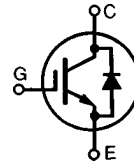


Low $V_{CE(sat)}$ IGBT with Diode
High speed IGBT with Diode

IXGH 17 N100U1
IXGH 17 N100AU1

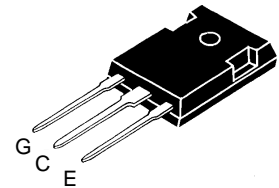
| V_{CES} | I_{C25} | $V_{CE(sat)}$ |
|---------------|-------------|---------------|
| 1000 V | 34 A | 3.5 V |
| 1000 V | 34 A | 4.0 V |

Combi Packs



| Symbol | Test Conditions | Maximum Ratings | |
|---|--|----------------------------------|------------------|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 1000 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$ | 1000 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 34 | A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 17 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | 68 | A |
| SSOA (RBSOA) | $V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 82\ \Omega$ Clamped inductive load, $L = 100\ \mu\text{H}$ | $I_{CM} = 34$ @ $0.8 V_{CES}$ | A |
| P_C | $T_C = 25^\circ\text{C}$ | 150 | W |
| T_J | | -55 ... +150 | $^\circ\text{C}$ |
| T_{JM} | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 | $^\circ\text{C}$ |
| M_d | Mounting torque (M3) | 1.13/10 | Nm/lb.in. |
| Weight | | 6 | g |
| Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | 300 | $^\circ\text{C}$ |

TO-247 AD



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

Features

- International standard package JEDEC TO-247 AD
- IGBT and anti-parallel FRED in one package
- 2nd generation HDMOS™ process
- Low $V_{CE(sat)}$
 - for minimum on-state conduction losses
- MOS Gate turn-on
 - drive simplicity
- Fast Recovery Epitaxial Diode (FRED)
 - soft recovery with low I_{RM}

Applications

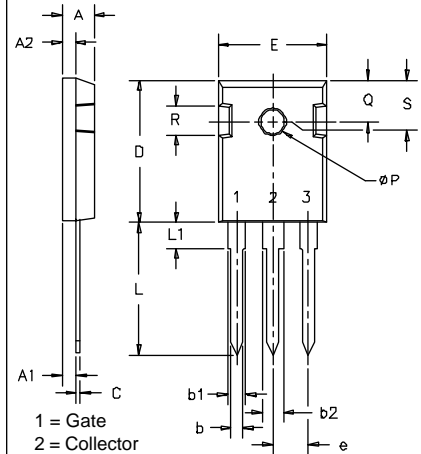
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

Advantages

- Saves space (two devices in one package)
- Easy to mount (isolated mounting screw hole)
- Reduces assembly time and cost

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|---|---|------|---------------------------|
| | | min. | typ. | max. |
| BV_{CES} | $I_C = 4.5\text{ mA}$, $V_{GE} = 0\text{ V}$ | 1000 | | V |
| $V_{GE(th)}$ | $I_C = 500\ \mu\text{A}$, $V_{CE} = V_{GE}$ | 2.5 | | V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0\text{ V}$ | | | 500 μA 8 mA |
| I_{GES} | $V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$ | | | $\pm 100\text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ | | | 3.5 V 4.0 V |
| | | | | 17N100U1 17N100AU1 |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | | |
|--------------|--|---|------|----------|----|
| | | min. | typ. | max. | |
| g_{fs} | $I_C = I_{C90}$; $V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | 6 | 15 | S | |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 1500 | pF | |
| C_{oes} | | | 210 | pF | |
| C_{res} | | | 40 | pF | |
| Q_g | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 100 | 120 nC | |
| Q_{ge} | | | 20 | 30 nC | |
| Q_{gc} | | | 60 | 90 nC | |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ | | 100 | ns | |
| t_{ri} | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 300\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 82\ \Omega$ | | 200 | ns | |
| $t_{d(off)}$ | | Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G | 500 | 1000 | ns |
| t_{fi} | | 17N100U1 | 750 | ns | |
| | | 17N100AU1 | 450 | 750 | ns |
| E_{off} | | 17N100AU1 | 3 | mJ | |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ | | 100 | ns | |
| t_{ri} | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 300\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 82\ \Omega$ | | 200 | ns | |
| E_{on} | | Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G | 700 | 1000 | ns |
| $t_{d(off)}$ | | 17N100U1 | 1200 | 2000 | ns |
| t_{fi} | | 17N100AU1 | 750 | 1000 | ns |
| E_{off} | | 17N100U1 | 8 | mJ | |
| | | 17N100AU1 | 6 | mJ | |
| R_{thJC} | | | | 0.83 K/W | |
| R_{thCK} | | | 0.25 | K/W | |

