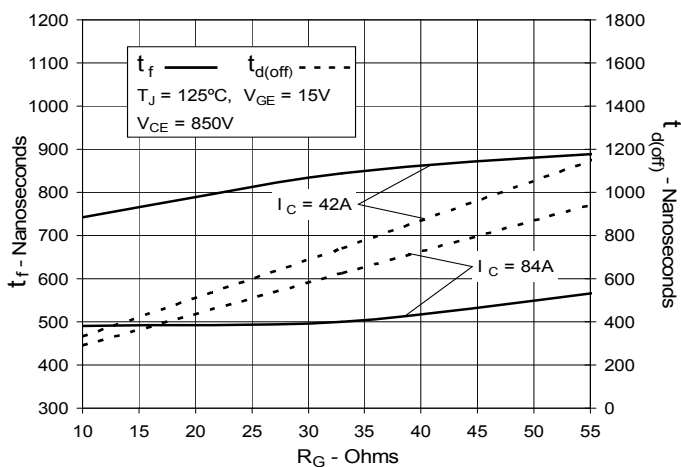


**Fig. 18. Resistive Turn-off  
Switching Times vs. Gate Resistance**





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