TO-247 AD Outline


| SYM | INCHES | | MILLIMETERS | |
|----------|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .185 | .209 | 4.7 | 5.3 |
| A1 | .087 | .102 | 2.2 | 2.54 |
| A2 | .059 | .098 | 2.2 | 2.6 |
| b | .040 | .055 | 1.0 | 1.4 |
| b1 | .065 | .084 | 1.65 | 2.13 |
| b2 | .113 | .123 | 2.87 | 3.12 |
| C | .016 | .031 | .4 | .8 |
| D | .819 | .845 | 20.80 | 21.46 |
| E | .610 | .640 | 15.75 | 16.26 |
| e | .215 BSC | | 5.45 BSC | |
| L | .780 | .800 | 19.81 | 20.32 |
| L1 | .177 | | 4.50 | |
| ϕP | .140 | .144 | 3.55 | 3.65 |
| Q | .212 | .244 | 5.4 | 6.2 |
| R | .170 | .216 | 4.32 | 5.49 |
| S | .242 BSC | | 6.15 BSC | |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|------------|--|---|------|-------|
| | | min. | typ. | max. |
| V_F | $I_F = I_{C90}$, $V_{GE} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 2.5 V |
| I_{RM} | $I_F = I_{C90}$, $V_{GE} = 0\text{ V}$, $-di_F/dt = 240\text{ A}/\mu\text{s}$ $V_R = 540\text{ V}$ $T_J = 125^\circ\text{C}$ $I_F = 1\text{ A}$; $-di/dt = 100\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$ $T_J = 25^\circ\text{C}$ | | 16 | 18 A |
| t_{tr} | | | 120 | ns |
| | | | 35 | 50 |
| R_{thJC} | | | | 1 K/W |

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 IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715
 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

Fig. 1 Saturation Characteristics

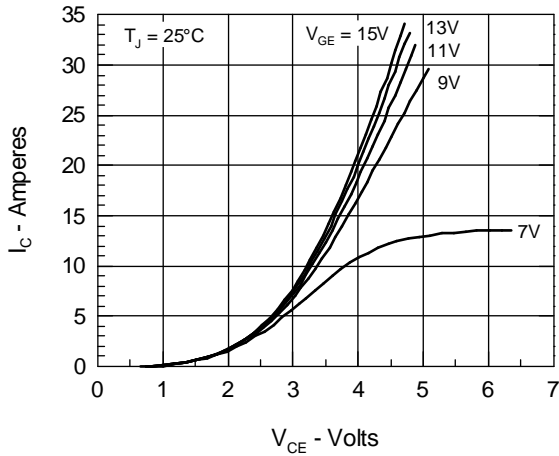


Fig. 2 Output Characteristics

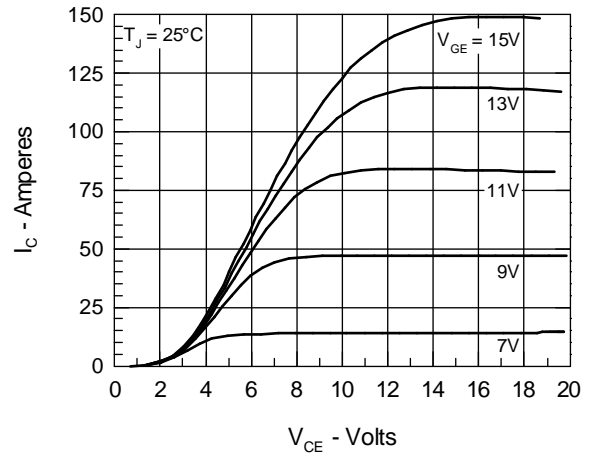


Fig. 3 Collector-Emitter Voltage vs. Gate-Emitter Voltage

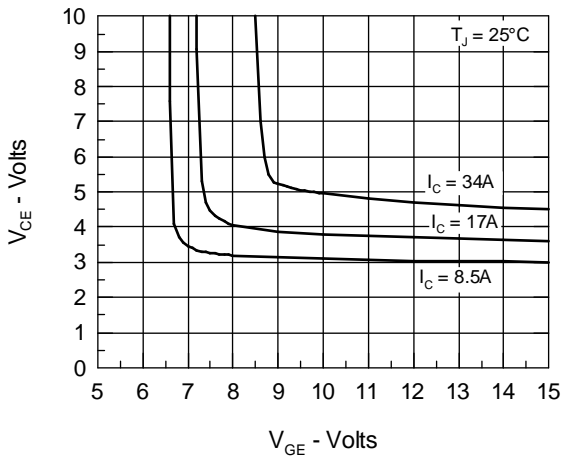


Fig. 4 Temperature Dependence of Output Saturation Voltage

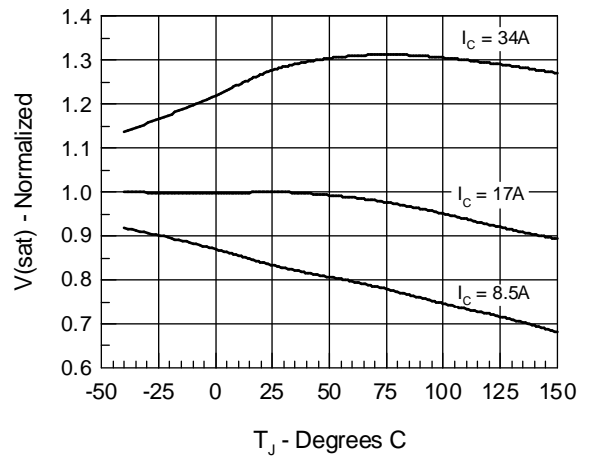


Fig. 5 Input Admittance

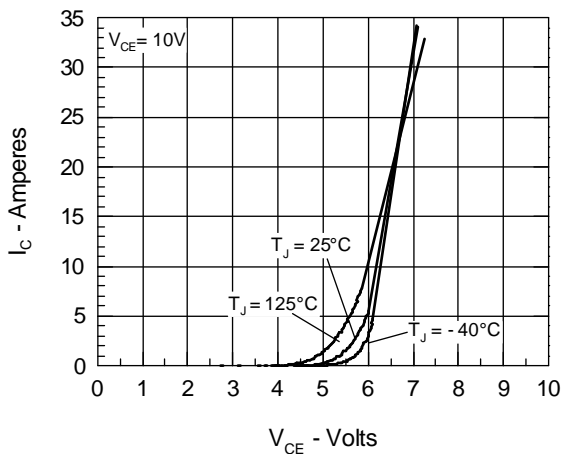


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

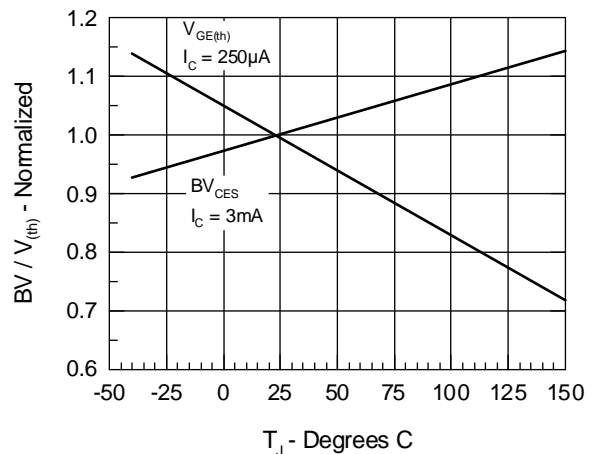


Fig.7 Gate Charge

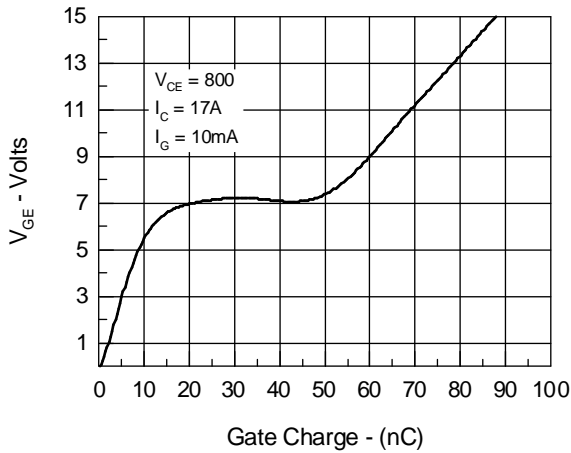


Fig.8 Turn-Off Safe Operating Area

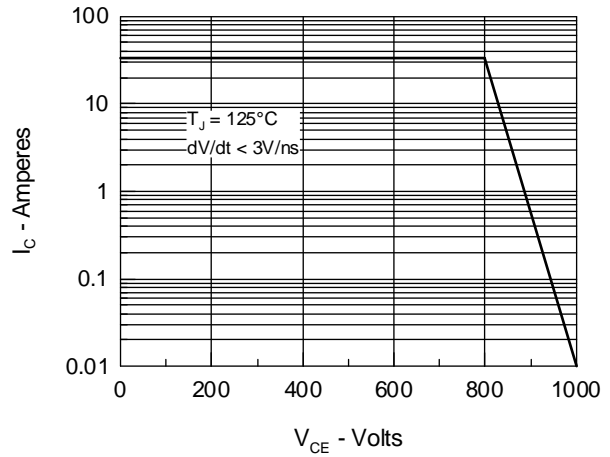


Fig.9 Capacitance Curves

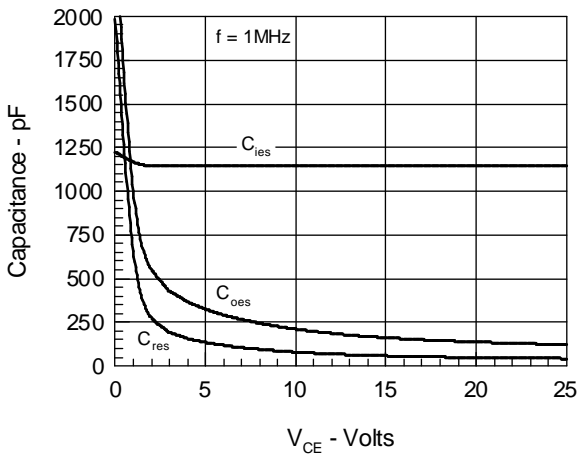
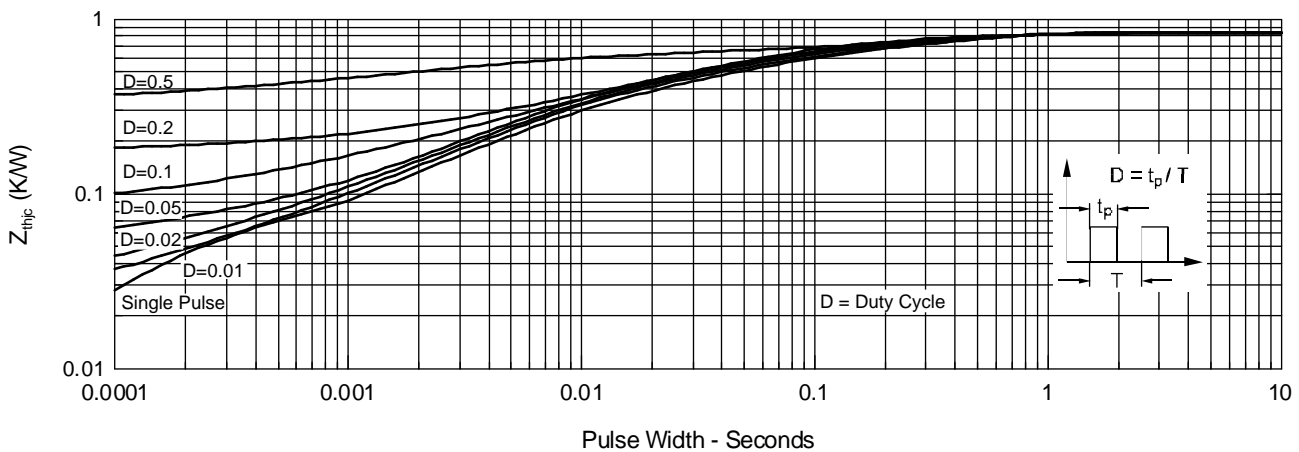


Fig.10 Transient Thermal Impedance



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4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

Fig.11 Maximum Forward Voltage Drop

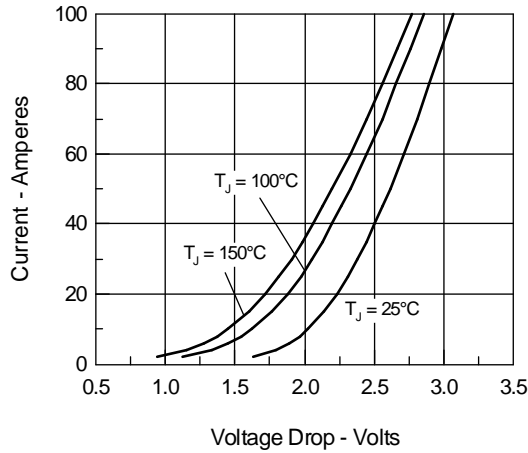


Fig.12 Peak Forward Voltage V_{FR} and Forward Recovery Time t_{FR}

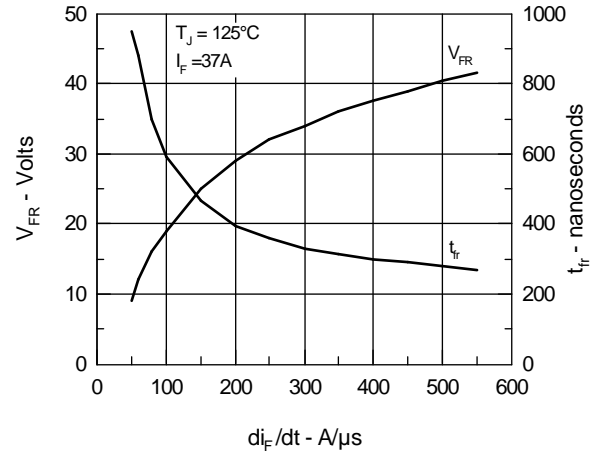


Fig.13 Junction Temperature Dependence of I_{RM} and Q_r

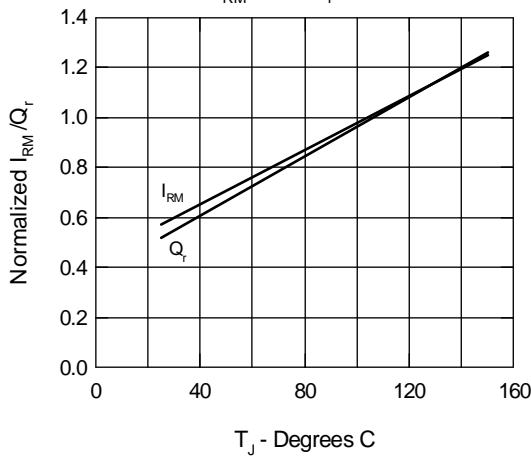


Fig.14 Reverse Recovery Charge

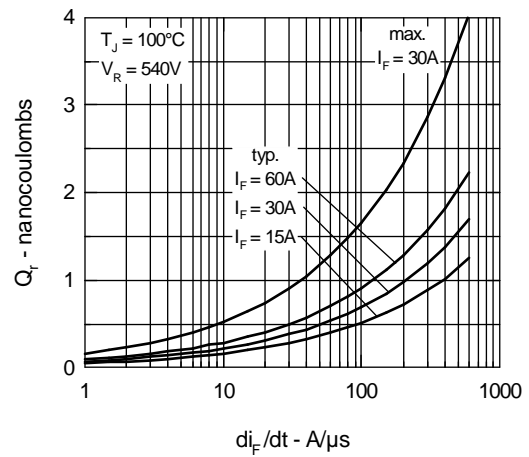


Fig.15 Peak Reverse Recovery Current

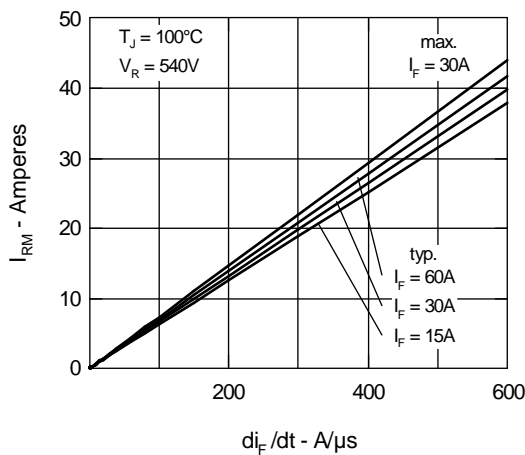


Fig.16 Reverse Recovery Time

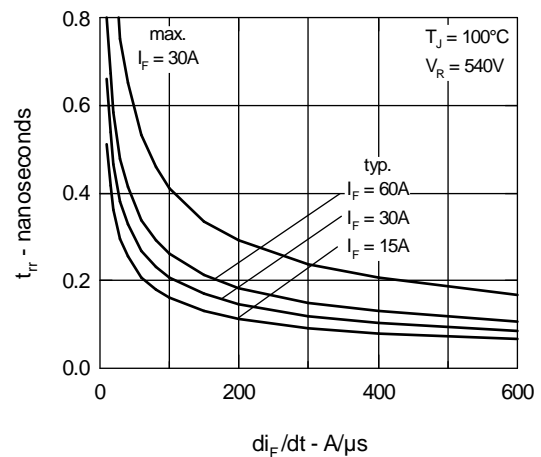
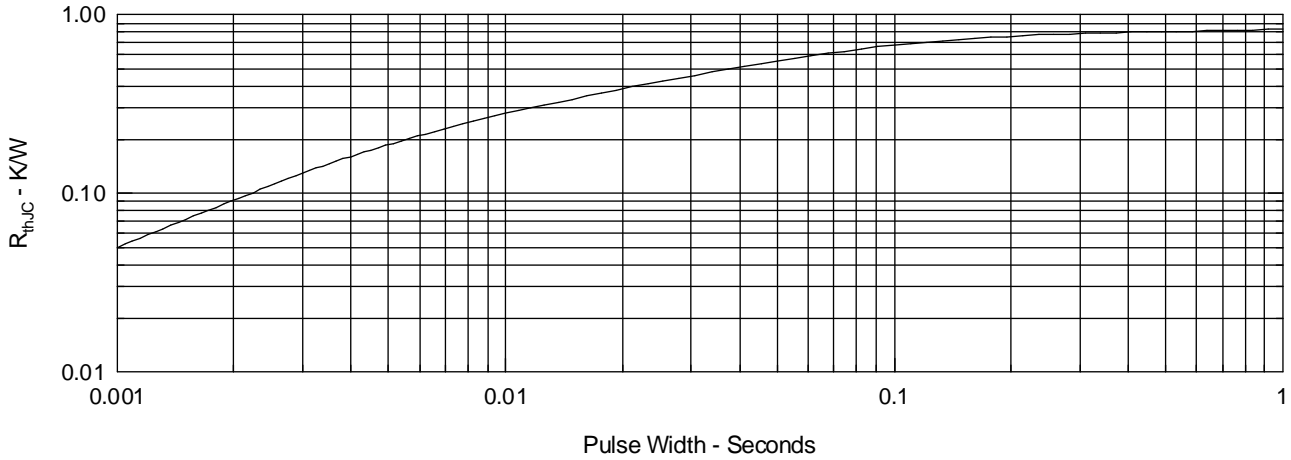


Fig.17 Diode Transient Thermal resistance junction to case



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| | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 4,835,592 | 4,881,106 | 5,017,508 | 5,049,961 | 5,187,117 | 5,486,715 |
| 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 |



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- Подбор аналогов;
- Консультации по применению компонента;
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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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